2016-05-10

cXML User's Guide

Version 1.2.030

Content

1 Preface. 12
1.1 Audience and Prerequisites. 12
1.2 Typography. 12

2 Introduction to cXML. 14
2.1 cXML, an XML Implementation. 14
2.2 cXML Capabilities. 15
Catalogs. 15
PunchOut. 16
Purchase Orders. 18
2.3 Types of Applications that Use cXML. 19
2.4 Content Delivery Strategy. 20
2.5 cXML DTDs. 21
2.6 Profile Transaction. 22
2.7 Service Status Response 22
2.8 XML Utilities. 23

3 cXML Basics. 24
3.1 Protocol Specification. 24
Request-Response Model. 24
cXML Conventions. 25
cXML Document. 26
Wrapping Layers. 26
Attachments. 27
cXML Envelope. 31
Header. 34
Request. 38
Response. 39
One-Way (Asynchronous) Model. 42
Message. 43
Transport Options. 43
Service Status Response. 46
3.2 Basic Elements. 47
Type Entities. 47
Base Elements. 48

4 Profile Transaction. 50
4.1 Introduction to the Profile Transaction. 50

4.2 ProfileRequest. . . . 50
4.3 ProfileResponse. . . . 51
Option Element. . . . 52
Transaction. . . . 55
4.4 Scenarios. . . . 55
From Buyer to Supplier. . . . 55
From Buyer to the Network. . . . 56
From a Network Hub to Supplier. . . . 57
From a Network Hub to Service Provider. . . . 58
From a Network Hub to Buyer. . . . 59
From Service Provider to Buyer. . . . 59

5 PunchOut Transaction. . . . 60
5.1 PunchOut Requirements. . . . 60
Buying Organizations. . . . 60
Suppliers. . . . 61
5.2 PunchOut Event Sequence. . . . 63
Steps 1 & 2: PunchOut Request. . . . 63
Step 3: Product Selection. . . . 65
Step 4: Check Out. . . . 66
Step 5: Transmittal of Purchase Order. . . . 67
5.3 PunchOut Documents. . . . 68
PunchOut Index Catalog. . . . 68
PunchOutSetupRequest. . . . 69
PunchOutSetupResponse. . . . 73
PunchOutOrderMessage. . . . 74
5.4 Modifications to the Supplier's Web Pages. . . . 75
Launch Page. . . . 76
Start Page. . . . 78
Sender Page. . . . 78
Order Receiver Page. . . . 81
5.5 PunchOut Website Suggestions. . . . 81
Implementation Guidelines. . . . 81
Buyer and Supplier Cookies. . . . 82
Personalization. . . . 82
5.6 PunchOut Transaction. . . . 83
Sourcing. . . . 83
PunchOutSetupRequest. . . . 83
PunchOutSetupResponse. . . . 88
PunchOutOrderMessage. . . . 88
5.7 Direct PunchOut. . . . 97
Authentication Methods. . . . 97

ProfileResponse. 98

6 Purchase Orders. 99

6.1 Purchase Order Process. 99

6.2 OrderRequest Documents. 100

OrderRequestHeader. 103

ItemOut. 120

6.3 Response to an OrderRequest. 162

6.4 Accepting Order Attachments. 163

7 Path Routing. 164

7.1 Overview of Path Routing. 164

7.2 Nodes. 165

Path Element. 165

Router Nodes. 166

Copy Nodes. 167

7.3 Adding Nodes to PunchOutOrderMessage. 168

Path Element. 168

Credentials. 169

7.4 Creating OrderRequests. 169

Path Element. 169

Credentials. 170

7.5 Other Routable Documents. 171

PunchOutSetupRequest. 171

ConfirmationRequest and ShipNoticeRequest. 172

7.6 CopyRequest. 172

8 Request for Quotations. 174

8.1 Overview of Request for Quotations. 174

Quote DTD. 174

Request for Quotations Document Sequence. 174

8.2 Request for Quotations. 175

QuoteRequestHeader. 175

QuoteItemOut. 178

8.3 quoteMessage. 179

QuoteMessageHeader. 179

QuoteItemIn. 182

9 Payment. 183

9.1 Overview of Payment. 183

PaymentRemittance DTD. 183

Payment Document Sequence. 184

9.2 PaymentProposalRequest. 184

PayableInfo. 185
PaymentMethod. 187
PaymentPartner. 188
DiscountBasis. 191
TaxAdjustment. 191
NetAmount. 192
9.3 PaymentRemittanceRequest. 192
PaymentRemittanceRequestHeader. 193
PaymentRemittanceSummary. 195
RemittanceDetail. 196
9.4 PaymentRemittanceStatusUpdateRequest. 199
DocumentReference. 199
PaymentRemittanceStatus. 200
9.5 Example Payment Documents. 201
PaymentProposalRequest Examples. 201
PaymentRemittanceRequest Example. 203
PaymentRemittanceStatusUpdateRequest Example. 205
9.6 TradeRequest. 206
TradeRequestHeader. 208
TradeRequestSummary. 208
TradeItem. 209

10 TimeCard Transaction. 211
10.1 TimeCard Requests. 211
Supplier to Buyer Request. 212
Buyer to Supplier Request. 212
10.2 TimeCard Element. 212
OrderInfo. 212
Contractor. 213
ReportedTime. 213
SubmitterInfo. 216
ApprovalInfo. 216
DocumentReference. 216
10.3 TimeCard Examples. 216

11 Master Agreements and Contracts. 220
11.1 Overview of Master Agreements. 220
11.2 MasterAgreementRequest. 220
MasterAgreementRequestHeader. 221
AgreementItemOut. 222
11.3 ContractRequest. 223
ContractRequestHeader. 225

ContractItemIn. 226
11.4 ContractStatusUpdateRequest. 227
Status. 227
ContractStatus. 228
Extrinsic. 228

12 Later Status Changes. 229
12.1 Overview of Status. 229
12.2 StatusUpdateRequest. 229
DocumentReference. 231
PaymentStatus. 231
SourcingStatus. 232
InvoiceStatus. 232
DocumentStatus. 233
Extrinsic. 236
12.3 ConfirmationRequest. 236
OrderReference. 238
ConfirmationHeader. 239
ConfirmationItem. 245
12.4 OrderStatusRequest. 249
OrderStatusRequestHeader. 249
OrderStatusRequestItem. 250
12.5 ShipNoticeRequest. 251
ShipNoticeHeader. 253
ShipControl. 258
ShipNoticePortion. 264
12.6 ReceiptRequest. 271
ReceiptRequestHeader. 271
ReceiptOrder. 272

13 Invoices. 276
13.1 Overview of Invoices. 276
Early InvoiceRequest Document. 276
Debit and Credit Amounts. 277
Shipping Information. 277
Types of Invoices. 277
Invoice DTD. 279
13.2 InvoiceDetailRequest. 279
InvoiceDetailRequestHeader. 279
InvoiceDetailOrder. 286
InvoiceDetailHeaderOrder. 307
InvoiceDetailSummary. 309

13.3 Response. . . . 312
13.4 Invoice Status Update. . . . 313
13.5 Example Invoices. . . . 314
Standard Header Invoice. . . . 314
Standard Detail Invoice. . . . 317
Service Invoice. . . . 320
Marketplace Invoice. . . . 324
Line Item Credit Memo for a Return Item. . . . 325
Invoice with Accounting Distributions. . . . 325

14 Service Sheets. . . . 329
14.1 Overview of Service Sheets. . . . 329
14.2 ServiceEntryRequest. . . . 329
ServiceEntryRequestHeader. . . . 330
ServiceEntryOrder. . . . 334
14.3 Service Sheet Status Updates. . . . 342

15 Catalogs. . . . 343
15.1 Catalog Definitions. . . . 343
Supplier. . . . 343
Index. . . . 345
15.2 Type Definitions. . . . 347
TypeProvider. . . . 348
Type. . . . 348
TypeAttribute. . . . 349
PrimitiveType. . . . 351
15.3 Subscription Management Definitions. . . . 352
Supplier Data. . . . 352
Supplier Profile Information. . . . 355
Catalog Subscriptions. . . . 358
15.4 Catalog Upload Transaction. . . . 361
CatalogUploadRequest. . . . 361
Response. . . . 366

16 Get Pending/Data Download Transaction. . . . 369
16.1 Introduction to Get Pending/Data Download Transaction. . . . 369
16.2 GetPendingRequest. . . . 369
16.3 GetPendingResponse. . . . 370
No Documents Waiting. . . . 370
Documents Waiting. . . . 371
16.4 DataRequest. . . . 373
16.5 DataResponse. . . . 373

17 Provider PunchOut Transaction. 375
17.1 Message Flow. 375
17.2 ProviderSetupRequest Document. 376
Header. 376
Request. 376
Sample. 378
17.3 ProviderSetupResponse Document. 379
Response. 380
Status. 380
ProviderSetupResponse. 380
StartPage URL. 380
Sample. 381
17.4 ProviderDoneMessage Document. 381
Header. 381
Message. 382
OriginatorCookie. 382
ReturnData. 383
ReturnValue. 383
Sample. 383

18 Supply Chain Collaboration. 385
18.1 ProductActivityMessage. 385
ProductActivityHeader. 386
ProductActivityDetails. 386
18.2 ComponentConsumptionRequest. 393
ComponentConsumptionHeader. 393
ComponentConsumptionPortion. 394
18.3 ProductReplenishmentMessage. 396
ProductReplenishmentHeader. 401
ProductReplenishmentDetails. 401
Extrinsic. 403

19 Logistics. 404
19.1 Overview of Logistics. 404
Logistics Terms. 404
Logistics Process. 405
19.2 TransportRequest. 406
TransportRequestHeader. 409
Consignment. 410
TransportSummary. 416
19.3 TransportConfirmation. 417
TransportConfirmationHeader. 421

TransportReference. . . . 421
ConsignmentConfirmation. . . . 422
19.4 Other Logistics Elements. . . . 423
DateInfo. . . . 424
ItemInfo. . . . 425
TransportIDInfo. . . . 425
TransportTemperature. . . . 426

20 Alternative Authentication Methods. . . . 427
20.1 Message Authentication Code (MAC). . . . 427
Overview of MACs. . . . 427
Computation Algorithm. . . . 427
Creation and Expiration Dates. . . . 428
Computation Process. . . . 428
ProfileResponse. . . . 430
CredentialMac. . . . 430
20.2 Auth Transaction. . . . 431
AuthRequest. . . . 432
AuthResponse. . . . 433

21 cXML Digital Signatures. . . . 435
21.1 Digital Signature Overview. . . . 435
Options for Signing. . . . 435
21.2 Signing cXML Documents. . . . 436
cXML Digital Signatures. . . . 436
Error Status Codes for Digital Signatures. . . . 439
Digital Signature Example. . . . 439

22 New Features in cXML 1.2.030. . . . 442
22.1 Logistics Enhancements. . . . 442
22.2 Order Collaboration Returns Process Enhancements. . . . 444
22.3 PaymentProposalRequest Enhancements. . . . 444
22.4 Invoice Reconciliation Enhancements. . . . 445
22.5 Purchase Order Enhancements. . . . 445
22.6 ProductActivityMessage Enhancements. . . . 446
22.7 TradeRequest Enhancements. . . . 446
22.8 Receipt Enhancement. . . . 447

23 Revision History. . . . 448

cXML License Agreement

IMPORTANT: PLEASE CAREFULLY READ THIS cXML LICENSE AGREEMENT ("LICENSE") BEFORE USING THE cXML SPECIFICATION ("SPECIFICATION"). BY USING THE SPECIFICATION, YOU AGREE TO BE BOUND BY THE TERMS OF THIS LICENSE. IF YOU DO NOT AGREE TO THE TERMS OF THIS LICENSE, DO NOT USE OR ACCESS THE SPECIFICATION. Licensor may publish new versions (including revisions) of this Agreement from time to time on the cXML site (www.cxml.org). The rights granted under this license with respect to the Specification are subject to the version of the Agreement in effect at the time it was downloaded or accessed by you.

1. Openness. cXML is designed and intended to be an open standard to facilitate electronic commerce. You are welcome to use and adopt this standard, and to submit comments, recommendations, and suggestions to cXML.org. Once submitted, your comments go through an approval process - and your comments may ultimately be incorporated into cXML.
2. License. Subject to the terms and conditions herein, Licensor hereby grants to you a perpetual, nonexclusive, royalty-free, worldwide right and license to use the Specification under the Licensor intellectual property necessary to implement the Specification to (a) use, copy, publish, and distribute (including but not limited to distribution as part of a separate computer program) the unmodified Specification, and (b) to implement and use the Specification, including the cXML tags and schema guidelines included in the Specification for the purpose of creating, distributing, selling or otherwise transferring computer programs that adhere to such guidelines. If you use, publish, or distribute the unmodified Specification, you may call it "cXML".
3. Restrictions. Your rights under this License will terminate automatically without notice from Licensor if you fail to comply with any terms of this License.
4. Licensor expressly reserves all other rights it may have in the material and subject matter of the Specification, and you acknowledge and agree that Licensor owns all right, title, and interest in and to the Specification, however, Licensor does not own the computer programs or related documentation you create, nor does Licensor own the underlying XML or non-Ariba intellectual property from which cXML has been derived. You agree to not assert any intellectual property rights that would be necessarily infringed by implementation or other use of the Specification against Licensor or any other entity with respect to such implementation or other use of the Specification; provided that your agreement to not assert shall cease to apply to any entity including Licensor (except where Licensor or another entity is asserting intellectual property rights against you as part of an assertion that you have breached this Agreement) that asserts against you that its intellectual property rights are infringed by your implementation or other use of the Specification. If you publish, copy or distribute the Specification, then this License must be attached. If you submit any comments or suggestions to Licensor, and Licensor modifies the Specification based on your input, Licensor shall own the modified version of the Specification.
5. No Warranty. YOU ACKNOWLEDGE AND AGREE THAT ANY USE OF THE SPECIFICATION BY YOU IS AT YOUR OWN RISK. THE SPECIFICATION IS PROVIDED FOR USE "AS IS" WITHOUT WARRANTY OF ANY KIND. LICENSOR AND ITS SUPPLIERS DISCLAIM ALL WARRANTIES OF ANY KIND, INCLUDING BUT NOT LIMITED TO ANY EXPRESS WARRANTIES, STATUTORY WARRANTIES, AND ANY IMPLIED WARRANTIES OF: MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMNT. YOUR SOLE AND EXCLUSIVE REMEDY RELATING TO YOUR USE OF THE SPECIFICATION SHALL BE TO DISCONTINUE USING THE SPECIFICATION.
6. Limitation of Liability. TO THE MAXIMUM EXTENT PERMITTED BY LAW, UNDER NO CIRCUMSTANCES SHALL LICENSOR BE LIABLE FOR ANY DAMAGES WHATSOEVER RELATING TO THIS LICENSE OR YOUR USE OF THE SPECIFICATION (INCLUDING BUT NOT LIMITED TO INCIDENTAL, SPECIAL, PUNITIVE, DIRECT, INDIRECT, OR CONSEQUENTIAL DAMAGES), REGARDLESS OF WHETHER A CLAIM IS BASED ON TORT,

CONTRACT, OR OTHER THEORY OF LIABILITY, AND EVEN IF LICENSOR IS ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. To the extent your jurisdiction does not allow any of the above exclusions of damages, in such case you agree that Licensor's total liability to you for all damages under this License shall not exceed the amount of ten dollars ($10.00). 6. Government End Users. If the Specification is supplied to the United States Government, the Specification is classified as "restricted computer software" as defined in clause 52.227-19 of the FAR. The United States Government's rights to the Specification are as provided in clause 52.227-19 of the FAR.

7. This License shall be deemed to have been made in, and shall be construed pursuant to the laws of the State of California and the federal U.S. laws applicable therein, excluding its conflict of laws provisions. Any legal action or proceeding relating to this License shall be instituted in a state or federal court in San Francisco, Santa Clara or San Mateo County, California, and each party hereby consents to personal jurisdiction in such counties. If for any reason a court of competent jurisdiction finds any provision, or portion thereof, to be unenforceable, the remainder of this License shall continue in full force and effect.
8. You assume the entire risk resulting from your use of the Specification.
9. Complete Agreement. This License is the complete and exclusive statement, and an absolute integration of the mutual understanding of the parties and supersedes and cancels all previous written and oral agreements and communications relating to the subject matter of this License. You acknowledge that any material breach by you of the provisions of the License will cause irreparable damage to Licensor and that a remedy at law will be inadequate. Therefore, in addition to any and all other legal or equitable remedies, Licensor will be entitled to seek injunctive relief necessary to remediate the breach of this License. Ariba, Inc. shall be deemed the Licensor.
10. Notices. Any notice directed to Licensor must be sent in writing to comments@cxml.org.

7-19-04

1 Preface

This document describes how to use cXML (commerce eXtensible Markup Language) for communication of data related to electronic commerce.

Audience and Prerequisites [page 12]

Typography [page 12]

1.1 Audience and Prerequisites

This document is intended for application developers who design cXML-enabled applications.

cXML is an open versatile language for the transaction requirements of:

- Network e-commerce hubs
- Electronic product catalogs
- PunchOut catalogs
- Procurement applications
- Buyers
- Suppliers
- E-commerce service providers

Readers should have a working knowledge of e-commerce concepts, the HTTP Internet communication standard, and XML format.

This document does not describe how to use specific procurement applications or commerce network hubs.

Which Chapters to Read

- **E-commerce Business Managers**—For an overview of cXML capabilities, read Introduction to cXML [page 14].
- **Web Programmers**—Web programmers who implement e-commerce sites should read all chapters.
- **Catalog Creators**—Suppliers creating cXML catalogs should read Catalogs [page 343].
- **PunchOut Site Implementors**—Web programmers creating PunchOut websites should read PunchOut Transaction [page 60].

1.2 Typography

cXML elements and attributes are denoted with a monotype font. cXML element and attribute names are case-sensitive. Both are a combination of lower and uppercase, with elements beginning with an uppercase letter, and

attributes beginning with a lowercase letter. For example, MyElement is a cXML element, and myAttribute is a cXML attribute.

The following table describes the typographic conventions used in this book:

Typeface or Symbol	Meaning	Example
`AaBbCc123`	Text you need to change is italicized.	http://*`server`*:*`port`*/inspector
AaBbCc123	The names of user interface controls, menus, and menu items	Choose **Edit** from the **File** menu.
`AaBbCc123`	Files and directory names, parameters, fields in CSV files, command lines, and code examples	A `ProfileRequest` document is sent from a buyer to the network.
AaBbCc123	Book titles	For more information, see *Acme Configuration Overview*.

2 Introduction to cXML

This section introduces cXML (commerce eXtensible Markup Language) for electronic-commerce transactions.

cXML, an XML Implementation [page 14]

cXML Capabilities [page 15]

Types of Applications that Use cXML [page 19]

Content Delivery Strategy [page 20]

cXML DTDs [page 21]

Profile Transaction [page 22]

Service Status Response [page 22]

XML Utilities [page 23]

2.1 cXML, an XML Implementation

XML (eXtensible Markup Language) is a meta-markup language used to create syntaxes for languages. It is also a standard for passing data between applications, particularly those that communicate across the Internet.

XML documents contain data in the form of tag/value pairs, for example:

```
<DeliverTo>Joe Smith</DeliverTo>
```

XML has a structure similar to HTML (HyperText Markup Language), which is an implementation of SGML, XML's parent meta language. Applications can extract and use data from XML documents more easily than from HTML documents, however, because XML data is tagged according to its purpose. XML contains only data, while HTML contains both data and presentation information.

Each cXML document is constructed based on XML Document Type Definitions (DTDs). Acting as templates, DTDs define the content model of a cXML document, for example, the valid order and nesting of elements, and the data types of attributes.

The DTDs for cXML are files available on the www.cXML.org website.

Related Information

Getting cXML DTDs [page 21]

2.2 cXML Capabilities

cXML allows buying organizations, suppliers, service providers, and intermediaries to communicate using a single, standard, open language.

Successful business-to-business electronic commerce (B2B e-commerce) portals depend upon a flexible, widely adopted protocol. cXML is a well-defined, robust language designed specifically for B2B e-commerce, and it is the choice of high volume buying organizations and suppliers.

cXML transactions consist of documents, which are simple text files containing values enclosed by predefined tags. Most types of cXML documents are analogous to hardcopy documents traditionally used in business.

The most commonly used types of cXML documents are:

- Catalogs [page 15]
- PunchOut [page 16]
- Purchase Orders [page 18]

The following subsections describe these cXML documents.

2.2.1 Catalogs

Catalogs are files that convey product and service content to buying organizations. They describe the products and services offered by a supplier and their prices, and they are the main communication channel from suppliers to their customers.

Suppliers create catalogs so that organizations that use procurement applications can see their product and service offerings and buy from them. Procurement applications read catalogs and store them internally in their databases. After a buying organization approves a catalog, that content is visible to users, who can choose items and add them to purchase requisitions.

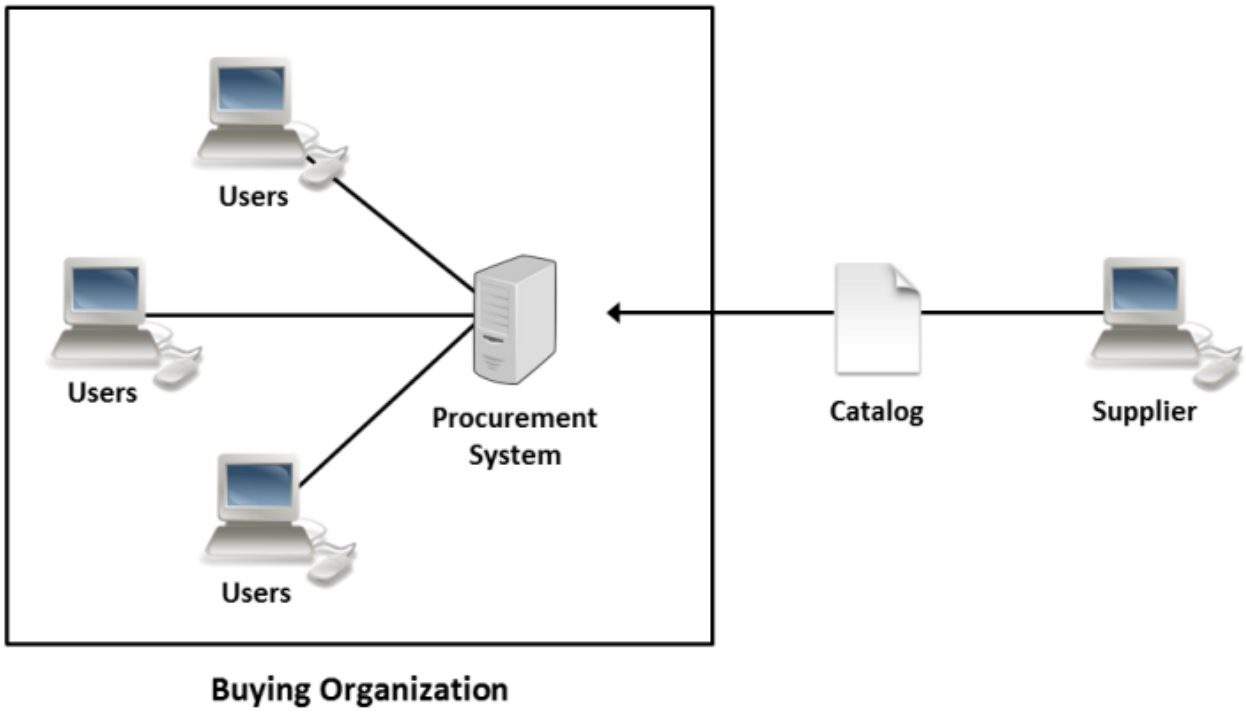


Figure 1: Sending Product and Service Content to a Buying Organization

Suppliers can create catalogs for any product or service, regardless of how it is measured, priced, or delivered.

For each item in a catalog, basic information is required, and optional information enables advanced catalog features, such as multi-language descriptions.

2.2.2 PunchOut

PunchOut is an easy-to-implement protocol for interactive sessions managed across the Internet. Using real-time, synchronous cXML messages, PunchOut enables communication between applications, providing seamless user interaction at remote sites.

There are three types of PunchOut:

- Procurement PunchOut [page 16]
- PunchOut Chaining [page 17]
- Provider PunchOut [page 18]

Procurement PunchOut

Procurement PunchOut gives suppliers an alternative to static catalog files. PunchOut sites are live, interactive catalogs running on a website.

Suppliers that have e-commerce websites can modify them to support PunchOut. PunchOut sites communicate with procurement systems over the Internet by using cXML.

For PunchOut sites, procurement applications display a button instead of product or pricing details. When users click this button, their Web browsers display pages from the supplier's local website. Depending on how the supplier implements these pages, users can browse product options, specify configurations, and select delivery methods. When users are done selecting items, they click a button that returns the order information to the procurement application. The fully configured products and their prices appear within users' purchase requisitions.

The following diagram shows an interactive PunchOut session between a user and a supplier web site.

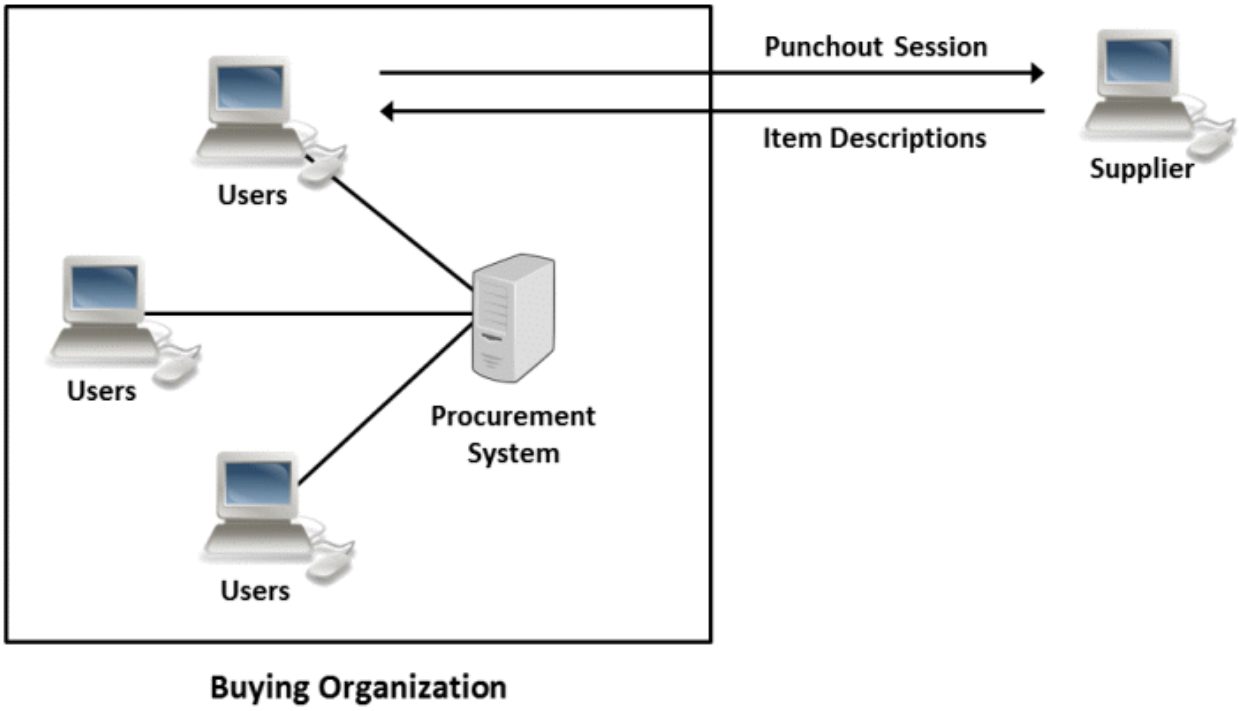


Figure 2: Interactive PunchOut Session Between a User and a Supplier Website

Suppliers' websites can offer previously agreed-upon contract products and prices.

PunchOut Chaining

PunchOut chaining is Procurement PunchOut that involves more than one PunchOut. cXML Path Routing enables this functionality.

Figure 3: PunchOut Chaining

cXML Path Routing allows the order and other subsequent messages to return to the marketplaces and suppliers involved in producing the quote. Path Routing notifies all parties about the final order, and any subsequent PunchOut specifies to the procurement application how to split orders on behalf of the marketplace.

Provider PunchOut

Provider PunchOut enables applications to punch out to a remote applications that supply services to the originating application, such as credit card validation, user authentication, or self-registration.

Related Information

PunchOut Transaction [page 60]

2.2.3 Purchase Orders

Buying organizations send purchase orders to suppliers to request fulfillment of a contract.

The following diagram shows a purchase order communicated to a supplier:

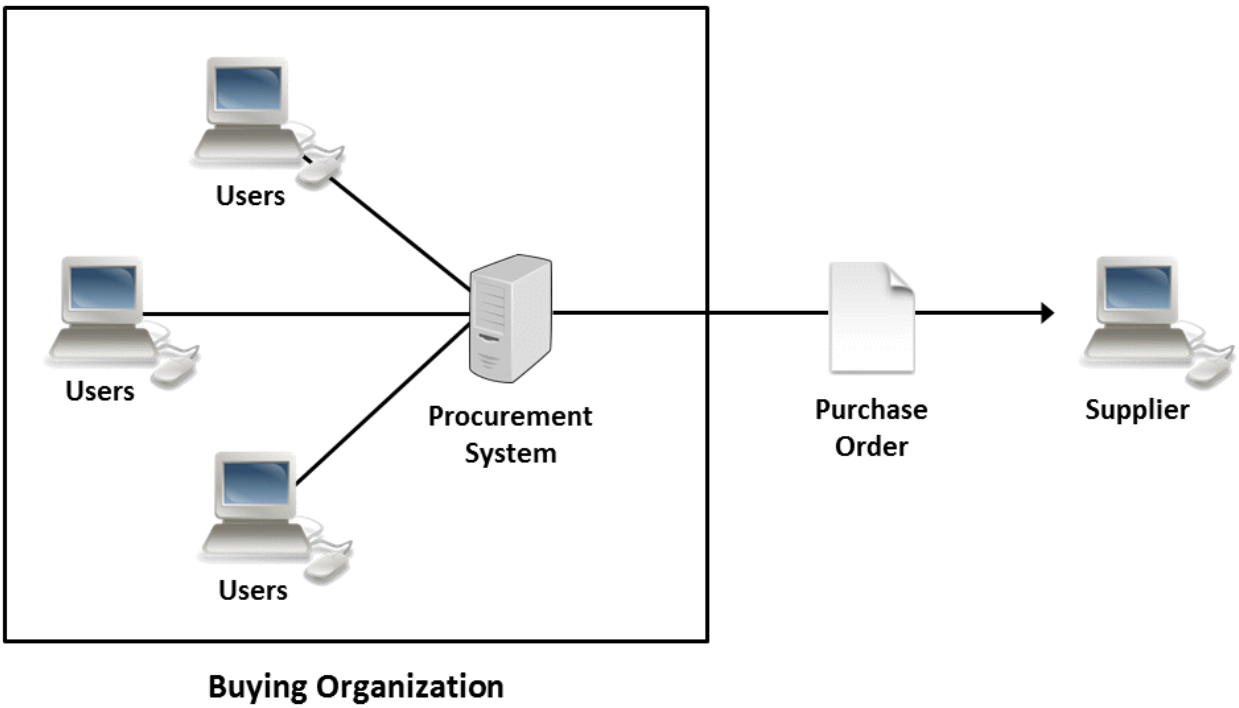


Figure 4: Purchase Order Communicated to a Supplier

cXML is better for communicating purchase orders than other formats (such as ANSI X12 EDI 850), because it is flexible, inexpensive to implement, and it supports the widest array of data and attachments.

Related Information

Purchase Orders [page 99]

2.3 Types of Applications that Use cXML

Any e-commerce application can use cXML. Buying organizations, vertical and horizontal buying communities, suppliers, and application vendors currently use cXML. The following subsections describe the main types of applications that currently use cXML.

Procurement Applications

Procurement applications, such as Ariba Buyer and Ariba Marketplace, Network Edition, use cXML for external transactions.

Ariba Buyer is an enterprise application hosted by large organizations for use by their employees over an intranet.

Ariba Marketplace, Network Edition, is an Internet-based service that allows the creation of buying communities composed of many small- to medium-sized businesses.

These applications allow communities of users to buy contract products and services from vendors approved by their purchasing managers. Managers in the communities first approve requested purchases, and approved purchase orders are transmitted to suppliers through several possible channels, including cXML over the Internet.

Commerce Network Hubs

Commerce network hubs, such as the Ariba Supplier Network, are Web-based services for connecting buyers and suppliers. These Web services provide features such as catalog validation and versioning, catalog publishing and subscription, automated purchase order routing, and purchase order history.

Commerce network hubs can act as intermediaries that authenticate and route requests and responses to and from diverse organizations. Communication between these organizations can occur entirely through cXML over the Internet.

PunchOut Catalogs

As described in the previous section, PunchOut catalogs are interactive catalogs, available at supplier websites. PunchOut catalogs are made possible by Web server applications, written in a programming language such as ASP (Active Server Pages), JavaScript, or CGI (Common Gateway Interface), that manage buyers' PunchOut sessions.

PunchOut catalogs accept PunchOut requests from procurement applications, identify the buying organization, and display the appropriate products and prices in HTML format. Users then select items, configure them, and select options if appropriate.

At the end of the PunchOut session, the PunchOut site sends descriptions of the users' selections, in cXML format, to the procurement applications.

Order-Receiving Systems

Order-receiving systems are applications at supplier sites that accept and process purchase orders sent by buying organizations. Order-receiving systems can be any automated system, such as inventory management systems, order-fulfillment systems, or order-processing systems.

Because it is simple to extract information from cXML purchase orders, it is relatively easy to create the adapters that enable existing order-receiving systems to accept them.

Related Information

PunchOut Transaction [page 60]
Purchase Orders [page 99]

2.4 Content Delivery Strategy

Procurement applications present product and service content to users. Suppliers want to control the way their customers view their products or services, because presentation is critical to their sales process. Buying organizations want to make content easily accessible and searchable to ensure high contract compliance.

Buying organizations and suppliers can choose from multiple methods for delivering product and service content. The particular method to use is determined by agreement between a buying organization and a supplier, and the nature of the products or services traded.

The following table lists example categories of commonly procured products and services, and their preferred content delivery methods.

Commodities	Properties	Content Delivery Method
Office Supplies, Internal Supplies	Static content, stable pricing	Static catalogs
Lab Supplies, MRO (Maintenance, Repair, and Operations), Electronic Parts	Requires normalization to be useful	PunchOut to a vertical commodity portal
Books, Chemicals	Large number of line Items	PunchOut to a supplier hosted site
Computers, Network Equipment, Peripherals	Many possible configurations	PunchOut to a supplier hosted configuration tool
Services, Printed Materials	Content has highly variable attributes	PunchOut to an electronic form at a supplier site

Buying organizations can either store content locally within the organization, or they can access it remotely on the Internet through PunchOut. cXML catalogs support both storage strategies.

As this table indicates, PunchOut offers a flexible framework upon which suppliers, depending on their commodity or customer, can provide customized content. The objective of this content strategy is to allow buyers and suppliers to exchange catalog data by the method that makes the most sense.

2.5 cXML DTDs

Because cXML is an XML language, it is thoroughly defined by a set of Document Type Definitions (DTDs). These DTDs are text files that describe the precise syntax and order of cXML elements. DTDs enable applications to validate the cXML they read or write.

The header of each cXML document contains the URL to the DTD that defines the document. cXML applications can retrieve the DTD and use it to validate the document.

For the most robust transaction handling, validate all cXML documents received. If you detect errors, issue the appropriate error code so the sender can retransmit. cXML applications are not required to validate cXML documents received, although it is recommended. However, all cXML documents must be valid and must refer to the cXML DTDs described in the following section.

Getting cXML DTDs

DTDs for all versions of cXML are available on cXML.org. The various kinds of cXML documents are defined in multiple DTDs to reduce DTD size, which enables faster validation in some parsers.

Document	DTD
Basic cXML documents	http://xml.cXML.org/schemas/cXML/*version*/cXML.dtd
Confirmation and Ship Notice	http://xml.cXML.org/schemas/cXML/*version*/Fulfill.dtd
Invoice	http://xml.cXML.org/schemas/cXML/*version*/InvoiceDetail.dtd
Type Definition	http://xml.cXML.org/schemas/cXML/*version*/Catalog.dtd
Payment Remittance	http://xml.cXML.org/schemas/cXML/*version*/PaymentRemittance.dtd
Request for Quotations	http://xml.cXML.org/schemas/cXML/*version*/Quote.dtd
Contracts	http://xml.cXML.org/schemas/cXML/*version*/Contract.dtd
Logistics	http://xml.cXML.org/schemas/cXML/*version*/Logistics.dtd

where *version* is the full cXML version number, such as 1.2.030.

cXML applications use these DTDs to validate all incoming and outgoing documents.

Caching DTDs

For best performance, cXML applications should cache DTDs locally. After cXML DTD files are published, they never change, so you can cache them indefinitely. (Each new version of the DTDs has a new URL.) When cXML

applications parse a cXML document, they should look at the SYSTEM identifier in the document header and retrieve that DTD if it has not already been stored locally.

Caching DTDs locally offers the advantages of faster document validation and less dependence on the cXML.org site.

In some environments, cXML applications might not be allowed to automatically retrieve DTDs as they receive new documents. In these environments, you must manually retrieve the DTDs, store them locally, and instruct your applications to look for them locally, not at cXML.org. However, generated cXML documents must point to the DTDs at cXML.org, not the local DTDs.

2.6 Profile Transaction

The Profile transaction communicates basic information about what transactions a particular cXML server can receive. All cXML servers must support this transaction. It is intended for back-end integrations between applications, making the capabilities of cXML servers available to client systems.

This transaction consists of two documents, `ProfileRequest` and `ProfileResponse`. Together, they retrieve server capabilities, including supported cXML version, supported transactions, and options to those transactions.

> **Note**
>
> All cXML 1.1 and higher servers must accept the Profile transaction.

ProfileRequest

The `ProfileRequest` document has no content. It simply routes to the specified cXML server.

ProfileResponse

The server responds with a `ProfileResponse` document, which lists the cXML transactions it supports, their locations, and any named options with a string value.

2.7 Service Status Response

A response with a status code of 200 from an URL that accepts POSTed cXML is up and running. When an HTTP GET is sent to a service location, the service responds with a valid, dynamically generated cXML Response document. A service can be any HTTP URL at which cXML Request documents are received.

2.8 XML Utilities

Utilities for editing and validating XML files are available free and for purchase on the Web. The following describes a few of these utilities:

- **Internet Explorer** from Microsoft. An XML-aware Web browser that can validate XML files against DTDs.
  www.microsoft.com/windows/ie/default.htm
- **Turbo XML** from TIBCO Software. An Integrated Development Environment (IDE) for creating, validating, converting and managing XML assets.
  www.tibco.com/software/metadata/turboxml.jsp
- **XML Spy** from Altova. A tool for maintaining DTDs and XML files with a grid, source and browser view.
  www.altova.com
- **XMLwriter** from Wattle Software. A graphical XML authoring tool designed to manage XML projects.
  www.xmlwriter.net

In addition, the following websites list more XML tools:

- www.xml.com
- http://www.ibm.com/developerworks/xml/

3 cXML Basics

This section describes the basic protocol and data formats of cXML. It contains information needed to implement all transactions.

Protocol Specification [page 24]

Basic Elements [page 47]

3.1 Protocol Specification

There are two communication models for cXML transactions: Request-Response and One-Way. Because these two models strictly specify the operations, they enable simple implementation. Both models are required, because there are situations when one model would not be appropriate.

3.1.1 Request-Response Model

Request-Response transactions can be performed only over an HTTP or HTTPS connection. The following figure illustrates the steps in a Request-Response interaction between parties A and B:

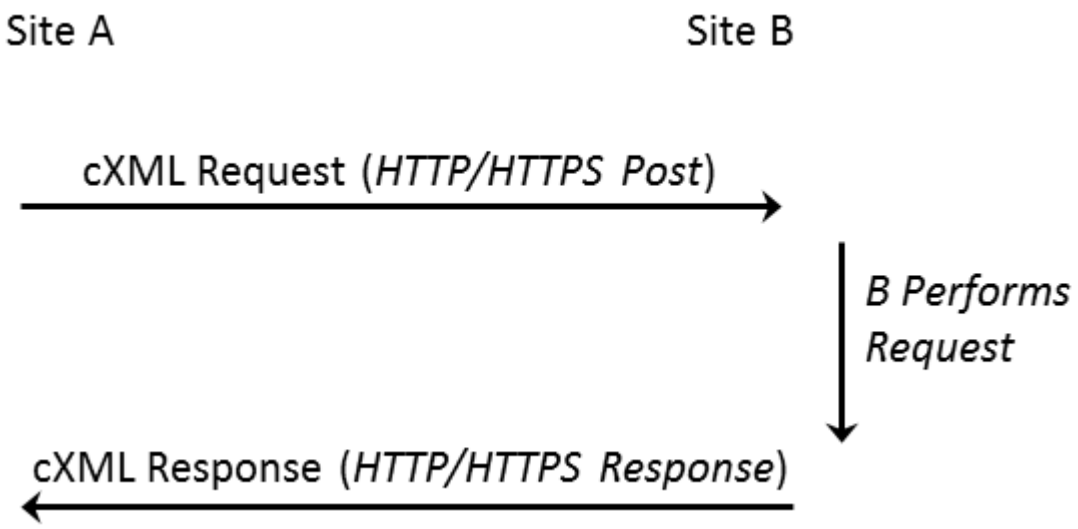


Figure 5: Request-Response Transaction

This transaction contains the following steps:

1. Site A initiates an HTTP/1.x connection with Site B on a predetermined URL that represents Site B's address.
2. Site A uses a POST operation to send the cXML document through the HTTP connection. Site A then waits for a response.

3. Site B has an HTTP/1.x-compliant server that dispatches the HTTP `Request` to the resource specified by the URL used in step 1. This resource can be any valid location known to Site B's HTTP server, for example, a CGI program or an ASP page.
4. Site B's resource identified in step 3 reads the cXML document contents and maps the `Request` to the appropriate handler for that request.
5. Site B's handler for the cXML `Request` performs the work that the `Request` specifies and generates a cXML `Response` document.
6. Site B sends the cXML `Response` to Site A through the HTTP connection established in step 1.
7. Site A reads the cXML `Response` and returns it to the process that initiated the `Request`.
8. Site A closes the HTTP connection established in step 1.

This process is then repeated for further `Request/Response` cycles.

To simplify the work in the above steps, cXML documents are divided into two distinct parts:

- Header—Contains authentication information and addressing.
- `Request` or `Response` data—Contains a specific request or response and the information to be passed.

Both of these elements are carried in a parent envelope element. The following example shows the structure of a cXML `Request` document:

```
<cXML>
    <Header>
        Header information
    </Header>
    <Request>
        Request information
    </Request>
</cXML>
```

The following example shows the structure of a cXML `Response` document:

```
<cXML>
    <Response>
        Response information
    </Response>
</cXML>
```

The `Response` structure does not use a `Header` element. It is not necessary, because the `Response` always travels in the same HTTP connection as the `Request`.

3.1.2 cXML Conventions

cXML uses elements to describe discrete items, which are properties in traditional business documents. Elements also describe information with obvious subdivisions and relationships between those subdivisions, such as an addresses, which are composed of street, city, and country.

cXML also uses attributes, which modify elements or provide context.

Element and attribute names are case-sensitive and use whole words with capitals (not hyphens) separating the words. Element names begin with an uppercase letter; attribute names begin with a lowercase letter, for example:

Elements: `Sender, Credential, Payment, ItemDetail`
Attributes: `payloadID, lineNumber, domain`

If optional elements have no content (they are null), leave them out entirely. Avoid empty or whitespace elements, because missing values can affect some parsers.

In DTD files and in this document, symbols are used to indicate how many times an element can occur in a transaction. A '+' means the element can occur one or more times, a '?' means the element can occur 0 or once, and a '*' means the element can occur 0 or more times.

3.1.3 cXML Document

The `cXML` element is the body of a cXML document. A document might begin as follows:

```
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML xml:lang="en-US"
    payloadID="1234567.4567.5678@buyer.com"
    timestamp="2002-01-09T01:36:05-08:00">
```

The first characters in cXML documents must be `<?` or `<!`. Documents must not start with white space or tabs. For example, the HTML form that contains a `PunchOutOrderMessage` document must not insert any character between the opening quote and the left angle bracket.

The second line in cXML documents must contain the DOCTYPE document type declaration. This is the only external entity that can appear in cXML documents. This line references the cXML DTD.

cXML documents can have any one of the following top-level elements: `cXML`, `Supplier`, `Contract`, and `Index`. The `cXML` element is for "transactional" data. The other elements describe static content.

Related Information

cXML DTDs [page 21]

3.1.4 Wrapping Layers

cXML documents are usually transmitted through HTTP with the HTTP header specifying a MIME (Multipurpose Internet Mail Extensions) media type of `text/xml` and a `charset` parameter matching the encoding in the cXML document.

Because HTTP is eight-bit clean, any character encoding supported by the receiving parser can be used without a content-transfer encoding such as `base64` or quoted-printable. All XML parsers support the `UTF-8` (Universal Transformation Format) encoding, which includes all Unicode characters, including all of US-ASCII. Therefore, applications should use UTF-8 when transmitting cXML documents.

> **Note**
>
> According to IETF RFC 2376 "XML Media Types," the MIME `charset` parameter overrides any encoding specified in the XML declaration. Further, the default encoding for the `text/xml` media type is `us-ascii`, not

UTF-8 as mentioned in Section 4.3.3 of the XML Specification. For clarity, cXML documents should include an explicit encoding in the XML declaration. MIME envelopes should use a matching charset parameter for the text/xml. You can also use the application/xml media type, which does not override the XML declaration or affect the recipient's decoding notes, and which does not require the charset parameter.

An HTTP transmission of a cXML document might include the following MIME and HTTP headers:

```
POST /cXML HTTP/1.0
Content-type: text/xml; charset="UTF-8"
Content-length: 1862
Accept: text/html, image/gif, image/jpeg, *; q=.2, */*; q=.2
User-Agent: Java1.1
Host: localhost:8080
Connection: Keep-Alive
<?xml version="1.0" encoding="UTF-8"?>
…
```

3.1.5 Attachments

The cXML protocol supports the attachment of external files of any type to cXML documents. For example, buyers sometimes need to clarify purchase orders with supporting memos, drawings, or faxes. Another example is the CatalogUploadRequest document, which includes catalog files as attachments.

Files referenced by cXML documents can reside either on a server accessible by the receiver or within an envelope that also includes the cXML documents themselves. To attach external files to a cXML document in a single envelope, use Multipurpose Internet Mail Extensions (MIME). The cXML document contains references to external parts sent within a multipart MIME envelope.

Including Attachments

A cXML requirement for this envelope (over the requirements described in IETF RFC 2046 “Multipurpose Internet Mail Extensions Part Two: Media Types”) is the inclusion of Content-ID headers with each attached file.

The contained URL must begin with cid:, which is the identifier for the referenced attachment within the larger transmission. The cid: identifier must match the Content-ID header of one (and only one) part of the MIME transmission containing the document being forwarded.

The following example shows the required skeleton of a cXML document with an attached JPEG image (without the HTTP headers shown above):

```
POST /cXML HTTP/1.0
Content-type: multipart/mixed; boundary=something unique
--something unique
Content-type: text/xml; charset="UTF-8"
<?xml version="1.0" encoding="UTF-8"?>
…
   <Attachment>
      <URL>cid:uniqueCID@sender.com</URL>
   </Attachment>
…
--something unique
```

```
Content-type: image/jpeg
Content-ID: <uniqueCID@sender.com>
…
--something unique--
```

This skeleton is also all that a receiving MIME parser must be able to process. Applications that make use of the media type described in RFC 2387 “The MIME Multipart/Related Content-type” will get much more information if the skeleton is enhanced:

```
POST /cXML HTTP/1.0
Content-type: multipart/related; boundary=something unique;
    type="text/xml"; start=<uniqueMainCID@sender.com>
--something unique
Content-type: text/xml; charset="UTF-8"
Content-ID: <uniqueMainCID@sender.com>
<?xml version="1.0" encoding="UTF-8"?>
…
   <Attachment>
      <URL>cid:uniqueAttachmentCID@sender.com</URL>
   </Attachment>
…
--something unique
Content-type: image/jpeg
Content-ID: <uniqueAttachmentCID@sender.com>
…
--something unique--
```

Receiving MIME parsers that do not understand the `multipart/related` media type must treat the two examples above identically. Each part of the MIME transmission can additionally have a Content-transfer-encoding and use that encoding. This addition is not necessary for HTTP transmission. Content-description and Content-disposition headers are optional within the cXML protocol, although they provide useful documentation.

Attachment Examples

The following example shows a `CatalogUploadRequest` with an attached catalog.

```
POST /cXML HTTP/1.0
Content-type: multipart/related; boundary=kdflkajfdksadjfk;
    type="text/xml"; start="<part1.PCO28.975@saturn.workchairs.com>"
<--! begin first MIME body part header -->
--kdflkajfdksadjfk
Content-type: text/xml; charset=UTF-8
Content-ID: <part1.PCO28.975@saturn.workchairs.com>
<--! end first MIME body part header -->
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2000-12-28T16:56:03-08:00" payloadID="12345666@10.10.83.39">
    <Header>
        <From>
            <Credential domain="DUNS">
                <Identity>123456789</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkID">
                <Identity>AN01000000001</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="DUNS">
```

```
                <Identity>123456789</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
        </Sender>
    </Header>
    <Request>
        <CatalogUploadRequest operation="new">
            <CatalogName xml:lang="en">Winter Prices</CatalogName>
            <Description xml:lang="en">premiere-level prices</Description>
            <Attachment>
            <!-- ID of MIME attachment follows -->
                <URL>cid:part2.PCO28.975@saturn.workchairs.com</URL>
            </Attachment>
        </CatalogUploadRequest>
    </Request>
</cXML>
<--! begin second MIME body part header -->
--kdflkajfdksadjfk
Content-type: text/plain; charset=US-ASCII
Content-Disposition: attachment; filename=PremiereCatalog.cif
Content-ID: <part2.PCO28.975@saturn.workchairs.com>
Content-length: 364
<--! end second MIME body part header -->
CIF_I_V3.0
LOADMODE: F
CODEFORMAT: UNSPSC
CURRENCY: USD
SUPPLIERID_DOMAIN: DUNS
ITEMCOUNT: 3
TIMESTAMP: 2001-01-15 15:25:04
DATA
942888710,34A11,C11,"Eames Chair",11116767,400.00,EA,3,"Fast MFG",,,400.00
942888710,56A12,C12,"Eames Ottoman",11116767,100.00,EA,3,"Fast MFG",,,100.00
942888710,78A13,C13,"Folding Chair",11116767,25.95,EA,3,"Fast MFG",,,25.95
ENDOFDATA
<!-- MIME trailer follows -->
--kdflkajfdksadjfk--
```

Surround IDs in `Content-ID` or `Content-Type` headers with angle brackets (< >), but omit these brackets when referring to IDs in `URL` elements. Similarly, prepend message IDs with `cid:` in `URL` elements, but not in MIME headers.

Special characters in cid URLs must be hex encoded (in `%hh` format).

Use the `Attachment` element when attaching text files, PDFs, images, or other such documents to a cXML document. When attaching another cXML document, use `cXMLAttachment`, regardless of whether that cXML document contains attachments itself. The `cXMLAttachment` element serves to alert the receiving system that additional cXML processing might be required to handle the attachment.

The following example shows a `CopyRequest` forwarding a cXML document with attachments using `cXMLAttachment`. For more information about `CopyRequest`, see CopyRequest [page 172].

```
Content-Type: Multipart/Related; boundary=outer-boundary
[Other headers]
--outer-boundary
Content-Type: text/xml; charset=UTF-8
Content-ID: <111@sendercompany.com>
[Other headers]
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="123@sendercompany.com"
            timestamp="2003-11-20T23:59:45-07:00">
    <Header>
        <From>
```

```
            <!-- Sender -->
            <Credential domain="AribaNetworkUserId">
                <Identity>sender@sendercompany.com</Identity>
            </Credential>
        </From>
        <To>
            <!-- Recipient -->
            <Credential domain="AribaNetworkUserId">
                <Identity>recipient@recipientcompany.com</Identity>
            </Credential>
        </To>
        <Sender>
            <!-- Sender -->
            <Credential domain="AribaNetworkUserId">
                <Identity>sender@sendercompany.com</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Sender Application 1.0</UserAgent>
        </Sender>
    </Header>
    <Request deploymentMode="production">
        <CopyRequest>
            <cXMLAttachment>
                <Attachment>
                    <URL>cid:222@sendercompany.com</URL>
                </Attachment>
            </cXMLAttachment>
        </CopyRequest>
    </Request>
</cXML>
--outer-boundary
Content-Type: Multipart/Related; boundary=inner-boundary
Content-ID: <222@sendercompany.com>
[Other headers]
--inner-boundary
Content-Type: text/xml; charset=UTF-8
Content-ID: <333@sendercompany.com>
[Other headers]
[Forwarded cXML]
--inner-boundary
[Attachment 1 of the forwarded cXML]
--inner-boundary
[Attachment 2 of the forwarded cXML]
--inner-boundary--
--outer-boundary--
```

More Information About MIME

For more information about the MIME standard, see the following websites:

- www.hunnysoft.com/mime
- www.ietf.org/rfc1341.txt
- www.ietf.org/rfc/rfc2046.txt
- www.ietf.org/rfc/rfc2387.txt

For more information about attaching external files to purchase orders, see Attachment [page 115].

3.1.6 cXML Envelope

The `cXML` element is the root of cXML documents, and it contains all other elements. The `cXML` element is present in every cXML transaction. The following example shows a fully specified `cXML` element:

```
<cXML xml:lang="en-US"
    payloadID=1234567.4567.5678@buyer.com
    timestamp="1999-03-31T18:39:09-08:00">
```

`cXML` has the following attributes:

Attribute	Description
`version` (deprecated)	This attribute was deprecated in cXML 1.2.007; do not use it in new cXML documents. Specifies the version of the cXML protocol. A validating XML parser could also determine the version attribute from the referenced DTD. Because this version number also appears in the SYSTEM identifier in the cXML document, you should omit this attribute.
`xml:lang`	The locale used for all free text sent within this document. The receiver should reply or display information in the same or a similar locale. For example, a client specifying `xml:lang="en-UK"` in a request might receive `"en"` data in return. Specify the most descriptive and specific locale possible.
`payloadID` (required)	A unique number with respect to space and time, used for logging purposes to identify documents that might have been lost or had problems. This value should not change for retry attempts. The recommended implementation is: datetime.process id.random number@hostname
`timestamp` (required)	The date and time the message was sent, in ISO 8601 format. This value should not change for retry attempts. The format is YYYY-MM-DDThh:mm:ss-hh:mm (for example, 2015-07-14T19:20:30+01:00).
`signatureVersion`	If present, implies that the document is digitally signed, that is, that the document contains one or more valid `ds:Signature` elements immediately following the `Request`, `Response`, or `Message` element. The only valid value for the attribute is 1.0; other values are reserved for future use.

Related Information

cXML Digital Signatures [page 435]

3.1.6.1 Locale Specified by xml:lang

The `xml:lang` attribute also appears with most free text elements (such as `Description` and `Comments`). While the XML specification allows the locale for an element to default to that specified for any parent element, such

defaults result in inefficient queries of the document tree. cXML attempts to keep the locale identifiers together with the affected strings. The most descriptive and specific locale known should be specified in this attribute.

The `xml:lang` attributes appearing throughout the cXML protocol have no effect on formatted data such as numbers, dates, and times. As described for the timestamp attribute in the following section, for the `timestamp` attribute, such discrete values are formatted according to their data types. Longer strings (and referenced Web pages) not intended for machine processing might contain a locale-specific numeric or date format that matches a nearby `xml:lang` attribute.

3.1.6.2 Date, Time, and Other Data Types

The `timestamp` attribute, and all other dates and times in cXML, must be formatted in the restricted subset of ISO 8601. This is described in the Word Wide Web Consortium (W3C) Note entitled "Date and Time Formats" available at
www.w3.org/TR/NOTE-datetime-970915.html.

Timestamps require a minimum of a complete date plus hours, minutes, and seconds. Fractions of a second are optional. This protocol requires times expressed in local time with a time-zone offset from UTC (Coordinated Universal Time, also known as Greenwich Mean Time). The "Z" time zone designator is not allowed.

For example, `2015-04-14T13:36:00-08:00` corresponds to April 14, 2015, 1:36 p.m., U.S. Pacific Standard Time.

Further references for the date, time, and other data type formats used by cXML are:

- Microsoft's XML Data Types Reference, msdn.microsoft.com/library/default.asp?url=/library/en-us/xmlsdk/html/b24aafc2-bf1b-4702-bf1c-b7ae3597eb0c.asp
- The original XML Data proposal to the Word Wide Web Consortium (W3C), www.w3c.org/TR/1998/NOTE-XML-data-0105

3.1.6.3 Special Characters

In cXML, as in XML, not all characters can be typed from the keyboard, such as the registered trademark symbol (®). Others, such as < and &, have special meaning to XML. These characters must be encoded using character entities.

XML defines the following built-in character entities:

Entity	Character
`<`	<
`>`	>
`&`	&
`"`	"
`'`	'

For characters outside of the encoding you use, use the Unicode number of the character (decimal or hexadecimal), preceded by pound (#). For example, ® and ® represent a registered trademark symbol, ®.

For example,

```
<Description xml:lang="en-US">The best prices for software®</Description>
```

could be encoded as

```
<Description xml:lang="en-US">The best prices for software ®</Description>
```

Single (') or double (") quotation marks must be escaped only within attribute values that are quoted using that delimiter. It is recommended that you use only single quotes to delimit attributes, unless the content will never contain quotes.

3.1.6.4 Handling Special Characters in Documents

1. Use a template that only uses single quotes to delimit attributes.
2. Add values to the template by doing one of the following:
   - If the document is a `PunchOutOrderMessage` to be transmitted by the cxml-urlencoded hidden field, fill the values in the template using US-ASCII encoding. This encoding requires XML character entities for all characters beyond that encoding. For example, as described above, enter the registered trademark symbol, which is not available in US-ASCII, as `®`.
   - Otherwise, fill the values in the document using UTF-8 encoding. UTF-8 should be used for all documents sent by HTTP Post directly, or embedded in a cXML-base64 hidden field. UTF-8 includes all of US-ASCII.
3. XML escape attribute values and element content as you create the cXML document. Characters that must be escaped are &, ', < and >.
   The following steps are required if you are transmitting the document in a `PunchOutOrderMessage`.
4. Pay attention to all characters that browsers interpret:
   - If you are using a cxml-urlencoded hidden field, convert all double quotes to `"`.
   - Further (for the cxml-urlencoded field), escape all ampersands that appear in contexts significant to HTML with `&`. To be safe, you can escape all ampersands. For example, escape `&` as `&` and `'` as `'`. Escape the trademark symbol `®` as `®`.
   - Otherwise, if you are using a cxml-base64 hidden field, base64 encode the entire cXML document.
5. Embed the document in the HTML form with double quotes around the string value. For example, to send a `Money` element with an attribute having the value `®®'"""&<>>` and containing the value `®®''"""&<>>"`, the XML document might appear as:

```
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE Money SYSTEM 'SpecialChars.dtd'>
<Money alternateAmount='®®&apos;""&quot;&&lt;>&gt;'>
®®'&apos;""&quot;&&lt;>&gt;</Money>
```

which should be encoded as follows:

```
<!-- Recommendation for cXML-urlencoding: Uses double quotes to delimit the -->
<!-- field value and single quotes for the contained attributes. -->
<Input type="Hidden" name="cXML-urlencoded" value="<?xml version='1.0'
encoding='UTF-8'?>
<!DOCTYPE Money SYSTEM 'SpecialChars.dtd'>
<Money alternateAmount='®®&apos;""
&quot;&amp;&lt;>&gt;'>®®'&apos;
""&quot;&amp;&lt;>&gt;</Money>">
<!-- Best choice: Base64 encode the value. Don't have to worry about what -->
```

```
<!-- the browser interprets. -->
<Input type="Hidden" name="cXML-
base64"value="PD94bWwgdmVyc2lvbj0nMS4wJyBlbmNvZGluZz0nVVRGLTgnPz4K
PCFET0NUWVBFIE1vbmV5IFNZU1RFTSAnU3BlY2lhbENoYXJzLmR0ZCc+CjxNb
25leSBhbHRlcm5hdGVBbW91bnQ9JyYjMTc0OyYjeEFFOyZhcG9zOyImIzM0OyZxd
W90OyZhbXA7Jmx0Oz4mZ3Q7Jz4KJiMxNzQ7JiN4QUU7JyZhcG9zOyImIzM0OyZx
dW90OyZhbXA7Jmx0Oz4mZ3Q7PC9Nb25leT4K">
```

The preceding examples illustrate alternatives for encoding the cXML-urlencoded field. They avoid XML escaping a few characters, such as angle brackets, that are not special to XML in all contexts. A direct implementation of the previous steps would result in an HTML field such as:

```
<Input type="Hidden" name="cXML-urlencoded" value="<?xml version='1.0'
encoding='UTF-8'?>
<!DOCTYPE Money SYSTEM 'SpecialChars.dtd'>
<Money alternateAmount='®®&apos;"""
&amp;&lt;&gt;&gt;'>®®''"""
&amp;&lt;&gt;&gt;</Money>">
```

or the XML document:

```
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE Money SYSTEM 'SpecialChars.dtd'>
<Money alternateAmount='®®&apos;"""&&lt;&gt;&gt'>
®®''"""&&lt;&gt;&gt;</Money>
```

3.1.7 Header

The `Header` element contains addressing and authentication information. The `Header` element is the same regardless of the specific `Request` or `Response` within the body of the cXML message. Applications need the requestor's identity, but not validation that the information provided for identity is correct.

The following example shows the `Header` element:

```
<Header>
    <From>
        <Credential domain="AribaNetworkUserId">
            <Identity>admin@acme.com</Identity>
        </Credential>
    </From>
    <To>
        <Credential domain="DUNS">
            <Identity>012345678</Identity>
        </Credential>
    </To>
    <Sender>
        <Credential domain="AribaNetworkUserId">
            <Identity>sysadmin@buyer.com</Identity>
            <SharedSecret>abracadabra</SharedSecret>
        </Credential>
        <UserAgent>Network Hub 1.1</UserAgent>
    </Sender>
</Header>
```

The `From` and `To` elements are synonymous with From and To in SMTP mail messages; they are the logical source and destination of the messages. `Sender` is the party that opens the HTTP connection and sends the cXML document.

`Sender` contains the `Credential` element, which allows the receiving party to authenticate the sending party. This credential allows strong authentication without requiring a public-key end-to-end digital certificate infrastructure. Only a user name and password need to be issued by the receiving party to allow the sending party to perform `Requests`.

When the document is initially sent, `Sender` and `From` are the same, However, if the cXML document travels through e-commerce network hubs, the `Sender` element changes to indicate current sending party.

3.1.7.1 From

This element identifies the originator of the cXML request.

3.1.7.2 To

This element identifies the destination of the cXML request.

3.1.7.3 Sender

This element allows the receiving party to identify and authenticate the party that opened the HTTP connection. It contains a stronger authentication `Credential` than the ones in the `From` or `To` elements, because the receiving party must authenticate who is asking it to perform work.

3.1.7.4 UserAgent

A textual string representing the `UserAgent` who is conducting the cXML conversation. This should be a unique per-product string, and ideally, per-version. Analogous to `UserAgent` for HTTP conversations.

3.1.7.5 Credential

This element contains identification and authentication values.

`Credential` has the following attributes:

Attribute	Description
`domain` (required)	Specifies the type of credential. This attribute allows documents to contain multiple types of credentials for multiple authentication domains. For messages sent on the Ariba Supplier Network, for instance, the domain can be `AribaNetworkUserId` to indicate an email address, `DUNS` for a D-U-N-S number, or NetworkId for a preassigned ID.
`type`	Requests to or from a marketplace identify both the marketplace and the member company in `From` or `To Credential` elements. In this case, the credential for the marketplace uses the `type` attribute, which is set to the value "`marketplace`".

`Credential` contains an `Identity` element and optionally a `SharedSecret` or a `CredentialMac` element. The `Identity` element states who the `Credential` represents, while the optional authentication elements verify the identity of the party.

SharedSecret

The `SharedSecret` element is used when the `Sender` has a password that the requester recognizes.

> **Note**
>
> Do not use authentication elements in documents sent through one-way communication. One-way transport routes through users' browsers, so users would be able to see the document source, including `Credential` elements.

CredentialMac

The `CredentialMac` element is used for the Message Authentication Code (MAC) authentication method. This authentication method is used in situations where the sender must prove to the receiver that it has been authenticated by shared secret by a trusted third party. For example, a direct PunchOut request can travel directly from a buyer to a supplier without going through a network commerce hub, because it contains a MAC (generated by the network commerce hub) that allows the supplier to authenticate it.

The trusted third party computes the MAC and transfers it to the sender through the Profile transaction. The MAC is opaque to the sender (it is secure and non-reversible). To see how the MAC is transmitted from the trusted third party to the sender, see ProfileResponse [page 51].

The receiver computes the MAC using the same inputs as the trusted third party and compares it with the MAC received in the cXML document. If the two values match, the document is authentic.

To learn how to compute the MAC value, see Message Authentication Code (MAC) [page 427].

`CredentialMac` has the following attributes:

Attribute	Description
`type` (required)	Identifies the data being authenticated and the method in which it is formatted for authentication. The only supported value is `"FromSenderCredentials"`.
`algorithm` (required)	Identifies for the MAC algorithm used on the data. The only supported value is `"HMAC-SHA1-96"`.
`creationDate` (required)	Specifies the date and time the MAC was generated.
`expirationDate` (required)	Specifies the date and time after which this MAC is no longer valid. Receivers must reject MACs that are received after the expirationDate. Receivers can optionally reject unexpired MACs. For example, a receiver might reject MACs that are scheduled to expire in less than an hour.

The following example shows a `Credential` element that contains a `CredentialMac` element:

```
<Sender>
    <Credential domain="NetworkId">
        <Identity>AN9900000100</Identity>
        <CredentialMac type="FromSenderCredentials"
                    algorithm="HMAC-SHA1-96"
                    creationDate="2003-01-15T08:42:46-0800"
                    expirationDate="2003-01-15T11:42:46-0800">
            MnXkusp8Jj0lw3mf
        </CredentialMac>
        <UserAgent>Procurement Application 8.1</UserAgent>
    </Credential>
</Sender>
```

Multiple Credentials

The `From`, `To`, and `Sender` elements can each optionally contain multiple `Credential` elements. The purpose of supplying multiple credentials is to identify a single organization using different domains. For example, an organization might be identified by including both a DUNS number and a NetworkId number.

The receiver should validate all credentials with domains it recognizes and it should reject the document if any credentials with recognized domains do not match an organization it knows. It should also reject the document if any two credentials in the same `From`, `To`, or `Sender` section appear to refer to different entities.

The receiver should reject the document if there are multiple credentials in a `To`, `From`, or `Sender` section that use different values but use the same domain.

3.1.7.6 Correspondent

The `From` and `To` elements can each optionally contain a `Correspondent` element. `Correspondent` elements are used in cases where a party or a connecting hub does not know the originating or receiving organization. The sender, receiver, or connecting hub can use the information in the `Correspondent` element to identify the unknown organization.

`Correspondent` has the following attribute:

Attribute	Description
`preferredLanguage`	The preferred language of the organization, if it is known.

Identify the unknown organization by using a Contact element.

Related Information

Contact [page 49]

3.1.8 Request

Clients send requests for operations. Only one `Request` element is allowed for each `cXML` envelope element, which simplifies the server implementations, because no de-multiplexing needs to occur when reading cXML documents. The `Request` element can contain virtually any type of XML data.

Typical `Request` elements are:

- `OrderRequest`
- `ProfileRequest`
- `PunchOutSetupRequest`
- `StatusUpdateRequest`
- `GetPendingRequest`
- `ConfirmationRequest`
- `ShipNoticeRequest`
- `ProviderSetupRequest`
- `PaymentRemittanceRequest`

`Request` has the following attributes:

Attribute	Description
`deploymentMode`	Indicates whether the request is a test request or a production request. Allowed values are “production” (default) or “test”.
`Id`	This attribute can be used to call out an element and all its children as a target for a digital signing.

Related Information

cXML Digital Signatures [page 435]

3.1.9 Response

Servers send responses to inform clients of the results of operations. Because the result of some requests might not have any data, the `Response` element can optionally contain nothing but a `Status` element. A `Response` element can also contain any application-level data. During PunchOut for example, the application-level data is contained in a `PunchOutSetupResponse` element.

The typical Response elements are:

- `ProfileResponse`
- `PunchOutSetupResponse`
- `GetPendingResponse`

`Response` has the following attribute:

Attribute	Description
`Id`	This attribute can be used to call out an element and all its children as a target for a digital signing.

Related Information

cXML Digital Signatures [page 435]

3.1.9.1 Status

This element conveys the success, transient failure, or permanent failure of a request operation.

`Status` has the following attributes:

Attribute	Description
`code` (required)	The status code of the request. For example, 200 represents a successful request. See the table of codes, below.
`text` (required)	The text of the status. This text aids user readability in logs, and is a canonical string for the error in English.
`xml:lang`	The language of the data in the `Status` element. Optional for compatibility with cXML 1.0. Might be required in future versions of cXML.

The attributes of the `Status` element indicate what happened to the request. For example:

```
<Status xml:lang="en-US" code="200” text="OK"> </Status>
```

The content of the `Status` element can be any data needed by the requestor and should describe the error. For a cXML `200/OK` status code, there might be no data. However, for a cXML `500/Internal Server Error` status

code, or other similar code, it is strongly recommended that the actual XML parse error or application error be presented. This error allows better one-sided debugging and interoperability testing. For example:

```
<Status code="406" text="Not Acceptable">cXML did not validate. Big Problem!</
Status>
```

The following table describes the cXML status code ranges:

Range	Meaning
2xx	Success
4xx	Permanent error. Client should not retry. The error prevents the request from being accepted.
5xx	Transient error. Typically a transport error. Client should retry. The recommended number of retries is 10, with a frequency of one hour. At a minimum a six hour retry window is recommended. For high priority requests, such as rush orders, you might want to increase the retry frequency.

Servers should not include additional Response elements (for example, a `PunchOutSetupResponse` element) unless the status code is in the cXML `200` range (for example, cXML `200/OK`).

Because cXML is layered above HTTP in most cases, many errors (such as HTTP `404/Not Found`) are handled by the transport. All transport errors should be treated as transient and the client should retry, as if a cXML 500 range status code had been received. All HTTP replies that don't include valid cXML content, including HTTP 404/Not found and HTTP 500/Internal Server Error status codes, are considered transport errors. Other common transport problems include timeouts, TCP errors (such as "`connection refused`"), and DNS errors (such as "`host unknown`"). Validation errors in parsing a `Request` document would normally result in a cXML permanent error in the `400` range, preferably `406/Not Acceptable`.

The following table includes possible cXML status codes:

Status	Text	Meaning
200	OK	The server was able to execute the request or deliver it to the final recipient. The returned `Response` might contain application warnings or errors: the cXML Request itself generated no errors or warnings, however, this status does not reflect any errors or warnings that might be generated afterward by the application itself. You will receive no further status updates, unless an error occurs during later processing.
201	Accepted	The request has been accepted for forwarding by an intermediate hub, or has been accepted by its ultimate destination and not yet been examined. You will receive updates on the status of the request, if a mechanism to deliver them is available. As mentioned in StatusUpdateRequest [page 229], the client should expect later `StatusUpdate` transactions.
204	No Content	All `Request` information was valid and recognized. The server has no `Response` data of the type requested. In a `PunchOutOrderMessage`, this status indicates that the PunchOut session ended without change to the shopping cart (or client requisition).
280		The request has been forwarded by an intermediate hub. You will receive at least one more status update. This status could mean that the request was delivered to another intermediary or to the final recipient with 201 status, or that it was forwarded via a reliable non-cXML transport.

Status	Text	Meaning
281		The request has been forwarded by an intermediate hub using an unreliable transport (such as email). You might receive status updates; however, if you do not received status updates, there is not necessarily a problem.
400	Bad Request	Request unacceptable to the server, although it parsed correctly.
401	Unauthorized	Credentials provided in the `Request` (the `Sender` element) were not recognized by the server.
402	Payment Required	This `Request` must include a complete `Payment` element.
403	Forbidden	The user has insufficient privileges to execute this `Request`.
406	Not Acceptable	`Request` unacceptable to the server, likely due to a parsing failure.
409	Conflict	The current state of the server or its internal data prevented the (update) operation request. An identical `Request` is unlikely to succeed in the future, but only after another operation has executed, if at all.
412	Precondition Failed	A precondition of the `Request` (for example, a PunchOut session appropriate for a `PunchOutSetupRequest edit`) was not met. This status normally implies the client ignored some portion of a previous transmission from a server (for example, the `operationAllowed` attribute of a `PunchOutOrderMessageHeader`).
417	Expectation Failed	`Request` implied a resource condition that was not met. One example might be a `SupplierDataRequest` asking for information about a supplier unknown to the server. This status might imply lost information at the client or server.
450	Not Implemented	The server does not implement the particular `Request`. For example, `PunchOutSetupRequest` or the requested operation might not be supported. This status normally implies the client has ignored the server's profile.
475	Signature Required	The receiver is unwilling to accept the document because it does not have a digital signature.
476	Signature Verification Failed	The receiver is unable to validate the signature, possibly because the document was altered in transit, or the receiver does not support one or more algorithms used in the signature.
477	Signature Unacceptable	The signature is technically valid, but is not acceptable to the receiver for some other reason. The signature policies or certificate policies may be unacceptable, the type of certificate used may be unacceptable, or there may be some other problem.
500	Internal Server Error	Server was unable to complete the `Request`.
550	Unable to reach cXML server	Unable to reach next cXML server to complete a transaction requiring upstream connections. An intermediate hub can return this code when a supplier site is unreachable. If upstream connections complete, intermediate hubs should return errors directly to the client.
551	Unable to forward request	Unable to forward request because of supplier misconfiguration. For example, an intermediate hub failed to authenticate itself to a supplier. Clients cannot rectify this error, but this error might be resolved before the client retries.
560	Temporary server error	For example, a server might be down for maintenance. The client should retry later.

For status codes related to catalog uploading, see Response [page 366].

When receiving unrecognized codes, cXML clients must handle them according to their class. Therefore, older clients should treat all new 2xx codes as 200 (success), 4xx codes as 400 (permanent failure), and 5xx codes as 500 (transient error). This behavior allows for both further expansions of the cXML protocol and server-specific codes without loss of interoperability.

3.1.10 One-Way (Asynchronous) Model

Unlike Request-Response transactions, One-Way messages are not restricted to the HTTP transport. One-way messages are for situations when an HTTP channel (a synchronous request-response type operation) is not appropriate. The following figure shows an example of how A and B might communicate with messages instead of the Request-Response transaction.

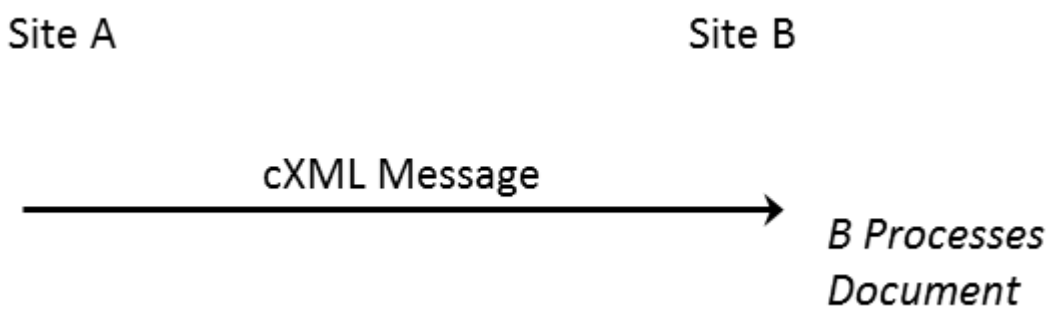


Figure 6: One-Way Message (Asynchronous)

In this case, a possible scenario would be:

1. Site A formats and encodes a cXML document in a transport that Site B understands.
2. Site A sends the document using the known transport. Site A does not (and cannot) actively wait for a response to come back from Site B.
3. Site B receives the cXML document and decodes it out of the transport stream.
4. Site B processes the document.

In the One-Way model, Site A and Site B do not have an explicit Request-Response cycle. For example, between One-Way messages, messages from other parties might arrive and other conversations could take place.

To fully specify a one-way transaction, the transport used for the message must also be documented. For the cXML transactions that use the one-way approach, the transport and encoding are specified. A common example of a transaction that uses one-way is the `PunchOutOrderMessage`.

One-way messages have a similar structure to the Request-Response model:

```
<cXML>
    <Header>
        Header information here…
    </Header>
    <Message>
        Message information here…
    </Message>
</cXML>
```

The `Header` element is treated exactly as it is in the Request-Response case. The `cXML` element is also identical to the one described in cXML Envelope [page 31]. The easiest way to tell the difference between a one-way message

and a Request-Response message is the presence of a `Message` element (instead of a `Request` or `Response` element). The following section discusses the `Message` element in more detail.

The Header element in a one-way message should not contain shared secret information in the sender credential. Authentication is done using the `BuyerCookie`. This is different from Request-Response Header.

3.1.11 Message

This element carries all the body level information in a cXML message. It can contain an optional `Status` element, identical to that found in a `Response` element—it would be used in messages that are logical responses to request messages.

`Message` has the following attributes:

Attribute	Description
`deploymentMode`	Indicates whether the request is a test request or a production request. Allowed values are "production" (default) or "test".
`inReplyTo`	Specifies to which `Message` this `Message` responds. The contents of the `inReplyTo` attribute would be the `payloadID` of a `Message` that was received earlier. This would be used to construct a two-way conversation with many messages.
`Id`	This attribute can be used to call out an element and all its children as a target for a digital signing.

The `inReplyTo` attribute can also reference the `payloadID` of an earlier `Request` or `Response` document. When a Request-Response transaction initiates a "conversation" through multiple one-way interactions, the first message can include the `payloadID` of the most recent relevant `Request` or `Response` that went in the other direction. For example, a `Message` containing a `PunchOutOrderMessage` might include an `inReplyTo` attribute containing the `payloadID` of the `PunchOutSetupRequest` that started the PunchOut session. The `BuyerCookie` included in the PunchOut documents performs a similar function to that of the `inReplyTo` attribute.

Related Information

cXML Digital Signatures [page 435]

3.1.12 Transport Options

There are two commonly used transports for one-way messages: HTTP and URL-Form-Encoding. These are just two of the well-defined transports today; more could become supported in the future.

HTTP

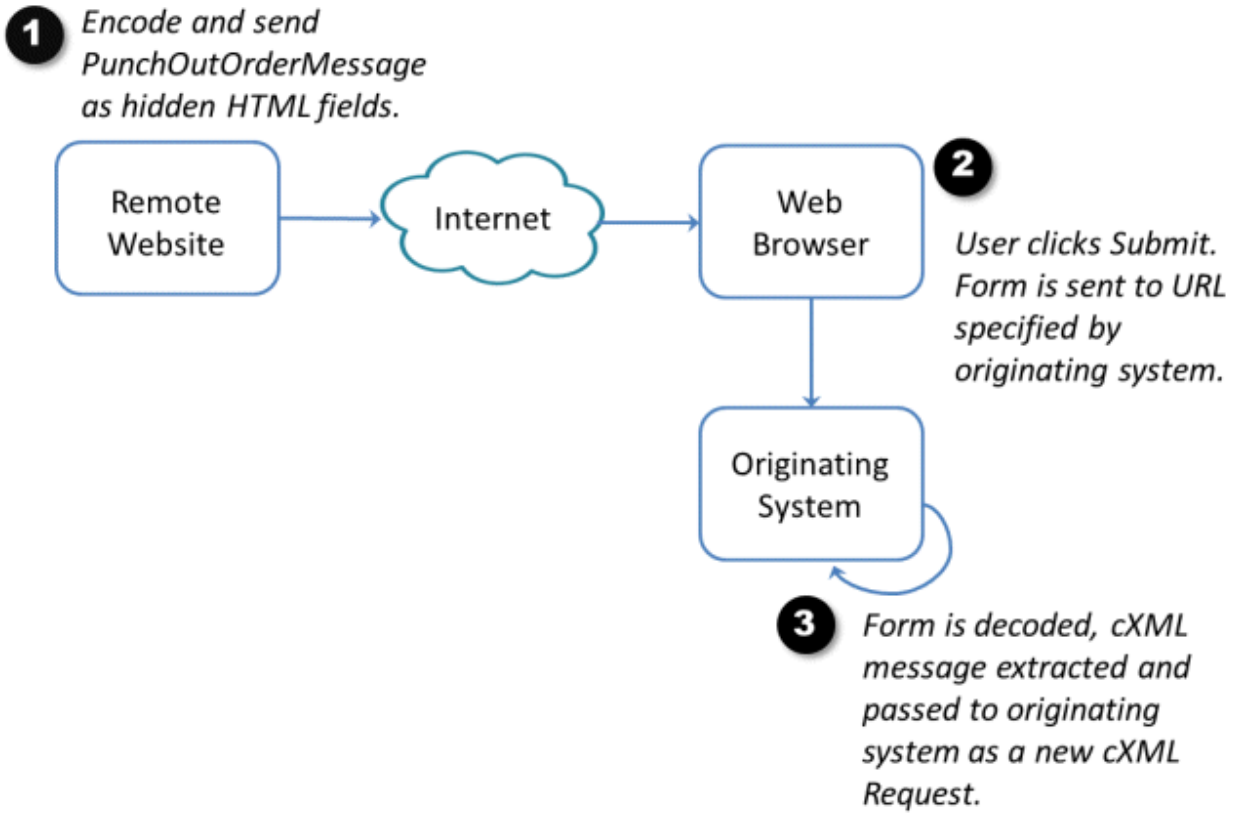
Procurement applications pull information using one-way HTTP communication. The one type of transaction that uses one-way HTTP communication is `GetPendingRequest`, discussed on page 380 [page 369].

HTTPS is preferred, because it encrypts transmitted data for security.

URL-Form-Encoding

URL-Form-Encoding enables integration between remote websites and procurement applications. It also serves as a way to avoid requiring a listening server on the buyer's system that is directly accessible through the Internet. This transport is best understood by examining how the `PunchOutOrderMessage` transaction works.

Remote websites do not directly send cXML `PunchOutOrderMessage` documents to procurement applications; instead, they encode them as hidden HTML Form fields and post them to the URL specified in the `BrowserFormPost` element of the `PunchOutSetupRequest`. When the user clicks a Check Out button on the website after shopping, the website sends the data to the procurement application as an HTML Form Submit. The following diagram illustrates what happens.



The semantics of packing and unpacking are described below.

Form Packing

Remote websites assign each `PunchOutOrderMessage` document to a hidden field on the Form named `cXML-urlencoded` or `cXML-base64`. They assign the HTML Form element a METHOD of POST and an ACTION consisting of the URL passed in the `BrowserFormPost` element of the `PunchOutSetupRequest`. For example:

```
<FORM METHOD=POST
        ACTION="http://workchairs.com:1616/punchoutexit">
    <INPUT TYPE=HIDDEN NAME="cXML-urlencoded"
        VALUE="Entire URL-Encoded PunchOutOrderMessage document">
    <INPUT TYPE=SUBMIT VALUE="Proceed">
</FORM>
```

Additional HTML tags on the page might contain the above fragment to describe the contents of the shopping basket in detail.

> **Note**
>
> When Web servers send the `cXML-urlencoded` field, it is not yet URL encoded. This encoding is required only when the form is submitted by Web browsers (when users click Check Out in the above example). Web browsers themselves meet this requirement. The Web server must HTML-encode only the field value, escaping quotation marks and other special characters, so the form displays properly for the user.

The names `cXML-urlencoded and cXML-base64` are case insensitive.

cXML-urlencoded

The `cXML-urlencoded` field is URL encoded (per the HTTP specification) by the Web browser, not by the Web server or the supplier. This is because the encoding is required only when the form is submitted by a Web browser, such as when a user clicks Check Out in the previous example. However, the Web server must HTML-encode the field value, escaping quotation marks and other special characters, so that the form will display correctly.

> **Note**
>
> Suppliers should never URL encode the cXML-urlencoded field. This field is automatically URL-encoded by the web browser.

For `cXML-urlencoded` data, the receiving parser cannot assume a `charset` parameter beyond the default for media type `text/xml`. No character encoding information for the posted data is carried in an HTTP POST. The receiving Web server cannot determine the encoding of the HTML page containing the hidden field. The cXML document forwarded in this fashion must therefore use `us-ascii` character encoding. Any characters (including those “URI encoded” as “%XX”) found in the XML source document must be in the “us-ascii” set. Other Unicode symbols can be encoded using character entities in that source document.

cXML-Base64

The `cXML-base64` hidden field supports international documents. cXML documents containing symbols outside of "us-ascii" should use this field instead of the `cXML-urlencoded` hidden field. This alternative has almost identical semantics, but the entire document is base64-encoded throughout transport and not HTML-encoded to the browser or URL-encoded to the receiving Web server. Base64-encoding is described in RFC 2045 "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies."

Base64-encoding from the remote website through the browser and to the receiving Web server at the client maintains the original character encoding of a cXML document. Though no `charset` parameter arrives with the posted information, the decoded document (after the transfer encoding is removed) can be treated as the media type `application/xml`. This encoding allows the receiving parser to honor any `encoding` attribute specified in the XML declaration. For this field (as for any `application/xml` documents), the default character encoding is `UTF-8`.

Either of these hidden fields (`cXML-urlencoded` or `cXML-base64`) must appear in the data posted to the procurement application. Though recipients should first look for `cXML-base64` in the data, it is wasteful to send both fields.

Form Unpacking and Processing

The procurement application, which previously provided the appropriate URL, receives an HTML Form POST containing the Form data as described above. The Form POST processor would first look for the `cXML-base64` variable, extract the value and base64-decode its contents. If that field does not exist in the data, the Form POST processor would look for the `cXML-urlencoded` variable, extract the URL-encoded cXML message and URL-decode it. The decoded content of the field is then processed as if it had been received through a normal HTTP Request/Response cycle.

The implied media type of the document after decoding varies, with different possible character encodings:

- The cXML-urlencoded variable is of media type text/xml with no charset attribute. It is thus restricted to the us-ascii character encoding. The receiving parser must ignore any encoding attribute in the XML declaration of the cXML document because the browser might have changed the encoding.
- The `cXML-base64` variable is of media type `application/xml` and thus might have any character encoding (indicated by the `encoding` attribute of the contained XML declaration, if any). The default character encoding is `UTF-8,` as for any `application/xml` documents.

The primary difference between this transaction and a normal Request-Response transaction is that there is no response that can be generated, because there is no HTTP connection through which to send it.

3.1.13 Service Status Response

This transaction determines whether a particular service is currently available. When an HTTP `GET` is sent to a service location, the service responds with a valid, dynamically generated cXML `Response` document. A service can be any HTTP URL at which cXML `Request` documents are received.

For example, an HTTP `GET` sent to `https://service.ariba.com/service/transaction/cxml.asp` yields the following response:

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE cXML "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2001-01-08T10:47:01-08:00"
payloadID="978979621537--4882920031100014936@206.251.25.169">
    <Response>
        <Status code="200" text="OK">Ping Response Message</Status>
    </Response>
</cXML>
```

> **Note**
>
> This combination of transport (HTTP) and protocol (cXML) levels should be used only for the case described above.

3.2 Basic Elements

The following entities and elements are used throughout the cXML specification. Most of the definitions listed here are basic vocabulary with which the higher-order business documents are described. The common type entities and the common elements representing low-level objects are defined here.

3.2.1 Type Entities

Most of these definitions are from the XML-Data note submission to the World Wide Web Consortium (W3C). A few higher-level type entities that are also defined here are not from XML-Data. These types are also discussed in cXML Envelope [page 31].

isoLangCode

An ISO Language Code from the ISO 639 standard.

isoCountryCode

An ISO Country Code from the ISO 3166 standard.

xmlLangCode

A language code as defined by the XML 1.0 Specification (at www.w3.org/TR/1998/REC-xml-19980210.html). In the most common case, this includes an ISO 639 Language Code and (optionally) an ISO 3166 Country Code separated by a hyphen. Unlike the full XML recommendation, IANA or private language codes should not be used in cXML. IANA and private subcodes are allowed, though they should come after a valid ISO 3166 Country Code.

The recommended cXML language code format is xx[-YY[-zzz]*]? where xx is an ISO 639 Language code, YY is an ISO 3166 Country Code and zzz is an IANA or private subcode for the language in question. Again, use of the Country Code is always recommended. By convention, the language code is lowercase and the country code is uppercase. This is not required for correct matching of the codes.

UnitOfMeasure

`UnitOfMeasure` describes how the product is packaged or shipped. It must conform to UN/CEFACT Unit of Measure Common Codes. For a list of UN/CEFACT codes, see www.unetrades.net.

URL

A URL (Uniform Resource Locator) as defined by the HTTP/1.1 standard.

3.2.2 Base Elements

These elements, used throughout the specification, range from generic ones such as `Name` and `Extrinsic` to specific ones such as `Money`.

Money

The `Money` element has three possible attributes: `currency`, `alternateAmount`, `alternateCurrency`. The attributes `currency` and `alternateCurrecy` must be a three-letter ISO 4217 currency code. The content of the `Money` element and of the `aternateAmount` attribute should be a numeric value. For example:

```
<Money currency="USD">12.34</Money>
```

The optional `alternateCurrency` and `alternateAmount` attributes are used together to specify an amount in an alternate currency. These can be used to support dual-currency requirements such as the euro. For example:

```
<Money currency="USD" alternateCurrency=”EUR” alternateAmount=”14.28”>12.34
</Money>
```

> **Note**
>
> You can optionally use commas as thousands separators. Do not use commas as decimal separators.

Country

Contains the name of the country in a location. Contained by the `PostalAddress` element.

CountryCode

Contains the International ITU dial code for the country code. It can be entered onto a telephone keypad after the escape code to reach the country. Used by the `Phone` and `Fax` elements.

Contact

The Contact element contains information about any contact important to the current transaction. For example:

```
<Contact>
    <Name xml:lang="en-US">Mr. Smart E. Pants</Name>
    <Email>sepants@workchairs.com</Email>
    <Phone name="Office">
    …
    </Phone>
</Contact>
```

Related Information

TermReference [page 129]

4 Profile Transaction

The Profile transaction retrieves cXML server capabilities, including the supported cXML version, transactions, and options on those transactions. The `ProfileRequest` and `ProfileResponse` documents must be supported by all cXML 1.1 and higher server implementations.

Introduction to the Profile Transaction [page 50]

ProfileRequest [page 50]

ProfileResponse [page 51]

Scenarios [page 55]

4.1 Introduction to the Profile Transaction

The Profile transaction enables one party to query another for cXML capabilities. These parties include suppliers, buyers, commerce network hubs, service providers, and marketplaces. To inquire about server capabilities, send a `ProfileRequest` document. The server returns a `ProfileResponse` document containing the server information.

The Profile transaction is the only transaction that all cXML servers must support. It is intended for back-end integration between applications, making the capabilities of cXML servers available to client systems.

The `ProfileResponse` should list all Requests supported at a particular website, not necessarily all those supported by the organization. Suppliers that can receive `OrderRequest` documents and send various messages or initiate Request/Response transactions describe their `OrderRequest` support in the profile transaction. The data returned by a `ProfileRequest` can be cached and used for a period of time, as determined by the manager of a trading community.

The Profile transaction can also be used to simply “ping” a server within the cXML protocol.

The Profile transaction can also retrieve the locations for follow-up documents. This use replaces the `Followup` element used in `OrderRequest` documents. To obtain information about where to send any document, send a `ProfileRequest` document to the server.

4.2 ProfileRequest

This element has no content. It is simply routed to the appropriate cXML server using the `Header`. The server responds with a single `ProfileResponse` as described below. The only dynamic portions of this response are the `payloadId` and `timestamp` attributes of the `cXML` element itself. In this particular case, servers are not required to provide responses in multiple locales.

An example `Request` of this type is:

```
<cXML payloadID="9949494"
    xml:lang="en-US" timestamp="2000-03-12T18:39:09-08:00">
    <Header>
        Routing, identification, and authentication information.
    </Header>
        <Request>
            <ProfileRequest />
        </Request>
</cXML>
```

`ProfileRequest` documents should be sent to the "root" URL of a commerce network hub, which should never change. Sending a `ProfileRequest` to this root URL obtains the URL location for every other cXML Request type. The `ProfileResponse` from a commerce network hub depends on the `To` element in the `ProfileRequest`.

4.3 ProfileResponse

This element contains a list of supported transactions, their locations, and any supported options. The following is a possible `ProfileResponse`:

```
<ProfileResponse effectiveDate="2001-03-03T12:13:14-05:00">
    <Option name="Locale">1</Option>
    …
    <Transaction requestName="PunchOutSetupRequest">
        <URL>http://www.workchairs.com/cXML/PunchOut.asp</URL>
        <Option name="operationAllowed">create inspect</Option>
        <Option name="dynamic pricing">0</Option>
        …
    </Transaction>
    …
</ProfileResponse>
```

A more likely `ProfileResponse` from a current supplier might be:

```
<ProfileResponse effectiveDate="2000-01-01T05:24:29-08:00"
    lastRefresh="2001-09-08T05:24:29-08:00">
    <Transaction requestName="OrderRequest">
        <URL>http://workchairs.com/cgi/orders.cgi</URL>
        <Option name="service">workchairs.orders</Option>
    </Transaction>
    <Transaction requestName="PunchOutSetupRequest">
        <URL>http://workchairs.com/cgi/PunchOut.cgi</URL>
        <Option name="service">workchairs.signin</Option>
    </Transaction>
</ProfileResponse>
```

`ProfileResponse` has the following attributes:

Attribute	Description
`effectiveDate` (required)	The date and time when these services became available. Dates should not be in the future.

Attribute	Description
`lastRefresh`	Indicates when the profile cache was last refreshed. When an application receives a `ProfileResponse` from a profile caching server, it will know the age of the data in the cache.

4.3.1 Option Element

The `Option` element contains the value for a defined option for either the overall service or a specific transaction. `Option` has the following attribute:

Attribute	Description
`name` (required)	The name of this option. This attribute should not be viewed directly (because the profile is intended for machine consumption). The client system must understand this before receiving a `ProfileResponse` document. Currently defined values for `name` are `"service"`, `"attachments"`, `"changes"`, and `"requestNames"`.

4.3.1.1 MAC Options

If the `ProfileResponse` document is sent by a trusted third party (such as a network commerce hub) and it lists transactions that rely on MAC authentication, it should contain `Option` elements that list MAC authentication values. The client will insert these values in a `CredentialMac` element in documents it sends directly to the server.

For example:

```
<ProfileResponse>
    <Option name="CredentialMac.type">FromSenderCredentials</Option>
    <Option name="CredentialMac.algorithm">HMAC-SHA1-96</Option>
    <Option name="CredentialMac.creationDate">2003-01-17T17:39:09-08:00</Option>
    <Option name="CredentialMac.expirationDate">2003-01-17T23:39:09-08:00</Option>
    <Option name="CredentialMac.value">67mURtR6VI6YnIsK</Option>
```

If the server supports direct PunchOut, additional `Option` elements should appear for `PunchOutSetupRequest` in the `ProfileResponse`.

Related Information

PunchOutSetupRequest Options [page 53]
Message Authentication Code (MAC) [page 427]

4.3.1.2 Service

The Profile transaction can return multiple variations of a single transaction type.

If a cXML server supports multiple implementations of a particular transaction, `ProfileResponse` can distinguish them. For example, a marketplace might provide two services within the `ProviderSetupRequest` transaction: marketplace.signin and marketplace.console. The `ProfileReponse` must list them in a way that differentiates them:

`ProfileResponse` can uniquely identify a specific location for each variation of a transaction. In the case of `ProviderSetupRequest`, the variation is the service name. `ProfileResponse` uses the `Option` element to include the service name and value, for example:

```
<Transaction requestName=”ProviderSetupRequest”>
    <URL>http://service.hub.com/signin</URL>
    <Option name="service">signin</Option>
</Transaction>
<Transaction requestName=”ProviderSetupRequest”>
    <URL>http://service.hub.com/console</URL>
    <Option name="service">console</Option>
</Transaction>
```

If there is only one location for a particular type of transaction, then the `Option` element is not needed.

When looking for a particular transaction type and `Option name=”service”` is provided, use the transaction that matches the desired service. If there is no such `Option` name and option value match, use the first transaction with no option name and value.

Each variation of a transaction must uniquely identify its particular location. In the case of `ProviderSetupRequest`, the unique identifier is “service”. These unique identifiers use the `Option` element in the `Transaction` element. The `Option` element contains the unique identifier’s name. The value for the `Option` element is the unique identifier’s value.

4.3.1.3 PunchOutSetupRequest Options

When `PunchOutSetupRequest` is returned as a supported transaction, three options can be specified to indicate that direct PunchOut is supported. These options inform clients that they can send `PunchOutSetupRequest` documents directly to servers, without going through network commerce hubs for authentication, and which authentication methods are supported:

- To specify the URL for receiving direct `PunchOutSetupRequest` documents:

  ```
  <Option name="Direct.URL">https://asp.workchairs.com/directPunchout</Option>
  ```

- To indicate that the server supports Message Authentication Code (MAC) authentication:

  ```
  <Optionz name="Direct.AuthenticationMethod.CredentialMac">Yes</Option>
  ```

In addition, this option instructs the trusted third party to generate a Message Authentication Code for the server. There are additional `Option` elements that should appear within the `ProfileResponse` element for profiles sent by trusted third parties.

- To indicate that the server supports the digital certificate authentication method:

  ```
  <Option name="Direct.AuthenticationMethod.Certificate">Yes</Option>
  ```

  This option indicates that the server sends `AuthRequest` documents to validate PunchOut requests.

These options are not used for regular PunchOut.

Related Information

MAC Options [page 52]
Message Authentication Code (MAC) [page 427]
Auth Transaction [page 431]
Direct PunchOut [page 97]

4.3.1.4 OrderRequest Options

When `OrderRequest` is returned as a supported transaction, two options must be specified: `attachments` and `changes`. The `attachments` option indicates whether attachments are accepted. The `changes` option specifies if change and delete orders are accepted. To specify acceptance of attachments:

```
<Option name = "attachments">Yes</Option>
```

To specify acceptance of change orders:

```
<Option name = "changes">Yes</Option>
```

The default for both options is `No`. Documents with `attachments` or `changes` set to `No` should be handled identically to documents that do not mention the option.

Related Information

Wrapping Layers [page 26]

4.3.1.5 SessionStatusRequest Options

When `SessionStatusRequest` is returned as a supported transaction, one option must be specified: `requestNames`. There is no default. This option informs the client that the server supports session checks and updates when performing any of the transactions specified in the content of the Option element. This content must be a space-separated list from the set "`OrderStatusSetupRequest`," "`ProviderSetupRequest`" and "`PunchOutSetupRequest`." `Transaction` elements for each of the listed requests must also be included in the `ProfileResponse` document.

4.3.2 Transaction

The description of a transaction supported by this service. The Profile definition currently indicates the locations to which to send specific requests. Future versions of cXML might add more `Option` definitions and extend the Profile information to include more information about supported requests.

The `Transaction` element must contain a `URL` element.

`Transaction` has the following attribute:

Attribute	Description
`requestName` (required)	A specific request that this server accepts at the given URL. Values can be the name of any `Request` document defined by cXML.

4.4 Scenarios

`ProfileRequest` documents can be sent by several possible entities to obtain server capabilities and information from suppliers, buyers, commerce network hubs, service providers, and marketplaces. The possible combinations of these parties and the kinds of transaction information that can be returned are described in the following scenarios.

4.4.1 From Buyer to Supplier

A `ProfileRequest` document is sent from a buyer to a supplier through a commerce network hub. The network commerce hub queries a supplier periodically, and caches the information to use in `ProfileResponse` documents sent to buyers.

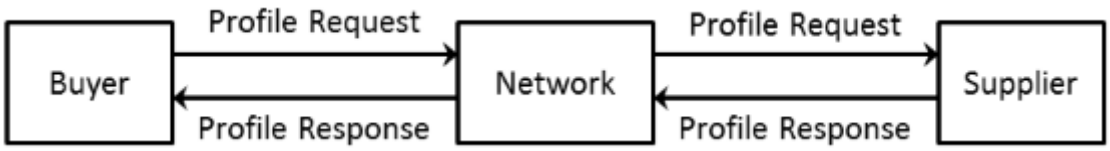


Figure 7: ProfileRequest Sent from Buyer to Supplier

The supplier returns in the `ProfileResponse` the transactions that it supports. For example:

- `OrderRequest`
- `PunchOutSetupRequest`

The `ProfileResponse` sent to the buyer can include capabilities offered by the network on behalf of that supplier.

4.4.2 From Buyer to the Network

A `ProfileRequest` document is sent from a buyer to the network.

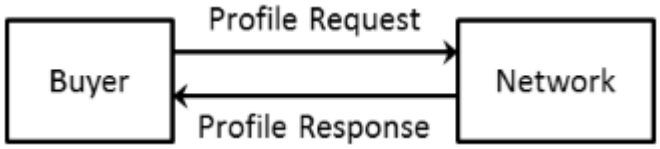


Figure 8: ProfileRequest Document Sent from a Buyer to the Network

The network returns in the `ProfileResponse` the transactions that it supports. For example:

- `SupplierDataRequest`
- `SubscriptionListRequest`
- `SubscriptionContentRequest`
- `GetPendingRequest`
- `OrderStatusSetupRequest`
- `SupplierListRequest`
- `ProviderSetupRequest`
- `SessionStatusSetupRequest`

Example `ProfileRequest` document:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="9949494" xml:lang="en-US"
    timestamp="2002-02-04T18:39:09-08:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN01001010101</Identity> <!-- marketplace's id -->
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN01000000001</Identity> <!-- Network -->
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN01001010101</Identity>
                <!-- marketplace's shared secret -->
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Marketplace 7.5</UserAgent>
        </Sender>
    </Header>
    <Request>
        <ProfileRequest />
    </Request>
</cXML>
```

Example `ProfileResponse` document:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="9949494" xml:lang="en-US"
            timestamp="2002-02-04T18:39:49-08:00">
```

```
    <Response>
        <Status code="200" text="OK"/>
        <ProfileResponse effectiveDate="2002-01-01T05:24:29-08:00">
            <Transaction requestName="OrderStatusSetupRequest">
                <URL>https://superduper.com/a/OrderStatusSetup</URL>
            </Transaction>
            <Transaction requestName="GetPendingRequest">
                <URL>https://superduper.com/a/GetPending</URL>
            </Transaction>
            <Transaction requestName="SubscriptionListRequest">
                <URL>https://superduper.com/b/SubscriptionList</URL>
            </Transaction>
            <Transaction requestName="SubscriptionContentRequest">
                <URL>https://superduper.com/b/SubscriptionContent</URL>
            </Transaction>
            <Transaction requestName="SupplierListRequest">
                <URL>https://superduper.com/c/SupplierList</URL>
            </Transaction>
            <Transaction requestName="SupplierDataRequest">
                <URL>https://superduper.com/c/SupplierData</URL>
            </Transaction>
            <Transaction requestName="ProviderSetupRequest">
                <URL>https://superduper.com/d/ProviderSetup</URL>
            </Transaction>
            <Transaction requestName="SessionStatusRequest">
                <URL>https://superduper.com/d/SessionStatus</URL>
                <Option name="requestNames">OrderStatusSetupRequest</Option>
            </Transaction>
        </ProfileResponse>
    </Response>
</cXML>
```

4.4.3 From a Network Hub to Supplier

A `ProfileRequest` is sent from a network commerce hub to a supplier. The network commerce hub queries a supplier periodically, and caches the information to use in `ProfileResponse` documents sent to buying organizations about a particular supplier.

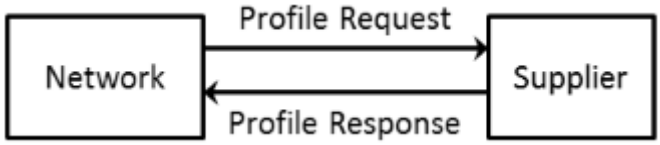


Figure 9: ProfileRequest Sent from Network Commerce Hub to a Supplier

The supplier returns in the `ProfileResponse` document the transactions that it supports. For example:

- `OrderRequest`
- `PunchOutSetupRequest`

Example `ProfileRequest` document:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="9949494" xml:lang="en-US"
        timestamp="2002-02-04T18:39:09-08:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
```

```
                <Identity>AN01001010101</Identity> <!-- Network's id -->
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN01234663636</Identity> <!-- any supplier's id -->
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN01001010101</Identity>
                <!-- Network's sharedscret -->
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Marketplace 7.5</UserAgent>
        </Sender>
    </Header>
    <Request>
        <ProfileRequest />
    </Request>
</cXML>
```

Example `ProfileResponse` document:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="9949494" xml:lang="en-US"
        timestamp="2002-02-04T18:39:49-08:00">
    <Response>
        <Status code="200" text="OK"/>
        <ProfileResponse effectiveDate="2002-01-01T05:24:29-08:00">
            <Transaction requestName="PunchOutSetupRequest">
                <URL>https://www.acme.com/cxml/PunchOutSetup</URL>
            </Transaction>
            <Transaction requestName="OrderRequest">
                <URL>https:// www.acme.com/cxml /Order</URL>
                <Option name="attachments">yes</Option>
                <Option name="changes">yes</Option>
            </Transaction>
        </ProfileResponse>
    </Response>
</cXML>
```

4.4.4 From a Network Hub to Service Provider

A `ProfileRequest` is sent from a network commerce hub to service provider partners. Routing service providers need to specify if one or two `ProfileReponses` will be returned, because profile information can be returned for both the service provider and downstream supplier accounts.

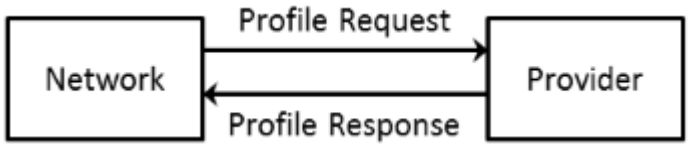


Figure 10: ProfileRequest Sent from a Network Commerce Hub to a Service Provider

The service provider returns in the `ProfileResponse` document the transactions that it supports. For example:

- `ProviderSetupRequest`

- `SessionStatus`
- `OrderRequest`

4.4.5 From a Network Hub to Buyer

A `ProfileRequest` is sent from a network commerce hub to a buyer. The network commerce hub queries a buyer periodically, and caches the information. Later, this information about the buyer is used in `ProfileResponse` documents sent to service providers and suppliers.

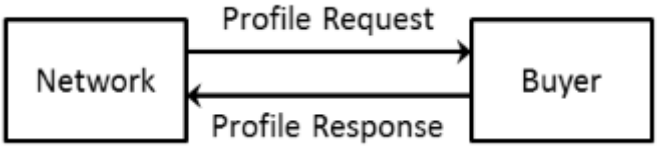


Figure 11: ProfileRequest Sent from a Network Commerce Hub to a Buyer

Buyers return in the `ProfileResponse` document the transactions that they support. For example:

- `StatusUpdateRequest`
- `InvoiceDetailRequest`

4.4.6 From Service Provider to Buyer

A `ProfileRequest` is sent from a service provider to a buyer and routed through a network commerce hub. This scenario is a replacement for the `Followup` element. The network commerce hub queries the buyer periodically, and caches the information. Later, this information about the buyer is used in `ProfileResponse` documents sent to service providers.

Figure 12: ProfileRequest Sent from a Service Provider to a Buyer

The network commerce hub returns in the `ProfileResponse` document to the service provider the transactions that it supports on behalf of a buyer. For example:

- `StatusUpdateRequest`
- `InvoiceDetailRequest`

5 PunchOut Transaction

PunchOut enables users of procurement applications to access supplier contracts for products or services that reside at the supplier's website. It eliminates the need for the suppliers to send whole catalogs to buying organizations. Instead, suppliers send just short index files that name their storefronts, product categories, or products.

PunchOut Requirements [page 60]

PunchOut Event Sequence [page 63]

PunchOut Documents [page 68]

Modifications to the Supplier's Web Pages [page 75]

PunchOut Website Suggestions [page 81]

PunchOut Transaction [page 83]

Direct PunchOut [page 97]

5.1 PunchOut Requirements

Before buying organizations configure their procurement applications for PunchOut, or suppliers implement PunchOut websites, both parties must evaluate the benefits and requirements of PunchOut.

5.1.1 Buying Organizations

Setup and testing of cXML-compatible procurement applications with a PunchOut-enabled supplier can be completed in less than one day.

Therefore, PunchOut is a good solution for buying organizations of all sizes and levels of technical expertise. The decision to use PunchOut should be based on the business practices and types of commodities purchased.

Related Information

Content Delivery Strategy [page 20]

5.1.1.1 Business Issues

Buying organizations should consider the following questions when deciding whether to use static catalog content such as an `Index` or `Contract` documents, or PunchOut:

- Do requisitioners and approvers have Internet access? If not, would controlled access to the Internet be allowed?
- Does the buying organization want their suppliers to create and maintain catalog content (including pricing)?
- Do requisitioners currently procure goods on the Internet? If so, do these goods require a supplier-side configuration tool or contain unique attributes that cannot conform to a static content model?
- Does the buying organization use content aggregators for catalogs (for example, Aspect, TPN Register, or Harbinger)?
- Does the buying organization currently procure services (for example, consultants, temp services, or maintenance) through the Internet?
- Does the buying organization currently conduct online sourcing?

If the answer to any of the above questions is yes, PunchOut might be appropriate for the buying organization.

5.1.1.2 Technical Issues

Buying organizations must meet the following technical requirements:

- **Direct Internet Access**—Users within buying organizations must have direct Internet access. PunchOut relies on regular Web browser sessions where the user interacts with live supplier websites. This communication occurs through regular intranet/Internet infrastructure, not through the procurement application.
- **Reliable Internet Connection**—Internet access must be constantly operational and reliable. If users cannot procure products because of Internet outages, they are likely to make rogue purchases.
- **Contracts with PunchOut Suppliers**—Purchasing agents must have established contracts with PunchOut-enabled suppliers. PunchOut websites allow access only to known, authenticated buying organizations.

5.1.2 Suppliers

The term supplier in the context of PunchOut encompasses more than the traditional definition of the term. The PunchOut protocol was designed as a flexible framework capable of transmitting data about virtually any kind of product or service from any kind of supplier, distributor, aggregator, or manufacturer.

Example products and services include:

- Computers direct from a manufacturer or reseller
- Chemicals and reagents from an aggregator
- Office supplies from a distributor
- Contract services from a temp agency

The supplier might already have a transactive website capable of hosting content and receiving purchase orders. Given this capability, the supplier needs to consider both the supplier's business practices and technical resources in deciding whether to implement PunchOut.

5.1.2.1 Business Issues

Suppliers should consider the following questions:

- Does the supplier currently sell the supplier's products or services through the Internet? If so, do they offer customer-specific content (contract pricing) through their website?
- Does the supplier's products and services fall into one of the PunchOut categories as described in the chart in Content Delivery Strategy [page 20]? To review, these categories include:
  - Highly configurable products (such as computers)
  - Large number of line items (such as books)
  - Unique product attributes (such as chemicals)
  - Normalized data (such as MRO Supplies)
  - Rapidly changing or expanding items (such as temperary services or books)
- Does the supplier prefer to receive purchase orders and/or payment through their website?

If the answer to any of the above questions is yes, PunchOut might be appropriate for the supplier's organization.

5.1.2.2 Technical Issues

Suppliers must meet the following technical requirements:

- **Reliable Internet Connection**—The Web server infrastructure and Internet connection must be extremely reliable. If users cannot access remote content, they are likely to go to another supplier.
- **Competent website Administrators**—The PunchOut website and supporting applications will require periodic maintenance and modification. Users' needs and the supplier's product offerings will change, so the supplier needs personnel to modify the supplier's PunchOut infrastructure.
- **Support for Basic Transactions**—PunchOut websites do not need to support all cXML functionality, but they must support the following required transactions:
  - Profile Transaction
  - PunchOutSetupRequest
  - PunchOutSetupResponse
  - PunchOutOrderMessage

5.1.2.3 Work Estimate

The following table lists estimates of work required for cXML PunchOut integration based on estimates from suppliers:

Level of Pre-existing Infrastructure	Estimated Time for Completion
cXML enabled and integrated with network commerce hub	1-2 weeks with in-house IT staff 2-3 weeks with contractors

Level of Pre-existing Infrastructure	Estimated Time for Completion
Transactive site with XML infrastructure	3 weeks with in-house IT staff 3-4 weeks with contractors
Transactive site without XML infrastructure	4 weeks with in-house IT staff 4-5 weeks with contractors

5.1.2.4 Understanding XML

The first step to becoming PunchOut enabled is to understand XML. To implement a PunchOut website, the supplier must have a fundamental understanding of how to create, parse, query, receive, and transmit XML data to and from a remote source.

The basic tools to process XML documents are XML parsers. These parsers are freely available from Microsoft and other companies (for example, an XML parser is standard in Microsoft Internet Explorer 5).

Related Information

cXML, an XML Implementation [page 14]
XML Utilities [page 23]

5.2 PunchOut Event Sequence

A PunchOut session is composed of several distinct steps.

5.2.1 Steps 1 & 2: PunchOut Request

Users log in to a procurement application and open new purchase requisitions. They find desired items by searching their local catalogs by commodity, supplier, or product description. When they select a PunchOut item, the procurement application opens a new browser window and logs them into their accounts at the supplier's website.

The following figure illustrates the PunchOut request steps:

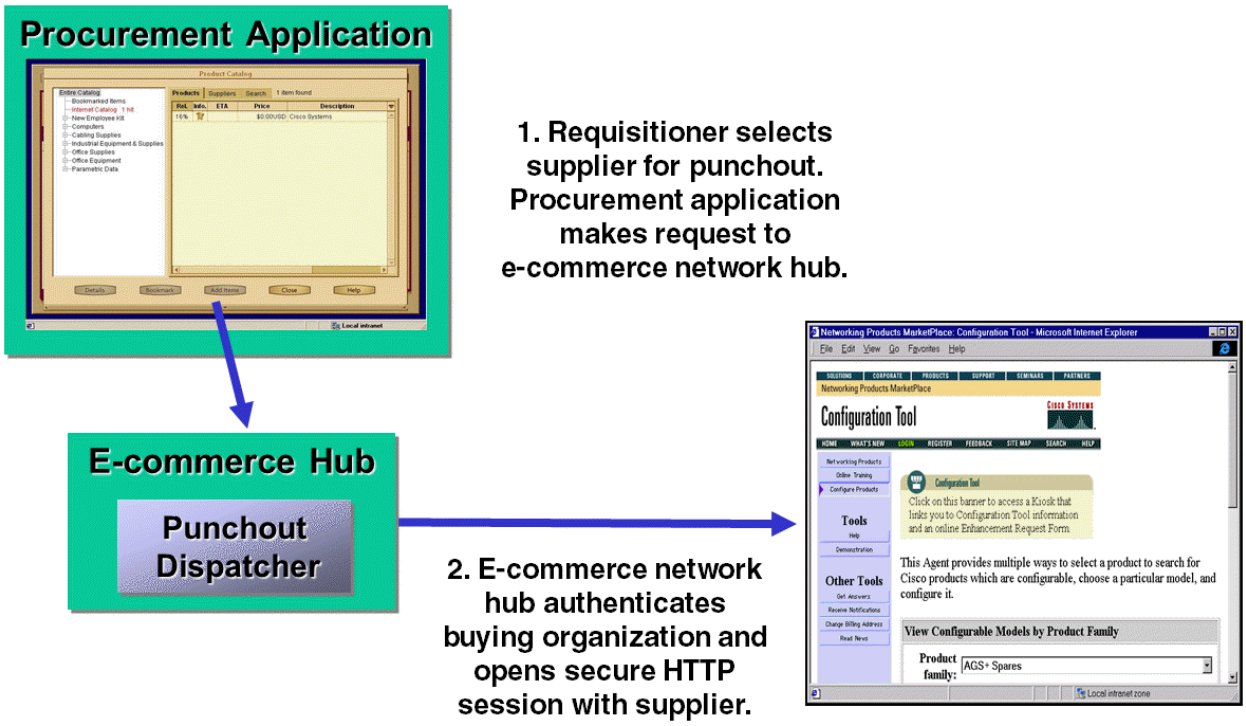


Figure 13: PunchOut Request Steps

How does it work? When a user clicks a PunchOut item, the procurement application sends a cXML `PunchOutSetupRequest` document to a network e-commerce hub. Acting as the trusted third party, the hub accepts the request, verifies the buying organization, and passes the request to the supplier's PunchOut website.

> **Note**
>
> All cXML documents sent through the Internet can travel through SSL (Secure Socket Layer) 3.0-encrypted HTTPS connections.

The purpose of this request is to notify the supplier's website of the buyer's identity, and to communicate the operation to be performed. Supported operations include the following:

- **create**—Initiates a new PunchOut session
- **edit**—Re-opens a PunchOut session for editing
- **inspect**—Re-opens a PunchOut session for inspection (no changes can be made to the data)
- **source**—Initiates a PunchOut session for a RFQ (Request for Quote) create/edit session in a sourcing application

After the supplier's website receives a request, it sends back a `PunchOutSetupResponse` containing a URL that tells the procurement application where to go to initiate a browsing session on the supplier's website.

The procurement application opens a new browser window, which displays a session logged into an account on the supplier's website. This account can be specific to a region, a company, a department, or a user.

Direct PunchOut is an alternative method for initiating PunchOut sessions, where the PunchOut site, not a network commerce hub, authenticates the PunchOut request.

Related Information

Direct PunchOut [page 97]

5.2.2 Step 3: Product Selection

Users select items from the supplier's inventory using all the features and services provided by the supplier's website:

3. Requisitioner uses supplier site to find and configure products.

Figure 14: PunchOut Product Selection

Depending on the product or customer, these features might include the following:

- Configurator tools for building customized products (for example, computers, organic compounds, or personalized products)
- Search engines for finding desired products from large catalogs.
- Views of normalized data for comparing products based on price, features, or availability (for example, MRO products)
- Views of attributes unique to a particular commodity (for example, printed materials, chemical and reagents, or services)
- Real-time pricing, inventory, and availability checking
- Automatic tax and freight calculations based on ship-to destination, size, or quantity of items (not necessary to calculate during the PunchOut session)

How does it work? After the procurement application directs users to the supplier's website, the shopping experience is the same as if they had logged on to the supplier's website directly. Thus, none of the previously listed features and services require modification.

5.2.3 Step 4: Check Out

The supplier's website calculates the total cost of the user's selections, including tax, freight, and customer-specific discounts. Users then click the supplier's website's "Check Out" button to send the contents of the shopping cart to the their purchase requisitions within the procurement application.

The following figure illustrates the check-out steps:

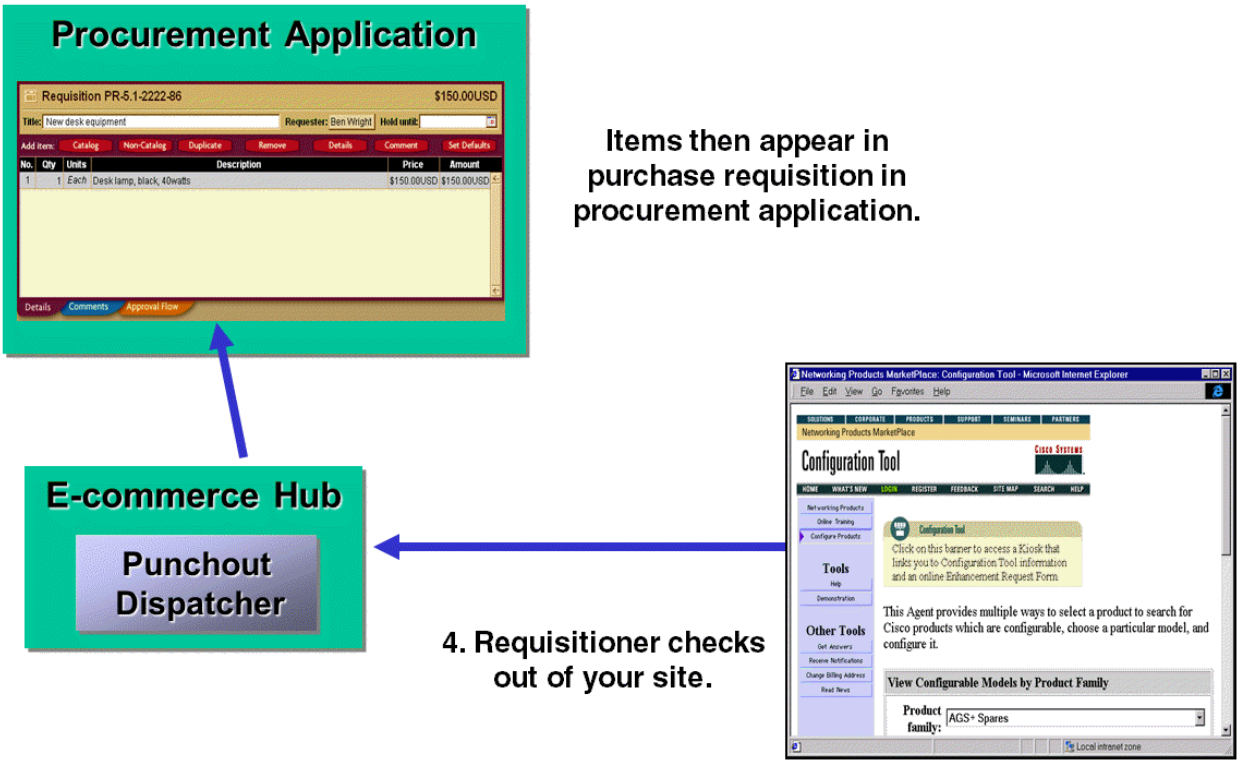


Figure 15: Check-Out Steps

How does it work? When users click the supplier's "Check Out" button, they submit an HTML form back to their procurement application. One form field consists of a cXML `PunchOutOrderMessage` containing product details and prices. The supplier can also send hidden supplier cookies, which can later associate items with a specific shopping session.

Effectively, the supplier has provided a quote for the requested items—the supplier has not yet received a purchase order, so the supplier cannot yet book the order.

If users, including approvers, later need to edit any of the items in a purchase requisition, the supplier can allow them to "re-PunchOut" to the supplier's website. The procurement application sends back the contents of the original shopping cart to the supplier's website, and users make any changes there. Upon check out, the supplier's website returns the items to the purchase requisition.

The supplier's website is the information source for all PunchOut items. Changes to the quantity or the addition of new items to the requisition might alter tax or shipping charges, which would require recalculation at the supplier's website. Thus, any changes to the original items need to be made at the supplier's website, not in the procurement application, therefore the need to re-PunchOut. A re-PunchOut is simply a `PunchOutSetupRequest` with "edit" as its operation.

5.2.4 Step 5: Transmittal of Purchase Order

After the contents of the shopping cart have been passed from the supplier's website to the user's purchase requisition, the procurement application approval processes take over. When the purchase requisition is approved, the procurement application converts it into a purchase order and sends it back to the supplier's website for fulfillment. Purchasing card data can be transmitted along with the order, or the supplier can invoice the order separately.

The following figure illustrates purchase order transmittal:

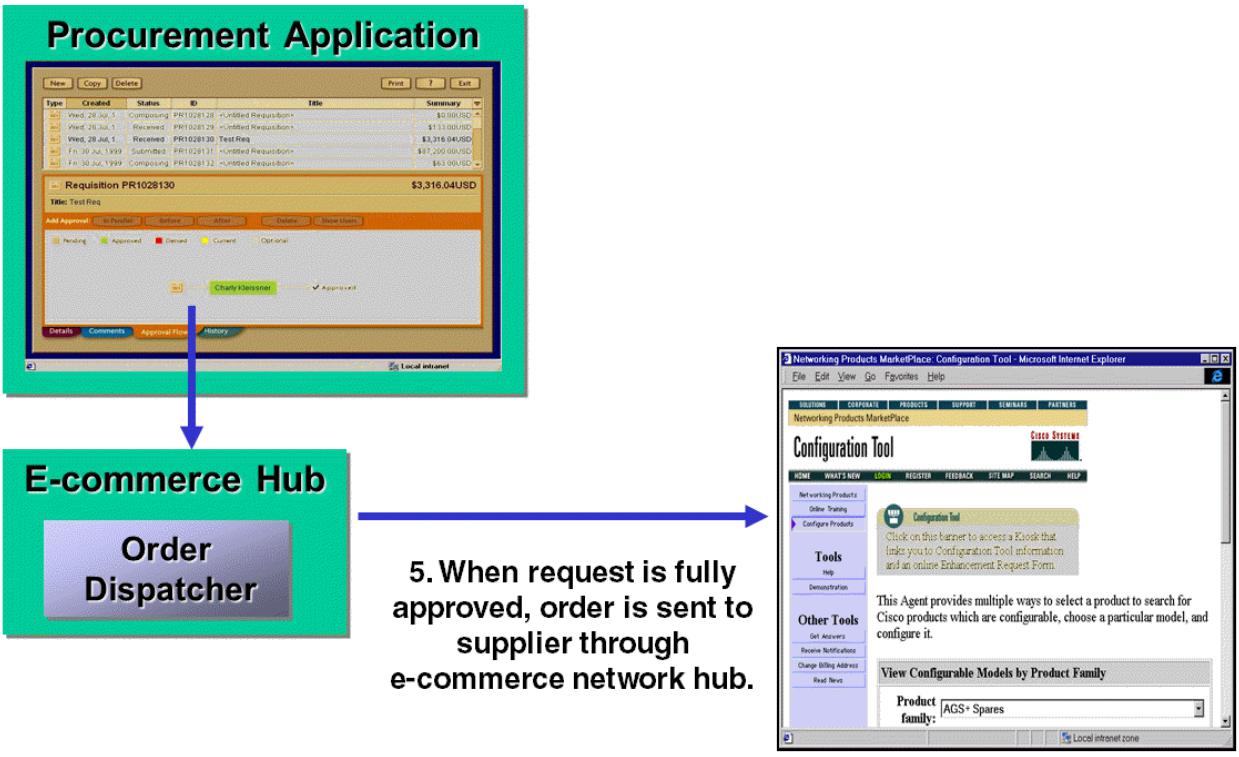


Figure 16: Order Transmittal Steps

How does it work? The procurement application sends all purchase orders to the e-commerce hub in cXML format. The hub then routes them to the supplier, using the supplier's preferred order-routing method. When the supplier acknowledges the receipt of a purchase order, the supplier has effectively booked the order.

For PunchOut-enabled suppliers, the best order routing method is cXML for the following reasons:

- cXML purchase orders allow embedded supplier cookie information to be transmitted back to the supplier. Because the supplier cookie is of data type "any", it does not easily map to other order routing methods such as fax, e-mail, or EDI.
- PunchOut-enabled suppliers are cXML-aware, so accepting cXML purchase orders is a small incremental effort.

Related Information

Purchase Orders [page 99]

5.3 PunchOut Documents

There are four types of cXML documents:

- PunchOut Index Catalog [page 68]
- PunchOutSetupRequest [page 69]
- PunchOutSetupResponse [page 73]
- PunchOutOrderMessage [page 74]

All but the PunchOut Index Catalog are considered PunchOut session documents because they are used to transmit data between a supplier's PunchOut site and the buyer during a PunchOut session.

5.3.1 PunchOut Index Catalog

PunchOut index catalogs are files that list PunchOut items and point to the supplier's PunchOut website.

The following example shows a PunchOut index catalog:

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- type of cXML doc and URL of DTD -->
<!DOCTYPE Index SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.016/cXML.dtd">
<Index>
    <SupplierID domain="DUNS">83528721</SupplierID>
    <IndexItem>
        <IndexItemPunchout>
            <ItemID>
<!-- The supplier's identifier for the PunchOut item -->
                <SupplierPartID>5555</SupplierPartID>
            </ItemID>             <PunchoutDetail punchoutLevel="shelf">
                <Description xml:lang="en-US">Desk Chairs</Description>
                <Description xml:lang="fr-FR">Chaises de Bureau</Description>
<!-- URL of the PunchOut website (launch page) if not configured elsewhere -->
                <URL>http://www.workchairs.com/punchout.asp</URL>
                <Classification domain="UNSPSC">5136030000</Classification>
            </PunchoutDetail>
        </IndexItemPunchout>
    </IndexItem>
</Index>
```

`SupplierID` identifies the supplier organization. The supplier can use any identification domain, but the recommended ones are D-U-N-S (Dun & Bradstreet Universal Naming System) and NetworkId. For more information about D-U-N-S numbers, see www.dnb.com.

`punchoutLevel` is an optional attribute that allows suppliers to specify how procurement applications should present the PunchOut item to users. This attribute can have the values `store`, `aisle`, `shelf`, or `product`. Procurement applications might display PunchOut items differently, depending on how they are tagged by suppliers. For example, they might display store-level items differently than product-level items.

`Description` specifies the text that the procurement application displays in product catalogs. The supplier can provide the description in multiple languages, and the procurement application displays the appropriate one for the user's locale.

`Classification` specifies the commodity grouping of the line item to the buyer. All the supplier's products and services must be mapped and standardized to the UNSPSC schema. For PunchOut index catalogs, the

Classification determines the location of the PunchOut item within catalogs displayed to users. For a list of UNSPSC codes, see www.unspsc.org.

5.3.1.1 Creating and Publishing Index Catalogs

Create these catalogs and publish them on an e-commerce hub to the supplier's customers. The catalog manager within buying organizations downloads them and stores them for use with procurement applications.

Users see the contents of the supplier's PunchOut index catalogs alongside regular, static catalog items.

5.3.1.2 PunchOut Item Granularity

The supplier can create store-level, aisle-level, or product-level catalogs.

- Store-level catalogs list one PunchOut item for all of the supplier's products and services. Users must search the supplier site to find the desired item.
- Aisle-level catalogs list multiple PunchOut items corresponding to related products and services.
- Product-level catalogs list only one product or service. Users do not need to search.

To determine how broad to make PunchOut items, consider the supplier's business model, the makeup of the supplier's product and service offerings, and the structure of the supplier's PunchOut website.

The more search and configuration tools the supplier has on the supplier's website, the more broad they can make the PunchOut items in the supplier's index catalogs.

5.3.2 PunchOutSetupRequest

To initiate a PunchOut session, the user selects the supplier's PunchOut item. The procurement application generates a `PunchOutSetupRequest` document and sends it to an e-commerce hub, which forwards it to the supplier's PunchOut website.

Following is a sample `PunchOutSetupRequest` document:

```
<?xml version="1.0"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML xml:lang="en-US" payloadID="933694607118.1869318421@jlee"
timestamp="2002-08-15T08:36:47-07:00">
    <Header>
<!-- Originator (buying organization) -->
        <From>
            <Credential domain="DUNS">
                <Identity>65652314</Identity>
            </Credential>
        </From>
<!-- Destination (supplier) -->
        <To>
            <Credential domain="DUNS">
                <Identity>83528721</Identity>
            </Credential>
```

```
        </To>
<!-- Previous relaying entity (network hub in this case) -->
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN200001</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Procurement System 2.0</UserAgent>
        </Sender>
    </Header>
    <Request>
<!-- type of request -->
        <PunchOutSetupRequest operation="create">
            <BuyerCookie>1CX3L4843PPZO</BuyerCookie>
            <Extrinsic name="UserEmail">jsmith</Extrinsic>
            <Extrinsic name="UniqueName">John_Smith</Extrinsic>
            <Extrinsic name="CostCenter">610</Extrinsic>
<!-- destination for final PunchOutOrderMessage -->
            <BrowserFormPost>
                <URL>https://bigbuyer.com:2600/punchout?client=NAwl4Jo</URL>
            </BrowserFormPost>
            <SupplierSetup>
                <URL>http://www.workchairs.com/punchout.asp</URL>
            </SupplierSetup>
            <ShipTo>
                <Address addressID="1000467">
                    <Name xml:lang="en">1000467</Name>
                    <PostalAddress>
                        <DeliverTo>John Smith</DeliverTo>
                        <Street>123 Main Street</Street>
                        <City>Sunnyvale</City>
                        <State>CA</State>
                        <PostalCode>94089</PostalCode>
                        <Country isoCountryCode="US">United States</Country>
                    </PostalAddress>
                </Address>
            </ShipTo>
<!-- item selected by user -->
            <SelectedItem>
                <ItemID>
                    <SupplierPartID>5555</SupplierPartID>
                </ItemID>
            </SelectedItem>
        </PunchOutSetupRequest>
    </Request>
</cXML>
```

The `payloadID` and `timestamp` attributes near the beginning are used by cXML clients to track documents and to detect duplicate documents.

The `From`, `To`, and `Sender` elements allow receiving systems to identify and authorize parties. The `From` and `To` elements in a document do not change. However, as the document travels to its destination, intermediate nodes (such as the Ariba Supplier Network) change the `Sender` element.

Network commerce hubs can change credential domains in the `From` and `To` elements, if that change results in more reliable identification. So for example, the `From` credential domain might change from `CustomDomain` to `DUNS`.

5.3.2.1 Create, Edit, Inspect, and Source Operations

The `operation` attribute specifies the type of session the buyer initiates. It can `create`, `edit`, `inspect`, or `source`.

- `create` sessions generate new shopping carts, which correspond to new purchase requisitions.
- `edit` sessions reopen previously created shopping carts or RFQs for modification. The procurement application sends line-item data as part of the `PunchOutSetupRequest`. The PunchOut website can use this data to re-instantiate the shopping cart created during the original session.
- `inspect` sessions reopen previously created shopping carts or RFQs for viewing only. As with the `edit` operation, the procurement application sends line-item data as part of the `PunchOutSetupRequest`. However, after re-instantiating the shopping cart, the PunchOut website does not allow modification of its contents.
- `source` sessions generate a RFQ for a sourcing application.

The following example lists an `edit` request:

```
<?xml version="1.0"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML xml:lang="en-US" payloadID="933695135608.677295401@jlee"
timestamp="2002-08-15T08:45:35-07:00">
    <Header>
        <From>
            <Credential domain="DUNS">
                <Identity>65652314</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="DUNS">
                <Identity>83528721</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN200001</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Procure 2.1</UserAgent>
        </Sender>
    </Header>
    <Request>
        <PunchOutSetupRequest operation="edit">
            <BuyerCookie>1CX3L4843PPZO</BuyerCookie>
            <Extrinsic name="UserEmail">jsmith</Extrinsic>
            <Extrinsic name="UniqueName">John_Smith</Extrinsic>
            <Extrinsic name="CostCenter">610</Extrinsic>
            <BrowserFormPost>
                <URL>https://bigbuyer.com:2600/punchout?client=NAwliuo</URL>
            </BrowserFormPost>
            <SupplierSetup>
                <URL>http://www.workchairs.com/punchout.asp</URL>
            </SupplierSetup>
            <ItemOut quantity="2">
                <ItemID>
                    <SupplierPartID>220-6338</SupplierPartID>
                    <SupplierPartAuxiliaryID>E000028901
                    </SupplierPartAuxiliaryID>
                </ItemID>
            </ItemOut>
        </PunchOutSetupRequest>
    </Request>
</cXML>
```

If the user initiated the `edit` session by selecting a catalog item, the `PunchOutSetupRequest` would contain a `SelectedItem` element, like a `create` session.

5.3.2.2 Authentication by an E-commerce Hub

`PunchOutSetupRequest` documents route through an e-commerce hub for authentication and to look up the URL of the supplier's PunchOut website. The steps are:

1. The hub receives the `PunchOutSetupRequest` document from the user.
2. The hub verifies the buyer's ID (`From` and `Shared Secret`) with that buyer's e-commerce account. It also identifies the requested supplier (`To`).
3. The hub looks up the supplier's shared secret from the supplier's account and inserts it (`Shared Secret`) into the `Sender` element.
4. The hub finds the URL of the supplier's PunchOut website in the supplier's account and sends the `PunchOutSetupRequest` document to it.
5. The supplier's website receives the cXML document and knows that it is authenticated because it contains the supplier's own shared secret.
6. The supplier's website uses information in the `From` element to identify the requester at the company level (for example, acme.com).
7. The supplier can use the `Contact` and extrinsic data in the body of the request to uniquely identify the user (for example, John Smith in Finance at acme.com).

The `PunchOutSetupRequest` and `PunchOutSetupResponse` documents pass through the e-commerce hub for authentication. The `PunchOutOrderMessage` document (returning the contents of the shopping basket to the procurement application) travels directly between the supplier's website and the procurement application through standard HTML Form submission.

Direct PunchOut is an alternative method for initiating PunchOut sessions, where the PunchOut site, not a network commerce hub, authenticates the PunchOut request.

Related Information

Direct PunchOut [page 97]

5.3.2.3 Supplier Setup URL and SelectedItem

In previous cXML releases, the `SupplierSetup` element provided the only way to specify the URL of the supplier's PunchOut website. Beginning with cXML 1.1, the e-commerce hub already knows the URL of the supplier's PunchOut website.

Also, starting with cXML 1.1, procurement applications can use the `SelectedItem` element to specify store-, aisle-, or product-level PunchOut.

The `SupplierSetup` element has been deprecated. However, the supplier's PunchOut website must handle both methods until all PunchOut websites and procurement applications recognize and send the `SelectedItem` element.

5.3.2.4 Contact Data and Extrinsic Data for User Identification

The `PunchoutSetupRequest` document can contain detailed user information in the `Contact` element that the supplier's website can use to authenticate and direct users, such as:

- User name and role
- E-mail address

In addition, the `PunchOutSetupRequest` might also contain extrinsic data, data that the supplier can use to further identify users, such as:

- User cost center and subaccount
- Region
- Supervisor
- Default currency

Buying organizations configure their procurement applications to insert `contact` and extrinsic data. Ask the supplier's customers what data the supplier can expect to receive.

5.3.3 PunchOutSetupResponse

After receiving a `PunchOutSetupRequest`, the supplier's website sends a `PunchOutSetupResponse`. The `PunchOutSetupResponse` document serves two functions:

- It indicates that the `PunchOutSetupRequest` was successful.
- It provides the procurement application with a redirect URL to the supplier's Start Page.

It contains a `URL` element that specifies the Start Page URL to pass to the user's Web browser for the interactive browsing session. This URL must contain enough state information to bind to a session context on the supplier's website, such as the identity of the requester and the contents of the `BuyerCookie` element. Due to URL length restrictions in many applications, this URL should refer to the state information rather than including it all.

The following example lists a `PunchOutSetupResponse` document:

```
<?xml version="1.0"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML xml:lang="en-US" payloadID="933694607739"
timestamp="2002-08-15T08:46:00-07:00">
    <Response>
        <Status code="200" text="success"></Status>
        <PunchOutSetupResponse>
            <StartPage>
                <URL>
                http://xml.workchairs.com/retrieve?reqUrl=20626;Initial=TRUE
                </URL>
            </StartPage>
```

```
        </PunchOutSetupResponse>
    </Response>
</cXML>
```

5.3.4 PunchOutOrderMessage

After the user selects items on the supplier's website, configures them, and clicks the supplier's "Check Out" button, the supplier's website sends a `PunchOutOrderMessage` document to communicate the contents of the shopping basket to the buyer's procurement application. This document can contain much more data than the other documents, because it needs to be able to fully express the contents of any conceivable shopping basket. This document does not strictly follow the Request/Response paradigm; its use will be explained in detail.

The following example lists a `PunchOutOrderMessage`:

```
<?xml version="1.0"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML xml:lang="en-US" payloadID="933695160894"
timestamp="2002-08-15T08:47:00-07:00">
    <Header>
        <From>
            <Credential domain="DUNS">
                <Identity>83528721</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="DUNS">
                <Identity>65652314</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="workchairs.com">
                <Identity>website 1</Identity>
            </Credential>
            <UserAgent>Workchairs cXML Application</UserAgent>
        </Sender>
    </Header>
    <Message>
        <PunchOutOrderMessage>
            <BuyerCookie>1CX3L4843PPZO</BuyerCookie>
            <PunchOutOrderMessageHeader operationAllowed="edit">
                <Total>
                    <Money currency="USD">763.20</Money>
                </Total>
            </PunchOutOrderMessageHeader>
            <ItemIn quantity="3">
                <ItemID>
                    <SupplierPartID>5555</SupplierPartID>
                    <SupplierPartAuxiliaryID>E000028901
                    </SupplierPartAuxiliaryID>
                </ItemID>
                <ItemDetail>
                    <UnitPrice>
                        <Money currency="USD">763.20</Money>
                    </UnitPrice>
                    <Description xml:lang="en">
                        <ShortName>Excelsior Desk Chair</ShortName>
                        Leather Reclining Desk Chair with Padded Arms
                    </Description>
                    <UnitOfMeasure>EA</UnitOfMeasure>
                    <Classification domain="UNSPSC">5136030000
                    </Classification>
```

```
                    <LeadTime>12</LeadTime>
                </ItemDetail>
            </ItemIn>
        </PunchOutOrderMessage>
    </Message>
</cXML>
```

`BuyerCookie` enables the procurement application to associate a given `PunchOutOrderMessage` with its originating `PunchOutSetupRequest`. Therefore, the supplier's website should return this element whenever it appears. Do not use the `BuyerCookie` to track PunchOut sessions, because it changes for every session, from `create`, to `inspect`, to `edit`.

`SupplierPartAuxiliaryID` acts as a supplier cookie. This field allows the supplier to transmit additional data, such as quote number or another cXML document. The procurement application passes it back to the supplier in any subsequent PunchOut `edit` or `inspect` sessions, and in the resulting cXML purchase order. The supplier can use the supplier cookie to associate items in a purchase requisition with the corresponding items in a shopping cart at the supplier's website.

> **Note**
>
> Procurement applications might use `SupplierPartAuxiliaryID` as part of the unique identifier for items, so PunchOut sites should not change this value during PunchOut `edit` or `inspect` sessions.

`UnitOfMeasure` describes how the product is packaged or shipped.

`Classification` lists the UNSPSC (United Nations Standard Products and Services Code) commodity code for each selected item. These codes are used by back-end systems within buyer and supplier organizations for accounting and report generation. For the list of UNSPSC codes, see www.unspsc.org.

Related Information

UnitOfMeasure [page 48]

5.4 Modifications to the Supplier's Web Pages

To receive or send the three cXML PunchOut session documents, `PunchOutSetupRequest`, `PunchOutSetupResponse`, and `PunchOutOrderMessage`, the supplier might need to modify or create four pages on the supplier's website:

- Launch Page [page 76]
- Start Page [page 78]
- Sender Page [page 78]
- Order Receiver Page [page 81]

To illustrate how the supplier might implement these pages, this chapter uses simple Active Server Page (ASP) code samples and the Microsoft Internet Explorer 5 XML Parser. Actual implementation of these pages will vary depending on the supplier development environment (for example, CGI, JavaScript, or WebObjects).

5.4.1 Launch Page

The Launch Page receives all authenticated `PunchOutSetupRequest` documents from the e-commerce hub. It reads the HTTP stream sent from the hub and validates the cXML request embedded within that stream against the cXML DTD (in the case of ASP, using method calls to the Internet Explorer 5 XML parser). After validation, the supplier's Launch Page extracts elements from the document in order to:

1. Identify the user and determine where to redirect that user.
2. Compose a `PunchOutSetupResponse` document and return it to the sender.

The supplier's Launch Page should store the following data for use by the supplier's Start Page:

- Identity of the requester (`Sender`)
- Identity of the language of the user (`xml:lang`) so the supplier can provide localized content
- Type of the request (`create`, `edit`, or `inspect`)
- Any extrinsic data that further identifies the user and the user location

Following is a sample Launch Page. This code does not use an XML tool to dynamically generate the `PunchOutSetupResponse`, but instead uses a static XML template into which line item data is filled. **This code is intended for illustrative purposes only.**

```
<script language=JScript RUNAT=Server>
function elementValue(xml, elem)
{
    var begidx;
    var endidx;
    var retStr;
    begidx = xml.indexOf(elem);
    if (begidx > 0) {
        endidx = xml.indexOf('</',begidx);
        if (endidx > 0)
            retStr = xml.slice(begidx+elem.length,
            endidx);
            return retStr;
        }
        return null;
}
function twoChar( str )
{
    var retStr;
    str = str.toString();
    if ( 1 == str.length ) {
        retStr = "0" + str;
    } else {
    retStr = str;
    }
    return retStr;
    }
function timestamp( dt )
    {
    var str;
    var milli;
    str = dt.getFullYear() + "-" + twoChar( 1 + dt.getMonth() ) + "-";
    str += twoChar( dt.getDate() ) + "T" + twoChar( dt.getHours() ) + ":";
    str += twoChar( dt.getMinutes() ) + ":" + twoChar( dt.getSeconds() ) + ".";
    milli = dt.getMilliseconds();
    milli = milli.toString();
    if ( 3 == milli.length ) {
        str += milli;
    } else {
        str += "0" + twoChar( milli );
```

```
    }
    str += "-08:00";
    return str;
    }
function genProlog( cXMLvers, randStr )
    {
    var dt;
    var str;
    var vers, sysID;
    var nowNum, timeStr;
    vers = "1.2.014";
    sysID = "http://xml.cXML.org/schemas/cXML/" + vers + "/cXML.dtd";
    dt = new Date();
    nowNum = dt.getTime();
    timeStr = timestamp( dt );
    str = '<?xml encoding="UTF-8"?>\n';
    str += '<!DOCTYPE cXML SYSTEM "' + sysID + '">\n';
    str += '<cXML payloadID="' + nowNum + ".";
    str += randStr + '@' + Request.ServerVariables("LOCAL_ADDR");
    str += '" timestamp="' + timeStr + '">';
    return str;
}
</script>
<%
REM Create data needed in prolog.
Randomize
randStr = Int( 100000001 * Rnd )
prologStr = genProlog( "1.0", randStr )
Response.ContentType = "text/xml"
Response.Charset = "UTF-8"
%>
<%
REM This receives the PunchOutSetup request coming from the e-commerce hub.
REM It takes the ORMSURL and buyercookie, attaches them to the Start Page URL,
REM and sends the response back to the requester.
REM punchoutredirect.asp?bc=2133hfefe&url="http://workchairs/com/..&redirect="
    Dim ret
    Dim punch
    Dim statusText
    Dim statusCode
    Dim cookie
    Dim url
    Dim xmlstr
    Dim fromUser
    Dim toUser
    cookie = ""
    url = ""
    xmlstr = ""
    dir = ""
    path = Request.ServerVariables("PATH_INFO")
    dir = Left(path, InstrRev(path, "/"))
    if IsEmpty(dir) then
        dir = "/"
    end if
REM This command reads the incoming HTTP cXML request
    xml = Request.BinaryRead(Request.TotalBytes)
    for i = 1 to Request.TotalBytes
        xmlstr = xmlstr + String(1,AscB(MidB(xml, i, 1)))
    Next
    cookie = elementValue(xmlstr, "<BuyerCookie>")
    url = elementValue(xmlstr, "<URL>")
    fromUser = elementValue(xmlstr, "<Identity>")
    newXMLStr = Right(xmlstr, Len(xmlstr) - (InStr(xmlstr,"<Identity>") +
Len("<Identity>")))
    toUser = elementValue(newXMLStr, "<Identity>")
%>
REM This formats the cXML PunchOutSetupReponse
<% if IsEmpty(cookie) then %>
```

```
<%= prologStr %>
    <Response>
        <Status code="400" Text="Bad Request">Invalid Document. Unable to extract
        BuyerCookie.</Status>
    </Response>
</cXML>
<% else %>
<%= prologStr %>
    <Response>
        <Status code="200" text="OK"/>
        <PunchOutSetupResponse>
            <StartPage>
                <URL>http://<%= Request.ServerVariables("LOCAL_ADDR")%>/<%= dir%>/
punchoutredirect.asp?bc=<%= cookie%>&url="<%= url%>"&from=<%= fromUser%>&to=<%=
toUser%>&redirect=<%= StartPage%></URL>
            </StartPage>
        </PunchOutSetupResponse>
    </Response>
</cXML>
<%end if%>
```

The supplier's Launch Page should return a `StartPage` URL that is unique for that PunchOut session. In addition, this URL should be valid for only a limited amount of time. By deactivating this URL, the supplier makes it more difficult for unauthorized users to access the supplier's Start Page.

Remember to implement functionality for subsequent `edit` and `inspect` sessions. Users cannot change order details for PunchOut items (such as quantity) within their procurement application. They must re-PunchOut with an `edit` session. For the greatest benefit to users, `inspect` sessions that occur after the supplier receives the order should display order status.

5.4.2 Start Page

The supplier's Start Page logs the requester into an account on the supplier's website. From the supplier's Start Page, users begin their shopping experience. This page might already exist at the supplier's website, so modify it to query user name and password information from the `PunchOutSetupRequest` document.

Allow only authorized users into the supplier's Start Page. If the supplier waits until the check-out step to authenticate them, their confidential pricing or terms are not protected.

If the supplier uses HTTP browser cookies to track user preferences and sessions, they should be destroyed after the `PunchOutOrderMessage` is sent to buyers. Destroying these cookies prevents the possibility of offering privileged features to unauthorized users.

5.4.3 Sender Page

The Sender Page sends the contents of the user's shopping cart to the user. As described earlier, after users fill their shopping carts, they click the supplier's "Check Out" button.

Below is a simple ASP implementation of this feature. This code does not use an XML tool to dynamically generate the `PunchOutOrderMessage`, but instead uses a static XML template into which line item data is filled. **This code is intended for illustrative purposes only.**

This is a portion of a supplier's website product page:

```
<!--#include file="punchoutitem.inc"-->
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<!-- saved from url=(0093)https://secure1.shore.net/wbird/cgi/vsc.cgi/wbird/houses/
urban.htm?L+wbird+wadt4101+928011405 -->
<TABLE border=0>
    <TBODY>
        <TR>
            <TD><IMG src="UrbanHouses_files/uhjm.gif"> </TD>
            <TD><STRONG>Jefferson Memorial</STRONG>- A birdfeeder with a rotunda!
This famous American monument will be a unique addition to any garden or yard. It
attracts small to medium sized birds and its dimensions are 11" x 9 1/2" x 8" H.
            </TD>
        </TR>
    </TBODY>
</TABLE><BR>
-Jefferson Memorial<STRONG>
$139.95</STRONG><BR>
<% AddBuyButton 139.95,101,"Bird Feeder, Jefferson Memorial",5 %>
<BR>
<HR>
```

The `AddBuyButton` function sends the `PunchOutOrderMessage` back to the user.

The following listing is the include file (`punchoutitem.inc`) referenced in the previous example:

```
<%
REM This asp is included in items.asp, which specifies the item parameters, formats
REM a cXML document, and allows the user to proceed with a checkout of the item.
function CreateCXML(toUser, fromUser, buyerCookie, unitPrice, supPartId, desc)
%>
<?xml version=&quot;1.0&quot; encoding=&quot;UTF-8&quot;?>
<!DOCTYPE cXML SYSTEM &quot;http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd&quot;>
<cXML payloadID=&quot;<%= Now &"@"& Request.ServerVariables("LOCAL_ADDR")%>&quot;
timestamp=&quot;<%= Now %>&quot;>
    <Header>
        <From>
            <Credential domain=&quot;hub.com&quot;>
                <Identity><%= toUser%></Identity>
            </Credential>
        </From>
        <To>
            <Credential domain=&quot;hub.com&quot;>
                <Identity><%= fromUser%></Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain=&quot;hub.com&quot;>
                <Identity><%= toUser%></Identity>
            </Credential>
            <UserAgent>PunchoutSite</UserAgent>
        </Sender>
    </Header>
    <Message>
        <PunchOutOrderMessage>
            <BuyerCookie><%= buyerCookie%></BuyerCookie>
            <PunchOutOrderMessageHeader
            operationAllowed=&quot;edit&quot;>
                <Total>
                    <Money currency=&quot;USD&quot;><%=
                    unitPrice%></Money>
                </Total>
            </PunchOutOrderMessageHeader>
            <ItemIn quantity=&quot;1&quot;>
                <ItemID>
```

```
                    <SupplierPartID><%= supPartId%></SupplierPartID>
                    <SupplierPartAuxiliaryID><%= supPartAuxId%>
                    </SupplierPartAuxiliaryID>
                </ItemID>
                <ItemDetail>
                    <UnitPrice>
                        <Money currency=&quot;USD&quot;><%= unitPrice%>
                        </Money>
                    </UnitPrice>
                    <Description xml:lang=&quot;en&quot;><%= desc%>
                    </Description>
                    <UnitOfMeasure>EA</UnitOfMeasure>
                    <Classification
                        domain=&quot;SupplierPartID&quot;><%= supPartId%>
                    </Classification>
                </ItemDetail>
            </ItemIn>
        </PunchOutOrderMessage>
    </Message>
</cXML>
<% end function
function AddBuyButton(unitPrice, supPartId, supPartAuxId, desc)
toUser = Session("toUser")
fromUser = Session("fromUser")
buyerCookie = Session("buyercookie")
url = Session("urlToPost")
if not IsEmpty(buyerCookie) then
    %>
    <FORM METHOD=POST ACTION=<%= url%>>
        <INPUT TYPE=HIDDEN NAME="cxml-urlencoded" VALUE="<% CreateCXML toUser,
fromUser, buyerCookie, unitPrice, supPartId, supPartAuxId, desc%>">
        <INPUT TYPE=SUBMIT  value=BUY>
    </FORM>
<%else%>
    </p>
    <%
end if
end function
%>
```

The `AddBuyButton` function contains the `FORM POST` that sends the URL-encoded `PunchOutOrderMessage` back to the user.

5.4.3.1 HTTP Form Encoding

To send a `PunchOutOrderMessage`, the supplier uses HTML form encoding, which is a different transport model from the traditional HTTP request/response model. This different transport facilitates easier integration between the supplier's website and the procurement application. It also enables buying organizations to receive XML data without requiring them to have a Web server available through a firewall.

Instead of sending a `PunchOutOrderMessage` directly to the procurement application, the supplier's website encodes it as a hidden HTML Form field and the user's browser submits it to the URL specified in the `BrowserFormPost` element of the `PunchOutSetupRequest`. The hidden HTML Form field must be named either `cxml-urlencoded` or `cxml-base64`, both case insensitive. Taken from the above example, the following code fragment inserts a hidden form field named `cxml-urlencoded` containing the `PunchOutOrderMessage` document to be posted:

```
<FORM METHOD=POST ACTION=<%= url%>>
    <INPUT TYPE=HIDDEN NAME="cxml-urlencoded" VALUE="<% CreateCXML toUser,
fromUser, buyerCookie, unitPrice, supPartId, supPartAuxId, desc%>">
```

```
    <INPUT TYPE=SUBMIT  value=BUY>
</FORM>
```

This encoding permits the supplier to design a checkout Web page that contains the cXML document. When users click the supplier's "Check Out" button, the supplier's website presents the data, invisible to users, to the procurement application as an HTML Form Submit.

5.4.3.2 Cancelling PunchOut

The supplier might want to add a "Cancel" button to their pages so that users can cancel their PunchOut session. The "Cancel" button sends an empty `PunchOutOrderMessage` that tells the procurement application that no items will be returned, and to delete existing PunchOut items from the requisition. The supplier can also use it to perform any housekeeping needed by the supplier's website, such as clearing the shopping cart and closing the user session.

5.4.4 Order Receiver Page

The Order Receiver Page accepts cXML purchase orders sent by buying organizations. It could be similar to the Launch Page discussed above. For information about receiving purchase orders, see Purchase Orders [page 99]

5.5 PunchOut Website Suggestions

This section provides suggestions and information you should consider when planning the implementation of a PunchOut website.

5.5.1 Implementation Guidelines

Follow these guidelines when developing the supplier's PunchOut website:

- Study the *cXML User's Guide* (this document).
- Use an XML parser and validate documents against the cXML DTD.
- Use the `xml:lang=` property to identify users' languages so the supplier can provide localized content.
- Use the `From` credential to identify buying organizations.
- Send a unique, temporary URL for the session on redirect.
- Do not persist browser cookies.
- Do not overburden the supplier's customers with extrinsic data requirements.
- For each line item, use UNUOM (United Nations Units of Measure) and UNSPSC (United Nations Standard Products and Services Code).
- Provide real value to the supplier's customers. Display product availability, order status, and special promotions.

- Checkout should be easy and intuitive. Ideally, users should need to click only three buttons to buy.
- Code for subsequent edit and inspect sessions. Users cannot change order details for PunchOut items (such as quantity) within their procurement application. They must re-PunchOut with an edit session.
- For the greatest benefit to users, inspect sessions should display order status.
- Test the supplier's PunchOut website. Allow time for testing with the supplier's customers' procurement applications.
- PunchOut transactions produce quotes, not purchase orders. Implement a cXML purchase-order receiving page to accept orders.

5.5.2 Buyer and Supplier Cookies

The buyer and supplier cookies enable both buyers and suppliers to re-instantiate their own line-item data for their back-end systems.

- The supplier should return the `BuyerCookie` element they receive. It should not be changed.
- Make use of the supplier cookie (`SupplierPartAuxiliaryID`).

The buyer cookie is analogous to a purchase requisition number; it conveys state information that allows the buying organization's system to maintain the relationship between a requisition and a shopping basket.

Likewise, the supplier cookie is analogous to a quote number; it conveys state information that allows the supplier's system to maintain a relationship between a shopping basket and the buyer's requisition and purchase order. Procurement applications pass the supplier cookie back to the supplier in subsequent PunchOut `edit` or `inspect` sessions, and in the resulting purchase order. The supplier's website should take advantage of the supplier cookie to eliminate the need to pass visible, supplier-specific data back to the buyer.

5.5.3 Personalization

The header of the `PunchOutSetupRequest` always identifies the buying organization, but the request might also contain `Contact` and `Extrinsic` data (such as user's cost center, user's location, or product category) that the supplier can use to determine the dynamic URL to serve to the user.

Although not all buying organizations send this extrinsic data, it can enable the supplier to customize the supplier's Web store beyond the simple organization level. For example, the supplier could provide a separate Web store for each cost center within the buying organization (or each product category or each user).

The supplier could also store and display the user's previous quotes. The supplier could allow users to reuse quotes, check the status of orders, and create reports on past activity. To avoid security problems, store quote history only at the per-user level.

A key consideration during planning is the amount of effort required to implement a highly dynamic and customized PunchOut website. The supplier needs to balance between customization and complexity—a complex website takes longer to implement and maintain, but it could offer more value to users. It is recommended that the supplier start with a simple PunchOut website and enhance it over time.

5.6 PunchOut Transaction

The PunchOut message definitions are request/response messages within the `Request` and `Response` elements. All of the following messages must be implemented by suppliers to support PunchOut.

`PunchOutSetupRequest` and `PunchOutSetupResponse` are the request/response pair used to set up a PunchOut session to a remote system. The client uses them to identify the procurement application, send setup information, and receive a response indicating where to go to initiate an HTML browsing session on the remote website.

The order of cXML message flow in the PunchOut transaction is shown in the following diagram:

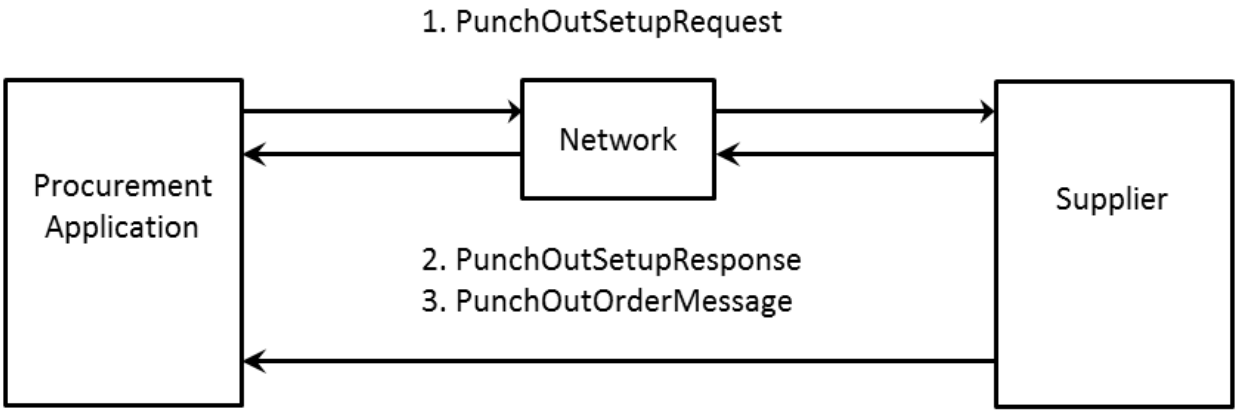


Figure 17: cXML Message Flow in PunchOut Transaction

5.6.1 Sourcing

PunchOut can also be used for sourcing. A user can PunchOut from a procurement application to a sourcing application to initiate a RFQ (Request For Quote) session. The sourcing application will return a `PunchOutSetupResponse` with the URL of the start page of the sourcing application. With the URL, the end user goes to the sourcing application to provide more configuration information for RFQ.

At the end of each user session, a `PunchOutOrderMessage` is sent by the sourcing application to the procurement application and contains either a new RFQ, update information for an existing RFQ, or a completed RFQ.

Related Information

PunchOutOrderMessage [page 88]

5.6.2 PunchOutSetupRequest

The `PunchOutSetupRequest` document contains a `Header` element and a `PunchOutSetupRequest` element.

5.6.2.1 Header

The `Header` element contains addressing and authentication information. Following is a sample `Header` element in a `PunchOutSetupRequest`.

```
<Header>
    <From>
        <Credential domain="DUNS">
            <Identity>65652314</Identity>
        </Credential>
    </From>
    <To>
        <Credential domain="DUNS">
            <Identity>83528721</Identity>
        </Credential>
    </To>
    <Sender>
        <Credential domain="NetworkId">
            <Identity>AN12345</Identity>
            <SharedSecret>abracadabra</SharedSecret>
        </Credential>
        <UserAgent>Procure Software 3.3</UserAgent>
    </Sender>
</Header>
```

From

The buying organization originating the `PunchOutSetupRequest`.

To

The supplier destination of the `PunchOutSetupRequest`.

Sender

Authentication details of the buying organization including `Identity`, `SharedSecret` (password), and `AribaNetworkId`, which is specified by `Credential domain`. The `SharedSecret` is the supplier's password or login to the PunchOut site.

UserAgent

A unique identifier for the application sending the `PunchOutSetupRequest`. Consists of the software company name, product name, and version. Version details can appear in parentheses.

5.6.2.2 PunchOutSetupRequest

A `PunchOutSetupRequest` element is contained within the `Request` element. The following example shows the element declaration of `PunchOutSetupRequest` from `cXML.dtd`:

```
<!ELEMENT PunchOutSetupRequest (
    BuyerCookie,
    Extrinsic*,
    BrowserFormPost?,
    Contact*,
    SupplierSetup?,
    ShipTo?,
    SelectedItem?,
    ItemOut*)>
```

The following example shows a `PunchOutSetupRequest`:

```
<PunchOutSetupRequest operation="create">
    <BuyerCookie>34234234ADFSDF234234</BuyerCookie>
    <Extrinsic name="UserEmail">betty</Extrinsic>
    <Extrinsic name="UniqueName">BettyBuyer</Extrinsic>
    <Extrinsic name="CostCenter">Marketing</Extrinsic>
    <BrowserFormPost>
        <URL>http://orms.acme.com:1616/punchoutexit</URL>
    </BrowserFormPost>
    <SelectedItem>
        <ItemID>
            <SupplierPartID>54543</SupplierPartID>
        </ItemID>
    </SelectedItem>
    <SupplierSetup>
        <URL>http://workchairs.com/cxml</URL>
    </SupplierSetup>
    <ShipTo>
        <Address addressID="1000467">
            <Name xml:lang="en">1000467</Name>
            <PostalAddress>
                <DeliverTo>Betty Buyer</DeliverTo>
                <Street>123 Main Street</Street>
                <City>Sunnyvale</City>
                <State>CA</State>
                <PostalCode>94089</PostalCode>
                <Country isoCountryCode="US">United States</Country>
            </PostalAddress>
        </Address>
    </ShipTo>
</PunchOutSetupRequest>
```

`PunchOutSetupRequest` has the following attribute:

Attribute	Description
`operation`	Specifies the type of `PunchOutSetupRequest`: “create”, “inspect”, “edit” or “source”.

This element also contains the following elements: `BuyerCookie`, `Extrinsic`, `BrowserFormPost`, `Contact`, `ShipTo`, `SelectedItem`, `SupplierSetup` and an `ItemOut` list. Only the `BuyerCookie` element is required. The structure of `Extrinsic`, `Contact`, and `ShipTo` elements is discussed in more detail in OrderRequestHeader Element [page 103]. The `ItemOut` element is discussed in ItemOut [page 120]. In this context (outside of an `OrderRequest`), the `Distribution` and `Comments` elements and `lineNumber`, `requisitionID`, and `requestedDeliveryDate` attributes of an `ItemOut` add little or no value and should not be included. Because PunchOut sessions take place before ordering, this information is not relevant within a `PunchOutSetupRequest`.

An `ItemOut` list describes an existing shopping cart (items from a previous PunchOut session). The `inspect` operation initiates a read-only PunchOut session (enforced by both the client and the server) to view details about the listed items. The `edit` operation also starts from the previous shopping cart (described using the `ItemOut` list), but allows changes. Support for the `edit` operation implies `inspect` support (see PunchOutOrderMessageHeader [page 89] and Empty Shopping Carts [page 90]). This list can also describe items to be sourced. For more information, see Sourcing [page 83].

The `Credential` of the supplier is used to obtain the PunchOut location from the E-commerce network hub where suppliers can store the URLs of their PunchOut websites. E-commerce network hubs receive the `PunchOutSetupRequest` document, read the supplier's ID, find the URL of the PunchOut website from the supplier's account information, and send the `PunchOutSetupRequest` document to that URL. The e-commerce network hub, not the buyer, specifies the URL of the PunchOut website, which is more flexible. The URL specified in the `SupplierSetup` element of the `PunchOutSetupRequest` has been deprecated; cXML servers will ignore this element in the future.

5.6.2.3 BuyerCookie

This element transmits information that is opaque to the remote website, but it must be returned to the originator for all subsequent PunchOut operations. This element allows the procurement application to match multiple outstanding PunchOut requests. `BuyerCookie` is unique per PunchOut session.

5.6.2.4 BrowserFormPost

This element is the destination for the data in the `PunchOutOrderMessage`. It contains a `URL` element whose use will be further explained in the `PunchOutOrderMessage` definition. If the URL-Form-Encoded method is not being used, this element does not have to be included.

5.6.2.5 Extrinsic

This optional element contains any additional data that the requestor wants to pass to the external website. The cXML specification does not define the content of `Extrinsic` elements—it is something that each requestor and remote website must agree on and implement.

`Extrinsic` elements are intended to provide additional machine-readable information. They extend the cXML protocol to support features not required by all implementations. In the following context, the new data further describes the user initiating the PunchOut request.

```
<Extrinsic name="department">Marketing</Extrinsic>
```

The following example passes the user initiating the PunchOut and their department.

```
<Extrinsic name=”CostCenter"">450</Extrinsic>
<Extrinsic name=”User”>jsmith</Extrinsic>"
```

With cXML 1.1 and higher, the `Contact` element obsoletes the “Cost Center” and “User” extrinsics.

The `Extrinsic` element can also appear in the `OrderRequestHeader`, `ItemDetail`, `SpendDetail`, `LaborDetail`, and `ContractItem` elements. These contexts are described further elsewhere in this document.

5.6.2.6 SelectedItem

An optional `SelectedItem` element allows suppliers to specify PunchOut for an entire store or any subset of product offerings. Suppliers can create their catalogs so that `SelectedItem` leads to store-, aisle-, or product-level PunchOut. Procurement applications can include the `SelectedItem` element in `PunchOutSetupRequest` documents, and PunchOut sites can use it to determine which products to display to users. The more specific the item is in the catalog, the less searching users have to do at the supplier’s website. If there is no `SelectedItem`, suppliers should present their entire (store-level) product offerings.

A `SelectedItem` contains an `ItemID`, for example:

```
<SelectedItem>
    <ItemID>
        <SupplierPartID>5555</SupplierPartID>
    </ItemID>
</SelectedItem>
```

For the contents of the `SelectedItem` element, procurement applications use the `ItemID` (`SupplierPartID` and `SupplierPartAuxiliaryID`) from the PunchOut index catalog. No catalog changes are required.

Procurement applications should initially send both the new `SelectedItem` element and the old PunchOut URL in the `PunchOutSetupRequest`. E-commerce network hubs use the old URL only for suppliers that have not yet stored their PunchOut URL destinations.

This element is usually present in `create` operations. Procurement applications that allow users to punch out directly from a supplier listing should leave out `SelectedItem` in that case.

For `edit` and `inspect` operations, `SelectedItem` should appear only if the user chose to return to the supplier’s website while viewing new information in the local catalog rather than items in an existing requisition. In either case, the current shopping cart must appear in the `ItemOut` list.

`SelectedItem` should not be used in a `source` operation.

5.6.2.7 SupplierSetup

This optional element specifies the URL to which to post the `PunchOutSetupRequest`. This element is not needed if the e-commerce network hub knows the supplier’s PunchOut URL.

5.6.2.8 ShipTo

This optional element specifies the Ship To address for the item. Suppliers might want to use this information to formulate delivery time or price estimates.

IDReference

An existing element that is now also a child element of `ShipTo`.

5.6.3 PunchOutSetupResponse

After the remote website has received a `PunchOutSetupRequest`, it responds with a `PunchOutSetupResponse`, as shown below:

```
<PunchOutSetupResponse>
    <StartPage>
        <URL>
            http://premier.workchairs.com/store?23423SDFSDF23
        </URL>
    </StartPage>
</PunchOutSetupResponse>
```

5.6.3.1 StartPage

This element contains a `URL` element that specifies the URL to pass to the browser to initiate the PunchOut browsing session requested in the `PunchOutSetupRequest`. This URL must contain enough state information to bind to a session context on the remote website, such as the requestor identity and the appropriate `BuyerCookie` element.

At this point, the user who initiated the `PunchOutSetupRequest` browses the external website, and selects items to be transferred back to the procurement application through a `PunchOutOrderMessage`.

5.6.4 PunchOutOrderMessage

This element sends the contents of the remote shopping basket or sourcing RFQ to the originator of a `PunchOutSetupRequest`. It can contain much more data than the other messages because it must be able to fully express the contents of any conceivable shopping basket on the external website. This message does not strictly follow the Request/Response model.

The remote website generates a `PunchOutOrderMessage` when the user checks out. This message communicates the contents of the remote shopping basket to the procurement application; for example:

```
<PunchOutOrderMessage>
    <BuyerCookie>34234234ADFSDF234234</BuyerCookie>
    <PunchOutOrderMessageHeader operationAllowed="create">
        <Total>
            <Money currency="USD">100.23</Money>
        </Total>
    </PunchOutOrderMessageHeader>
    <ItemIn quantity="1">
        <ItemID>
            <SupplierPartID>1234</SupplierPartID>
```

```
            <SupplierPartAuxiliaryID>
                additional data about this item
            </SupplierPartAuxiliaryID>
        </ItemID>
        <ItemDetail>
            <UnitPrice>
                <Money currency="USD">10.23</Money>
            </UnitPrice>
            <Description xml:lang="en">
                Learn ASP in a Week!
            </Description>
            <UnitOfMeasure>EA</UnitOfMeasure>
            <Classification domain="SPSC">12345</Classification>
            <LeadTime>1</LeadTime>
        </ItemDetail>
    </ItemIn>
</PunchOutOrderMessage>
```

A `PunchOutOrderMessage` document can be empty, which allows users to end PunchOut shopping sessions without selecting any items. Suppliers can implement a Cancel button that generates an empty `PunchOutOrderMessage` document. Then, both the PunchOut site and the procurement application know when a user has canceled a shopping session, and they can delete the shopping cart, delete items from the requisition, and perform other housekeeping tasks.

5.6.4.1 BuyerCookie

This element is the same element that was passed in the original `PunchOutSetupRequest`. It must be returned here to allow the procurement application to match the `PunchOutOrderMessage` with an earlier `PunchOutSetupRequest`.

5.6.4.2 PunchOutOrderMessageHeader

This element contains information about the entire shopping basket contents being transferred. The only required element is `Total`, which is the overall cost of the items being added to the requisition, excluding tax and shipping charges.

Additional elements that are allowed are `Shipping` and `Tax`, which are the amount and description of any shipping or tax charges computed on the remote website.

`ShipTo` is also optional, and it specifies the Ship-To addressing information the user selected on the remote site or that was passed in the original `PunchOutSetupRequest`.

All monetary amounts are in a `Money` element that always specifies currency in a standardized format.

The `SourcingStatus` element is optional, and relays updated information about a sourced RFQ. The content of the element could be a textual description of the update, such as the actual status update string displayed to the user.

PunchOutOrderMessageHeader has the following attributes:

Attribute	Description
operationAllowed	Specifies the operations allowed in subsequent PunchOutOrderRequests: "create", "inspect", or "edit".
quoteStatus	Optional attribute specifies whether the order is "pending" or "final". If quoteStatus is "final", the transaction is complete.

The operationAllowed attribute controls whether the user can initiate later PunchOut sessions containing data from this PunchOutOrderMessage:

- operationAllowed="create": disallows subsequent PunchOut sessions for these items. Users cannot inspect or edit these items.
- operationAllowed="inspect": allows subsequent PunchOut sessions only to inspect these items. The items cannot be changed.
- operationAllowed="edit": allows subsequent PunchOut sessions to both inspect and change these items.

The quoteStatus attribute is used for a sourced RFQ or any other long-running operation. The PunchOutOrderMessage will contain the results of an end user session in the sourcing application and contains either status update information for a particular RFQ, a new RFQ, or an update to a completed RFQ.

5.6.4.3 Empty Shopping Carts

The PunchOutOrderMessage can contain a list of items corresponding to a shopping cart on the supplier website. It always indicates the end of the interactive PunchOut session. The following list describes a few cases when there are no items in the PunchOutOrderMessage. These messages allow clients to resume immediately when the user leaves the supplier website.

- If the operation in the original PunchOutSetupRequest was inspect, the item list of the PunchOutOrderMessage must be ignored by the procurement application. The supplier site should return no ItemIn elements in this case.
- If a PunchOutOrderMessage contains no ItemIn elements and the operation was create, no items should be added to the requisition because the supplier site or the user has canceled the PunchOut session without creating a shopping cart.
- If the operation was edit and the PunchOutOrderMessage contains no ItemIn elements, existing items from this PunchOut session must be deleted from the requisition in the procurement application.

The Status code “204/No Content” indicates the end of a session without change to the shopping cart. Again, the PunchOutOrderMessage (which is always needed for the BuyerCookie) should not contain ItemIn elements. This code would be handled identically to the other “empty” cases detailed above unless the operation was edit. In that case, the user canceled the session without making any change and no change should be made to the requisition in the procurement application.

5.6.4.4 ItemIn

This element adds an item from a shopping basket to a requisition in the procurement application. It can contain a variety of elements, only two of which are required: `ItemID` and `ItemDetail`.

`ItemIn` has the following attributes:

Attribute	Description
`quantity` (required)	The number of items selected by the user on the remote website. Because the supplier site can enforce rules for partial units, the protocol allows fractional quantities. Should never be negative.
`lineNumber`	The position of this item within an order. Because PunchOut sessions normally take place prior to ordering and the server cannot control placement of items within an order in any case, this attribute is not relevant within a `PunchOutOrderMessage`.
`parentLineNumber`	The line number of the corresponding parent line item. This attribute is applicable only for a line item with `itemType="item"`.
`itemType`	Specifies whether the line item is a grouped item having child items or an independent line item. The `itemType` attribute can have the following values: `"composite"` to identify an item group or `"item"` to identify an independent line item. This attribute is applicable only for a line item with an item group.
`compositeItemType`	Specifies whether a parent item uses group-level pricing. Possible values are `"groupLevel"` or `"itemLevel"`.
`itemClassification`	Specifies whether the current line item is material or service. Possible values are: • `material` • `service`

`ItemIn` has the following elements:

Element	Description
`ItemID` (required)	Provides unique identification of an item. See ItemID [page 93].
`Path`	A list of nodes that records the path taken by a user through a punchout chaining scenario. See Path Element [page 165].
`ItemDetail` (required)	Contains descriptive information about the item that procurement applications present to users. See ItemDetail [page 93].
`SupplierID | SupplierList`	Specify a list of suppliers that can be involved in a sourcing process: • `SupplierID` is the ID of the supplier. • `SupplierList` contains the `Name` and the list of `SupplierID`s for each supplier. See SupplierID or SupplierList [page 96].

Element	Description
`ShipTo`	The ship to address for a item. `ShipTo` contains four elements: `Address`, `CarrierIdentifier`, `TransportInformation`, and `IdReference`.
`Shipping`	Definition of a cXML Shipping item. Represents a shipping cost in the shopping basket.
`Tax`	Tax information.
`SpendDetail`	Captures spend detail information. See SpendDetail [page 127].
`Distribution`	Accounting information generated by the buying organization, such as cost center or general ledger category.
`Contact`	The contact information for the supplier. Can specify more than one `Contact` element.
`Comments`	Contains comments associated with this object.
`BillTo`	The bill to address for an item.

The optional elements are `ShipTo`, `Shipping`, and `Tax`, which are the same elements as those specified in `PunchOutOrderMessage`, above. In addition, `ItemIn` can contain the optional `SpendDetail`, which can contain the optional `TravelDetail`, `FeeDetail`, `LaborDetail`, and `Extrinsic` elements. `TravelDetail` provides detailed information about travel and expense line items, `FeeDetail` provides information about fees not defined elsewhere, and `LaborDetail` provides detailed information about temporary labor line items.

The `ItemIn` and `ItemOut` structures match one-to-one, except for the `Distribution` and `Comments` elements and `requisitionID` and `requestedDeliveryDate` attributes available in the `ItemOut` element. The procurement application can convert directly between `ItemIn` and `ItemOut` lists when initiating an `inspect` or `edit` operation. Suppliers can convert one to the other (dropping the listed extensions available in the `ItemOut` element) when executing an `edit` operation. The procurement application can perform the direct conversion and add additional shipping and distribution information and comments when initiating an `OrderRequest` transaction. `ItemDetail` data (with the possible exception of `Extrinsic` elements) contained within `ItemIn` elements must not be removed when converting from `ItemIn` to `ItemOut`.

Related Information

TravelDetail [page 133]
FeeDetail [page 128]
LaborDetail [page 128]
Extrinsic [page 119]

5.6.4.4.1 ItemID

The `ItemID` element provides unique identification of an item. For example, this element uniquely identifies the item to a remote website. It is the only element required to return to the remote website to re-identity the item in later PunchOut sessions.

`ItemID` has the following elements:

Element	Description
`SupplierPartID` (required)	`SupplierPartID` is how the supplier identifies an item.
`SupplierPartAuxiliaryID`	If `SupplierPartID` does not uniquely identify the item, the supplier should use `SupplierPartAuxiliaryID` to specify an "auxiliary" key that identifies the part uniquely when combined with the `SupplierID` and `SupplierPartID`. For example, a supplier might use the same `SupplierPartID` for an item, but have a different price for units of "EA" and "BOX". In this case, a reasonable `SupplierPartAuxiliaryID` for the two items might be "EA" and "BOX." `SupplierPartAuxiliaryID` could also be used as a supplier cookie, enabling the supplier to refer to complex configuration or part data. It could contain all the data necessary for the supplier to reconstruct what the item in question is in their computer system (a basket or cookie of data that makes sense only to the supplier). See Buyer and Supplier Cookies [page 82]. `SupplierPartAuxiliaryID` can help a remote website transport complex configuration or bill-of-goods information to re-identify the item when it is presented to the remote website in the future. If `SupplierPartAuxiliaryID` contains special characters (for example, if it contains additional XML elements not defined in the cXML protocol), they must be escaped properly. Due to the necessity to pass `SupplierPartAuxiliaryID` information through applications and back to the originating supplier, an internal subset containing any additional XML elements is insufficient.
`BuyerPartID`	Represents an item in buyer system. This identifier is specified by the buyer.
`IdReference`	Defines an ID reference. Within an application context (for example, certain pair of buyer and supplier), the (identifier, domain) pair should be unique.

5.6.4.4.2 ItemDetail

This element contains descriptive information about the item that procurement applications present to users. The contents of an `ItemDetail` element can be quite complex, but the minimum requirements are simple: `UnitPrice`, `Description`, `UnitOfMeasure`, and `Classification`. Optional elements include a `ManufacturerPartID`, a `ManufacturerName`, a `URL`, a `LeadTime`, `PriceBasisQuantity`, `Dimension`, and any number of `Extrinsic` elements.

In the context of an `ItemIn` element, the `Extrinsic` elements contained within an `ItemDetail` function identically to those found within an Index (specifically an `IndexItemAdd`).

Note that in an `IndexItemAdd` element, duplicate `LeadTime` information might come from both `ItemDetail`, where it is optional, and `IndexItemDetail`, where it is mandatory. If the `LeadTime` elements are defined in both cases, then they should be identical.

`ItemDetail` has the following elements:

Element	Description
`UnitPrice` (required)	Price per unit of the item.

`Description`
(required)
	Describes the item in a textual form. Because this text might exceed the limits of a short table of line items (or other constrained user interface) and random truncations could occur, the `Description` element contains an optional `ShortName` element.
	
	The `Description` element has `type` as an attribute. A type attribute is added to the description element to contribute to the code that comes along with product descriptions specifying either the consumer or the supplier unit.
	
	`ShortName` is a short (30-character recommended, 50-character maximum) name for the item, which fits product lists presented to users. If provided, clients should present the `ShortName` instead of a truncation of the `Description` text in any restricted fields. Clients must continue to truncate the `Description` text if no `ShortName` is provided.
	
	For example:
	
	`<Description xml:lang="en-US">`
	
	`<ShortName>Big Computer</ShortName>`
	`This wonder contains three really big disks, four CD-Rom drives, two Zip drives, an ethernet card or two, much more memory than you could ever use, four CPUs on two motherboards. We'll throw in two monitors, a keyboard and the cheapest mouse we can find lying around. </Description>`
	
	The `ShortName` might appear as "Big Computer" where space is tight, and "Big Computer: This wonder ... lying around." (or as two separate but complete fields) where there is space to display more text.
	
	Catalog creators should not use `ShortName` to duplicate the information in `Description`. Instead, they should use `ShortName` to name the product, and `Description` to describe product details.
	
	CIF 3.0 catalog format also supports `ShortName`. The CIF field name is `Short Name`.

`UnitOfMeasure` (required)	Describes how the product is packaged or shipped. It must conform with UN/CEFACT Unit of Measure Common Codes. See UnitOfMeasure [page 48].

Element	Description
`PriceBasisQuantity`	Describes the quantity-based pricing for a line item. It has the `UnitOfMeasure` and `Description` as elements and `quantity` and `conversionFactor` as attributes. See PriceBasisQuantity [page 289].
`Classification` (required)	Lists the UNSPSC (United Nations Standard Products and Services Code) commodity code for each selected item. These codes are used by back-end systems within buyer and supplier organizations for accounting and report generation. For the list of UNSPSC codes, see www.unspsc.org. `Classification@domain` can also be "MaterialGroup", which refers to a grouping of materials and services according to their characteristics in the SAP ERP. `Classification` also has an optional `code` attribute, which identifies the commodity by its designated code.
`ManufacturerPartID`	ID with which the item's manufacturer identifies the item.
`ManufacturerName`	Name of the item's manufacturer.
`URL`	Specifies a URL (Uniform Resource Locator) for the PunchOut website.
`LeadTime`	Specifies the number of days needed for the buyer to receive the product. For example: `<LeadTime>14</LeadTime>`
`Dimension`	Specifies item dimensions. See Dimension [page 158].
`ItemDetailIndustry`	Contains the detailed industry-specific information. See ItemDetailIndustry [page 125].
`AttachmentReference`	Contains a reference to a remote attachment. See AttachmentReference [page 95].
`Extrinsic`	Contains any additional information related to this object. See Extrinsic [page 86].

5.6.4.4.2.1 AttachmentReference

`AttachmentReference` contains a reference to a remote attachment. It has the following attributes:

Attribute	Description
`length`	Contains the length of the attachment in bytes.
`version`	Specifies the version of the external source. Examples: "1.0", "2.4.10" "Beta", "V-2".

AttachmentReference has the following elements:

Element	Description
Name	The name of the attachment.
Description	A description of the attachment.
InternalID	The internal ID of the attachment. The domain attribute of InternalID is currently optional. To prevent circular references, the sending application can use a predefined value of "local" for the domain to indicate that the attachment requested is local to the other application.
URL	A link to a referenced source on the buyer's system. The URL scheme must conform to RFC 1738 (Uniform Resource Locators). Both https and http transmission protocols are supported, but https with the latest TLS set is recommended.

Note

AttachmentReference can be used inside Extrinsic elements that have a predefined name of "Attachments".

The following example shows an AttachmentReference that references a URL:

```
<ItemDetail>
    ...

    <AttachmentReference version="1">
        <Name xml:lang="en">name of remote file </
Name>
        <Description xml:lang="en">Description Text</Description>
        <InternalID></InternalID>
        <URL>https://link.to/remote.file</URL>
    </AttachmentReference>
    ...
</ItemDetail>
```

5.6.4.4.3 SupplierID or SupplierList

In a sourced RFQ PunchOutOrderMessage, the ItemOut and ItemIn elements can specify a list of suppliers that can be involved in a sourcing process.

SupplierID is the ID of the supplier. See SupplierID [page 127].

SupplierList contains the Name and the list of SupplierIDs for each supplier. The following ItemOut example shows a SupplierList with two suppliers.

```
<ItemOut quantity="6" lineNumber="1">
    <ItemID>
        <SupplierPartID>unknown</SupplierPartID>
    </ItemID>
    <ItemDetail>
```

```
        <UnitPrice>
            <Money currency="USD">10.23</Money>
        </UnitPrice>
        <Description xml:lang="en">Learn ASP in a Week!</Description>
        <UnitOfMeasure>EA</UnitOfMeasure>
        <Classification domain="SPSC">12345</Classification>
        <ManufacturerPartID>ISBN-23455634</ManufacturerPartID>
        <ManufacturerName>O'Reilly</ManufacturerName>
        <URL> URL for more information </URL>
        <LeadTime>7</LeadTime>
    </ItemDetail>
    <SupplierList>
        <Supplier>
            <Name xml:lang="en">Supplier #1 </Name>
            <SupplierID domain="duns">0000000</SupplierID>
        </Supplier>
        <Supplier>
            <Name xml:lang="en">Supplier #2 </Name>
            <SupplierID domain="duns">1111111</SupplierID>
            <SupplierID domain="duns">2222222</SupplierID>
        </Supplier>
    </SupplierList>
</ItemOut>
```

5.7 Direct PunchOut

Direct PunchOut is a cXML capability that can reduce the time it takes for users to display the first page of a supplier's PunchOut site.

It offers faster PunchOut session initiation than regular PunchOut by allowing clients to send `PunchOutSetupRequest` documents directly to PunchOut sites for authentication, without first going through a network commerce hub for authentication and forwarding.

If suppliers indicate (through their cXML profile) that they support direct PunchOut, clients send PunchOut requests directly to them. Clients enable PunchOut sites to authenticate these requests by either including a Message Authentication Code (MAC) generated by a trusted third party, or by making a client digital certificate available.

5.7.1 Authentication Methods

Direct PunchOut is made possible by two alternative authentication methods:

- MAC Authentication [page 427]—The server interprets a Message Authentication Code (MAC) in the `Sender` credential in `PunchOutSetupRequest` documents.
- Auth Transaction [page 431]—The server asks a network commerce hub to authenticate the client's digital certificate and caches the response for subsequent PunchOut requests.

Servers indicate the authentication method they support through their cXML Profile.

5.7.2 ProfileResponse

PunchOut sites indicate that they support direct PunchOut and specify the authentication methods they support by including the following options for `PunchOutSetupRequest` in their `ProfileResponse` documents.

```
<Transaction requestName="PunchOutSetupRequest">
    <URL>https://service.bighub.com/cxml</URL>
    <Option name="Direct.URL">https://bigsupplier.com/punchout</Option>
    <Option name="Direct.AuthenticationMethod.CredentialMac">Yes</Option>
    <Option name="Direct.AuthenticationMethod.Certificate">Yes</Option>
```

Related Information

PunchOutSetupRequest Options [page 53]

6 Purchase Orders

This section describes how to set up a website to receive cXML-format purchase orders. It also describes how to send purchase order status messages to buying organizations or marketplaces.

Purchase Order Process [page 99]

OrderRequest Documents [page 100]

Response to an OrderRequest [page 162]

Accepting Order Attachments [page 163]

6.1 Purchase Order Process

Procurement applications convert approved purchase requisitions into one or more purchase orders. A purchase order is a formal request from a buying organization to a supplier to fulfill a contract.

cXML is just one format for transmitting purchase orders. Other common formats are e-mail, fax, and ANSI X.12 EDI (Electronic Data Interchange). cXML is the best format for purchase orders because it allows you to easily automate order processing. cXML's well-defined structure allows order-processing systems to easily interpret the elements within a purchase order. With little or no human intervention, the appropriate data within purchase orders can be routed to your shipping, billing, and sales departments, as needed.

In addition, the cXML order-routing method allows the transmittal of any supplier cookies (`SupplierPartAuxiliaryID`) and purchase order attachments.

When you configure your account on a network commerce hub, you specify a URL to which all cXML purchase orders will be sent. Upon receiving a purchase order, you send it to your internal order management system and fulfill it as you normally would. Your website must also return an Order Response document to the network commerce hub, which tells the buyer that you successfully received and parsed the purchase order.

You do not need a PunchOut website in order to receive cXML purchase orders; PunchOut and cXML order-receiving are distinct capabilities. However, the infrastructure and applications required for supporting PunchOut are the same for receiving cXML purchase orders.

There are two types of cXML documents used in the transaction of purchase orders. Procurement applications send `OrderRequest` documents, and you respond with generic `Response` documents. These documents pass through the network commerce hub for authentication and routing.

6.2 OrderRequest Documents

The `OrderRequest` document is analogous to a purchase order. The following example shows the structure of the `OrderRequest` element:

```
<OrderRequest>
    <OrderRequestHeader>
        <Total/>
        <ShipTo/>
        <BillTo/>
        <Shipping/>
        <Tax/>
        <Payment/>
        <PaymentTerm/>
        <Contact/>
        <Comments/>
        <Followup/>
        <ControlKeys/>
        <DocumentReference/>
        <SupplierOrderInfo/>
        <TermsOfDelivery/>
        <DeliveryPeriod/>
        <IdReference/>
        <OrderRequestHeaderIndustry/>
        <Extrinsic/>
    </OrderRequestHeader>
    <ItemOut>
        <ItemID/>
        <Path/>
        <ItemDetail/> | <BlanketItemDetail/>
        <SupplierID/> | <SupplierList/>
        <ShipTo/>
        <Shipping/>
        <Tax/>
        <SpendDetail/>
        <Distribution/>
        <Contact/>
        <TermsOfDelivery/>
        <Comments/>
        <Tolerances/>
        <ControlKeys/>
        <ScheduleLine/>
        <MasterAgreementReference/> | <MasterAgreementIDInfo/>
        <ItemOutIndustry/>
        <Packaging/>
        <ReleaseInfo/>
        <Batch/>
    </ItemOut>
</OrderRequest>
```

Note

For information about `OrderStatusRequest`, see OrderStatusRequest [page 249].

The following example shows an `OrderRequest` for an item:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML xml:lang="en-US" payloadID="93369535150910.10.57.136"
timestamp="2000-08-03T08:49:11+07:00">
    <Header>
        <From>
```

```
            <Credential domain="AribaNetworkUserId">
                <Identity>admin@acme.com</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="DUNS">
                <Identity>114315195</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="AribaNetworkUserId">
                <Identity>sysadmin@ariba.com</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Network Hub V1.1</UserAgent>
        </Sender>
    </Header>
    <Request>
        <OrderRequest>
            <OrderRequestHeader orderID="DO102880"
                        orderDate="2012-08-03T08:49:09+07:00" type="new">
                <Total>
                    <Money currency="USD">86.50</Money>
                </Total>
                <ShipTo>
                    <Address isoCountryCode="US" addressID="1000467">
                        <Name xml:lang="en">Acme, Inc.</Name>
                        <PostalAddress name="default">
                            <DeliverTo>John Q. Smith</DeliverTo>
                            <DeliverTo>Buyers Headquarters</DeliverTo>
                            <Street>123 Main Street</Street>
                            <City>Mountain View</City>
                            <State>CA</State>
                            <PostalCode>94089</PostalCode>
                            <Country isoCountryCode="US">United States</Country>
                        </PostalAddress>
                        <Email name="default">john_smith@acme.com</Email>
                        <Phone name="work">
                            <TelephoneNumber>
                                <CountryCode isoCountryCode="United States">
                                1</CountryCode>
                                <AreaOrCityCode>800</AreaOrCityCode>
                                <Number>5555555</Number>
                            </TelephoneNumber>
                        </Phone>
                     </Address>
                </ShipTo>
                <BillTo>
                    <Address isoCountryCode="US" addressID="12">
                        <Name xml:lang="en">Acme Accounts Payable</Name>
                        <PostalAddress name="default">
                            <Street>124 Union Street</Street>
                            <City>San Francisco</City>
                            <State>CA</State>
                            <PostalCode>94128</PostalCode>
                            <Country isoCountryCode="US">United States</Country>
                        </PostalAddress>
                         <Phone name="work">
                            <TelephoneNumber>
                                <CountryCode isoCountryCode="US">1</CountryCode>
                                <AreaOrCityCode>415</AreaOrCityCode>
                                <Number>6666666</Number>
                            </TelephoneNumber>
                        </Phone>
                    </Address>
                </BillTo>
                <Shipping>
                    <Money currency="USD">10.00</Money>
```

```
                <Description xml:lang="en-US">FedEx 2-day</Description>
            </Shipping>
            <Tax>
                <Money currency="USD">1.5</Money>
                <Description xml:lang="en">CA State Tax</Description>
            </Tax>
            <Payment>
                <PCard number="1234567890123456" expiration="2015-03-12"/>
            </Payment>
        </OrderRequestHeader>
        <ItemOut quantity="2" lineNumber="1">
            <ItemID>
                <SupplierPartID>220-3165</SupplierPartID>
                <SupplierPartAuxiliaryID>E000028901</SupplierPartAuxiliaryID>
            </ItemID>
            <ItemDetail>
                <UnitPrice>
                    <Money currency="USD">55.00</Money>
                     </Modifications>
                         <Modification>
                             <OriginalPrice>
                                     <Money currency = "USD">50.00</Money>
                             </OriginalPrice>
                            <AdditionalCost>
                                      <Money currency = "USD">5</Money>
                        </AdditionalCost>
                        <ModificationDetail
                             endDate = "2013-11-30T10:15:00-08:00"
                             name = "Royalties"
                            startDate = "2012-08-03T10:15:00-08:00">
                            <Description xml:lang = "en-US">Charge for Royalties
                            </Description>
                         </ModificationDetail>
                         </Modification>
                    </Modifications>
                </UnitPrice>
                <Description xml:lang="en">Laptop Computer Notebook Pentium® II
                    processor w/AGP, 300 MHz, with 12.1&quot; TFT XGA
                    Display</Description>
                <UnitOfMeasure>EA</UnitOfMeasure>
                <Classification domain="UNSPSC">43171801</Classification>
                <URL>http://www.supplier.com/Punchout.asp</URL>
                <Extrinsic name="ExtDescription">Enhanced keyboard</Extrinsic>
            </ItemDetail>
            <Distribution>
                <Accounting name="DistributionCharge">
                    <AccountingSegment id="7720">
                        <Name xml:lang="en-US">Account</Name>
                        <Description xml:lang="en-US">Office Supplies
                        </Description>
                    </AccountingSegment>
                    <AccountingSegment id="610">
                        <Name xml:lang="en-US">Cost Center</Name>
                        <Description xml:lang="en-US">Engineering Management
                        </Description>
                    </AccountingSegment>
                </Accounting>
                <Charge>
                    <Money currency="USD">20.00</Money>
                </Charge>
            </Distribution>
        </ItemOut>
    </OrderRequest>
  </Request>
</cXML>
```

6.2.1 OrderRequestHeader

The following example shows an `OrderRequestHeader` in full detail:

```
<OrderRequestHeader
    orderID="DO1234"
    orderDate="2013-06-03T13:30:23+8.00"
    type="new"
    requisitionID="R1234"
    shipComplete="yes">
    <Total>
        <Money currency="USD">65.00</Money>
    </Total>
    <Modifications>
        <Modification>
            <OriginalPrice>
                <Money currency = "USD">40.00</Money>
            </OriginalPrice>
            <AdditionalCost>
                 <Money currency = "USD">10</Money>
            </AdditionalCost>
            <ModificationDetail
                endDate = "2013-11-30T10:15:00-08:00"
                name = "Access Charges"
                startDate = "2013-06-03T10:15:00-08:00">
                <Description xml:lang = "en-US">Access Charges
                </Description>
             </ModificationDetail>
         </Modification>
    </Modifications>
    <ShipTo>
        <Address>
            <Name xml:lang="en">Acme Corporation</Name>
            <PostalAddress name="Headquarters">
                <DeliverTo>Joe Smith</DeliverTo>
                <DeliverTo>Mailstop M-543</DeliverTo>
                <Street>123 Anystreet</Street>
                <City>Sunnyvale</City>
                <State>CA</State>
                <PostalCode>90489</PostalCode>
                <Country isoCountryCode="US">United States</Country>
            </PostalAddress>
        </Address>
        <CarrierIdentifier domain="companyName">UPS</CarrierIdentifier>
        <TransportInformation>
            <Route method="motor"/>
            <ShippingContractNumber>34567</ShippingContractNumber>
            <ShippingInstructions>
                <Description xml:lang="en-US">As per the contract</Description>
            </ShippingInstructions>
        </TransportInformation>
    </ShipTo>
    <BillTo>
        <Address>
            <Name xml:lang="en">Acme Corporation</Name>
            <PostalAddress name="Finance Building">
                <Street>124 Anystreet</Street>
                <City>Sunnyvale</City>
                <State>CA</State>
                <PostalCode>90489</PostalCode>
                <Country isoCountryCode="United States">United States</Country>
            </PostalAddress>
        </Address>
    </BillTo>
    <Shipping>
        <Money currency="USD">12.5</Money>
```

```
        <Description xml:lang="en-US">FedEx 2-day</Description>
    </Shipping>
    <Tax>
        <Money currency="USD">2.5</Money>
        <Description xml:lang="en">CA State Tax</Description>
    </Tax>
    <Payment>
        <PCard number="1234567890123456" expiration="2015-03-12"/>
    </Payment>
    <PaymentTerm payInNumberOfDays="45">
    </PaymentTerm>
    <PaymentTerm payInNumberOfDays="30">
        <Discount>
            <DiscountPercent percent="2">
        </Discount>
    </PaymentTerm>
    <PaymentTerm payInNumberOfDays="20">
         <Discount>
             <DiscountPercent percent="3">
         </Discount>
    </PaymentTerm>
    <Contact role="purchasingAgent">
        <Name xml:lang="en-US">Mr. Purchasing Agent</Name>
        <Email>puragent@acme.com</Email>
        <Phone name="Office">
            <TelephoneNumber>
                <CountryCode isoCountryCode="US">1</CountryCode>
                <AreaOrCityCode>800</AreaOrCityCode>
                <Number>5551212</Number>
            </TelephoneNumber>
        </Phone>
    </Contact>
    <Comments xml:lang="en-US">
        Anything well formed in XML can go here.
    </Comments>
    <TermsOfDelivery>
        <TermsOfDeliveryCode value="PriceCondition"/>
        <ShippingPaymentMethod value="AdvanceCollect"/>
        <TransportTerms value="Other">Contract Transport terms</TransportTerms>
        <Address>
            <Name xml:lang="en-US">SN Services/Name>
            <PostalAddress name="default">
                <Street>123 Anystreet</Street>
                <City>Sunnyvale</City>
                <State>AL</State>
                <PostalCode>35762</PostalCode>
                <Country isoCountryCode="US">United States</Country>
            </PostalAddress>
        </Address>
        <Comments xml:lang="en-US" type="Transport">Transport Terms
        </Comments>
        <Comments xml:lang="en-US" type="TermsOfDelivery">Terms per
            the contract</Comments>
        </TermsOfDelivery>
        <DeliveryPeriod>
            <Period startDate="2013-06-10T14:37:31-07:00"
                endDate = "2013-06-11T14:37:31-07:00"></Period>
        </DeliveryPeriod>
    <IDReference></IDReference>
    <SupplierOrderInfo orderID=12345>
</OrderRequestHeader>
```

`OrderRequestHeader` has the following attributes:

Attribute	Description
`orderID` (required)	The identifier for this order. Analogous to the purchase order number.
`orderDate` (required)	The date and time this order was placed, in ISO 8601 format.
`orderType`	Type of order: `regular`, `release` (a release against a master agreement or against a blanket purchase order), or `blanket` (a blanket purchase order).
`releaseRequired`	Used only if orderType is `blanket` to indicate whether the blanket order requires releases (purchase orders). If "yes" is specified, the blanket order requires separate release orders before the supplier can act. If not specified, the supplier can act on the blanket order itself. The default is unspecified.
`type`	Type of request: `new` (default), `update`, or `delete`. Update and delete orders must use the `DocumentReference` element with the `PayloadId` to refer to the original purchase order. See DocumentReference Element [page 231].
`orderVersion`	Specifies the order version number of change orders, starting with "1" for the original order.
`isInternalVersion`	Indicates whether the order includes changes that are relevant only within the buying organization. For example, a minor change was made that does not affect information used by the supplier. Suppliers might not see internal order versions, depending on their customers' configuration.
`agreementID`	Used only if `orderType` is `release` to indicate the buyer's identifier for associated master agreement or blanket purchase order.
`agreementPayloadID`	Used only if `orderType` is `release` to indicate the cXML document payload ID for the associated master agreement or blanket purchase order.
`parentAgreementID`	Used only if `orderType` is `blanket` to indicate the parent blanket order.
`parentAgreementPayloadID`	Used only if `orderType` is `blanket` to indicate the document reference identifier for the parent blanket order.
`effectiveDate`	Required if `orderType` is `blanket` to indicate the date the blanket order becomes effective (the date from which releases can be created or invoices submitted for the blanket order).
`expirationDate`	Used only if `orderType` is `blanket` to indicate the date the blanket order expires. Releases cannot be created against the blanket order after this date.
`requisitionID`	The buyer's requisition identifier for this entire order. It might be the same as `orderID`, and it might not be included at all. Must not be included if `requisitionID` is specified in any `ItemOut` elements.

Attribute	Description
shipComplete	A preference against partial shipments. The only allowed value is “yes”. By default, items are shipped when available. Because orders might include items with varying ShipTo elements, only groups of items with common shipping locations should be held until complete when shipComplete=“yes”.
pickUpDate	The date when the order should be ready for pickup and delivery.
requestedDeliveryDate	Essential date information for the supplier as well as for the freight forwarder. In many cases this reflects the time, or time frame, when the buyer is able and willing to receive the goods.

OrderRequestHeader and ItemOut (when extended with ItemDetail) contain similar information. Where OrderRequestHeader includes overall billing (BillTo) and payment (Payment, PaymentTerm) information, ItemOut describes the individual items (in ItemID, ItemDetail, SpendDetail, and Distribution).

Do not use the information in OrderRequestHeader as the default for item-specific elements. If present, ShipTo, Shipping, Contact, and each named Extrinsic must appear either with every ItemOut or in the OrderRequestHeader. The Comments and Tax elements can appear simultaneously at both levels; however, the header-level Tax element contains a total for the order, whereas the item-level Tax element contains the tax just for the item. Do not include duplicate information in Comments elements at both levels.

The following example shows an OrderRequestHeader for a blanket order:

```
<OrderRequestHeader
parentAgreementPayloadID="1184102133611.2058850054.000000002@1zVE0KpzNZLO9HTrpqF27Ne
bqbI=" parentAgreementID="BPO31" expirationDate="2007-07-31T23:59:59-07:00"
orderDate="2007-07-10T14:37:31-07:00" orderID="BPO36" orderVersion="1"
effectiveDate="2007-07-10T00:00:00-07:00" releaseRequired="yes" orderType="blanket"
type="new">
```

6.2.1.1 Total

This element contains the total cost for the items in the order, excluding any tax and shipping. It is a container for the Money and Modifications elements.

If the order is of type “blanket,” the Total element is not used to compute the sum of the item level subtotals. Total is then used to indicate the maximum commitment with the supplier. The total will not add up to the individual item level subtotal or MaxAmounts. The sum of the item level MaxAmounts should not exceed the header level total. If the item level MaxAmount is not specified, it is assumed that the item level maximum amount is the same as the total maximum amount of the purchase order.

The Modifications element stores any modification to the original price or shipping price of the item. This element can store a set of one or more Modification elements. You can add the Modifications element to the Shipping element.

The Modification element contains details of the allowances and charges applicable at the header-level and line-item level. It has one opitonal attribute, level, which represents the level of the modification (in the case of cascading modifications). For example:

- **Charge 1 (Level 1):** Original Price $10 Charge: $1
- **Charge 2 (Level 1):** Original Price $10 Charge: $1
- **Charge 3 (Level 2):** Original Price $8 Charge: $1
- **Charge 4 (Level 3):** Original Price $7 Charge: $1

The following example shows how the `level` attribute is used for an item with several modifications:

```
<InvoiceHeaderModifications>
    <Modification level=”1”>
        <OriginalPrice>5.500</OriginalPrice>
        <AdditionalDeduction>
             <DeductionPercent>2</DeductionPercent>
        </AdditionalDeduction>
    </Modification>
    <Modification level="1">
        <OriginalPrice>5.500</OriginalPrice>
        <AdditionalCost>
            <Money currency="USD">2.00</Money>
        </AdditionalCost>
    </Modification>
    <Modification level="2">
        <OriginalPrice 7.390</OriginalPrice >
        <AdditionalDeduction>
            <DeductionPercent>10</DeductionPercent>
        </AdditionalDeduction>
    </Modification>
</InvoiceHeaderModifications>
```

The `Modification` element has the following elements:

Element	Description
`OriginalPrice`	The original price of the item. The allowances and charges are applied on the original price. This element has the `Money` element. It also contains an optional `type` attribute. For example, the `type` value can be the MSRP, ListPrice, Actual, AverageSellingPrice, CalculationGross, BaseCharge, AverageWholesalePrice, ExportPrice, AlternatePrice, ContractPrice, etc.
`AdditionalDeduction`	The details of the deductions available for the item.Used only when allowances are applicable. This element can have any one of the following elements that defines the deduction value: • `DeductionAmount`—This element has the `Money` element. • `DeductionPercent`—This has a `percent` attribute. • `DeductedPrice`—This element has the `Money` element. It contains the final price of the item. This price overrides the price of the item. The `AdditionalDeduction` element has an optional `type` attribute. It contains details on the type of deductions available for the item.

Element	Description
`AdditionalCost`	The details of the additional charges applied on an item.This element can be specified when the `AddtionalDeduction` element is not specified. It contains the following elements: • `Money`—Enter the money value in the `value` attribute. This is a mandatory attribute. **Note** Do not use this element for shipping, special handling, freight, etc. • `Percentage`—Enter the percentage value in the percent attribute. This is a mandatory attribute.
`ModificationDetail`	The details of any information for the `AdditionalDeduction` or `AdditionalCost` element. `ModificationDetail` has the following attributes: • `name` (required)—The name of the modification, for example, "Allowance". • `startDate`—The start date of the modification. • `endDate`—The end date of the modification. • `code`—The service code for the modification. `ModificationDetail` has the following elements: • `Description` • `Extrinsic`
`Tax`	This tax for the allowances and charges. **Note** The `OriginalPrice` element is an optional element when added as part of the `Modification` element. See Tax [page 309].

```
<OrderRequestHeader
    orderDate = "2012-08-03T10:15:00-08:00"
    orderID = "2482012_5"
    orderType = "regular"
    type = "new">
    <Total>
        <Money currency = "USD">52</Money>
        <Modifications>
            <Modification>
                <OriginalPrice>
                    <Money currency = "USD">100.00</Money>
                </OriginalPrice>
                <AdditionalDeduction>
                    <DeductionAmount>
                        <Money currency = "USD">50.00</Money>
                    </DeductionAmount>
                </AdditionalDeduction>
                <ModificationDetail
                    endDate = "2013-11-30T10:15:00-08:00"
                    name = "Allowance"
                    startDate = "2012-08-03T10:15:00-08:00">
                    <Description xml:lang = "en-US">Promotional Allowance
```

```
                    </Description>
                </ModificationDetail>
            </Modification>
            <Modification>
                <OriginalPrice>
                    <Money currency = "USD">100.00</Money>
                </OriginalPrice>
                <AdditionalCost>
                    <Percentage percent = "2"/>
                </AdditionalCost>
                <ModificationDetail
                    endDate = "2013-11-30T10:15:00-08:00"
                    name = "Export Packing Charges"
                    startDate = "2012-08-03T10:15:00-08:00">
                    <Description xml:lang = "en-US">Charges for export packing</
                    Description>
                </ModificationDetail>
            </Modification>
        </Modifications>
    </Total>
<ShipTo>
```

6.2.1.2 ShipTo/BillTo

These elements contain the addresses of the `ShipTo` and `BillTo` entities on the `OrderRequest`.

All items must be billed to a single entity. Therefore, the `BillTo` element appears only in the `OrderRequestHeader`. Items from an order can be sent to multiple locations. Like the `Shipping` element (see next section), the `ShipTo` element can therefore appear either in the `OrderRequestHeader` or in individual `ItemOut` elements.

For information about `IdReference`, see IdReference [page 113].

The `Address` element contains the following attributes:

Attribute	Description
`isoCountryCode`	The ISO 3166 2-letter country code for the country containing this location.
`addressID`	Specifies an ID for the address. This attribute is used to support address codes for relationships that require ID references. This value should not be the name of a company or person. It is intended to deepen application-to-application integration. For example, a `ShipTo` location identifier could be: `<Address isoCountryCode="US" addressID="1000487">`
`addressIDDomain`	Specifies a code that represents the agency or organization responsible for the `addressID` numbering. For example, DUNS or ILN. This code is required if there is a value in the `addressID` attribute.

The `Name` element contained within an `Address` element should always specify the company name.

The `DeliverTo` element is listed twice, the first line specifying the name of the person to receive the goods, and the second specifying their location (building, city, office, mailstop) where the items should be delivered. The location should always be complete enough to be used in a mailing label. For example,

```
<PostalAddress name="Headquarters">
    <DeliverTo>Joe Smith</DeliverTo>
```

```
    <DeliverTo>Mailstop M-543</DeliverTo>
    <Street>123 Anystreet</Street>
    <City>Sunnyvale</City>
    <State>CA</State>
    <PostalCode>90489</PostalCode>
    <Country isoCountryCode="US">UnitedStates</Country>
</PostalAddress>
```

`Country` contains a human readable name.

The `CarrierIdentifier` element contains the carrier name of the shipment. For example:

```
<ShipTo>
    <Address>
        <Name xml:lang="USD">Acme</Name>
        <PostalAddress name="Headquarters">
            <DeliverTo>Joe Smith</DeliverTo>
            <DeliverTo>Mailstop M-543</DeliverTo>
            <Street>123 Anystreet</Street>
            <City>Sunnyvale</City>
            <State>CA</State>
            <PostalCode>90489</PostalCode>
            <Country isoCountryCode="US">UnitedStates</Country>
        </PostalAddress>
    <CarrierIdentifier domain="companyName">UPS</CarrierIdentifier>
```

The `TransportInformation` element contains the transport information in a purchase order or ship notice. This element is specified only at the header-level.

The `TransportInformation` element contains the following elements:

Element	Description
`Route`	Shipping method for the shipment. This is required if you select a carrier. See Route [page 260].
`ShippingContractNumber`	The shipping contract number specified for the transportation of the shipment.
`ShippingInstructions`	Information for the shipment

Here is an example for the `TransportInformation` element:

```
<OrderRequestHeader orderDate="2010-03-26T16:40:53" orderID="POw4401"
orderType="regular" type="Update">
    <Total>
        <Money currency="USD">1.00</Money>
    </Total>
    <ShipTo>
        <Address>
            <Name xml:lang="USD">Acme</Name>
            <PostalAddress name="default">
                <DeliverTo>Joe Smith</DeliverTo>
                <DeliverTo>Mailstop M-543</DeliverTo>
                <Street>123 Anystreet</Street>
                <City>Sunnyvale</City>
                <State>AL</State>
                <PostalCode>35762</PostalCode>
                <Country isoCountryCode="US">United States</Country>
            </PostalAddress>
        </Address>
        <CarrierIdentifier domain="companyName">UPS</CarrierIdentifier>
        <TransportInformation>
            <Route method="motor"/>
            <ShippingContractNumber>1245</ShippingContractNumber>
            <ShippingInstructions>
```

```
                <Description xml:lang="en-US">Contract Instructions</Description>
            </ShippingInstructions>
        </TransportInformation>
```

Avoid empty or whitespace elements because missing values can affect EDI and cXML suppliers.

6.2.1.3 Shipping

This element describes how to ship line items and the shipping cost. If the `Shipping` element is present in the `OrderRequestHeader`, it must not appear in the `ItemOut` elements. If it is not present in the `OrderRequestHeader`, it must appear in the `ItemOut` elements.

6.2.1.4 Tax

This element contains the tax associated with the order. This element is present if the buying organization computes tax. When appearing within the `OrderRequestHeader`, `Tax` describes the total tax for an order. `Tax` elements at the item level can describe line item tax amounts.

The `Tax` element supports the `Extrinsic` element for additional tax-related information.

6.2.1.5 Payment

Describes the payment instrument used to pay for the items requested. In the above example, the `Payment` element contains a `PCard` element, which encodes a standard purchasing card into the cXML document. In the future, other payment instruments might be defined.

6.2.1.6 PaymentTerm

Defines the payment term in orders and invoices. Use `PaymentTerm` instead of the `InvoiceDetailPaymentTerm` previously defined. `PaymentTerm` defines either the net term (without discount) or the discount term (with discount). This element is enhanced with the Extrinsic element to include information like DueDate, and ValueDate.

`PaymentTerm` has one attribute:

Attribute	Description
`payInNumberOfDays`	Indicates the invoice must be paid in a certain number of days after the invoice effective date.

Discount

The percentage or amount of the discount term. The discount rate applies if the invoice total is paid within the time specified by `payInNumberOfDays`. Positive rates denote discounts and negative rates denote penalties. Do not use a percentage sign (%) or divide by 100; for example “2” means 2%.

Do not use the `Discount` element if the `PaymentTerm` is a net term.

Extrinsic

Any additional information related to the payment term.

6.2.1.7 Contact

The supplier uses `Contact` element information to follow up on an order. This element identifies a person and provides a list of ways to reach that person or entity. The only required element is the `Name` of the contact. Optional and repeating possibilities include `PostalAddress` (not recommended for immediate correction of order problems), `Email`, `Phone`, `Fax`, `URL`, `IdReference`, and `Extrinsic`.

In cXML 1.0, the extrinsics `User` and `CostCenter` elements often provided contact information. With cXML 1.1 and higher, the `Contact` element provides alternatives to these extrinsics.

Buying organizations might use this element to identify the original requestor, the procurement application system administrator, or some other contact who can take responsibility for correcting problems with orders. `Contact` can differ from both `BillTo` and `ShipTo` information for an order.

`Contact` has the following attributes:

Attribute	Description
`role`	The position of this person within the procurement process.
`addressID`	An ID for the address. `addressID` supports address codes for relationships that require ID references.
`addressIDDomain`	The code that specifies the agency or organization responsible for the address ID numbering. For example, DUNS or ILN. This code is required if there is a value in the `addressID` attribute.

Possible values for the `role` attribute:

Value	Description
`endUser`	Contact details about the end user.
`administrator`	Contact details about the administrator.
`purchasingAgent`	Contact details about the purchasing agent.
`technicalSupport`	Technical support contact

Value	Description
customerService	Customer service contact
sales	Sales contact
supplierCorporate	Contact details about the supplier.
supplierMasterAccount	Contact details about the supplier master account.
SupplierAccount	Contact details about the supplier account.
buyerCorporate	Contact details the supplier has about the buying organization.
buyerMasterAccount	Contact details about the buyer master account.
buyerAccount	Contact details about the buyer account.
buyer	Contact details about the buyer.
subsequentBuyer	Contact details about the subsequent buyer.

The same `Contact role` must not appear at both the header and item levels.

There is no default role, due to the disparate contents of the `Contact` element. So, cXML applications treat a `Contact` without a `role` attribute as an additional role.

IdReference

Defines an ID reference. The identifier/domain pair should be unique within each trading partner relationship (a buying organization and a supplier). See IdReference [page 282].

TelephoneNumber

The `TelephoneNumber` element contains the telephone number of the person or department where the goods are to be shipped or billed. For example, a telephone number in the United States:

```
<TelephoneNumber>
    <CountryCode isoCountryCode="US">1</CountryCode>
    <AreaOrCityCode>800</AreaOrCityCode>
    <Number>5551212</Number>
</TelephoneNumber>
```

For international dialing, the `CountryCode` contains the dial code for a country after any escape codes. England, for example, would be represented as:

```
<CountryCode isoCountryCode="UK">44</CountryCode>"
```

The following, therefore, is an example for London:

```
<TelephoneNumber>
    <CountryCode isoCountryCode="UK">44</CountryCode>
    <AreaOrCityCode>137</AreaOrCityCode>
```

```
    <Number>2801007</Number>
</TelephoneNumber>
```

Fax

The `Fax` element specifies the Fax number of the person or department where goods are to be shipped or billed. This element contains the `TelephoneNumber` element described above.

Municipality

Specifies the name of the municipality for a division of the state in an Address' location. This is an optional element and added as part of the `PostalAddress` element.

For example:

```
<PostalAddress>
    <Street>24 Mossy Creek</Street>
    <City>Chihuahua</City>
    <Municipality>Juárez</Municipality>
    <State>Chihuahua</State>
    <PostalCode>94089</PostalCode>
    <Country isoCountryCode = "MX">Mexico</Country>
</PostalAddress>
```

Extrinsic

Specifies the name of the department or employee. Possible values for the `Extrinsic` element:

Extrinsic Item	Description
`ContactPerson`	The name of a contact person. For example: `<Extrinsic name = "ContactPerson">JIM SMITH</Extrinsic>`

6.2.1.8 Comments

Arbitrary human-readable information buyers can send within purchase orders. This string data is not intended for the automated systems at supplier sites.

The `Comments` element can contain an `Attachment` element for including external files.

Attachment

`Comments` can attach external files to augment purchase orders. The `Attachment` element appears within `Comments`, and it contains only a reference to the external MIME part of the attachment. All attachments should be sent in a single multipart transmission with the `OrderRequest` document. Even if this is not possible, the `contentID` provided by the `Attachment` element must be usable to retrieve the attachment.

For details about the transfer of attached files, see Attachments [page 27].

`Attachment` contains a single URL with scheme “cid:”. An attached file in a cXML document might appear as:

```
<Comments>
    <Attachment>
        <URL>cid: uniqueCID@cxml.org</URL>
    </Attachment>
    Please see attached image for my idea of what this
    should look like
</Comments>
```

The `Comments` element appears in many places within the cXML protocol, but it can contain the `Attachment` element only within `OrderRequest` documents.

Use `Comments` to provide local comments specific to the current document.

6.2.1.9 Followup

The use of the `Followup` element is strongly discouraged. In early implementations, `Followup` was used to specify the URL to which future `StatusUpdateRequest` documents should be posted.

All cXML implementations should use the more robust Profile transaction to retrieve and convey information about server capabilities, including supported cXML version, supported transactions, and options to those transactions.

Related Information

Profile Transaction [page 22]

6.2.1.10 ControlKeys

Provides elements that allow you to override default business rules for order confirmations, ship notices, and invoices.

`ControlKeys` has the following elements:

Element	Description
`OCInstruction`	Indicates whether an order confirmation is allowed for this order or line item, regardless of the default business rules configured in Ariba Network. `OCInstruction` has a required `value` attribute that can have one of the following values: `"allowed"`, `"notAllowed"`, or `"requiredBeforeASN"`. `OCInstruction` has two optional elements: • `Lower`—Specifies tolerances that define a lower limit. • `Upper`—Specifies tolerances that define an upper limit.
`ASNInstruction`	Indicates whether a ship notice is allowed for this order or line item, regardless of the default business rules configured in Ariba Network. `ASNInstruction` has a required `value` attribute that can have one of the following values: `"allowed"` or `"notAllowed"`. `ASNInstruction` has two optional elements: • `Lower`—Specifies tolerances that define a lower limit. • `Upper`—Specifies tolerances that define an upper limit.
`InvoiceInstruction`	Indicates whether an invoice is allowed for this order or line item, regardless of the default business rules configured in Ariba Network. `InvoiceInstruction` has a required `value` attribute that can have one of the following values: `"isERS"` or `"isNotERS"`. The value `"isERS"` means the order is flagged for Evaluated Receipt Settlement, indicating that the system will post an invoice for the order automatically based on goods receipts.

Here is an example of the `ControlKeys` element used in the `OrderRequestHeader` element:

```
<OrderRequestHeader orderDate="2015-12-31T16:52:15+05:30"
  orderID="ERS_header_10" orderType="regular" type="new">
  ...
  <ControlKeys>
    <InvoiceInstruction value="isERS"/>
  </ControlKeys>
</OrderRequestHeader>
```

6.2.1.11 DocumentReference

This element provides an exact reference to an earlier document (for example, `OrderRequest,MasterAgreementRequest, or InvoiceReference`). In a `StatusUpdateRequest`, `DocumentReference` identifies the purchase order to be updated.

6.2.1.12 SupplierOrderInfo

This element is used in `OrderRequestHeader` to define supplier sales order information related to the current order. `SupplierOrderInfo` is used in `OrderRequest` and `InvoiceDetailRequest` documents.

When `SupplierOrderInfo` is used in a `PunchOutOrderMessage`, it indicates that the supplier has created an order associated with the PunchOut order message. The buyer can later cancel the order by sending an `OrderRequest` of type "delete" and including the `SupplierOrderInfo` element in the `OrderRequestHeader`. to refer to the sales order to be deleted.

`SupplierOrderInfo` has the following attributes:

Attribute	Description
`orderID`	Supplier sales order id of this order.
`orderDate`	The date an order is sent to a supplier.

6.2.1.13 TermsofDelivery

This element specifies the terms of delivery in a purchase order or ship notice. The `TermsofDelivery` element can appear at the header-level or line-item level. To add at line-item level, include this element to the `ItemOut` element.

> **Note**
>
> You can also add this element to the `ShipNoticeHeader` to specify terms at the header level. To add at the line-item level, include it to the `ShipNoticeItem` element.

The `TermsofDelivery` element contains the following elements:

Element	Description
`TermsOfDeliveryCode`	The Standard delivery terms and Incoterms.
`ShippingPaymentMethod`	Denotes the mode of shipping payment. • `Account`—When shipping charges are charged to an account. • `Collect`—When the consignee pays the freight charges. • `Prepaid by Seller`—When the seller makes the payment to the carrier for freight charges prior to a shipment. • `Mixed`—When the consignment is partially Collect and partially Prepaid. • `Other`—Any other shipping payment method or the third-party pays the shipment charges. You can enter additional information for the payment method.
`TransportTerms`	The terms of transportation. Possible values: • `Free-Carrier` • `CostAndFreight` • `DeliveredAtFrontier` • `Other`—When you specify this option, you can additionally enter a description.

Element	Description
`Address`	The Deliver To address for the ship notice.
`Comments`	Additional information for the delivery terms, for example, when "`Other`" Transport Term is selected.

Here is an example of the `TermsofDelivery` element:

```
<TermsOfDelivery>
    <TermsOfDeliveryCode value="PriceCondition"/>
    <ShippingPaymentMethod value="AdvanceCollect"/>
    <TransportTerms value="Other">Contract Terms</TransportTerms>
    <Address>
        <Name xml:lang="en-US">SN Services</Name>
        <PostalAddress name="default">
            <Street>123 Anystreet</Street>
            <City>Sunnyvale</City>
            <State>AL</State>
            <PostalCode>35762</PostalCode>
            <Country isoCountryCode="US">United States</Country>
        </PostalAddress>
    </Address>
    <Comments xml:lang="en-US" type="Transport">As per the Transport
        contract</Comments>
    <Comments xml:lang="en-US" type="TermsOfDelivery">Delivery at the
        doorstep</Comments>
</Terms Of Delivery>
```

6.2.1.14 DeliveryPeriod

Specifies the earliest date and latest date when either the supplier can deliver the goods or when the receiver is able to handle incoming shipments.

Period

Contains the following attributes:

Attribute	Description
`startDate`	Specifies the earliest date that the supplier can deliver the goods, or when the receiver is able to accept incoming shipments.
`endDate`	Specifies the latest date that the supplier can deliver the goods, or the date after which the receiver is not able to accept incoming shipments

6.2.1.15 IdReference

For information about `IdReference`, see IdReference [page 113].

6.2.1.16 OrderRequestHeaderIndustry

Contains industry-specific information for an order. `OrderRequestHeaderIndustry` has the following elements:

Element	Description

`ReferenceDocumentInfo`	Contains information about a referenced document. This is an optional element, and it can occur multiple times. It has two optional attributes:
	• `lineNumber`—Line number of an item in the referenced document
	• `status`—Status used to refer to the referenced document. Possible values are:
	  ○ `created`
	  ○ `released`
	  ○ `open`
	  ○ `completed`
	  ○ `closed`
	  ○ `cancelled`
	`ReferenceDocumentInfo` has the following elements:
	• `DocumentInfo` | `DocumentReference`
	• `DateInfo`
	• `Contact`
	• `Extrinsic`

`Priority`	Indicates the priority of orders for the suppliers. This is an optional element. It has a `Description` element, which describes the priority. The `level` attribute specifies the priority level, an integer from 1 to 5.

6.2.1.17 Extrinsic

This element contains machine-readable information related to the order, but not defined by the cXML protocol. In contrast, the `Comments` element passes information for human use. `Extrinsic` elements contain data that is likely to appear in later documents; the `Comments` element does not. At this level, `Extrinsic` extends the description of all items contained in the purchase order. Some `Extrinsic` information might also describe the overall purchase order without affecting the meaning of any contained `ItemOut`.

Each named `Extrinsic` can appear only once within the lists associated with the `OrderRequestHeader` and individual `ItemOut` elements (within the contained `ItemDetail` elements). The same name must not appear in both the `OrderRequestHeader` list and any list associated with the `ItemOut` elements. If the same `Extrinsic` name and value is repeated in all `ItemOut` lists, it should be moved to the `OrderRequestHeader`.

The `Extrinsic` element can also appear in the `IndexItem`, `PunchOutSetupRequest`, `ContractItem`, and PostalAddress elements. These contexts are described later in this document. Extrinsic values are case-insensitive.

6.2.2 ItemOut

The following example shows a minimum valid `ItemOut` element.

```
<ItemOut quantity="1"
    lineNumber="1">
    <ItemID>
        <SupplierPartID>5555</SupplierPartID>
    </ItemID>
</ItemOut>
```

`ItemOut` has the following attributes:

Attribute	Description
`quantity` (required)	The number of items desired. Fractions are allowed for some units of measure. The value might have already been checked by the supplier during a PunchOut session. This value should never be negative.
`lineNumber`	Position of the item within an order. This ordinal value increases once per `ItemOut` in a "new" `OrderRequest`. Clients should always specify this attribute in an `OrderRequest`, although it might not be useful in other `ItemOut` contexts.
`requisitionID`	The buyer's requisition identifier for this line item. Must not be included if `requisitionID` is specified in the `OrderRequestHeader`.
`agreementItemNumber`	The buyer's master agreement identifier for the line item.
`requestedDeliveryDate`	The date item was requested for delivery, which allows item-level delivery dates in the `OrderRequest`. It must be in ISO 8601 format.
`isAdHoc`	Indicates that the item is a non-catalog (ad-hoc) item. Non-catalog purchase orders contain items entered manually by requisitioners, not items selected from electronic catalogs. Often, these items do not have valid part numbers. Non-catalog orders usually require special validation and processing. Users enter non-catalog items to purchase products and services on an ad-hoc basis or because they could not find them in electronic catalogs.
`parentLineNumber`	The line number of the corresponding parent line item. This is a mandatory field and applicable only for a line item with `itemType="item"`.
`itemType`	Specifies whether the line item is a grouped item having child items or an independent line item. Possible values are `"composite"` to identify an item group or `"item"` to identify an independent line item. This attribute is applicable only for a line item with an item group.
`requiresServiceEntry`	Specifies whether or not the item requires a `ServiceEntryRequest` service sheet to describe how it was serviced.
`confirmationDueDate`	Specifies the date by which the supplier must respond to the buyer confirming receipt of the purchase order.
`compositeItemType`	Specifies whether a parent item uses group-level pricing. Possible values are `"groupLevel"` or `"itemLevel"`.

Attribute	Description
itemCategory	Specifies how a component or material is procured. Possible values: • subcontract—Procuring a material by providing component information that makes the finished product. • consignment—Managing a material through a special process where the payment to supplier is withheld until the material or service is consumed by the buyer. • thirdParty—Procuring a material a third-party vendor.
requestedShipmentDate	The ship date requested by the buyer for the item.
isReturn	Set to "yes" to indicate that the item is a return item.
returnAuthorizationNumber	Return authorization number for a line item.

The lineNumber attribute remains constant for any item through updates to the order. Deletion of items from an order never changes the lineNumber of remaining items. New items have higher numbers than those previously included in the order. A change to an existing item (an increased quantity, for example) does not affect the lineNumber of that item.

The following example shows a more complicated ItemOut.

```
<ItemOut quantity="2" lineNumber="1"
    requestedDeliveryDate="1999-03-12">
    <ItemID>
        <SupplierPartID>1233244</SupplierPartID>
        <SupplierPartAuxiliaryID>ABC</SupplierPartAuxiliaryID>
    </ItemID>
    <ItemDetail>
        <UnitPrice>
            <Money currency="USD">1.34</Money>
        </UnitPrice>
        <Description xml:lang="en">hello</Description>
        <UnitOfMeasure>EA</UnitOfMeasure>
        <Classification domain="UNSPSC">12345</Classification>
        <ManufacturerPartID>234</ManufacturerPartID>
        <ManufacturerName xml:lang="en">foobar</ManufacturerName>
        <URL>www.bar.com</URL>
    </ItemDetail>
    <ShipTo>
        <Address>
            <Name xml:lang="en">Acme Corporation</Name>
            <PostalAddress name="Headquarters">
                <Street>123 Anystreet</Street>
                <City>Sunnyvale</City>
                <State>CA</State>
                <PostalCode>90489</PostalCode>
                <Country isoCountryCode="US">United States</Country>
            </PostalAddress>
        </Address>
    </ShipTo>
    <Shipping>
        <Money currency="USD">1.34</Money>
        <Description xml:lang="en-US">FedEx 2-day</Description>
    </Shipping>
    <Tax>
        <Money currency="USD">1.34</Money>
        <Description xml:lang="en">foo</Description>
    </Tax>
    <Distribution>
        <Accounting name="DistributionCharge">
```

```
            <AccountingSegment id="23456">
                <Name xml:lang="en-US">G/L Account</Name>
                <Description xml:lang="en-US">Entertainment</Description>
            </AccountingSegment>
            <AccountingSegment id="2323">
                <Name xml:lang="en-US">Cost Center</Name>
                <Description xml:lang="en-US">Western Region Sales
                </Description>
            </AccountingSegment>
        </Accounting>
        <Charge>
            <Money currency="USD">.34</Money>
        </Charge>
    </Distribution>
    <Distribution>
        <Accounting name="DistributionCharge">
            <AccountingSegment id="456">
                <Name xml:lang="en-US">G/L Account</Name>
                <Description xml:lang="en-US">Travel</Description>
            </AccountingSegment>
            <AccountingSegment id="23">
                <Name xml:lang="en-US">Cost Center</Name>
                <Description xml:lang="en-US">Europe Implementation
                </Description>
            </AccountingSegment>
        </Accounting>
        <Charge>
            <Money currency="USD">1</Money>
        </Charge>
    </Distribution>
    <Comments xml:lang="en-US">Comment</Comments>
</ItemOut>
```

The `ItemDetail` element allows additional data to be sent to suppliers instead of just the unique identifier for the item represented by the `ItemID`.

If `isAdHoc`="yes" exists for some items and not for others, the requisition should be broken into two requisitions: one for catalog items and one for non-catalog items. Suppliers will then be able to automatically process as many requisition items as possible, instead of having to manually process both catalog and non-catalog items.

The `ShipTo`, `Shipping`, `Tax`, `Contact`, `Comments`, and `Extrinsic` elements (some nested within `ItemDetail` or `SpendDetail`) are identical to the ones that can be in the `OrderRequestHeader`. These elements specify per-item data such as shipping, shipping type, and associated cost. Use these elements either at the `OrderRequestHeader` level, or at the `ItemOut` level, but not at both levels. Tax is the only exception, for more information, see Tax [page 111].

The following example shows an `ItemOut` for a return item:

```
<ItemOut quantity="2" isReturn="true"
    returnAuthorizationNumber="RMA235">
    <ItemDetail>
        ...
    </ItemDetail>
    <Comments>Defective product</Comments>
</ItemOut>
```

The following example shows an item group with group-level pricing type:

```
<InvoiceDetailOrder>
    <InvoiceDetailOrderInfo>
        <OrderIDInfo orderID=""></OrderIDInfo>
    </InvoiceDetailOrderInfo>
```

```
    <InvoiceDetailItem quantity="1" invoiceLineNumber="1"
        itemType="composite" compositeItemType="groupLevel">
        <UnitOfMeasure></UnitOfMeasure>
        <UnitPrice>
            <Money currency="USD">21.00</Money>
        </UnitPrice>
        <InvoiceDetailItemReference lineNumber="1">
            <ItemID>
                <SupplierPartID>1</SupplierPartID>
            </ItemID>
            <Description xml:lang="en">Parent Item</Description>
        </InvoiceDetailItemReference>
        <TotalAllowances>
            <Money currency="USD">25.00</Money>
        </TotalAllowances>
        <TotalAmountWithoutTax>
            <Money currency="USD">290.00</Money>
        </TotalAmountWithoutTax>
        <NetAmount>
            <Money currency="USD">290.00</Money>
        </NetAmount>
    </InvoiceDetailItem>
    <InvoiceDetailItem invoiceLineNumber="2" quantity="15"
        parentInvoiceLineNumber="1" itemType="item">
        <UnitOfMeasure>33</UnitOfMeasure>
        <UnitPrice>
            <Money currency="USD">21.00</Money>
        </UnitPrice>
        <InvoiceDetailItemReference lineNumber="1">
            <ItemID>
                <SupplierPartID>1</SupplierPartID>
            </ItemID>
            <Description xml:lang="en">Child Item</Description>
        </InvoiceDetailItemReference>
        <SubtotalAmount>
            <Money currency="USD">315.00</Money>
        </SubtotalAmount>
        <GrossAmount>
            <Money currency="USD">290.00</Money>
        </GrossAmount>
        <InvoiceItemModifications>
            <Modification>
                <AdditionalDeduction>
                    <DeductionAmount>
                        <Money currency="USD">47.25</Money>
                    </DeductionAmount>
                    <DeductionPercent percent="15"></DeductionPercent>
                </AdditionalDeduction>
                <ModificationDetail name="Contract Allowance">
                    <Description xml:lang="en"/>
                </ModificationDetail>
            </Modification>
        </InvoiceItemModifications>
        <TotalAllowances>
            <Money currency="USD">25.00</Money>
        </TotalAllowances>
        <TotalAmountWithoutTax>
            <Money currency="USD">290.00</Money>
        </TotalAmountWithoutTax>
        <NetAmount>
            <Money currency="USD">290.00</Money>
        </NetAmount>
    </InvoiceDetailItem>
</InvoiceDetailOrder>
```

The following example shows an item group with item-level pricing type:

```
<InvoiceDetailOrder>
    <InvoiceDetailOrderInfo>
        <OrderIDInfo orderID=""></OrderIDInfo>
    </InvoiceDetailOrderInfo>
    <InvoiceDetailItem quantity="1" invoiceLineNumber="1"
        itemType="composite" compositeItemType="itemLevel">
        <UnitOfMeasure></UnitOfMeasure>
        <UnitPrice>
            <Money currency="USD">0.00</Money>
        </UnitPrice>
        <InvoiceDetailItemReference lineNumber="1">
            <ItemID>
                <SupplierPartID>1</SupplierPartID>
            </ItemID>
            <Description xml:lang="en">Parent Item</Description>
        </InvoiceDetailItemReference>
    </InvoiceDetailItem>
    <InvoiceDetailItem invoiceLineNumber="2" quantity="15"
        parentInvoiceLineNumber="1" itemType="item">
        <UnitOfMeasure>33</UnitOfMeasure>
        <UnitPrice>
            <Money currency="USD">21.00</Money>
        </UnitPrice>
        <InvoiceDetailItemReference lineNumber="1">
            <ItemID>
                <SupplierPartID>1</SupplierPartID>
            </ItemID>
            <Description xml:lang="en">Child Item</Description>
        </InvoiceDetailItemReference>
        <SubtotalAmount>
            <Money currency="USD">315.00</Money>
        </SubtotalAmount>
        <GrossAmount>
            <Money currency="USD">290.00</Money>
        </GrossAmount>
        <InvoiceItemModifications>
            <Modification>
                <AdditionalDeduction>
                    <DeductionAmount>
                        <Money currency="USD">47.25</Money>
                    </DeductionAmount>
                    <DeductionPercent percent="15"/>
                </AdditionalDeduction>
                <ModificationDetail name="Contract Allowance">
                    <Description xml:lang="en"></Description>
                </ModificationDetail>
            </Modification>
        </InvoiceItemModifications>
        <TotalAllowances>
            <Money currency="USD">25.00</Money>
        </TotalAllowances>
        <TotalAmountWithoutTax>
            <Money currency="USD">290.00</Money>
        </TotalAmountWithoutTax>
        <NetAmount>
            <Money currency="USD">290.00</Money>
        </NetAmount>
    </InvoiceDetailItem>
</InvoiceDetailOrder>
```

6.2.2.1 ItemID

The `ItemID` element provides unique identification of an item. See ItemID [page 93].

6.2.2.2 Path

The basic `Path` element, which provides node and path information for a document. `Path` is defined at Path Element [page 165].

6.2.2.3 ItemDetail

The basic `ItemDetail` element, which contains descriptive information about a line item that procurement applications present to users. See ItemDetail [page 93].

Modifications

The `UnitPrice` element contained within `ItemDetail` also stores the `Modifications` element. The `Modification` element contains details of the allowances and charges applicable for line items at the line-item level. For more information, see Total [page 106].

6.2.2.3.1 ItemDetailIndustry

`ItemDetailIndustry` contains the detailed industry-specific information. This is an optional element. It has the following attribute:

Element	Description
`isConfigurableMaterial`	Set to "`yes`" to indicate that the item is defined as a configurable material and therefore has product characteristics.

`ItemDetailIndustry` has the following element:

Element	Description
`ItemDetailRetail`	Contains the detailed item-specific information for the retail industry. This is an optional element. See ItemDetailRetail [page 126].

The following example shows `ItemDetailIndustry`:

```
<ItemDetail>
    <ItemDetailIndustry>
```

```
        <ItemDetailRetail>
            <EANID>815-12</EANID>
            <EuropeanWasteCatalogID>5-12</EuropeanWasteCatalogID>
        </ItemDetailRetail>
    </ItemDetailIndustry>
</ItemDetail>
<ItemOutIndustry>
    <ItemOutRetail>
        <PromotionVariantID>815-12</PromotionVariantID>
        <PromotionDealID>8-13</PromotionDealID>
    </ItemOutRetail>
</ItemOutIndustry>
```

6.2.2.3.1.1 ItemDetailRetail

`ItemDetailRetail` contains the detailed item-specific information for the retail industry. It has the following elements:

Element	Description
`EANID`	Specifies an ID assigned to a manufacturer's product according to the International Article Numbering Association or UPC(Universal Product Code) for an article. This is an optional element.
`EuropeanWasteCatalogueID`	Specifies a unique ID for articles listed in the EU Waste Catalogue (EWC) if it requires special handling. This is an optional element.
`Characteristic`	Specifies detailed information about an item that can be used across several different industries. This is an optional element. `Characteristic` has the following attributes: **Attribute** / **Description** `domain` (required) — Type of characteristic. Examples: `size`, `sizeCode`, `color`, `colorCode`, `quality`, `qualityCode`, `grade`, `gradeCode` `value` (required) — Value for the domain. `code` — Code associated with a characteristic, such as a currency code or unit of measure.

6.2.2.4 BlanketItemDetail

Provides supplier and commodity level details specific to blanket orders (`orderType="blanket"`). `BlanketItemDetail` must contain `Description`. Optional elements include `LimitType`, `MaxAmount`,

MinAmount, MaxQuantity, MinQuantity, UnitPrice, UnitOfMeasure, PriceBasisQuantity, and any number of Classification and Extrinsic elements.

6.2.2.5 SupplierID

The ID of the supplier. This is a (domain, value) pair so that suppliers have the flexibility to define their ID's according to an arbitrary convention, such as D-U-N-S or TaxID.

6.2.2.6 SupplierList

Defines a list of suppliers that might be associated with a quote item in ItemOut.

SupplierList has no attributes.

Supplier

The common Supplier element is optional in ItemOut.

6.2.2.7 ShipTo, Shipping, and Tax

The common elements, described elsewhere in this document.

6.2.2.8 SpendDetail

This optional element provides detailed information regarding travel, fee, and labor line items. The following example shows the element declaration of SpendDetail from cXML.dtd:

```
<!ELEMENT SpendDetail (TravelDetail | FeeDetail |
    LaborDetail | Extrinsic)>
```

SpendDetail can be present in ItemIn and ItemOut elements for the following types of messages:

- PunchOutSetupRequest
- PunchOutOrderMessage
- OrderRequest
- ConfirmationRequest

SpendDetail has no attributes.

The basic `ItemIn` element adds an item from a shopping basket to a requisition in the procurement application during a PunchOut session. `ItemIn` is defined at ItemIn [page 91].

6.2.2.8.1 FeeDetail

Conveys information about one-time or recurring fees that are not explicitly defined elsewhere in cXML. For example, a one-time fee for furniture rental would not fall into any category defined in `TravelDetail` or `LaborDetail`, but could be described in `FeeDetail`.

`FeeDetail` has the following attribute:

Attribute	Description
`isRecurring`	Indicates that the fee is recurring.

UnitRate

The amount to be paid per unit of time or other measure. In the case of multiple `UnitRates`. as in a rate schedule, use `TermReference` elements to distinguish them.

Period

Defines the period covered by the `FeeDetail`.

6.2.2.8.2 LaborDetail

`LaborDetail` contains information about an item related to temporary labor. The following example shows the element declaration of `LaborDetail` from `cXML.dtd`:

```
<!ELEMENT LaborDetail (
    UnitRate+,
    Period,
    Contractor?,
    JobDescription?,
    Supervisor?,
    WorkLocation?,
    Extrinsic*)>
```

`LaborDetail` has the following attribute:

Attribute	Description
`supplierReferenceCode`	The supplier's quote or proposal ID, for cross reference.

UnitRate

`UnitRate` represents the amount to be paid per unit of time (or of some other measure). In the case of multiple `UnitRates`, use `TermReference` elements to distinguish them.

TermReference

`TermReference` is a generic base element that identifies the definition of the `UnitRate` in question. `TermReference` has these attributes:

Attribute	Description
`termName` (required)	The name of the ID attribute containing the term.
`term` (required)	The value of that attribute, that is, the term itself.

Here is a sample `UnitRate` with a `TermReference`:

```
<UnitRate>
    <Money currency="USD">75</Money>
    <UnitOfMeasure>HUR</UnitOfMeasure>
    <TermReference termName="payCode" term="Overtime"/>
</UnitRate>
```

This `TermReference` identifies this `UnitRate` as being the rate for the Overtime payCode.

Period

`Period` specifies the period of time over which the service occurs.

Contractor

`Contractor` identifies the contractor being engaged for temporary labor. The contractor is uniquely identified by a `ContractorIdentifier` element, which is exchanged between the buyer and supplier prior to sending orders or timecards. For more information about TimeCard transactions, see TimeCard Transaction [page 211]

`Contractor` has the following elements:

Element	Description
`ContractorIdentifier`	Uniquely identifies the contractor for both the buyer and supplier. `ContractorIdentifier` has the following attribute: **Attribute** / **Description** `domain` (required) — The domain in which the contractors identity is represented. This attribute allows the buyer and supplier systems to determine who assigned the identification. `buyerReferenceID` implies that the identification was generated in the buyer system. `supplierReferenceID` implies that the identification was generated in the supplier system.
`Contact`	Contains contact information for the contractor.

JobDescription

`JobDescription` is a text description of the job or work to be performed.

Supervisor

`Supervisor` specifies contact information for the person who will supervise the contractor.

WorkLocation

`WorkLocation` is the address of the place where the work is to be performed.

Extrinsic

This optional element in `LaborDetail` contains any additional data that the buying organization wants to pass to the supplier. The cXML specification does not define the content of `Extrinsic` elements—it is something that each buying organization and supplier must agree on and implement.

The following example passes the region in which the work is to be performed.

```
<Extrinsic name=”region"">sfbay</Extrinsic>
```

6.2.2.8.3 Extrinsic

`Extrinsic` is supported in `SpendDetail`, enabling buyer-supplier pairs to convey detailed information on spend that does not fit within `TravelDetail`, `FeeDetail`, or `LaborDetail`.

Extrinsic elements are intended to provide additional machine-readable information. They extend the cXML protocol to support features not required by all implementations. The cXML specification does not define the content of `Extrinsic` elements. Each buyer-supplier pair must agree on and implement their definitions of `Extrisic` elements.

Describes detailed information for any undefined spend category. The `name` attribute of the `Extrinsic` element should specify the type of spend category, such as print, market research, or project labor.

It is recommend that all `Extrinsic` elements in a single `SpendDetail` element be included under a single `Extrinsic` with the `name` attribute used to specify the name of the category. This example shows two `Extrinsic` elements nested under one heading, within a `SpendDetail` element:

```
<SpendDetail>
    <Extrinsic name="MarketResearchDetail">
        <Extrinsic name="ResearchObjectives">test objectives</Extrinsic>
        <Extrinsic name="ProjectNumber">PN3434343</Extrinsic>
    </Extrinsic>
</SpendDetail>
```

The `Extrinsic` element can also appear in the `OrderRequestHeader`, `ItemDetail`, and `ContractItem` elements. These contexts are described further elsewhere in this document.

6.2.2.9 Distribution

Distribution divides the cost of an item among multiple parties. Suppliers return the `Distribution` element on invoices to facilitate the buyer's reconciliation process.

Accounting

The `Accounting` element groups `AccountingSegments` to identify who is charged.

`Accounting` has the following attribute:

Attribute	Description
`name` (required)	The name for this accounting combination. The account from which this charge will be paid.

AccountingSegment

The `AccountingSegment` element can contain any relevant accounting code used by a buying organization. Examples of possible values are asset number, billing code, cost center, G/L account, and department. For example:

```
<AccountingSegment id="456">
    <Name xml:lang="en-US">G/L Account</Name>
    <Description xml:lang="en-US">Travel</Description>
</AccountingSegment>
```

`AccountingSegment` has the following attribute:

Attribute	Description
`id` (required)	The unique identifier within this `AccountingSegment` type. This value might be the actual account code if the type were "Cost Center".

Name

An identifying name for this `AccountingSegment` with respect to the others in the `Accounting` element.

Description

A description of the accounting entity.

Charge

Specifies the amount to be charged to the entity represented by the `Accounting` element.

Money

Contains the amount of the `Charge` at the line item level.

Attribute	Description
`currency` (required)	The unique ISO standard three-letter currency code. For example, "USD" = United States Dollar.
`alternateAmount`	The amount of money in the `alternateCurrency`. Optional and used to support dual-currency requirements such as the Euro.

Attribute	Description
alternateCurrency	Specifies the currency for the alternateAmount. Must conform to ISO 4217 currency codes.

6.2.2.10 Contact

The supplier uses Contact element information to follow up on an order. See Contact [page 112].

6.2.2.11 TermsofDelivery

Specifies the terms of delivery for the ship notice. See TermsofDelivery [page 117].

6.2.2.12 TravelDetail

TravelDetail is a child of SpendDetail and describes information about travel line items.

The following example shows the element declaration of TravelDetail from cXML.dtd:

```
<!ELEMENT TravelDetail (
    (AirDetail | CarRentalDetail | HotelDetail | RailDetail),
    PolicyViolation*,
    Comments?,
    TermsAndConditions?)>
```

The following example shows the location of SpendDetail and TravelDetail within an OrderRequest document:

```
<OrderRequest... >
    <OrderRequestHeader >
        ...
    </OrderRequestHeader >
    <ItemOut>
        <ItemDetail >
                ...
        </ItemDetail>
        <SpendDetail>
            <TravelDetail>
                            ...
            </TravelDetail>
         </SpendDetail>
     </ItemOut>
</OrderRequest>
```

`TravelDetail` has the following attributes:

Attribute	Description
`confirmationNumber` (required)	A unique confirmation number that is understood by both the traveler and the vendor who is providing the service for this travel line item. For example, hotel reservation number or e-ticket number from the airline.
`pnrLocator`	Passenger Name Record (PNR) locator used by the travel booking provider.
`quoteExpirationTime`	Date and time that this quote will expire. This value is normally supplied in the PunchoutOrderMessage. If no value is supplied, it is assumed that this quote will not expire.

6.2.2.13 TravelDetail Common Elements

Several common elements are used throughout `TravelDetail`.

Date and Time in cXML

Dates and times in cXML must be formatted in the restricted subset of ISO 8601. This is described in the Word Wide Web Consortium (W3C) Note entitled "Date and Time Formats" available at www.w3.org/TR/NOTE-datetime-970915.html. See Date, Time, and Other Data Types [page 32] for more information.

Vendor

The common `Vendor` element. When used in `TravelDetail`, `Vendor` provides information about a vendor of a service. `Vendor` can be used in `AirLeg`, `CarRentalDetail`, `HotelDetail`, and `RailLeg`.

`Vendor` has one attribute:

Attribute	Description
`preferred` (required)	Is this a preferred vendor? `yes | no`

Vendor has the following element:

Element	Description
Address	The basic Address element provides the physical address of the vendor. Typically, this is the address the vendor's a business location or headquarters. Address is described further in cXML Conventions [page 25]. The Address element contains an addressIDDomain attribute which specifies a code that represents the agency or organization responsible for the addressID numbering. For example, DUNS or ILN. This code is required if there is a value in the addressID field. Address has the following element: • SupplierID Supplier ID for this vendor. This is a (domain, value) pair so that travel booking providers can define their SupplierID elements according to the convention they prefer, such as D-U-N-S or TaxID. SupplierID has one required attribute: Attribute: domain (required) — Description: Domain of the supplier ID. Each travel booking provider can specify multiple Supplier ID values. This capability enables a provider to use a single implementation to coordinate with various enterprise implementations that use different SupplierID domains.

TermsAndConditions

Text descriptions of terms and conditions associated with a travel line item. For example, a car rental TermsAndConditions normally includes boundary limit, additional mileage charges, gasoline charges, and other restriction information. Multiple TermsAndConditions can be included in a single travel line item.

TermsAndConditions has the following element:

Element	Description
Description	Text description of terms and conditions. If TermsAndConditions is present, Description is required.

PolicyViolation

Line-item level policy violation that results from the user selecting this particular travel item. Policy violations are not associated at the header level to ensure clear identification of a violation with the appropriate line item.

`PolicyViolation` has one attribute:

Attribute	Description
`level` (required)	The level of the `PolicyViolation`: `warning` | `violation` `warning` - a non-serious violation `violation` - a serious violation of company policy

`PolicyViolation` has the following elements:

Element	Description
`Description`	Description is a common free-text element, which provides a textual description of an element, such as `PolicyViolation`.
`PolicyViolationJustification`	Justification for this `PolicyViolation`. Typically, the user selects a `PolicyViolationJustification` from a standard list of justifications at the travel booking provider's web site.
`Comments`	Additional comments to further clarify the `PolicyViolationJustification`, given by the user.

Penalty

Penalty (if any) for this travel segment. `Penalty` has the following elements:

Element	Description
`Money`	The penalty amount.
`Description`	Textual description of the cause of the penalty. For example, a change fee associated with an air ticket.

AvailablePrice

The common `AvailablePrice` element describes other available prices that the user did not select.

`AvailablePrice` has one attribute:

Attribute	Description
`type` (required)	Description of the level of compliance with company policy.

Possible values for the `type` attribute of `AvailablePrice`:

Value	Description
`lowest`	Lowest price available regardless of the travel policies
`lowestCompliant`	Lowest price available that is compliant with travel policies
`highestCompliant`	Highest price available that is compliant with travel policies
`highest`	Highest price available regardless of the travel policies
`other`	Other, specify in the `Description`

`AvailablePrice` has the following elements:

Element	Description
`Money`	The amount of an available price.
`Description`	A text description of an available price, including information on how the price was found or particular requirements for the price.

Rate

Defines the rate for a travel item. The following example shows a `Rate` element for a `CarRentalFee`:

```
<CarRentalFee type="baseRate">
    <Total>
        <Money currency="USD">215.99</Money>
    </Total>
    <Rate quantity="4">
        <Total>
            <Money currency="USD">119.96</Money>
        </Total>
        <UnitRate>
            <Money currency="USD">215.99</Money>
            <UnitOfMeasure>WEE</UnitOfMeasure>
        </UnitRate>
    </Rate>
</CarRentalFee type="baseRate">
```

`Rate` has one attribute:

Attribute	Description
`quantity` (required)	The quantity for the rate. For example, a four-night stay at a hotel would be expressed as: `quantity` = 4 `UnitofMeasure` in `UnitRate` = DAY

`Rate` has the following elements:

Element	Description
`Total`	The total amount for the rate. The total amount must equal to `quantity` x `UnitRate`. All `Rate` amounts for a line item must add up to the `Total` for that line item.
`UnitRate`	`UnitRate` defines the rate for a single unit according to the unit of measure. For example, a single nightly rate for a hotel room can be expressed with `Money` equal to the nightly rate amount and the `UnitOfMeausre` equal to DAY. The amount to be paid per unit (of time or other measure). In the case of multiple `UnitRates` (a rate schedule), use `TermReference` elements to distinguish them.
`Description`	Textual description for the rate. For a hotel stay, the `Description` could contain "hotel nightly rate."

BookingClassCode

`BookingClassCode` is a common element. When used in a travel line item, it indicates the class of the line item. For example, `BookingClassCode` is commonly used to convey frequent flyer information for air travel reservations.

Each buyer-travel booking provider pair can use any industry standard they choose. The following example shows a minimal `BookingClassCode` element:

```
<BookingClassCode code="W">
    <Description xml:lang="en">Coach class</Description>
</BookingClassCode>
```

For information on car rental codes, see "CarRentalDetail" [page 144].

`BookingClassCode` has the following attributes:

Attribute	Description
`domain` (required)	The domain for this code, for example, IATA.
`code` (required)	An industry standard code, or per agreement of buyer-travel booking provider pair.

`BookingClassCode` has the following element:

Element	Description
`Description`	Contains a text description of the code.

Airport

The common `Airport` element, which contains the three-letter IATA airport code, is used in `AirLegOrigin`, `AirLegDestination`, `CarRentalPickup`, `CarRentalDropoff`, `HotelDetail`, `RailLegOrigin` and `RailLegDestination`.

`Airport` has one attribute:

Attribute	Description
`airportCode` (required)	The three-letter IATA airport code. For information on the International Air Transport Association (IATA) standard, see: www.iata.org/nr/rdonlyres/3346f400-3450-48a6-a543-86a3921c23f7/0/xml_fuel_transaction_v202.pdf.

`Airport` has the following optional element:

Element	Description
`Address`	Provides the physical address of the airport.

Meal

The `Meal` element of an `AirLeg` can contain two optional, common elements: `BookingClassCode` and `Description`. The following example represents a heated vegetarian dinner for an `AirLeg`.

```
<Meal>
    <Description xml:lang="en">vegetarian dinner</Description>
    <BookingClassCode code="H"></BookingClassCode>
</Meal>
```

`Meal` has the following elements:

Element	Description
`Description`	A text description of the meal, including any special needs such as vegetarian, gluten-free, or dairy-free.

Element	Description
`BookingClassCode`	The common `BookingClassCode` element is defined at BookingClassCode [page 138]. Defines the code for the meal. For example, airlines typically use the following meal codes:

Code	Description
B	Breakfast
C	Complimentary liquor
D	Dinner
F	Food for purchase
G	Food and beverage for purchase
H	Hot meal
K	Continental breakfast
L	Lunch
M	Meal
N	No meal service
O	Cold meal
P	Liquor for purchase
R	Refreshments
S	Snack or brunch
V	Refreshments for purchase

6.2.2.13.1 AirDetail

The `AirDetail` element is a child of `TravelDetail` and provides information about an air trip. The following example shows the element declaration of `AirDetail` from `cXML.dtd`:

```
<!ELEMENT AirDetail (
    TripType,
    AirLeg+,
    AvailablePrice*,
    Penalty?)>
```

`AirDetail` has no attributes.

TripType

`TripType` is a container for the `type` attribute, which is required in both `AirDetail` and `RailDetail` to indicate a round trip, one way, or multi-leg trip.

For example, a `TripType` for a round trip would appear as:

```
<TripType type="round"></TripType>
```

The `TripType` element has the following attribute:

Attribute	Description
`type` (required)	`round`: round trip `oneWay`: one-way trip `multiLeg`: multi-leg or open-jaw trip

AirLeg

Each `AirDetail` must include at least one `AirLeg` element.

The following example shows the element declaration of `AirLeg` from `cXML.dtd`:

```
<!ELEMENT AirLeg (
    Vendor,
    AirLegOrigin,
    AirLegDestination,
    BookingClassCode?,
    Rate?,
    Meal*)>
```

The `AirLeg` element provides detailed information about a trip that includes one or more airplane flights. The following example shows an `AirLeg` element for a one-way flight:

```
<AirLeg travelSegment="1"
    departureTime="2004-12-01T16:10:00-08:00"
    arrivalTime="2004-12-01T17:10:00-08:00"
    flightNumber="SW 990"
    seatNumber="20F"
    seatType="aisle"
    stops="0"
    equipment="Boeing 737">
    <Vendor preferred="no">
        <Address>
            ...
        </Address>
    </Vendor>
    <AirLegOrigin>
        <Airport airportCode="SFO">
            <Address>
                ...
            </Address>
        </Airport>
    </AirLegOrigin>
    <AirLegDestination>
        <Airport airportCode="BUR">
            <Address>
                ...
            </Address>
        </Airport>
    </AirLegDestination>
    <BookingClassCode code="W">
        <Description xml:lang="en">Coach class</Description>
    </BookingClassCode>
    <Meal type="snack">
```

```
        <Description xml:lang="en">Vegetarian snack</Description>
    </Meal>
</AirLeg>
```

`AirLeg` has the following attributes:

Attribute	Description
`travelSegment` (required)	Text description to identify this travel segment. This information is specific to the travel booking provider.
`departureTime` (required)	Local departure date and time for this air leg.
`arrivalTime` (required)	Local arrival date and time for this air leg.
`flightNumber` (required)	Flight number for this air leg.
`seatNumber`	Seat number for this air leg.
`seatType`	Seat type: `window`, `aisle`, or `middle`
`upgrade`	Is this ticket an upgrade: `no` (default), or `yes`
`stops`	The number of stop for this air leg. Use a numeral for the number of stops, or '0' (zero) for a direct flight. If no numeral is entered, '0' (zero) is implied.
`equipment`	The plane equipment information for this air leg. For example, the model of airplane used.

`AirLeg` has the following elements:

Element	Description
`Vendor`	The common `Vendor` element, which provides information about the vendor of a service, is defined at Vendor [page 134].

Element	Description

`AirLegOrigin` | `AirLegDestination`	These elements contain the addresses of the `AirLegOrigin` and `AirLegDestination` entities on the `AirLeg`.
	
	`AirLegOrigin` and `AirLegDestination` have the following child element:
	
	• `Airport`
	The common `Airport` element, which contains the three-letter IATA airport code in the `airportCode` attribute, and an optional `Address` element, is defined at Airport [page 139].
	For information on the International Air Transport Association (IATA) standard, see: www.iata.org/codes.
	The following example shows a detailed `AirLeg` for a flight from San Francisco to Miami.
	
	`<AirLegOrigin>`
	`  <Airport airportCode="SFO">`
	`  <Address>`
	`  <Name xml:lang="en">San Francisco Internal Airport</Name>`
	`  <PostalAddress>`
	`  <Street>San Francisco International Airport</Street>`
	`  <City>San Francisco</City>`
	`  <State>CA</State>`
	`  <PostalCode>94128</PostalCode>`
	`  <Country isoCountryCode="US">UnitedStates</Country>`
	`  </PostalAddress>`
	`  </Address>`
	`  </Airport>`
	`</AirLegOrigin>`
	`<AirLegDestination>`
	`  <Airport airportCode="MIA">`
	`  <Address>`
	`  <Name xml:lang="en">Miami International Airport</Name>`
	`  <PostalAddress>`
	`  <Street>4200 NW 21 Street>`
	`  <City>Miami</City>`
	`  <State>FL</State>`
	`  <PostalCode>33122</PostalCode>`
	`  <Country isoCountryCode="US">UnitedStates</Country>`
	`  </PostalAddress>`
	`  </Address>`
	`  </Airport>`
	`</AirLegDestination>`
	
	• `BookingClassCode`
	The common `BookingClassCode` element is defined at BookingClassCode [page 138].
	The `BookingClassCode` element of an `AirLeg` defines the class of travel for the `AirLeg` according to the de-facto airline standard. The following table shows sample IATA codes:
	
	IATA Codes: `F, FN, P, R, A`
	Description: first class

Element	Description
	<table><tr><th>IATA Codes</th><th>Description</th></tr><tr><td>C, CN, D, J, I, Z</td><td>business class</td></tr><tr><td>Y, YN, B, BN, M, H, V, VN, O, Q, QN, S, K, KN, L, U, T, W</td><td>coach class</td></tr></table> The sample codes are not guaranteed to be accurate or current. For information on the International Air Transport Association (IATA) standard, see: www.iata.org/codes. BookingClassCode has the following elements: ○ Rate The common Rate element is defined at Rate [page 137]. The total of all specified AirLeg rates must equal the line item total. ○ Meal The common Meal element, which describes one meal in a travel line item, is defined at Meal [page 139].

AvailablePrice

The optional, common AvailablePrice element, which defines available prices that the user did not select, is defined at AvailablePrice [page 136]. The AvailablePrice element of AirDetail defines available price information for a single-leg, multi-leg, or round trip.

Penalty

The common Penalty element, which describes extra charges assessed by vendors for user changes to travel line items, is defined at Penalty [page 136]. The Penalty element of an AirLeg describes extra charges for changes to, or cancellation of, an air travel reservation.

6.2.2.13.2 CarRentalDetail

CarRentalDetail is a child of TravelDetail and provides information about a single car rental event.

The following example shows the element declaration of CarRentalDetail from cXML.dtd:

```
<!ELEMENT CarRentalDetail (
    Vendor,
    CarRentalPickup,
    CarRentalDropoff,
    BookingClassCode?,
    CarRentalFee+,
    LimitedMileage?,
```

```
    AvailablePrice*)>
```

`CarRentalDetail` has the following attributes:

Attribute	Description
`travelSegment` (required)	Text description used to identify this travel segment. The description is specific to the travel booking provider.
`pickupTime` (required)	Intended local pickup date and time.
`dropoffTime` (required)	Intended local drop-off date and time.

Vendor

The common `Vendor` element, which provides information about the vendor of a service, is defined at Vendor [page 134].

CarRentalPickup / CarRentalDropoff

These elements contain the addresses of the `CarRentalPickup` and `CarRentalDropoff` entities on the `CarRentalDetail`. Both `CarRentalPickup` and `CarRentalDropoff` require the common `Airport` element, which specifies the airport location.

BookingClassCode

A four-letter code, which indicates the rental car class. Each buyer-travel booking provider pair can use the standard they choose. For example, a common U.S. standard for car rental:

1st Letter	M (Mini) E (Economy) C (Compact) S (Standard) I (Intermediate) F (Full size) P (Premium) L (Luxury) V (MiniVan) X (Special)

2nd Letter	B (2 door) C (2/4 door) D (4 door) T (Convertible) F (Four wheel drive) V (Van) W (Wagon) S (Sport) X (Special)
3rd Letter	A (Automatic) M (Manual)
4th Letter	R (A/C) N (No A/C)

CarRentalFee

`CarRentalFee` defines the actual charges and fees that apply to this car rental. To capture the breakdown of various fees, use multiple `CarRentalFee` elements within one `CarRentalDetail` element. The total of these fees must add up to the total at the line item level.

> **Note**
>
> Use `TermsAndConditions` text to specify conditional charges for items such as extra mileage that are over the mileage limit.

`CarRentalFee` has one attribute:

Attribute	Description
`type`	The type of fee, expressed in the form “baseRate”.

Possible values for the `type` of a `CarRentalFee` are:

Value	Description
`additionalDriver`	Additional driver fee
`airportAccessFee`	Airport access fee
`baseRate`	Base rental rate
`childSeat`	Child seat charge
`collisionDamageInsurance`	Collision damage insurance
`dropOffCharge`	Drop off charge
`liabilityInsurance`	Liability insurance
`luggageRack`	Luggage rack charge

Value	Description
`mobilePhone`	Mobile phone base charge
`navigationSystem`	Navigation system
`other`	Other charges
`prepaidGasoline`	Prepaid gasoline charge
`touristTax`	Tourist tax
`vehicleLicensingFee`	Vehicle licensing fee

`CarRentalFee` has the following elements:

Element	Description
`Total`	Total amount for this `CarRentalFee`. All `Rate` amounts for a line item must add up to the `Total` for that line item.
`Rate`	Fee information for individual charges for this `CarRentalFee`.

LimitedMileage

`LimitedMileage` specifies the quantity and unit of measure of the mileage limit.

`LimitedMileage` has one attribute:

Attribute	Description
`quantity` (required)	The mileage limit amount, expressed as a numeral.

`LimitedMileage` has one element:

Element	Description
`UnitOfMeasure`	Unit of measure, expressed in miles or kilometers. See UnitOfMeasure [page 48].

AvailablePrice

The optional, common `AvailablePrice` element, which defines available prices that the user did not select, is defined at AvailablePrice [page 136].

6.2.2.13.3 HotelDetail

`HotelDetail` is a child of `TravelDetail`. The following example shows the element declaration of `HotelDetail` from `cXML.dtd`:

```
<!ELEMENT HotelDetail (
    Vendor,
    Address,
    RoomType,
    BookingClassCode?,
    Meal*,
    Rate*,
    AvailablePrice*)>
```

`HotelDetail` has the following attributes:

Attribute	Description
`travelSegment` (required)	Text information to identify this travel segment. This information is specific to the travel booking provider.
`arrivalTime` (required)	Local date and time of arrival at the hotel. This is used as an advisory to the hotel vendor for the arrival time.
`departureTime` (required)	Local date and time of departure from the hotel. This is an advisory to the hotel vendor for the departure time.
`checkinTime` (required)	Local official hotel checkin time.
`checkoutTime` (required)	Local official hotel checkout time.
`earlyCheckinAllowed`	Does the hotel allow early checkin? `no`, or `yes (default)`.
`lateCheckoutAllowed`	Does the hotel allow late checkout? `no`, or `yes (default)`

Vendor

The common `Vendor` element, which provides information about the vendor of a service, is defined at Vendor [page 134]. For `HotelDetail`, the `Vendor` element defines the hotel provider.

Address

Physical address of the hotel. This might be different from the address specified in the `Vendor` field. The `Address` in `Vendor` might be the address of the hotel's corporate headquarters, for example, while the `Address` in `HotelDetail` would be the address of the individual hotel.

RoomType

Information about the type of hotel room reserved.

`RoomType` has the following attributes:

Attribute	Description
`smoking` (required)	Smoking or non-smoking room: `yes` | `no`
`numberOfBed`	The number of beds in the room.
`bedType`	The type of bed in the room: `king` | `queen` | `full` | `double` | `single` | `other`

`RoomType` has the following elements:

Element	Description
`Description`	Text description of the hotel room.
`Amenities`	Text description of amenities. For example, DSL connection, two telephone lines, and other information about a hotel room. `Amenities` has no attributes. It has one element: • `Description` Text description of the amenities. For example, DSL connection, two telephone lines, and other information about the hotel room.

BookingClassCode

The common `BookingClassCode` element is defined at BookingClassCode [page 138]. Each buyer-travel booking provider pair can use any standard they choose.

Meal

The common `Meal` element is defined at Meal [page 139]. The `Meal` element of `HotelDetail` defines any complimentary meals that are included with the room, such as complimentary continental breakfast.

Rate

The common `Rate` element is defined at Rate [page 137]. The `Rate` element of `HotelDetail` defines one or more rates for the hotel stay. For example, the nightly rate or valet parking rate.

AvailablePrice

The common `AvailablePrice` element is defined at AvailablePrice [page 136]. The `AvailablePrice` element of `HotelDetail` defines other available prices that the user did not pick. Available prices can be from the same vendor or another vendor.

6.2.2.13.4 RailDetail

The following example shows the element declaration of `RailDetail` from `cXML.dtd`:

```
<!ELEMENT RailDetail (
    TripType,
    RailLeg+,
    AvailablePrice*,
    Penalty?)>
```

`RailDetail` has no attributes.

TripType

`TripType` is a container for the `type` attribute, which is required in both `AirDetail` and `RailDetail` . The `TripType` element defines a round trip, one way, or multi-leg trip.

For example, a `TripType` for a round trip would appear as:

```
<TripType type="round"></TripType>
```

Possible values for the `type` attribute of `TripType`:

Value	Description
`round`	round trip
`oneWay`	one-way trip
`multiLeg`	multi-leg or open-jaw trip

RailLeg

One or more `RailLeg` elements that make up this `RailDetail`. Each `RailDetail` must include at least one `RailLeg`.

The following example shows the element declaration of `RailLeg` from the DTD:

```
<!ELEMENT RailLeg (
    Vendor,
    RailLegOrigin,
    RailLegDestination,
```

```
    BookingClassCode?,
    Rate?,
    Meal*)>
```

RailLeg has the following attributes:

Attribute	Description
travelSegment (required)	Text information to identify this travel segment. This information is specific to the travel booking provider.
departureTime (required)	Local date and time of departure from the originating location.
arrivalTime (required)	Local date and time of arrival at the destination location.
trainNumber (required)	Train number.
seatNumber	Seat number.
carType	The type of the rail car.

Vendor

The common Vendor element, which provides information about the vendor of a service, is defined at Vendor [page 134]. For RailLeg, the Vendor element defines the rail travel provider, such as Amtrak.

RailLegOrigin / RailLegDestination

RailLegOrigin and RailLegDestination have two possible elements, of which exactly one must be included:

Element	Description
Airport	The common Airport element, which contains the three-letter IATA airport code in the airportCode attribute, and an optional Address element, is defined at Airport [page 139]. For information on the International Air Transport Association (IATA) standard, see: www.iata.org/codes.
Address	The physical address of the rail station. Neither RailLegOrigin nor RailLegDestination has any attributes.

BookingClassCode

The common `BookingClassCode` element is defined at BookingClassCode [page 138]. The `BookingClassCode` element of a `RailLeg` element defines the class of travel for the `RailLeg` according to a rail standard agreed upon by the buyer-travel booking provider pair.

Rate

The common `Rate` element is defined at Rate [page 137]. Rate information for this rail leg. If specified, all the rates in all rail legs must add up to the total at the travel line item level.

Meal

The common `Meal` element is defined at Meal [page 139]. The `Meal` element of `HotelDetail` defines any complimentary meals that are included with the room, such as complimentary continental breakfast.

AvailablePrice

The common `AvailablePrice` element is defined at AvailablePrice [page 136]. The `AvailablePrice` element of `RailDetail` defines other available prices that the user did not pick. Available prices can be from the same vendor or another vendor.

Penalty

The common `Penalty` element, which describes extra charges assessed by vendors for user changes to travel line items, is defined at Penalty [page 136]. The `Penalty` element of `RailLeg` defines extra charges for changes to, or cancellation of, a rail travel reservation.

6.2.2.14 Tolerances

This is an optional element and allows buyers to specify line item quantity tolerance for individual purchase orders or different line items in a purchase order they send from their order management system. The tolerances specified in the purchase order are applied when a supplier creates ship notices and invoices against the purchase order.

QuantityTolerance

The quantity tolerance for a line item. This element has the following elements:

Element	Description
`Percentage`	The percentage for the quantity tolerance.
`Value`	The quantity number for the quantity tolerance. You can specify one these elements in the `QuantityTolerance` element.

PriceTolerance

The price tolerance for a line item. This element has the following elements:

Element	Description
`Percentage`	The percentage for the price tolerance.
`Money`	The amount and currency for the price tolerance. You can specify one these elements in the Price`Tolerance` element.

TimeTolerance

The time tolerance for a line item. It defines a certain amount of time used to check if a concrete delivery date is within the tolerance regarding the requested delivery date. `TimeTolerance` has the following attributes:

Attribute	Description
`limit` (required)	Specifies the time tolerance limit.
`type`	Specifies the type of time limit. Possible values are: • `minutes` • `hours` • `days` (default) • `weeks`

6.2.2.15 ControlKeys

Provides elements that allow you to override default business rules for order confirmations, ship notices, and invoices. See ControlKeys [page 115].

Here is an example of the `ControlKeys` element used in the `ItemOut` element:

```
<ItemOut lineNumber="1" quantity="2" requestedDeliveryDate="2015-12-31">
  ...
  <ControlKeys>
    <InvoiceInstruction value="isERS"/>
  </ControlKeys>
</ItemOut>
```

6.2.2.16 ScheduleLine

`ScheduleLine` contains information related to delivery schedules for a line item. It has the following attributes:

Attribute	Description
`quantity` (required)	Quantity of items to be shipped.
`requestedDeliveryDate` (required)	Date that the specified quantity is expected to be delivered.
`deliveryWindow`	Duration of time in which the quantity is expected to be delivered.
`lineNumber`	A line number can be added as a line identifier for a specific schedule line.
`requestedShipmentDate`	The ship date requested by the buyer for the item.

`ScheduleLine` has the following elements:

UnitOfMeasure

`The UnitOfMeasure` for the specified quantity of the line item.

ScheduleLineReleaseinfo

The `ScheduleLineReleaseInfo` element stores details about a specific release of items or materials for a schedule line.

`ScheduleLineReleaseInfo` contains the following attributes:

Attribute	Description
`commitmentCode` (required)	A string value to identify the type of the delivery. Possible values: • `firm`—Go-ahead for production. Vendor can ship against the schedule line. Customer is responsible for cost of production as well as cost of material procurement. • `tradeoff`—Go-ahead for material procurement. Vendor can ship against the schedule line if rule is enabled. Buyer is responsible for cost of material procurement. • `forecast`—Informational. Customer can change the schedule line without incurring any liabilities with the vendor.
`cumulativeScheduledQuantity` (required)	Total quantity to be shipped for a particular line item up through the schedule line.

SubcontractingComponent

Contains detailed information about a subcontracting component, which is used to manufacture the finished goods. For example, it could contain an ID, a description, a buyer's product ID, a quantity, or the date required.

`SubcontractingComponent` has the following attributes:

Attribute	Description
`quantity` (required)	Quantity of the subcontracting component required to produce the finished goods in a unit of measurement.
`requirementDate`	The date on which the requested quantity of subcontracting component is required.

`SubcontractingComponent` has the following elements:

Element	Description
`ComponentID`	An identifier for a subcontracting component within the procurement process.
`UnitOfMeasure`	Unit of measure code.
`Description`	Description of subcontracting component
`Product`	Information about the subcontracting component, such as buyer product ID, supplier product ID, standard product ID, or internal product ID.
`ProductRevisionID`	An identifier that is assigned when changes are made to component.
`Batch`	An element carrying a batch information for material or goods produced in a single manufacturing run, such as buyer/supplier batch ID, production date, and property valuation.

Extrinsic

Alternately, use the `Extrinsic` element list to insert additional data about the `ScheduleLine` element.

6.2.2.17 MasterAgreementReference

An optional field. Can contain a reference to the master agreement from which the release is derived.

6.2.2.18 MasterAgreementIDInfo

An optional field. Can contain the ID of the master agreement from which the release is derived.

6.2.2.19 ItemOutIndustry

This element contains the industry-specific information. This is an optional element, and it has the following optional attribute:

Attribute	Description
`planningType`	Specifies the planning strategy. Possible values are: • `MTO`—Make to Order • `MTS`—Make to Stock

`ItemOutIndustry` has the following elements:

Element	Description
`ItemOutRetail`	Contains the retail industry item-specific information. This is an optional element. `ItemOutRetail` has the following elements: • `PromotionVariantID` Specifies a specific ID if only one or some variants of an article are promoted. Product variant is a specific code that specifies the characteristic of a product (color, shape, and so on). This is an optional element. • `PromotionalDealID` Specifies an ID assigned by a supplier related to a promotional activity. Promotions affect the forward planning/ordering process (and the related pricing). This is an optional element.

Element	Description

`ReferenceDocumentInfo`	Contains information about a referenced document. This is an optional element, and it can occur multiple times. It has two optional attributes:
	• `lineNumber`—Line number of an item in the referenced document
	• `status`—Status used to refer to the referenced document. Possible values are:
	  ○ `created`
	  ○ `released`
	  ○ `open`
	  ○ `completed`
	  ○ `closed`
	  ○ `cancelled`
	`ReferenceDocumentInfo` has the following elements:
	• `DocumentInfo` | `DocumentReference`
	• `DateInfo`
	• `Contact`
	• `Extrinsic`

`Priority`	Indicates the priority of orders for the suppliers. This is an optional element. It has a `Description` element, which describes the priority. The `level` attribute specifies the priority level, an integer from 1 to 5.

6.2.2.20 Packaging

Specifies the details about the packaging of the line item.

PackagingCode

Specifies the unique ID of packaging material (box, container, palet, rack). This field describes the type of packaging and is relevant to the receiver (buyer) during unloading and storage. The package type in many cases also defines the maximum load or weight of articles. This is a mandatory field.

Each `PackagingCode` must contain a single string corresponding to the packaging for this item. When multiple `PackagingCode` are used, they must all describe the same packaging in different languages or locales. Two `PackagingCode` elements cannot have the same xml:lang attribute.

If the `PackagingCode` is specified, then its optional to specify the `Dimension` element. But if the `PackagingCode` element is not specified, then the `Dimension` element is a mandatory field.

xml:lang Attribute

Specifies one language-specific code for the packaging of the item. Values such as "pallet", "skid" and "truck load" might be appropriate for an English-based locale. The xml:lang attribute specifies the language or locale in which the PackagingCode content is written. This is a mandatory field.

Dimension

Specifies a single dimension for the packaging of the item. It also can be used to define item dimensions.

Dimension has the following attributes:

Attribute	Description
quantity (required)	Specifies the size in this dimension. Expressed in the units given in the UnitOfMeasure element.
type (required)	Type of dimension. Possible values: • length—The length of the packaging or item. • width—The width of the packaging or item. • height—The height of the packaging or item. • weight—The weight or net weight of the packaging or item. • volume—The volume or net volume of the packaging or item. • stackHeight—The stack height of the packaging. This indicates total height of the stacked packages. • grossWeight—The gross weight is the total weight including packaging. • grossVolume—The total volume, including packaging. • unitGrossWeight—The gross weight per unit of the item. • unitNetWeight—The net weight per unit of the item.

Dimension has the following element:

Element	Description
UnitofMeasure	See UnitOfMeasure [page 48].

Description

The description of the package.

PackagingLevelCode

Specifies the level for packages (for example, ‘inner’, ‘outer’, ‘intermediate’). This qualifies the packing level within the packing hierarchy, and is of particular importance for the buyer side in order to plan unloading and storage accordingly.

PackageTypeCodeIdentifierCode

Specifies the unique ID of packaging material (box, container, palet, rack). This field describes the type of packaging and is relevant to the receiver (buyer) during unloading and storage. The package type in many cases also defines the maximum load or weight of articles.

SerialShippingContainerCode

The serial number of a package that helps to identify a package during transportation and inventory.

ShippingContainerSerialCodeReference

The reference from a package shipping code to the shipping code of the next higher package level.

PackageID

Package-related IDs.

`PackageID` has the following elements:

Element	Description
`GlobalIndividualAssetID`	Unique ID for a package. GIAI, numbering scheme of GS1 specifying the ownership of an asset. This is an optional field.
`ReturnablePackageID`	Specifies an ID that facilitates the return of a package to the supplier. This is an optional field.
`PackageTrackingID`	Specifies additional information to track packages based on the supplier’s internal numbering scheme. This is an optional field

ShippingMark

Specifies the shipping marks. This field is often used in industries where packaging proposals and packaging hierarchy are driven from the logistic back-end system. This field is typically used to specify special signing or handling instructions.

This is an optional element.

OrderedQuantity

Specifies a the number of items/products for a given line item in a purchase order. This element has an optional `quantity` attribute.

`OrderedQuantity` has the following element:

Element	Description
`UnitofMeasure`	See UnitOfMeasure [page 48].

DispatchQuantity

Specifies the delivered quantity (compared to the ordered quantity). This is useful in determining the correctness of any shipment. This element has an optional `quantity` attribute.

`DispatchQuantity` has the following element:

Element	Description
`UnitofMeasure`	See UnitOfMeasure [page 48].

FreeGoodsQuantity

Specifies the quantity that will be delivered without any cost to the buyer. For example, samples, redemptions, promotions, fill-ups, etc. These do not appear on the commercial invoice or marked with value 0.00.

This element has an optional `quantity` attribute.

`FreeGoodsQuantity` has the following element:

Element	Description
`UnitofMeasure`	See UnitOfMeasure [page 48].

QuantityVarianceNote

Specifies detailed information about partial delivery. This element can be used to specify a line item having different measurements. For example, 1 lot = 500 pieces.

BestBeforeDate

Specifies the date after which the item/goods begin to lose quality. This can be used to indicate best before date for all goods related to food, drugs, chemicals etc. This element has a mandatory `date` attribute.

Extrinsic

Alternately, use the `Extrinsic` element list to insert additional data about the packaging element.

6.2.2.21 ReleaseInfo

The `ReleaseInfo` element stores the details about a release of items or materials.
`ReleaseInfo` contains the following attributes:

Attribute	Description
`releaseType` (required)	A mandatory field. A string value to identify the type of delivery schedule against the schedule agreement release. Possible values: • `JIT` (Just-In-Time) • `Forecast`
`cumulativeReceivedQuantity` (required)	A mandatory field. A number value to identify the cumulative quantity of all goods received against the scheduling agreement release over a period up to a certain date.
`productionGoAheadEndDate`	An optional field. Date denoting the end of the production go-ahead period (go-ahead for production).
`materialGoAheadEndDate`	Date denoting the end of the material go-ahead period (go-ahead for purchase of input materials).

`ReleaseInfo` contains the following elements:

Element	Description
`ShipNoticeReleaseInfo`	References the last shipment received from a delivery schedule. This reference is against the last shipment made for the schedule line in the schedule agreement release.

Element	Description
`UnitofMeasure`	Unit of measure for the quantity specified for the schedule line item.
`Extrinsic`	Any additional information for the schedule line item.

6.2.2.22 Batch

An element carrying batch information for material or goods produced in a single manufacturing run. For example, `Batch` can include ID, characteristic, or date.

`Batch` has the following attributes:

Attribute	Description
`productionDate`	Date on which when a batch of material or goods is produced.
`expirationDate`	Date on which when a batch of material/goods becomes expired.
`originCountryCode`	Country of origin for a batch of material or goods.

`Batch` has the following elements:

Element	Description
`BuyerBatchID`	An identifier from the buyer to identify the material/goods produced in a single manufacturing run.
`SupplierBatchID`	An identifier from the supplier to identify the material/goods produced in a single manufacturing run. See SupplierBatchID [page 269].
`PropertyValuation`	The property to be valuated and its associated values. It has the following elements: • `PropertyReference` The property being valuated. • `ValueGroup` Contains a group of values pertaining to a property.

6.3 Response to an OrderRequest

This document is the response part of the synchronous Request-Response transaction. The following example shows a `Response` to an `OrderRequest` document:

```
<cXML payloadID="9949494" xml:lang="en"
        timestamp="1999-03-12T18:39:09-08:00">
    <Response>
        <Status code="200" text="OK"/>
    </Response>
</cXML>
```

As shown above, this `Response` is straightforward. In this case, there is no actual element named "OrderResponse", because the only data that needs to be sent back to the requestor is the `Status` part of the `Response`.

The `Response` tells the requestor its `OrderRequest` was successfully parsed and acted on by the remote part of HTTP connection. It does not communicate order-level acknowledgement, such as which items can be shipped, or which need to be backordered.

6.4 Accepting Order Attachments

Buyers often need to clarify purchase orders with supporting memos, drawings, or faxes. They can attach files of any type to cXML purchase orders by using MIME (Multipurpose Internet Mail Extensions).

cXML contains only references to external MIME parts sent within one multipart MIME envelope (with the cXML document, in an e-mail or faxed together). Commerce network hubs receive the attachments, and can forward them to suppliers or store them for online retrieval.

Related Information

Attachments [page 27]

7 Path Routing

In complex relationships between buyers and suppliers, a document might be routed through several intermediary systems before reaching the intended recipient. Path Routing enables documents to be routed by and copied to intermediary systems such as marketplaces, and commerce network hubs.

Overview of Path Routing [page 164]

Nodes [page 165]

Adding Nodes to PunchOutOrderMessage [page 168]

Creating OrderRequests [page 169]

Other Routable Documents [page 171]

CopyRequest [page 172]

7.1 Overview of Path Routing

Path routing is especially useful in direct and indirect marketplaces. In direct marketplaces, suppliers bill buyers directly. In indirect marketplaces, suppliers bill and receive payment from the marketplace host, which in turn bills and receives payment from member buyers.

Path Routing in PunchOut

Direct marketplaces can be PunchOut sites that enable external buyers to access suppliers' PunchOut catalogs. For a marketplace to track transactions originating from it, it must receive copies of all purchase orders as they route to the supplier.

To receive copies of all purchase orders as they route, the marketplace adds itself as a copy node to the `Path` of all `PunchOutOrderMessage` documents sent to the external buyers. This information also allows a marketplace to support edit/inspect PunchOut from procurement applications because it can distinguish which items in the shopping cart come from an external marketplace by inspecting the `Path` element.

Indirect Marketplaces can receive `OrderRequest` documents, modify them, split them, and route them to suppliers. Indirect marketplaces are router nodes that create new versions and route `OrderRequest` documents to suppliers.

To enable path routing in PunchOut:

1. Each system adds itself as a node to the `Path` element of `PunchOutOrderMessage` documents sent by suppliers to procurement applications.
2. Procurement applications generate `OrderRequest` documents by splitting the order based on the `Path` and `SupplierID` of each of the `ItemIn` elements of `PunchOutOrderMessage` documents. Procurement applications put a `Path` element at the cXML header level of each `OrderRequest` document.

3. Subsequent documents, such as `OrderRequest`, `PunchOutSetupRequest`, `ConfirmationRequest`, and `ShipNoticeRequest` documents are routed and copied by using the `Path` element at the header level.

Adding a `Path` element at the item or header level enables copying and routing of cXML documents for marketplaces and commerce network hubs. The `Path` element records the path taken between the buyer and supplier which documents can later use to find their way back to a supplier.

Path Routing in a Multi-Tier Supply Chain

In a multi-tier supply chain that involves multiple trading partners to deliver a finished product, end-to-end visibility and collaboration is essential. Consequently, buyers and suppliers need to send copies of orders, order confirmations, and ship notices to other tiered suppliers. To accomplish this, path routing can be initiated directly from an `OrderRequest` without a `PunchOutRequestMessage`. If no route nodes are included in the `Path` element, then only copies of orders, order confirmations, and ship notices are processed and sent to suppliers. Invoices are not routed.

Copy Requests are created for each copy node. The Copy Request adds an `OriginalDocument` with the payload ID of the source document for the copy request.

7.2 Nodes

Nodes appear in the `Path` element of either the header section, or `ItemIn` and `ItemOut` elements. Each node in the `Path` element can be either a router node or a copy node. If the node is of type “copy”, the system simply wants a copy of each document passing through. If the node is of type “route”, the system will modify and re-route each document passing through. Each system in the path must specify which type it is.

7.2.1 Path Element

The `Path` element contains nodes that are either of `type=”copy”` or `type=”route”`. For example, the following contains a copy node and a router node:

```
<Path>
    <Node type="copy">
        <Credential domain="NetworkId">
            <Identity>AN01000000111</Identity>
        </Credential>
    </Node>
    <Node type="route">
        <Credential domain="NetworkId">
            <Identity>AN01000000233</Identity>
        </Credential>
    </Node>
</Path>
```

7.2.2 Router Nodes

A router node creates a new version of the document it receives and routes it to the next node in the path. The routed document typically changes unit price, bill-to, or ship-to address information.

7.2.2.1 OriginalDocument

The new document must reference the document it is modifying by adding an `OriginalDocument` element, if it is not already present, at the header level that specifies the `payloadID` of the original document. This enables the network hub to keep track of each hop in the `Path` and decide which version of the document to display to the appropriate party.

7.2.2.2 DocumentReference

Each node is responsible for updating any `DocumentReference` elements in the new document it generates. For example, when an `OrderRequest` of type `update` or `delete` is routed to an intermediary node, this node must

change the `DocumentReference` in the new version of the updated `OrderRequest` to reference the correct payloadId as illustrated in the following diagram:

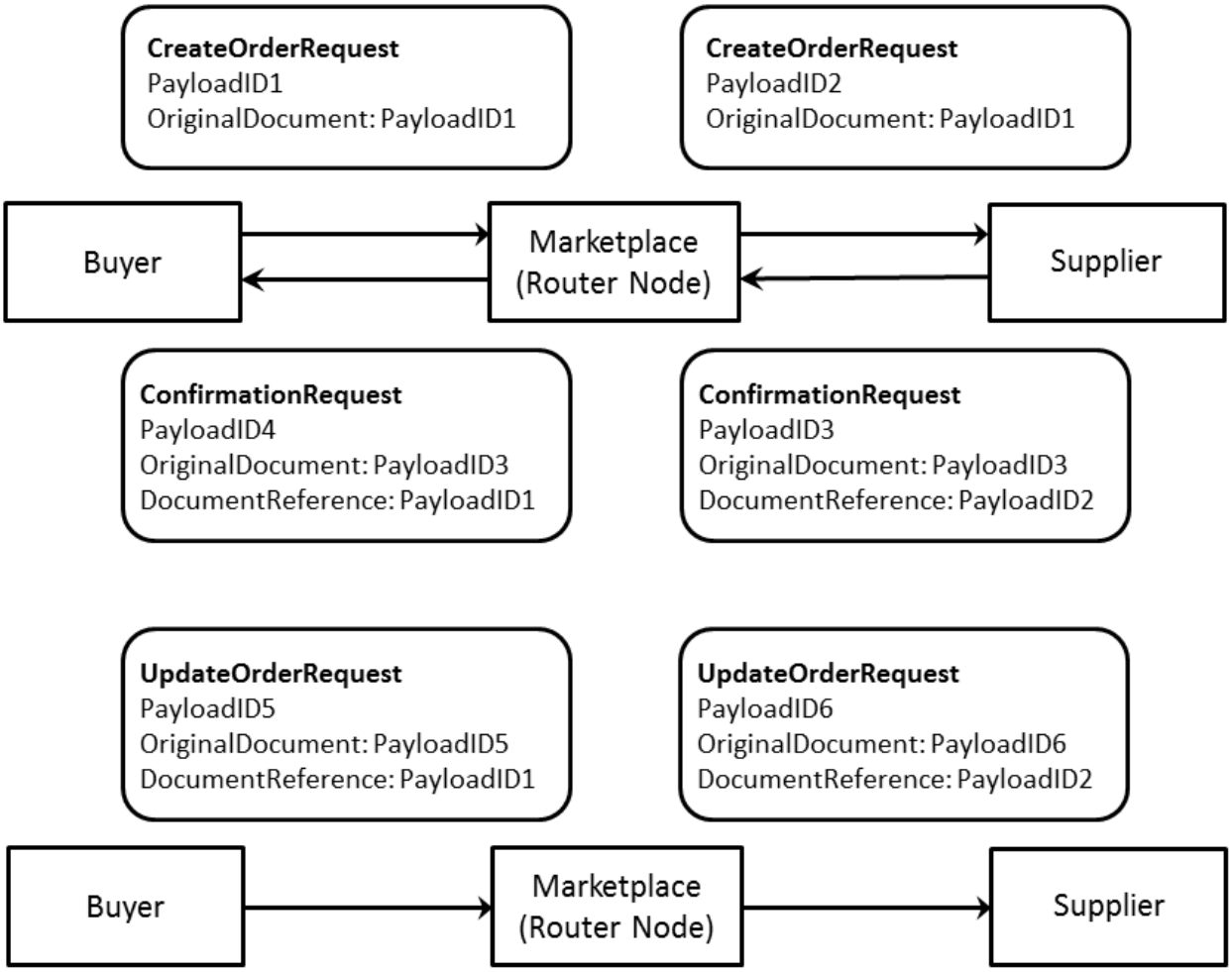


Figure 18: Updating DocumentReference Elements in New Documents

7.2.3 Copy Nodes

A copy node results in the system requesting a copy of the document. For example, the following excerpt illustrates several copy nodes in the cXML header, which results in a copy being sent to multiple suppliers in a multi-tier supply chain:

```
<Header>
    <From>
        <Credential domain="NetworkID">
            <Identity>AN990000000168</Identity>
        </Credential>
    </From>
    <To>
        <Credential domain="NetworkID">
            <Identity>AN990000000169</Identity>
        </Credential>
    </To>
    <Sender>
        <Credential domain="NetworkID">
            <Identity>AN990000000168</Identity>
```

```
            <SharedSecret>welcome</SharedSecret>
        </Credential>
        <UserAgent>Ariba Buyer 7.0</UserAgent>
    </Sender>
    <Path>
        <!-- Contract Manufacturer -->
        <Node type="copy">
            <Credential domain="NetworkId">
                <Identity>AN01000000170</Identity>
            </Credential>
        </Node>
        <!-- Component Supplier A -->
        <Node type="copy">
            <Credential domain="NetworkId">
                <Identity>AN01000000171</Identity>
            </Credential>
        </Node>
        <!-- Component Supplier B -->
        <Node type="copy">
            <Credential domain="NetworkId">
                <Identity>AN01000000172</Identity>
            </Credential>
        </Node>
    </Path>
    <!-- Original order to copy -->
    <OriginalDocument payloadID="989280592595-5564367883689744433@10.11.128.149"/>
</Header>
```

7.3 Adding Nodes to PunchOutOrderMessage

`PunchOutOrderMessage` documents generated by PunchOut sessions can go through intermediary sites on their way back to the buyer. Each intermediary site must add itself as a node to the `Path` element of the relevant `ItemIn` elements of the `PunchOutOrderMessage`.

Node sequence is top to bottom, with the originating buyer at the top. The intermediary node closest to the end supplier must add the supplier of record to the path as well, if the supplier has not already created the path.

The procurement application must include itself as the first router node in the path, which allows other documents such as `ConfirmationRequest` and `ShipmentNoticeRequest` documents to be routed back to the originating buyer.

7.3.1 Path Element

The `Path` element contains nodes that are either of `type="copy"` or `type="route"`. A `Path` element is in each `ItemIn` element of a `PunchOutOrderMessage`. Each system visited by the `PunchOutOrderMessage` must add itself as a node to the `Path` element for each `ItemIn` element it cares about.

The following `PunchOutOrderMessage` shows the `Path` element with two nodes:

```
<ItemIn quantity="1">
    <ItemID>
        <SupplierPartID>1234</SupplierPartID>
    </ItemID>
```

```
    <Path>
        <Node type="copy">
            <Credential domain="NetworkId">
                <Identity>AN01000000111</Identity>
            </Credential>
        </Node>
        <Node type="route">
            <Credential domain="NetworkId">
                <Identity>AN01000000233</Identity>
            </Credential>
        </Node>
    </Path>
    <ItemDetail>
        <UnitPrice>
            <Money currency="USD">10.23</Money>
        </UnitPrice>
        <Description xml:lang="en">Learn ASP in a Week!</Description>
        <UnitOfMeasure>EA</UnitOfMeasure>
        <Classification domain="SPSC">12345</Classification>
        <ManufacturerPartID>ISBN-23455634</ManufacturerPartID>
        <ManufacturerName>O'Reilly</ManufacturerName>
    </ItemDetail>
</ItemIn>
```

7.3.2 Credentials

The `From` and `To` elements of the cXML header in a routed document refer to the buyer and supplier of record. Neither of these parties is required to appear in the Path, because they might be visible only to one of the Router nodes.

7.4 Creating OrderRequests

When generating purchase orders, procurement applications split requisitions based on the `Path` and `SupplierID` of each of the `ItemIn` elements.

7.4.1 Path Element

Procurement applications put `Path` elements in the cXML header level of each of the orders. Procurement applications should not include the identical `Path` element in any of the `ItemOut` elements in an `OrderRequest`.

In `OrderRequest` documents containing PunchOut items, procurement applications must include nodes for both the originating buyer and the supplier of record.

7.4.2 Credentials

Because commerce network hubs are responsible for routing `OrderRequest` documents to the next node in the path, the `Sender` credential is always the network hub credential when received by the next node. The preceding node (most recent originator) can always be found by examining the `From Credential` list or, the Path for the most recent Router node if the Router node doesn't modify the `From` element. In addition, the `type="marketplace"` credential must be one of the router nodes in the path. A `From` credential list with no `type="marketplace"` credential implies that the identical node is the originating procurement application.

The following example is the header of an `OrderRequest` sent from a procurement application. Because the `From` credential has no `type="marketplace"`, the node sending this `OrderRequest` must be the procurement application. The first node in the path is a marketplace Router node.

```
<Header>
    <From>
        <Credential domain="AribaNetworkUserId">
            <Identity>admin@acme.com</Identity>
        </Credential>
    </From>
    <To>
        <Credential domain="NetworkId" type="marketplace">
            <Identity>AN01000000233</Identity>
        </Credential>
        <Credential domain="DUNS">
            <Identity>942888711</Identity>
        </Credential>
    </To>
    <Sender>
        <Credential domain="NetworkId">
            <Identity>AN01000000001</Identity>
            <SharedSecret>abracadabra</SharedSecret>
        </Credential>
        <UserAgent>Network Hub</UserAgent>
    </Sender>
    <Path>
        <Node type="route">
            <Credential domain="AribaNetworkUserId">
                <Identity>admin@acme.com</Identity>
            </Credential>
        </Node>
        <Node type="copy">
            <Credential domain="NetworkId">
                <Identity>AN01000000111</Identity>
            </Credential>
        </Node>
        <Node type="route">
            <Credential domain="NetworkId">
                <Identity>AN01000000233</Identity>
            </Credential>
        </Node>
    </Path>
    <OriginalDocument payloadID="pay1"/>
</Header>
```

The following example is an `OrderRequest` from a marketplace Router node:

```
<Header>
    <From>
        <Credential domain="AribaNetworkUserId">
            <Identity>admin@acme.com</Identity>
        </Credential>
        <Credential domain="NetworkId" type="marketplace">
```

```
            <Identity>AN01000000233</Identity>
        </Credential>
    </From>
    <To>
        <Credential domain="NetworkId" type="marketplace">
            <Identity>AN01000000233</Identity>
        </Credential>
        <Credential domain="DUNS">
            <Identity>942888711</Identity>
        </Credential>
    </To>
    <Sender>
        <Credential domain="NetworkId">
            <Identity>AN01000000001</Identity>
            <SharedSecret>abracadabra</SharedSecret>
        </Credential>
            <UserAgent>Network Hub</UserAgent>
    </Sender>
    <Path>
        <Node type="route">
            <Credential domain="AribaNetworkUserId">
                <Identity>admin@acme.com</Identity>
            </Credential>
        </Node>
        <Node type="copy">
            <Credential domain="NetworkId">
                <Identity>AN01000000111</Identity>
            </Credential>
        </Node>
        <Node type="route">
            <Credential domain="NetworkId">
                <Identity>AN01000000233</Identity>
            </Credential>
        </Node>
    </Path>
    <OriginalDocument payloadID="pay1"/>
</Header>
```

7.5 Other Routable Documents

Follow-up documents such as `PunchOutSetupRequest`, `ConfirmationRequest`, and `ShipNoticeRequest` documents also use the `Path` element to route and copy documents.

7.5.1 PunchOutSetupRequest

Procurement applications must include the same path information in the `ItemOut` elements for any subsequent edit or inspect PunchOut sessions.

Procurement applications must not perform any item grouping according to the `Path` element during PunchOut sessions.

7.5.2 ConfirmationRequest and ShipNoticeRequest

Route `ConfirmationRequest` and `ShipNoticeRequest` documents by using the `Path` element from the cXML header of the `OrderRequest`. The Path must be reversed to route the `ConfirmationRequest` or `ShipNoticeRequest` to the originating application.

7.6 CopyRequest

Organizations that want to receive copies of purchase orders, but that are not the primary recipients, are called copy organizations. They receive copies of purchase orders as cXML documents within `CopyRequest` attachments sent by commerce network hubs.

Copy organizations must add the `CopyRequest` transaction to their cXML profile. When the commerce network hub receives a purchase order containing path routing copy information, it first looks up the copy organization's `CopyRequest` URL in the organization's cXML profile. It then sends the attached document to the copy organization.

`CopyRequest` has the following optional attribute:

Attribute	Description
`processingMode`	Indicates the processing mode for the cXML document. Possible values are: • `info`—The document is for information only. • `process`—The recipient of the document should process the document. • `copy`—The document is a copy as a result of a `Path` element with copy nodes (`type="copy"`) in the source document.

Note that the use of `CopyRequest` attachments differs from previous implementations of `CopyRequest`, in which cXML documents were contained as internal elements within `CopyRequest/cXML`. In cXML 1.2.011, the use of the `cXML` element as a child of `copyRequest` is deprecated. Instead, use the `cXMLAttachment` element to attach another cXML document, whether or not it contains attachments itself.

The following example shows a `CopyRequest` element forwarding a cXML document that does not itself contain attachments:

```
Content-Type: Multipart/Related; boundary=mime-boundary
[Other headers]
--mime-boundary
Content-Type: text/xml; charset=UTF-8
Content-ID: <111@sendercompany.com>
[Other headers]
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="123@sendercompany.com"
        timestamp="2003-11-20T23:59:45-07:00">
    <Header>
        <From>
            <Credential domain="AribaNetworkUserId">
                <Identity>sender@sendercompany.com</Identity>
            </Credential>
        </From>
        <To>
```

```
            <Credential domain="AribaNetworkUserId">
                <Identity>recipient@recipientcompany.com</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="AribaNetworkUserId">
                <Identity>sender@sendercompany.com</Identity>
                    SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Sender Application</UserAgent>
        </Sender>
    </Header>
    <Request deploymentMode="production">
        <CopyRequest>
            <cXMLAttachment>
                <Attachment>
                    <URL>cid:222@sendercompany.com</URL>
                </Attachment>
            </cXMLAttachment>
        </CopyRequest>
    </Request>
</cXML>
--mime-boundary
Content-Type: text/xml; charset=UTF-8
Content-ID: <222@sendercompany.com>
[Other headers]
[Forwarded cXML]
--mime-boundary--
```

Related Information

Attachments [page 27]
Attachment Examples [page 28]

8 Request for Quotations

Buyers can send a cXML request for quotation to a sourcing application that supports these requests for quotation. The suppliers in the sourcing application can view and respond to the requests for quotation by sending a quote. The sourcing application collects the quotes for the requests for quotation submitted by suppliers and matches them based on certain requirements. Based on the best quote received, the sourcing application sends all or only the winning quote received from the supplier to the buyer.

Overview of Request for Quotations [page 174]

Request for Quotations [page 175]

quoteMessage [page 179]

8.1 Overview of Request for Quotations

A buyer can send a request for quotations to a sourcing application using the `quoteRequest` document. The `quoteRequest` document contains information on the type of request for quotations and other details. A supplier responds to a `quoteRequest` with a `quoteMessage` document.

The sourcing application can respond to the request for quotations using the `quoteMessage` document. The `quoteMessage` document contains detailed information on the quote placed by the supplier.

8.1.1 Quote DTD

The cXML standard uses multiple DTDs to optimize the performance of validating parsers. The requests for quotation transactions described in this chapter are defined in a DTD named `Quote.dtd`, available at:

http://xml.cXML.org/schemas/cXML/*<version>*/Quote.dtd

8.1.2 Request for Quotations Document Sequence

Buyers send the `quoteRequest` documents and sourcing applications respond with `quoteMessage` documents.

8.2 Request for Quotations

The cXML `quoteRequest` documents represent requests for quotation. It contains details on the requests for quotations sent by the buyer to the sourcing application.

The following example shows the structure of the `QuoteRequest` element:

```
<QuoteRequest>
    <QuoteRequestHeader>
        header information
    </QuoteRequestHeader>
    <QuoteItemOut>
        QuoteItemOut information
    </QuoteItemOut>
</QuoteRequest>
```

The `QuoteRequest` element has the following elements:

8.2.1 QuoteRequestHeader

This header information stores the details of the request for quotations that is sent to a supplier.

`QuoteRequestHeader` has the following attributes:

Attribute	Description
`requestID` (required)	Unique internal number from the buyer's system for the request for quotations.
`requestDate` (required)	The date and time of the `quoteRequest` document.
`type`	Type of `quoteRequest`. The default value is `"new"`. Possible values: • `new` • `update` • `delete`
`openDate` (required)	The date the `quoteRequest` is open for suppliers to respond.
`closeDate` (required)	The date the `quoteRequest` is closed for supplier responses.
`previewDate`	The date the `quoteRequest` is available to suppliers.
`templateName`	The template used by the sourcing application. The template can outline the terms and conditions regarding the details for a request for quotation sent between the buyer and sourcing application.
`currency` (required)	Currency for the `quoteRequest` and `quoteMessage`. Must be a three-letter ISO currency code.

Attribute	Description
`xml:lang` (required)	The language for the `quoteRequest` and `quoteMessage`.
`quoteReceivingPreference`	The buyer's system preference on how they want to receive the `quoteMessage` from the sourcing application. The default value is based on the value configured in the template used by the sourcing application. If the buyer wants to override the value configured in the template, they must specify the required value in this attribute. Possible values: • `winningOnly`—The winning quotes that are awarded are sent to the buyer from the sourcing application. • `finalBidsFromAll`—Quotes are sent to the buyer from the sourcing application only after all the bids have been received and the event is closed. • `all`—Quotes are sent to the buyer from the sourcing application as soon as suppliers submit the bid. The sourcing application does not wait for the event to close to send the quote.

The `QuoteRequestHeader` element has the following elements:

8.2.1.1 Name

The name of the `quoteRequest`. This is an optional field.

8.2.1.2 SupplierSelector

Defines how suppliers are selected while responding to a `quoteRequest`. This is an optional field.

The `SupplierSelector` element has the following attribute:

Attribute	Description
`matchingType`	Specifies how suppliers are invited for a `quoteRequest`. Possible values: • `InvitationOnly`—Only invited suppliers. Suppliers that can join the event are specified in the `OrganizationID` element. • `approvedVendorOnly`—Suppliers from the approved supplier list. However, the sourcing application may filter the suppliers that can bid based on the commodity and territory matching rules. • `public`—Any public supplier. The supplier can also exist in the approved supplier list. However, the sourcing application may filter the suppliers that can bid based on the commodity and territory matching rules.

The `SupplierSelector` element has the following elements:

SupplierInvitation

Defines how the supplier was invited. Can specify more than one `SupplierInvitation` element.

The `SupplierInvitation` element has the following attribute:

Attribute	Description
`supplierStatus`	Status of supplier in the buyer's system. Possible values are: • `approved`—The supplier exists in the buyer's system and is approved by the buyer. The default value is "approved." • `contracted`—The supplier is an approved supplier in the buyer's system and has an associated master agreement of a contract. The buyer can specify the MasterAgreementIDInfo.

OrganizationID

The unique identification of the supplier. This element is used by the buyer to specify suppliers that are invited for bidding.

Correspondent

This element stores the contact information of the supplier and is used to identify and contact the supplier.

This is an optional field.

MasterAgreementIDinfo

The ID number of the buyer for the corresponding master agreement of the contract or release order. This element is enhanced with the `IdReference` element.

This is an optional field.

Extrinsic

The `Extrinsic` element for the `SupplierInvitation`. Can specify more than one `Extrinsic` element.

This is an optional field.

8.2.1.3 Total

The total amount for the line item in the `quoteRequest`. This is an optional field.

8.2.1.4 Description

Description of the `quoteRequest`. This is an optional field.

8.2.1.5 ShipTo

The ShipTo information for the line item in the `quoteRequest`. This information is used to determine the sales territory of the supplier. This is an optional field.

8.2.1.6 Contact

The Contact information for the supplier. Can specify more than one `Contact` element. This is an optional field.

8.2.1.7 Comments

Buyers can send comments and attachments in the `quoteRequest`. This is an optional field.

8.2.1.8 Extrinsic

The `Extrinsic` element for the `quoteRequest`. Can specify more than one `Extrinsic` element. This is an optional field.

8.2.2 QuoteItemOut

Stores details on the line items sent in a `quoteRequest`.

The `QuoteItemOut` element has the following attributes:

Attribute	Description
`quantity` (required)	The number of items.
`lineNumber`	Line position of the item in a `quoteRequest`. Used to maintain a reference between the items in the document with the type as "new" and "update."
`requestedDeliveryDate`	The delivery date requested for the line item.

The `QuoteItemOut` has the following elements:

- `ItemID`
- `ItemDetail`
- `ShipTo`
- `Shipping`
- `Tax`
- `SpendDetail`
- Total
- `Contact`
- `Comments`

For more information on these elements, see Purchase Orders [page 99].

8.3 quoteMessage

A supplier can respond to the request for quotations (`quoteRequest`) by sending a quote. The sourcing application sends these quotes using the `quoteMessages` to the buyer.

8.3.1 QuoteMessageHeader

This element stores the header details of the `quoteMessage` that is sent to the buyer.

`QuoteMessageHeader` has the following attributes:

Attribute	Description
`type` (required)	The type of `quoteMessage`. Possible values: • `accept` • `reject` • `update` • `final` • `award`

Attribute	Description
`quoteID` (required)	Unique ID of the quote.
`quoteDate` (required)	Date on which the quote was submitted.
`currency` (required)	Currency for the `quoteRequest` and `quoteMessage`. Must be a three-letter ISO currency code.
`xml:lang` (required)	The language for the `quoteRequest` and `quoteMessage`.

`QuoteMessageHeader` has the following elements:

8.3.1.1 OrganizationID

The unique identification of the supplier.

8.3.1.2 Total

The total amount for the line item in the `quoteMessage`.

8.3.1.3 ShipTo

The ShipTo address for the line item in the `quoteMessage`. This information is used to determine the sales territory of the supplier. This is an optional field.

8.3.1.4 Contact

The Contact information for the supplier. This is an optional field.

8.3.1.5 QuoteRequestReference

This is an optional field. Stores details about the `QuoteRequest` ID and date.

`QuoteRequestReference` has the following attributes:

Attribute	Description
`requestID` (required)	Unique internal number from the buyer's system for the request for quotations.
`requestDate` (required)	The date and time of the `quoteRequest` document.

The `QuoteRequestReference` has the following element:

Document Reference

The `DocumentReference` element is listed only when the type is "`update`" or "`delete`". In this case, the `DocumentReference` references the most recent `quoteRequest` document for the `quoteRequest`.

For example when an `quoteRequest` is created, updated, and then deleted, the final document should contain a `DocumentReference` referring to the `quoteRequest` with `type="update"`. That document in turn refers to the original (`type="new"`) `quoteRequest` document.

This is an optional element.

8.3.1.6 Comments

This is an optional field.

8.3.1.7 Extrinsic

This is an optional field.

8.3.2 QuoteItemIn

The `QuoteItemIn` has the following attributes:

Attribute	Description
`type` (required)	The type of `quoteMessage`. Possible values: • `accept` • `reject` • `update` • `final` • `award`
`quantity` (required)	The number of items.
`lineNumber`	Line position of the item in the `quoteRequest`. Used to maintain a reference between the items in the document with the type as "`new`" and "`update`."
`requestedDeliveryDate`	The delivery date requested for the line item.
`rank`	The rank of the quote.

The `QuoteItemIn` has the following elements:

- `ItemID`
- `ItemDetail`
- `ShipTo`
- `Shipping`
- `Tax`
- `SpendDetail`
- `Total`
- `Contact`
- `Comments`

Related Information

Purchase Orders [page 99]

9 Payment

Buying organizations use cXML payment documents to pay suppliers for provided products or services. cXML payment documents provides immediate access to payment scheduling information, allowing more accurate forecasting and scheduling of payables and receivables.

Overview of Payment [page 183]

PaymentProposalRequest [page 184]

PaymentRemittanceRequest [page 192]

PaymentRemittanceStatusUpdateRequest [page 199]

Example Payment Documents [page 201]

TradeRequest [page 206]

9.1 Overview of Payment

cXML automates the payment process through scheduled payment and remittance advice documents. These documents allow trading partners to track and process payments. The cXML payment process includes scheduled payments (plans for payment), discounts, creating and sending payments regardless of where payments are made, and ensuring that payments have been received.

The `PaymentProposalRequest` document is a scheduled payment. It allows buying organizations to specify payment due dates and discounts.

The `PaymentRemittance` document lists payment transaction details for a wide variety of business scenarios, including standard invoices, credit memos, and debit memos.

When a payment is made, the organization making the payment also creates an associated remittance advice document. Remittance advice documents are summary statements that provides details about payments that have been made. A typical remittance advice includes the payment method used, bank information, discount amount, amount paid, and a list of payables included in the payment.

9.1.1 PaymentRemittance DTD

The cXML standard uses multiple DTDs to optimize the performance of validating parsers. The payment transactions described in this chapter are defined in a DTD named `PaymentRemittance.dtd`, available at:

```
http://xml.cXML.org/schemas/cXML/<version>/PaymentRemittance.dtd
```

9.1.2 Payment Document Sequence

Procurement applications send `PaymentProposalRequest` and `PaymentRemittanceRequest` documents and suppliers respond with generic `Response` documents. When payment transaction status levels are updated, procurement applications send `PaymentRemittanceStatusUpdateRequest` documents. These documents can all pass through a network commerce hub for authentication and routing.

9.2 PaymentProposalRequest

cXML `PaymentProposalRequest` documents represent scheduled payments. They list payment amounts and dates and can be for information only or for triggering payment.

After a buying organization sends scheduled payment to a network commerce hub, it can travel immediately to a supplier, or the network commerce hub can store it until the payment date.

`PaymentProposalRequest` has the following attributes:

Attribute	Description
`paymentProposalID` (required)	A buyer-generated identifier for the scheduled payment.
`operation` (required)	Defines the operation to be performed. Possible values: • `new`—Creates a new scheduled payment. • `update`—Updates an existing scheduled payment identified by `paymentProposalID`. • `delete`—Cancels an existing scheduled payment identified by `paymentProposalID`. All optional attributes and sub-elements of `PaymentProposalRequest` will be ignored. • `hold`—Puts on hold an existing scheduled payment identified by `paymentProposalID`. All optional attributes and sub-elements of `PaymentProposalRequest` are ignored.
`isNetworkPayment`	Set to "`yes`" if this scheduled payment is to be paid through a network commerce hub. By default it is set to "`no`".
`paymentDate`	The date that the bank initiates payment.

`PaymentProposalRequest` has the following elements:

Element	Description
`PayableInfo` (required)	Provides a reference to the payable document, such as an invoice, order, or master agreement. See PayableInfo [page 185].
`PaymentMethod`	Specifies the method of payment. Must be provided if `isNetworkPayment` is set to "`yes`". See PaymentMethod [page 187].

Element	Description
PaymentPartner	Specifies all partners involved in the payment, such as payer, payee, originating bank, receiving bank, and remitTo. See PaymentPartner [page 188].
GrossAmount	The gross payment amount.
DiscountBasis	Defines the discount basis for the payable. See DiscountBasis [page 191].
DiscountAmount	The discount amount.
AdjustmentAmount	The total of various adjustment amounts. The adjustment amount can be positive indicating a decrease in payment amount, or negative indicating an increase in payment amount (such as for late charges or penalties).
Tax	Defines the tax for the payable. See Tax [page 292].
TaxAdjustment	Defines the tax adjustment for the payable. See TaxAdjustment [page 191].
NetAmount	Defines the net amount. See NetAmount [page 192].
Comments	Contains comments associated with this object.
Extrinsic	Contains any additional information related to this object.

9.2.1 PayableInfo

A reference to the payable document, such as an invoice, order, or master agreement. `PayableInfo` is known to both buyer and supplier. For example, the `PayableInfo` for an invoice would be the `PayableInvoiceInfo`.

The following example shows the element declaration of `PayableInfo` from `PaymentRemittance.dtd`:

```
<!ELEMENT PayableInfo (PayableInvoiceInfo | PayableOrderInfo |
    PayableMasterAgreementInfo)>
```

The following example shows the structure of a minimum valid `PayableInfo` element:

```
<PayableInfo>
    <PayableInvoiceInfo>
        <InvoiceIDReference or InvoiceIDInfo>
            .....
        </InvoiceIDReference or InvoiceIDInfo>
    </PayableInvoiceInfo>
</PayableInfo>
```

The following example shows the structure of a `PayableInfo` element that includes an optional `PayableOrderInfo`:

```
<PayableInfo>
    <PayableInvoiceInfo>
        <InvoiceIDReference or InvoiceIDInfo>
            <PayableOrderInfo>
                <OrderIDInfo>
```

```
                    .....
                </OrderIDInfo>
            </PayableOrderInfo>
        </InvoiceIDReference or InvoiceIDInfo>
    </PayableInvoiceInfo>
</PayableInfo>
```

`PayableInfo` has no attributes.

9.2.1.1 PayableInvoiceInfo

A reference to the invoice being paid. `PayableInvoiceInfo` must contain either `InvoiceReference` or `InvoiceIDInfo`, and might contain either `PayableOrderInfo` or `PayableMasterAgreementInfo`.

InvoiceReference

Provides a clear reference to a prior `InvoiceDetailRequest` document. The `InvoiceReference` is copied from the `InvoiceDetailRequest` message.

InvoiceIDInfo

Defines the ID of an invoice known to the supplier system. `InvoiceIDInfo` is a container for two attributes:

Attribute	Description
`invoiceID` (required)	The ID of an invoice known to the supplier system
`invoiceDate`	The invoice date

9.2.1.2 PayableOrderInfo

Provides supplementary information related to the order. For example, a payment against a consolidated invoice might include associated order information. Defines payable information related to an order that was paid.

`PayableOrderInfo` has no attributes.

OrderReference

The reference to the order being paid.

OrderIDInfo

The order ID from the procurement application.

9.2.1.3 PayableMasterAgreementInfo

Provides supplementary information related to the master agreement (contract). For example, a payment against a consolidated invoice might include associated master agreement information. Defines payable information related to the master agreement being paid.

9.2.2 PaymentMethod

The method of payment. Must be provided if `isNetworkPayment` is true.

Buying organizations use this element to identify the method for a payment.

`PaymentMethod` has one attribute:

Attribute	Description
`type` (required)	The type of the payment method. Possible values: • `ach`—Automated Clearing House • `cash`—Cash payment • `check`—Check payment • `creditCard`—Credit card or PCard payment • `debitCard`—Debit card payment • `draft`—A written payment order, directing a second party to pay a third party • `wire`—Wire transfer • `other`—Other, not defined in cXML

9.2.2.1 Description

The description of the payment method. `Description` is mandatory if the type is set to “other.” The `ShortName` element in `Description` must indicate the name of the payment method.

ShortName

A short string describing something in fewer characters than the entire `Description`. Use the `ShortName` element when limited space is available. For example, a table of elements might show the `ShortName`. A linked

"details" view would show the entire `Description`. Without a `ShortName`, the user interface must default to a truncation of `Description`.

This element does not require an xml:lang attribute because it appears only within a `Description` element. The language of the `ShortName` must match that of the surrounding `Description`.

9.2.3 PaymentPartner

Specifies all partners involved in the payment, such as payer, payee, originating bank, receiving bank, and remitTo. The number of payment partners required depends on the payment method used. `PaymentPartner` has no attributes.

9.2.3.1 Contact

Contact information of the payment partner.

`Contact` has the following attributes:

Attribute	Description
`role`	The role of the payment partner. Possible values: • `payer`—The payer of this transaction • `payee`—The recipient of the payment • `originatingBank`—The bank from which the payment will be drawn. Required for bank transfers. • `receivingBank`—The bank to which the payment will be deposited. Required for bank transfers. • `originatingCorrespondentBank`—(optional) The bank that will hold the payment and transfer it to the receiving bank or the receiving correspondent bank • `receivingCorrespondentBank`—(optional) The bank that will receive the payment and transfer it to the receiving bank • `intermediaryBank`—(optional) The intermediary bank • `remitTo`—(optional) The supplier's remittance address. For this role value, the IdReference and PCard elements can be omitted.
`addressID`	An ID for the address. `addressID` supports address codes for relationships that require ID references.
`addressIDDomain`	The code that specifies the agency or organization responsible for the address ID numbering. For example, DUNS or ILN. This code is required if there is a value in the `addressID` attribute.

`Contact` elements with role `payer` and `payee` are always required. If the payment method indicates a bank transfer, then `Contact` elements with role `originatingBank` and `receivingBank` are required.

The `remitTo` role must be provided if `isNetworkPayment` is true.

9.2.3.2 IdReference

Contains a unique identification reference for the payment partner, including information such as bank account identification, bank identification, and optional bank branch identification.

`IdReference` is mandatory for all transactions that involve electronic payments. It is optional only for non-electronic payment methods, such as check or cash.

`IdReference` has the following attributes:

Attribute	Description
`identifier` (required)	The unique identifier of the `IdReference` within the `domain`.
`domain` (required)	The `domain` of the `IdReference`. Possible values: • `bankRoutingID`—The routing ID of this payment partner's bank • `accountReceivableID`—The ID of the payee's accounts receivable account or department • `bankAccountID`—The ID of this payment partner's bank account • `ibanID`—The International Bank Account Number for this payment partner, as specified in ISO 13616 • `abaRoutingNumber`—The American Banking Association 9-digit routing transit number of this payment partner's bank • `bankNationalID`—A national clearing code that is specific to a country. This should uniquely identify the bank within the country specified in the Contact • `isoBicID`—ISO BIC ID (Bank Identifier Code) as specified in ISO 9362. The Bank Identifier Code (BIC) is a universal method of identifying financial institutions. The BIC consists of 8 or 11 characters, comprising a bank code (4 characters), a country code (2 characters), a location code (2 characters) and an optional branch code (3 characters) • `swiftID`—SWIFT ID (Society for Worldwide Interbank Financial Telecommunications) identification number • `bankBranchID`—The identification number of the bank branch

The bank account identification is specified as follows:

Value	Description
`identifier`	The unique identifier of the `IdReference` within the domain.
`domain`	The domain of the account ID. Possible values: • `abaRoutingNumber`—ABA (American Banking Association) routing number • `swiftID`—SWIFT ID (Society for Worldwide Interbank Financial Telecommunications) identification number • `chipsID`—CHIPS ID (Clearing House Interbank Payment System) identification number • `isoBicID`—ISO BIC ID (Bank Identifier Code) as specified in ISO 9362. The Bank Identifier Code (BIC) is a universal method of identifying financial institutions. The BIC consists of 8 or 11 characters, comprising a bank code (4 characters), a country code (2 characters), a location code (2 characters) and an optional branch code (3 characters). • `bankNationalID`—If none of the above bank identification methods is applicable, then use the `bankNationalID` to indicate national clearing codes that are specific to a country. This should uniquely identify the bank within the country specified in the `Contact`.

The bank branch identification, if necessary, is specified as follows:

Value	Description
`bankBranchID`	The bank branch ID.

The following table illustrates some valid `role` - `domain` value combinations for `Contact` and `IdReference`:

Contact@role	IdReference@domain
`payer`	`bankAccountID` `ibanID`
`payee`	`bankAccountID` `ibanID`

`originatingBank`	`abaRoutingNumber`
	`bankNationalID`
	`isoBicID`
	`swiftID`
	`bankBranchID (optional)`

`receivingBank`	`abaRoutingNumber`
	`bankNationalID`
	`isoBicID`
	`swiftID`
	`bankBranchID (optional)`

`originatingCorrespondentBank`	`abaRoutingNumber`
	`isoBicID`
	`swiftID`

`receivingCorrespondentBank`	`abaRoutingNumber`
	`isoBicID`
	`swiftID`

`intermediaryBank`	`abaRoutingNumber`
	`isoBicID`
	`swiftID`

Creator

The creator of this `IdReference`, such as United Parcel Service or Bank of America.

Description

Text description of the `IdReference`. This is especially useful when the `Creator` value is not immediately understood by the reader.

9.2.3.3 PCard

Specifies purchasing card information, such as card number and expiration date. This element allows buying organizations to charge PCards after they approve invoices. If you specify a PCard, use `Contact` with `role="payer"`.

9.2.4 DiscountBasis

`DiscountBasis` defines the discount basis for the payable. It has the following element:

Element	Description
`Money` (required)	Monetary amount for the discount basis.

9.2.5 TaxAdjustment

`TaxAdjustment` defines the tax adjustment for the payable. It has the following elements:

Element	Description
`Money` (required)	Describes the total tax adjustment given on the payable.
`TaxAdjustmentDetail`	Defines the details of adjustments given over category and region.

9.2.5.1 TaxAdjustmentDetail

`TaxAdjustmentDetail` defines the details of adjustments given over category and region. It has the following attributes:

Attribute	Description
`category` (required)	String describing the tax adjustment category.
`region`	String describing the region where the tax adjustment occurred.

`TaxAdjustmentDetail` has the following element:

Element	Description
`Money` (required)	Monetary amount of the tax adjustment given on the payable for a particular category or region.

9.2.6 NetAmount

The net amount.

`NetAmount = GrossAmount - DiscountAmount - AdjustAmount`

If `NetAmount` is negative, it indicates a credit to the buyer. In this case, except for `ProposalID`, `operation`, and `PayableInfo`, `NetAmount`, all other attributes and sub-elements of `PaymentProposalRequest` are ignored.

9.3 PaymentRemittanceRequest

The `PaymentRemittanceRequest` document is analogous to remittance detail advice for payment or remittance.

The following example shows the structure of `PaymentRemittanceRequest`:

```
<PaymentRemittanceRequest>
    <PaymentRemittanceRequestHeader>
        <PaymentMethod/>
        <PaymentPartner/>
        <PaymentReferenceInfo/>
        <Comments/>
        <Extrinsic/>
    </PaymentRemittanceRequestHeader>
    <PaymentRemittanceSummary>
        <NetAmount/>
        <GrossAmount/>
        <DiscountAmount/>
        <AdjustmentAmount/>
    </PaymentRemittanceSummary>
    <RemittanceDetail>
        <PayableInfo/>
        <NetAmount/>
        <GrossAmount/>
        <DiscountAmount/>
        <AdjustmentAmount/>
        <Comments/>
        <Extrinsic/>
    </RemittanceDetail>
</PaymentRemittanceRequest>
```

`PaymentRemittanceRequest` has no attributes.

For an example of a `PaymentRemittanceRequest` for an invoice, see PaymentRemittanceRequest Example [page 201].

9.3.1 PaymentRemittanceRequestHeader

The `PaymentRemittanceRequestHeader` element defines header information that applies to the entire payment or remittance.

The following example shows the structure of `PaymentRemittanceRequestHeader`:

```
<PaymentRemittanceRequestHeader>
    <PaymentMethod>
        <Description>
            <ShortName/>
        </Description>
    </PaymentMethod>
    <PaymentPartner>
        <Contact/>
        <IdReference/>
        <PCard/>
    </PaymentPartner>
    <PaymentReferenceInfo>
        <PaymentReference/>
        <DocumentReference/>
    </PaymentReferenceInfo>
    <Comments/>
    <Extrinsic/>
</PaymentRemittanceRequestHeader>
```

`PaymentRemittanceRequestHeader` has the following attributes:

Attribute	Description
`paymentRemittanceID` (required)	A unique identifier for this `PaymentRemittance`, generated by the buying organization's system.
`paymentDate` (required)	The date and time this Payment or Remittance transaction was created. `paymentDate` should be earlier than the timestamp of the actual `PaymentRemittanceRequest`.
`isPayment`	Indicates whether this request is intended for making payment or is for remittance advice only. If the request is for payment purposes, set the attribute to "yes." Remittance advice information can be included in a `PaymentRemittanceRequest` with `isPayment` = yes. If `isPayment` is not specified, the document is assumed to be for remittance advice only.
`paymentReferenceNumber`	Indicates a payment transaction reference or payment identification number. For example, for check payments, the paymentReferenceNumber is the check number, and for electronic payments, it is an electronic reference or confirmation number.

9.3.1.1 PaymentMethod

Identifies the method for a payment. For more information, see PaymentMethod [page 187].

9.3.1.2 PaymentPartner

Identifies a party involved in the payment. For more information, see PaymentPartner [page 188].

9.3.1.3 PaymentReferenceInfo

Defines the ID of an earlier payment made by a buying organization. This ID should uniquely identify the payment made in the buyer system.

`PaymentReferenceInfo` has no attributes.

PaymentReference

Reference to an earlier `PaymentRemittanceRequest`. If the earlier payment was made through cXML, this element is required.

`PaymentReference` has the following attributes:

Attribute	Description
`paymentRemittanceID`	The `paymentRemittanceID` of the request. **Note** Do not use the transaction identification number, such as check number.
`paymentDate`	The payment date.

`PaymentReference` has the following element:

- `DocumentReference`
  The `DocumentReference` element of a `PaymentReference` is a container for the `payloadID` attribute, which refers to a prior `PaymentRemittanceRequest`.
  `DocumentReference` has the following attribute:

Attribute Name	Description
`payloadID` (required)	A unique identifier for the prior `PaymentRemittanceRequest`. The `payloadID` is copied directly from the cXML element of the `PaymentRemittanceRequest`.

PaymentIDInfo

The `PaymentIDInfo` of a `PaymentReference` refers to the unique identifier for this payment in the buying organization's system. `PaymentIDInfo` is a container for `paymentRemittanceID` and `paymentDate` attributes.

`PaymentIDInfo` has the following attributes:

Attribute Name	Description
`paymentRemittanceID` (required)	The `paymentRemittanceID` of the request. **Note** Do not use the transaction identification number, such as check number.
`paymentDate`	The payment date.

9.3.1.4 Comments

Header-level textual comments about the payment remittance, for the `PaymentRemittanceRequestHeader`.

9.3.1.5 Extrinsic

Additional information related to this payment. Information in the `Extrinsic` element of `PaymentRemittanceRequestHeader` should not duplicate information in the `PaymentRemittanceRequest`.

9.3.2 PaymentRemittanceSummary

The `PaymentRemittanceSummary` element defines summary information of a `PaymentRemittanceRequest`. Each money amount in a `PaymentRemittanceSummary` element is expressed as a flat amount with currency.

`PaymentRemittanceSummary` has no attributes.

9.3.2.1 NetAmount

The `NetAmount` element defines the total net payment amount. `NetAmount` should satisfy the following equation:

NetAmount = GrossAmount - DiscountAmount - AdjustmentAmount

9.3.2.2 GrossAmount

The total gross amount.

9.3.2.3 DiscountAmount

The total discount amount.

9.3.2.4 AdjustmentAmount

The total adjustment amount.

9.3.3 RemittanceDetail

The `RemittanceDetail` element defines the remittance detail of a specific payable that has been paid. Each money amount in a `RemittanceDetail` element is expressed as a flat amount with currency.

```
<RemittanceDetail>
    <PayableInfo/>
    <NetAmount/>
    <GrossAmount/>
    <DiscountAmount/>
    <AdjustmentAmount/>
    <Comments/>
    <Extrinsic/>
</RemittanceDetail>
```

`RemittanceDetail` has one attribute:

Attribute	Description
`lineNumber` (required)	The line number of the associated payable

9.3.3.1 PayableInfo

A reference to the payable document, such as an invoice, order, or master agreement. See PayableInfo [page 185].

PayableInvoiceInfo

A reference to the invoice being paid. `PayableInvoiceInfo` must contain either `InvoiceReference` or `InvoiceIDInfo`, and might contain either `PayableOrderInfo` or `PayableMasterAgreementInfo`.

`PayableInvoiceInfo` has the following elements:

Element	Description
`InvoiceReference`	Provides a clear reference to a prior `InvoiceDetailRequest` document. The `InvoiceReference` is copied from the `InvoiceDetailRequest` message.
`InvoiceIDInfo`	Defines the ID of an invoice known to the supplier system. `InvoiceIDInfo` is a container for two attributes: **Attribute** — **Description** `invoiceID` (required) — The ID of an invoice known to the supplier system `invoiceDate` — The invoice date

PayableOrderInfo

Provides supplementary information related to the order. For example, a payment against a consolidated invoice might include associated order information. Defines payable information related to an order that was paid.

`PayableOrderInfo` has no attributes. It has the following elements:

Element	Description
`OrderReference`	The reference to the order being paid.
`OrderIDInfo`	The order ID from the procurement application.

PayableMasterAgreementInfo

Provides supplementary information related to the master agreement (contract). For example, a payment against a consolidated invoice might include associated master agreement information. Defines payable information related to the master agreement being paid.

9.3.3.2 NetAmount

The detail-level net amount for this payable:

`NetAmount` = `GrossAmount` - `DiscountAmount` - `AdjustmentAmount`

9.3.3.3 GrossAmount

The detail-level gross payment amount for this payable.

9.3.3.4 DiscountAmount

Defines the detail-level discount information for this payable.

9.3.3.5 AdjustmentAmount

The total of various adjustment amounts for this payable, if any. The adjustment amount can be positive, indicating a decrease in payment amount, or negative, indicating an increase in payment amount. For example, a negative `AdjustmentAmount` might be used to account for late charges or other penalties.

`AdjustmentAmount` has the following elements:

Element	Description
`Money`	The adjustment for this payable in dollar (or other currency) amount. If there are multiple `Modification` elements inside the `Modifications` element, then `Money` = (Sum of all `AdditionalDeduction`) - (Sum of all `AdditionalCost`).
`Description`	The reason for the adjustment
`Modifications`	Details of the `AdjustmentAmount`. Can contain multiple `Modification` elements.

The following example shows `AdjustmentAmount` and `Comments` elements for a `PaymentRemittanceRequest` document. One of the deductions is for withholding tax (`type="withholdingTax"`), which indicates the amount of tax withheld for the payment line item.

```
<AdjustmentAmount>
    <Money currency="USD">110.00</Money>
    <Modifications>
        <Modification>
            <AdditionalDeduction type="withholdingTax">
                <DeductionAmount>
                    <Money currency="USD">95.00</Money>
                </DeductionAmount>
            </AdditionalDeduction>
        </Modification>
        <Modification>
            <AdditionalDeduction type="other">
                <DeductionAmount>
                    <Money currency="USD">15.00</Money>
                </DeductionAmount>
            </AdditionalDeduction>
        </Modification>
    </Modifications>
</AdjustmentAmount>
<Comments>Tax Withheld</Comments>
```

9.4 PaymentRemittanceStatusUpdateRequest

The `PaymentRemittanceStatusUpdateRequest` document provides status information for a payment remittance. Buying organizations send `PaymentRemittanceStatusUpdateRequest` documents to suppliers to inform suppliers of the status of their payables. The `PaymentRemittanceStatus` element supports Extrinsic elements.

The following example shows the structure of the `PaymentRemittanceStatusUpdateRequest` element:

```
<Request>
    <PaymentRemittanceStatusUpdateRequest>
        <DocumentReference>
            .....
        </DocumentReference>
        <PaymentRemittanceStatus>
            ....
        <Extrinsic name="OriginalSupplierAccountNumber">4232334545</Extrinsic>
        <Extrinsic
            name="CorrectedSupplierAccountNumber">004232334545</Extrinsic>
        <Extrinsic name="OriginalSupplierBankAbaNumber">121000358</Extrinsic>
        <Extrinsic name="CorrectedSupplierBankAbaNumber">221000358</Extrinsic>
    </PaymentRemittanceStatusUpdateRequest>
        ....
        </PaymentRemittanceStatus>
    </PaymentRemittanceStatusUpdateRequest>
<Request>
```

9.4.1 DocumentReference

The `DocumentReference` element is a container for `payloadID`, which associates a status update with a particular `PaymentRemittanceRequest` document. `DocumentReference` repeats a required attribute of the earlier document and adds one optional identifier generated by the supplier. For example:

```
<DocumentReference payloadID="0c300508b7863dcclb_14999"/>
```

`DocumentReference` contains no elements, but has the following attribute:

Attribute	Description
`payloadID` (required)	A unique identifier for the document. Copied directly from the cXML element of the previous `PaymentRemittanceRequest`.

9.4.2 PaymentRemittanceStatus

Defines the status for a payment transaction specified by an existing `PaymentRemittanceRequest`. `PaymentRemittanceStatus` has the following attributes:

Attribute	Description
`type` (required)	The status type of the payment transaction.
`paymentReferenceNumber`	Indicates a unique number for a payment. For a check payment, for example, the `paymentReferenceNumber` would be the check number.

Possible values of the `type` attribute in `PaymentRemittanceStatus` are:

Value	Description
`paying`	The payment transaction is in progress.
`paid`	The payment transaction was completed successfully.
`failed`	The payment transaction failed. Under certain conditions, a `PaymentRemittance` of type "`failed`" can be resubmitted by the buying organization.
`canceled`	The payment transaction was canceled.

Related Information

Status [page 39]

9.4.2.1 PaymentRemittanceStatusDetail

Defines status details of the payment transaction specified by an existing `PaymentremittanceStatusDetail`. `PaymentRemittanceStatusDetail` contains a PCDATA string. Typically, this element describes the specifics of a problem.

`PaymentRemittanceStatusDetail` has the following attributes:

Attribute	Description
`code` (required)	Payment transaction status code provided by the payment provider.
`description` (required)	Textual description of the status code (not specific issue).
`xml:lang` (required)	The language in which the text attribute and element content are written.

9.4.2.2 Extrinsic

The `Extrinsic` element list can be used to insert additional data. These elements can include pre-defined keywords and values affecting workflow in the receiving system.

Elements in the `Extrinsic` list can appear in any order.

`Extrinsic` has the following attribute:

Attribute	Description
`name` (required)	The value used to indicate the type or nature of the data.

9.5 Example Payment Documents

The following examples illustrate payment documents:

"PaymentProposalRequest Example" [page 201]

"PaymentRemittanceRequest Example" [page 201]

"PaymentRemittanceStatusUpdateRequest Example" [page 205]

9.5.1 PaymentProposalRequest Examples

The following scheduled payment is for an ACH payment.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/
PaymentRemittance.dtd">
<cXML payloadID="123@bigbuyer.com" timestamp="2005-04-20T23:59:45-07:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN99123456789</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN99987654321</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN99123456789</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Procurement Application 1.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <PaymentProposalRequest
                    ProposalID="proposal123"
```

```
                    operation="new"
                    paymentDate="2005-07-20T23:59:20-07:00">
            <PayableInfo>
                <PayableInvoiceInfo>
                    <InvoiceReference invoiceID="ABC">
                        <DocumentReference payloadID="25510.10.81.231"/>
                    </InvoiceReference>
                    <PayableOrderInfo>
                        <OrderReference orderID="DEF">
                            <DocumentReference payloadID="25510.10.81.002"/>
                        </OrderReference>
                    </PayableOrderInfo>
                </PayableInvoiceInfo>
            </PayableInfo>
            <PaymentMethod type="ach"/>
            <Contact role="remitTo" addressID="Billing">
                <Name xml:lang="en">Lisa Dollar</Name>
                <PostalAddress name="billing department">
                    <DeliverTo>Lisa Dollar</DeliverTo>
                    <Street>100 Castro Street</Street>
                    <City>Mountain View</City>
                    <State>CA</State>
                    <PostalCode>95035</PostalCode>
                    <Country isoCountryCode="US">United States</Country>
                </PostalAddress>
                <Email name="default">ldollar@workchairs.com</Email>
                <Phone name="work">
                    <TelephoneNumber>
                        <CountryCode isoCountryCode="US">1</CountryCode>
                        <AreaOrCityCode>650</AreaOrCityCode>
                        <Number>9990000</Number>
                    </TelephoneNumber>
                </Phone>
            </Contact>
            <GrossAmount>
                <Money currency="USD">3000.00</Money>
            </GrossAmount>
            <DiscountAmount>
                <Money currency="USD">160.00</Money>
            </DiscountAmount>
            <AdjustmentAmount>
                <Money currency="USD">30.00</Money>
            </AdjustmentAmount>
            <NetAmount>
                <Money currency="USD">2810.00</Money>
            </NetAmount>
        </PaymentProposalRequest>
    </Request>
</cXML>
```

The following payment proposal passes a discount basis and tax amounts:

```
<PaymentProposalRequest paymentProposalID="1100000124" operation="new"
paymentDate="2016-04-05T11:59:20-07:00">
    <PayableInfo>
        <PayableInvoiceInfo>
            <InvoiceIDInfo invoiceID="INV8291087"
invoiceDate="2016-04-01T18:31:35+05:30"></InvoiceIDInfo>
        </PayableInvoiceInfo>
    </PayableInfo>
    <PaymentMethod type="ach"></PaymentMethod>
    <GrossAmount>
        <Money currency="USD">13440</Money>
    </GrossAmount>
    <DiscountBasis>
        <Money currency="USD">12000</Money>
    </DiscountBasis>
```

```
    <DiscountAmount>
        <Money currency="USD">1200</Money>
    </DiscountAmount>
    <AdjustmentAmount>
        <Money currency="USD">0</Money>
    </AdjustmentAmount>
    <Tax>
        <Money currency="USD">1440.00</Money>
        <Description xml:lang="en-US"></Description>
        <TaxDetail category="gst" percentageRate="5">
            <TaxableAmount>
                <Money currency="USD">12000.00</Money>
            </TaxableAmount>
            <TaxAmount>
                <Money currency="USD">600.00</Money>
            </TaxAmount>
            <Description xml:lang="en-US"></Description>
        </TaxDetail>
        <TaxDetail category="pst" percentageRate="7">
            <TaxableAmount>
                <Money currency="USD">12000.00</Money>
            </TaxableAmount>
            <TaxAmount>
                <Money currency="USD">840.00</Money>
            </TaxAmount>
            <Description xml:lang="en-US"></Description>
        </TaxDetail>
    </Tax>
    <TaxAdjustment>
        <Money currency="USD">60</Money>
        <TaxAdjustmentDetail category="gst" location="BC">
            <Money currency="USD">60</Money>
        </TaxAdjustmentDetail>
    </TaxAdjustment>
    <NetAmount>
        <Money currency="USD">12180</Money>
    </NetAmount>
    <Extrinsic name="Scheduling"></Extrinsic>
    <Extrinsic name="Scheduled">yes</Extrinsic>
    <Extrinsic name="immediatepay">yes</Extrinsic>
</PaymentProposalRequest>
```

9.5.2 PaymentRemittanceRequest Example

This example shows a minimum valid `PaymentRemittanceRequest`.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/
PaymentRemittance.dtd">
<cXML xml:lang="en-US" timestamp="2004-03-10T14:20:53-08:00"
payloadID="PR-031004-01">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN99123456789</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN99987654321</Identity>
            </Credential>
        </To>
        <Sender>
```

```
            <Credential domain="”NetworkId”>
                <Identity>AN99123456789</Identity>
            </Credential>
            <UserAgent>Procurement Application 1.0</UserAgent>
        </Sender>
    </Header>
    <Request deploymentMode="production">
        <PaymentRemittanceRequest>
            <PaymentRemittanceRequestHeader paymentDate="2004-10-10T00:00:00-08:00"
                paymentReferenceNumber="ACH123456789"
                paymentRemittanceID="PR-031204-01">
                <PaymentMethod type="ach"></PaymentMethod>
                    <PaymentPartner>
                        <Contact role="payer">
                            <Name xml:lang="en">buyer</Name>
                            <PostalAddress>
                                <Street>100 1st Street</Street>
                                <City>Anywhere</City>
                                <State>CA</State>
                                <PostalCode>94089</PostalCode>
                                <Country isoCountryCode="US">United States</Country>
                            </PostalAddress>
                        </Contact>
                </PaymentPartner>
                <PaymentPartner>
                    <Contact role="payee">
                        <Name xml:lang="en">Supplier</Name>
                        <PostalAddress>
                            <Street>100 Main Street</Street>
                            <City>Anywhere</City>
                            <State>CA</State>
                            <PostalCode>94089</PostalCode>
                            <Country isoCountryCode="US">United States</Country>
                        </PostalAddress>
                    </Contact>
            </PaymentPartner>
            <PaymentPartner>
                <Contact role="originatingBank">
                    <Name xml:lang="en">Moose Credit Union</Name>
                    <PostalAddress>
                        <Street>100 Elk Drive</Street>
                        <City>Mooseville</City>
                        <State>CA</State>
                        <PostalCode>94087</PostalCode>
                        <Country isoCountryCode="US">United States</Country>
                    </PostalAddress>
                </Contact>
                <IdReference domain="abaRoutingNumber"
                    identifier="234567890"></IdReference>
            </PaymentPartner>
            <PaymentPartner>
                <Contact role="receivingBank">
                    <Name xml:lang="en">Gold Rush Bank</Name>
                    <PostalAddress>
                        <Street>100 Bret Harte Road</Street>
                        <City>Gold Rush</City>
                        <State>CA</State>
                        <PostalCode>97123</PostalCode>
                        <Country isoCountryCode="US">United States</Country>
                    </PostalAddress>
                </Contact>
                <IdReference domain="abaRoutingNumber"
                    identifier="678902345"></IdReference>
            </PaymentPartner>
        </PaymentRemittanceRequestHeader>
        <PaymentRemittanceSummary>
            <NetAmount>
                <Money currency="USD">2.00</Money>
```

```
            </NetAmount>
            <GrossAmount>
                <Money currency="USD">2.85</Money>
            </GrossAmount>
            <DiscountAmount>
                <Money currency="USD">0.35</Money>
            </DiscountAmount>
            <AdjustmentAmount>
                <Money currency="USD">0.50</Money>
            </AdjustmentAmount>
        </PaymentRemittanceSummary>
            <RemittanceDetail lineNumber="1">
                <PayableInfo>
                    <PayableInvoiceInfo>
                        <InvoiceIDInfo invoiceID="INV-031204-01">
                        </InvoiceIDInfo>
                        <PayableOrderInfo>
                            <OrderIDInfo orderID="P0-031204-01"></OrderIDInfo>
                        </PayableOrderInfo>
                    </PayableInvoiceInfo>
                </PayableInfo>
                <NetAmount>
                    <Money currency="USD">2.00</Money>
                </NetAmount>
                <GrossAmount>
                    <Money currency="USD">2.85</Money>
                </GrossAmount>
                <DiscountAmount>
                    <Money currency="USD">0.35</Money>
                </DiscountAmount>
                <AdjustmentAmount>
                    <Money currency="USD">0.50</Money>
                </AdjustmentAmount>
            </RemittanceDetail>
        </PaymentRemittanceRequest>
    </Request>
</cXML>
```

9.5.3 PaymentRemittanceStatusUpdateRequest Example

This example shows a `PaymentRemittanceStatusUpdateRequest` sent from a buyer to a supplier:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/
PaymentRemittance.dtd">
<cXML payloadID="1068173501644--6417095366782271471@10.10.13.124"
timestamp="2003-04-20T23:59:45-07:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN99123456789</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN99987654321</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>Procurement Application 1.0</Identity>
            </Credential>
        </Sender>
```

```
    </Header>
    <Request deploymentMode="production">
        <PaymentRemittanceStatusUpdateRequest>
            <DocumentReference
                    payloadID="1234567890123-123456789012345678 9@10.10.10.100">
            </DocumentReference>
            <PaymentRemittanceStatus type="canceled"
            paymentReferenceNumber="PaymentRefNumber">1234</
            </PaymentRemittanceStatus>
        </PaymentRemittanceStatusUpdateRequest>
    </Request>
</cXML>
```

9.6 TradeRequest

Represents a request to create or update a supply chain financing `TradeItem` object

Here is an example of a `TradeRequest` document:

```
<TradeRequest>
    <TradeRequestHeader operation="new" status="accepted" tradeID="trade200922"
        tradeDate="2015-09-30T10:43:36-07:00"
        tradeApprovedDate="2015-09-30T12:43:36-07:00"
        settlementDate="2015-10-02T10:43:36-07:00" autoTrade="no">
        <PaymentPartner>
            <!—Funder information-->
            <Contact role="payer">
                <Name xml:lang="en">Bank Of America</Name>
                <IdReference domain="financialInstitutionID" identifier="987654321">
                </IdReference>
            </Contact>
        </PaymentPartner>
        <PaymentPartner>
            <!-- supplier information -->
            <Contact role="payee">
                <Name xml:lang="en">Supplier Name</Name>
            </Contact>
        </PaymentPartner>
        <Contact>
            <Name xml:lang = "en">John Smith</Name>
            <Phone>  <!—optional -->
                <TelephoneNumber>
                    <CountryCode isoCountryCode = "BE">32</CountryCode>
                    <AreaOrCityCode/>
                    <Number>0477 07 26 41</Number>
                </TelephoneNumber>
            </Phone>
        </Contact>
        <Comments>Optional comments</Commets>
    </TradeRequestHeader>
    <TradeRequestSummary>
        <!— trade level totals -->
        <OriginalAmount>    <!— sum of all OriginalAmount of all TradeItems -->
            <Money currency="USD">1000</Money>
        </OriginalAmount>
        <CreditApplied>    <!— sum of all credit applied of all TradeItems -->
            <Money currency="USD">100</Money>
        </CreditApplied >
        <FeeAmount>    <!-- total fee -->
            <Money currency="USD">20</Money>
            </Feemount >
```

```
            <Amount >   <!-- total projected amount to be paid to supplier -->
                <Money currency="USD">880</Money>
            </Amount >
    </TradeRequestSummary>
    <TradeItem lineNumber=”1” paymentProposalID="PPR910">
        <PayableInfo>
            <PayableInvoiceInfo>
                <InvoiceIDInfo invoiceDate="2015-03-30T10:43:36-07:00"
                    invoiceID="330inv1"></InvoiceIDInfo>
            </PayableInvoiceInfo>
        </PayableInfo>
        <OriginalAmount >  <!-- payment amount of the original PPR -->
            <Money currency="USD">1000</Money>
        </OriginalAmount >
        <AdjustmentAmount>
            <Money currency="USD”>100.00</Money>
            <Modifications>
                <Modification>
                    <AdditionalDeduction type=“creditApplied">
                        <DeductionAmount>
                            <Money currency="USD”>100.00</Money>
                        </DeductionAmount>
                    </AdditionalDeduction>
                </Modification>
            </Modifications>
        </AdjustmentAmount>
        <DaysPaidEarly>10</DaysPaidEarly>
        <Amount>  <!-- trade amount: GrossAmount - AdjustmentAmount - FeeAmount-->
            <Money currency="USD">900</Money>
        </Amount >
        <!-- fee information, optional and not in credit memo -->
        <FeeAmount>
            <Money currency="USD”>15.00</Money> <!-- total fee -->
            <Fee type=“serviceProvider”>
                <Money currency="USD”>5.00</Money>
            </Fee>
            <Fee type=“community”>
                <Money currency="USD”>5.00</Money>
            </Fee>
            <Fee type=“funder”>
                <Money currency="USD”>5.00</Money>
            </Fee>
        </FeeAmount>
    </TradeItem>
    <TradeItem lineNumber=”2” paymentProposalID="PPR911"> <!-- credit memo -->
        <PayableInfo>
            <PayableInvoiceInfo>
                <InvoiceIDInfo invoiceDate="2015-03-30T10:43:36-07:00"
                    invoiceID="cm123"></InvoiceIDInfo>
            </PayableInvoiceInfo>
        </PayableInfo>
        <OriginalAmount>
            <Money currency="USD">-100</Money>
        </OriginalAmount>
        <AdjustmentAmount>
            <Money currency="USD”>-100.00</Money>
            <Modifications>
                <Modification>
                    <AdditionalDeduction type=“creditApplied">
                        <DeductionAmount>
                            <Money currency="USD”>-100.00</Money>
                        </DeductionAmount>
                    </AdditionalDeduction>
                </Modification>
            </Modifications>
        </AdjustmentAmount>
        <DaysPaidEarly>0</DaysPaidEarly>
        <Amount>
```

```
            <Money currency="USD">0</Money>
        </Amount>
    </TradeItem>
</TradeRequest>
```

9.6.1 TradeRequestHeader

Contains header information for a `TradeRequest` object. It has the following attributes:

Attribute	Description
`operation` (required)	The operational mode of the trade document. Possible values are `"new"` or `"update"`.
`status` (required)	The status of the `TradeRequest`. Possible values are: • `accepted`—The funder has accepted the trade request. • `rejected`—The funder has rejected the trade request. The funder may update the status to `"accepted"` later.
`tradeID` (required)	ID of a trade transaction in the Supply Chain Financing provider's system.
`tradeDate`	The date and time the trade was created.
`settlementDate`	The date and time that the payment will be paid in supplier's bank account.
`autoTrade`	Indicates whether it's an automatic trade (`"yes"` or `"no"`).

`TradeRequestHeader` has the following elements:

Element	Description
`PaymentPartner` (required)	Contains payer and payee information. Payer is required. You can specify multiple `PaymentPartner` elements. See PaymentPartner [page 188].
`Contact`	The supplier user who created this `TradeRequest`.
`Comments`	Textual comments for this `TradeRequest`.
`Extrinsic`	Additional information related to this payment. Should not duplicate anything in `TradeRequest`.

9.6.2 TradeRequestSummary

Contains summary information for a `TradeRequest` object. It has the following elements:

Element	Description
`OriginalAmount` (required)	The total original net payment amount. All amounts for all `TradeItem` objects should add up to the total in `TradeRequestSummary`.
`CreditApplied`	The total amount of all credit memos in the trade.

Element	Description
`FeeAmount` (required)	Contains the sum of all fees that occur during a trade that the supplier must give to receive this early payment. This should be equal to the sum of all `FeeAmount` elements in `TradeItem` objects.
`Amount` (required)	The total net value of the trade. This is the projected value to be paid to the supplier. It should be equal to the sum of `NetAmount` values for `TradeItem` objects, and it should satisfy the following equation: `Amount = OriginalAmount - FeeAmount`

9.6.3 TradeItem

Contains trading information about a payment proposal or a credit memo. It has the following attribute:

Attribute	Description
`lineNumber`	Line number for the trade item from the associated payable document.
`paymentProposalID` (required)	Original payment proposal number.

`TradeItem` has the following elements:

Element	Description
`PayableInfo` (required)	A reference to the payable document, such as an invoice, order, or master agreement.
`OriginalAmount` (required)	Original amount for this payable. This amount is negative for credit memo items.
`AdjustmentAmount`	Adjustment amount applied to the `GrossAmount`. The only adjustment that can be applied is a credit memo, which has an `AdditionalDeduction` with type `"creditMemoApplied"`.
`DaysPaidEarly` (required)	The number of days that the supplier is paid early.
`Amount` (required)	Net value of this trade item. This amount is always zero for credit memo items. The value should satisfy the following equation: `Amount = OriginalAmount - FeeAmount - AdjustmentAmount`

Element	Description

`FeeAmount`	Contains various fees that occur during a trade.
	
	`FeeAmount` has the following elements:
	
	• `Money`—Fee amount.
	• `Fee`—Different types of individual fees. The optional `type` attribute for `Fee` can be one of the following values:
	  ○ `serviceProvider`
	  ○ `community`
	  ○ `funder`

`Extrinsic`	Contains any additional information related to this object.

10 TimeCard Transaction

Timecards are used for placing orders related to temporary labor and contractors. They can be generated and sent by either the buyer or the supplier, depending upon which system captures the timecard information.

TimeCard Requests [page 211]

TimeCard Element [page 212]

TimeCard Examples [page 216]

10.1 TimeCard Requests

Because of the two-way nature of timecards, there are two requests that involve the `TimeCard` element: `TimeCardRequest` and `TimeCardInfoRequest`.

The contractor—that is, the temporary laborer in question—enters timecard information in either the buyer or supplier system, depending upon the situation. Therefore, either buyers or suppliers can send timecard documents, and timecard documents can flow in either direction. In this way, timecards differ from invoices, which are typically sent only by suppliers.

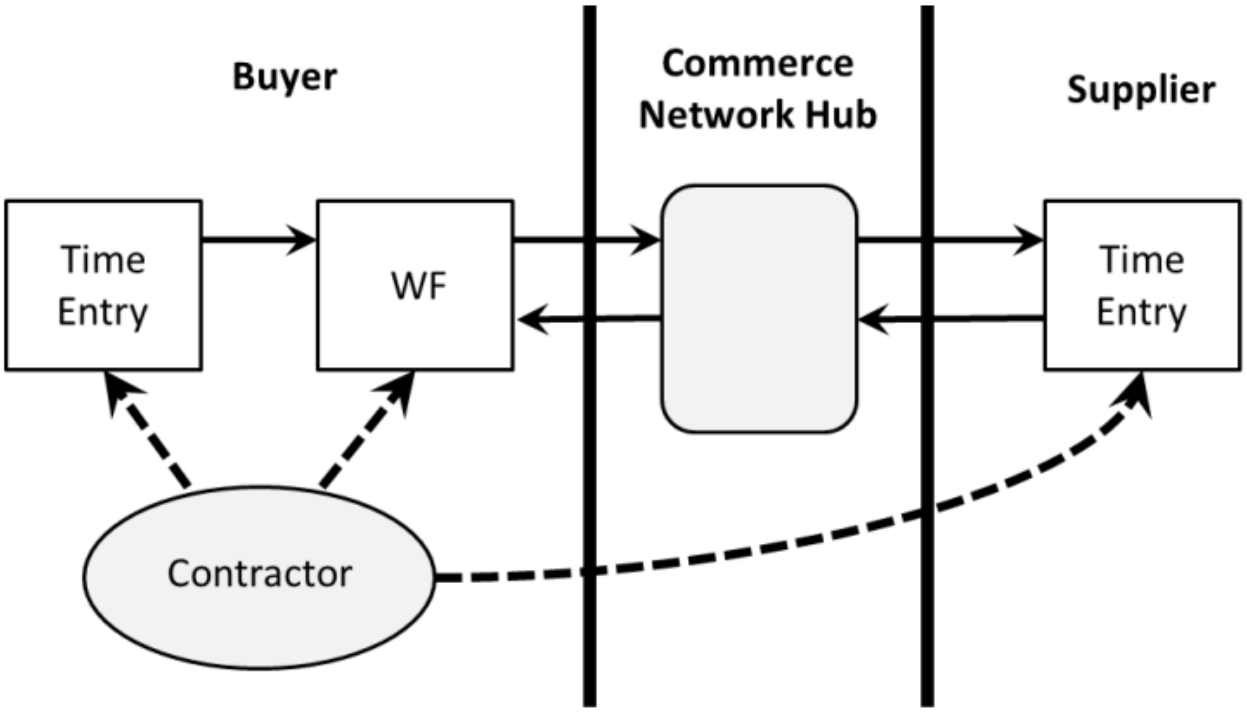


Figure 19: Timecard Document Flow

10.1.1 Supplier to Buyer Request

`TimeCardRequest` describes a timecard document that is sent from a supplier, such as a staffing agency, to a buyer. The `from` and `sender` credentials are the supplier's, and the `to` credential is the buyer's. When the timecard is approved, the buyer sends a `StatusUpdateRequest` with the `DocumentApprovalStatus` element indicating whether the timecard was approved or rejected.

10.1.2 Buyer to Supplier Request

`TimeCardInfoRequest` describes a timecard document that is sent from a buyer to a supplier. The `from` credential is the buyer's, and `to` credential is the supplier's.

10.2 TimeCard Element

The `TimeCard` element is used to capture the hours worked by a contractor or other temporary laborer. The following example shows the element declaration of `TimeCard` from `Fulfill.dtd`:

```
<!ELEMENT TimeCard (
    OrderInfo,
    Contractor,
    ReportedTime,
    SubmitterInfo,
    ApprovalInfo*,
    Comments?,
    DocumentReference?)>
```

The `TimeCard` element has the following attributes:.

Attribute	Description
`type`	Possible values are `new`, `update`, and `delete`. The value defaults to `new`, unless the original timecard is updated.
`status`	Possible values are `submitted`, `approved`, `denied`. The default value is `submitted`.
`timeCardID` (required)	Represents the unique identifier for this timecard in the buyer and supplier systems.

10.2.1 OrderInfo

The `OrderInfo` element is used to reference the order. One timecard can reference only one order.

10.2.2 Contractor

The `Contractor` element is the definition of a contractor used in the context of temporary labor.

10.2.2.1 ContractorIdentifier

`ContractorIdentifier` uniquely identifies the contractor in both the buyer and supplier systems, and is agreed upon by the buyer and the supplier prior to sending out orders or timecards. The `ContractorIdentifier` element contains the following attribute:

Attribute	Description
`domain` (required)	The domain in which the `ContractorIdentifier` is represented. Possible values are `supplierReferenceID` or `buyerReferenceID`, indicating the system in which the `ContractorIdentifier` originated.

10.2.2.2 Contact

The generic `Contact` element describes the contractor.

10.2.3 ReportedTime

The `ReportedTime` element captures the line items for the timecard.

10.2.3.1 Period

`Period` denotes the period of time for which the timecard is being submitted.

10.2.3.2 TimeCardTimeInterval

The `TimeCardTimeInterval` element represents the time interval being reported on a timecard. It contains the following attributes:

Attribute	Description
`duration` (required)	The duration of time being claimed for the line item, represented in the ISO 8601 format `PnYn MnDTnH nMnS`, where `nY` represents the number of years, `nM` the number of months, `nD` the number of days, `T` the date/time separator, `nH` the number of hours, `nM` the number of minutes and `nS` the number of seconds. For example, to indicate a duration of 1 year, 2 months, 3 days, 10 hours, and 30 minutes, one would write: `P1Y2M3DT10H30M`. In the event that `duration` and `TimeRange` do not agree, `duration` takes precedence. For example, if `duration` is 2 hours, and `TimeRange` is from 4:00 p.m. to 8:00 p.m., then the 2 hour `duration` takes precedence. However, if `duration` is not present, then it is computed from the TimeRange.
`payCode` (required)	The pay code to be used. Recommended pay codes include: • `Regular` • `Overtime` • `Doubletime` • `Mealbreak` • `Tripletime` • `WeeklyRestDay` • `HolidayWorked` • `RegularNightShift` • `OvertimeNightShift` • `DoubletimeNightShift` • `TripletNightShift` • `WeeklyRestDayNightShift` • `RegularMixedShift` • `OvertimeMixedShift` • `DoubletimeMixedShift` • `TripletimeMixedShift` • `WeeklyRestDayMixedShift`
`isNonBillable`	Implied attribute that designates whether or not the time is billable. The default behavior is billable.

10.2.3.3 Expense

The `Expense` element represents any expense a contractor reported on a timecard. It contains the following attributes:

Attribute	Description
`expenseDate` (required)	The date of the expense.
`expenseType`	The type of expense. Recommended expense types include: • `mileage` • `airfare` • `fuel` • `taxi` • `perDiem` • `hotel`
`isNonBillable` (required)	Implied attribute that designates whether or not the expense is billable. The default behavior is billable.

10.2.3.4 ExpenseAmount

The `ExpenseAmount` element represents the monetary value and currency of an expense a contractor reported on a timecard.

10.2.3.5 TimeRange

The `TimeRange` element defines a time range in which the start and end dates can be unbounded.

The `TimeRange` element contains the following attributes:

Attribute	Description
`startDate`	The first date in the billable period.
`endDate`	The last date in the billable period.

10.2.4 SubmitterInfo

The `SubmitterInfo` element contains information about the person submitting the timecard. It has the following attribute:

Attribute	Description
`submittedDate` (required)	The time when the timecard was submitted.

10.2.4.1 Contact

If the `Contact` element is absent, then it is assumed that the contractor is also the submitter.

10.2.5 ApprovalInfo

The `ApprovalInfo` element includes information about the approver of the timecard. This information is sent by the supplier for informational purposes only, and can include all the approvers in the chain. There can be multiple approvals because many people might need to approve the timecard in question.

The `ApprovalInfo` element has the following attributes:

Attribute	Description
`approvedDate` (required)	The time when the timecard was approved.

10.2.6 DocumentReference

`DocumentReference` is used on an update operation to refer to a previous `TimeCardRequest` or `TimeCardInfoRequest.`

10.3 TimeCard Examples

The following example shows a `TimeCardInfoRequest` sent upon submission to the supplier:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/Fulfill.dtd">
<cXML xml:lang="en-US"
            payloadID=" tc1@buyer.com"
            timestamp="2003-10-01T23:00:06-08:00">
    <Header>
```

```
        <From>
            <Credential domain="NetworkId">
                <Identity>AN0100023456</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity> AN0100023457</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity> AN0100023456</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Our Procurement Application 2.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <TimeCardInfoRequest>
            <TimeCard type="new" status="submitted" timeCardID="TC101">
            <OrderInfo>
                <OrderIDInfo orderID="PO12" orderDate="2003-07-22T08:00:00-08:00"/>
            </OrderInfo>
            <Contractor>
                <ContractorIdentifier domain="supplierReferenceID">Doe8610
                </ContractorIdentifier>
                <Contact>
                    <Name xml:lang="en">John Doe</Name>
                </Contact>
            </Contractor>
            <ReportedTime>
                <Period startDate="2003-09-22T08:00:00-08:00"
                endDate="2003-09-26T18:00:00-08:00"/>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular">
                        <TimeRange startDate="2003-09-22T08:00:00-08:00"
                                endDate="2003-09-22T18:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT2H"
                                payCode="Mealbreak" isNonBillable="yes">
                        <TimeRange startDate="2003-09-22T012:00:00-08:00"
                        endDate="2003-09-22T14:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT2H" payCode="Overtime">
                        <TimeRange startDate="2003-09-22T18:00:00-08:00"
                        endDate="2003-09-22T20:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular">
                        <TimeRange startDate="2003-09-23T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular">
                        <TimeRange startDate="2003-09-24T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular">
                        <TimeRange startDate="2003-09-25T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular">
                        <TimeRange startDate="2003-09-26T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
                </ReportedTime>
                <SubmitterInfo submittedDate="2003-10-01T08:00:00-08:00">
                    <Contact>
                        <Name xml:lang="en">John Doe</Name>
                    </Contact>
                </SubmitterInfo>
            </TimeCard>
        </TimeCardInfoRequest>
    </Request>
```

```
</cXML>
This example show an update sent upon approval to the supplier.
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/Fulfill.dtd">
<cXML xml:lang="en-US"
            payloadID=" tc1-update@buyer.com"
            timestamp="2003-10-01T23:00:06-08:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN0100023456</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity> AN0100023457</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity> AN0100023456</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Suppliers Time Card Application 5.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <TimeCardInfoRequest>
            <TimeCard type="update" status="approved" timeCardID="TC101">
                <OrderInfo>
                    <OrderIDInfo orderID="PO123"
                    orderDate="2003-07-22T08:00:00-08:00"/>
                </OrderInfo>
                <Contractor>
                    <ContractorIdentifier domain="supplierReferenceID">Doe8610
                    </ContractorIdentifier>
                    <Contact>
                        <Name xml:lang="en">John Doe</Name>
                    </Contact>
                </Contractor>
            <ReportedTime>
                <Period startDate="2003-09-22T08:00:00-08:00"
                endDate="2003-09-26T18:00:00-08:00"/>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular">
                        <TimeRange startDate="2003-09-22T08:00:00-08:00"
                        endDate="2003-09-22T18:00:00-08:00"/>
                        </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT2H"
                    payCode="Mealbreak" isNonBillable="yes">
                        <TimeRange startDate="2003-09-22T012:00:00-08:00"
                        endDate="2003-09-22T14:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT2H" payCode="Overtime" >
                        <TimeRange startDate="2003-09-22T18:00:00-08:00"
                        endDate="2003-09-22T20:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular" >
                        <TimeRange startDate="2003-09-23T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular" >
                        <TimeRange startDate="2003-09-24T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular" >
                        <TimeRange startDate="2003-09-25T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
                    <TimeCardTimeInterval duration="PT8H" payCode="Regular" >
                        <TimeRange startDate="2003-09-26T08:00:00-08:00"/>
                    </TimeCardTimeInterval>
```

```
                </ReportedTime>
                <SubmitterInfo submittedDate="2003-10-01T08:00:00-08:00">
                    <Contact>
                        <Name xml:lang="en">John Doe</Name>
                    </Contact>
                </SubmitterInfo>
                <ApprovalInfo approvedDate="2003-10-02T08:00:00-08:00">
                    <Contact>
                        <Name xml:lang="en">John Doe</Name>
                    </Contact>
                </ApprovalInfo>
                <DocumentReference payloadID="tc1@buyer.com"/>
            </TimeCard>
        </TimeCardInfoRequest>
    </Request>
</cXML>
```

11 Master Agreements and Contracts

cXML supports the transmission of Master Agreement documents, which are contracts between trading partners. It also supports sending `ContractRequest` and `ContractStatusUpdateRequest` documents, which represent contracts sent from a buyer to an external buyer system.

Overview of Master Agreements [page 220]

MasterAgreementRequest [page 220]

ContractRequest [page 223]

ContractStatusUpdateRequest [page 227]

11.1 Overview of Master Agreements

Master Agreements enable buyers to establish a commitment for goods and services with suppliers. They represent a common mechanism for managing supplier and budget commitments, and they enable buyers to negotiate better discounts by basing the discounts on future purchases, while enabling suppliers to more accurately forecast demand.

The Master Agreement transaction enables procurement application to facilitate the negotiation and creation of Master Agreements with suppliers and creation of Release Orders from those Master Agreements. These Agreement documents can be routed from the procurement application to the supplier by a network hub. The execution of an order against a contract is called a release.

11.2 MasterAgreementRequest

The MasterAgreementRequest document defines the Master Agreement created by the buying organization. It specifies beginning and end dates, and the committed maximum and minimum values of the agreement. It also lists maximum and minimum values and quantities for individual items.

The following example shows a `MasterAgreementRequest` document:

```
<MasterAgreementRequest>
    <MasterAgreementRequestHeader
        agreementID="MA123"
        agreementDate="2001-12-01"
        type="value"
        effectiveDate="2002-01-01"
        expirationDate="2002-12-31"
        operation="new">
        <MaxAmount>
            <Money currency="USD">10000</Money>
        </MaxAmount>
        <MaxReleaseAmount>
```

```
            <Money currency="USD">10000</Money>
        </MaxReleaseAmount>
        <Contact role="BuyerLocation">
            <Name xml:lang="en">Buyer Company</Name>
            <PostalAddress name="default">
                <DeliverTo>Joe Smith</DeliverTo>
                <DeliverTo>Mailstop M-543</DeliverTo>
                <Street>123 Anystreet</Street>
                <City>Sunnyvale</City>
                <State>CA</State>
                 <PostalCode>90489</PostalCode>
                <Country isoCountryCode="US">United States</Country>
            </PostalAddress>
        </Contact>
        <Comments xml:lang="en-US">well formed XML can go here.</Comments>
    </MasterAgreementRequestHeader>
    <AgreementItemOut maxQuantity="100">
        <MaxAmount>
            <Money currency="USD">1000</Money>
        </MaxAmount>
        <MaxReleaseAmount>
            <Money currency="USD">100</Money>
        </MaxReleaseAmount>
        <ItemOut quantity="1">
            <ItemID>
                <SupplierPartID>1233244</SupplierPartID>
            </ItemID>
            <ItemDetail>
                <UnitPrice>
                    <Money currency="USD">1.34</Money>
                </UnitPrice>
                <Description xml:lang="en">Blue Ballpoint Pen</Description>
                <UnitOfMeasure>EA</UnitOfMeasure>
                <Classification domain="UNSPSC">12345</Classification>
                <ManufacturerPartID>234</ManufacturerPartID>
                <ManufacturerName>foobar</ManufacturerName>
                <URL>www.foo.com</URL>
            </ItemDetail>
            <Shipping trackingDomain="FedEx" trackingId="1234567890">
                <Money currency="USD">2.5</Money>
                <Description xml:lang="en-us">FedEx 2-day</Description>
            </Shipping>
            <Comments xml:lang="en-US">Any well formed XML</Comments>
        </ItemOut>
    </AgreementItemOut>
</MasterAgreementRequest>
```

11.2.1 MasterAgreementRequestHeader

The `MasterAgreementRequestHeader` contains information about the Master Agreement common to all contained items.

`MasterAgreementHeader` has the following attributes:

Attribute	Description
`agreementID` (required)	The procurement system agreement ID for this request.
`agreementDate` (required)	The date and time the agreement request was created. This is different from the effective and expiration date of the agreement.

Attribute	Description
`type`	Specifies whether the agreement refers to a value or quantity.
`effectiveDate` (required)	Specifies the date the agreement is available for ordering or releases.
`expirationDate` (required)	Specifies the date the agreement is no longer available
`parentAgreementPayloadID`	Payload ID for the corresponding parent document from which this agreement is derived.
`operation`	Specifies the type of the agreement request. Can be `"new"`, `"update"` or `"delete"`. Defaults to `"new"`. The `"delete"` operation is used to cancel an existing agreement. The delete request should be an exact replica of the original request.

`MasterAgreementHeader` can contain the following optional child elements:

Element	Description
`MaxAmount`	Contains the maximum amount for all line items in the Master Agreement.
`MinAmount`	Contains the committed amount for all line items on the Master Agreement.
`MaxReleaseAmount`	The contractual maximum amount per release of this Master Agreement.
`MinReleaseAmount`	The contractual minimum amount per release of this Master Agreement.
`Contact`	Supplies any additional Address or Location information.
`Comments`	Contains additional information about the status of the overall Master Agreement.
`Extrinsic`	Can be used to insert additional data about the Master Agreement for application consumption.

11.2.2 AgreementItemOut

The `AgreementItemOut` element specifies the requirements of a particular line item that is part of the Master Agreement contract.

`AgreementItemOut` has the following optional attributes:

Attribute Name	Description
`maxQuantity`	Specifies the maximum quantity for this particular line Item.
`minQuantity`	Specifies the minimum quantity for this particular line Item.
`maxReleaseQuantity`	Specifies the maximum quantity per release for this particular line Item.
`minReleaseQuantity`	Specifies the minimum quantity per release for this particular line Item.

`AgreementItemOut` can contain the following optional child elements:

Element	Description
`MaxAmount`	Contains the maximum amount for this particular line Item.
`MinAmount`	Contains the minimum amount for this particular line Item.
`MaxReleaseAmount`	Indicates the item level maximum amount per release.
`MinReleaseAmount`	Indicates the item level minimum amount per release.
`ItemOut` (required)	A line item that is part of the master agreement. The `lineNumber` attribute in the `ItemOut` specifies the corresponding `lineNumber` on the Master Agreement in the Procurement Application. The `quantity` attribute in the `ItemOut` should be set to `"one"` and ignored at the Master Agreement implementation processing stage.

11.3 ContractRequest

The `ContractRequest` element represents a contract sent from a buyer to an external buyer system.

Here is an example of a `ContractRequest`:

```
<Request deploymentMode="production">
  <ContractRequest>
    <ContractRequestHeader
      operation="new"
      xml:lang="en"
      expirationDate="2016-01-30T00:00:00-00:00"
      effectiveDate="2016-01-11T00:00:00-00:00"
      type="value"
      agreementDate="2016-01-12T00:00:00-00:00"
      createDate="2016-01-11T23:36:18+08:00"
      contractID="CW2009">
      <LegalEntity domain="CompanyCode">100</LegalEntity>
      <OrganizationID>
        <Credential domain="NetworkID">
          <Identity>AN02000000120</Identity>
        </Credential>
        <Credential domain="sap">
          <Identity>0000000100</Identity>
        </Credential>
      </OrganizationID>
      <OrganizationalUnit domain="PurchasingOrganization">
          1001
      </OrganizationalUnit>
      <OrganizationalUnit domain="PurchasingGroup">
        10101
      </OrganizationalUnit>
      <PaymentTerm payInNumberOfDays="10">
        <Discount>
          <DiscountPercent percent="2"></DiscountPercent>
        </Discount>
        <Extrinsic name="Id">0001</Extrinsic>
      </PaymentTerm>
      <MaxAmount>
        <Money currency="USD">2000.00</Money>
```

```
      </MaxAmount>
      <TermsOfDelivery>
        <TermsOfDeliveryCode value="TransportCondition"/>
        <ShippingPaymentMethod value ="Other"/>
        <TransportTerms value="FOB">Free on board vessel</TransportTerms>
      </TermsOfDelivery>
    </ContractRequestHeader>
    <ContractItemIn>
      <TermsOfDelivery>
        <TermsOfDeliveryCode value="TransportCondition"/>
        <ShippingPaymentMethod value ="Other"/>
        <TransportTerms value="FOB">Free on board vessel</TransportTerms>
      </TermsOfDelivery>
      <ItemIn lineNumber="1" quantity="100" itemClassification=”material”>
        <ItemID>
          <SupplierPartID>1</SupplierPartID>
          <SupplierPartAuxiliaryID></SupplierPartAuxiliaryID>
          <BuyerPartID>992</BuyerPartID> <!-- Material code -->
        </ItemID>
        <ItemDetail>
          <UnitPrice>
            <Money currency="USD">1000.00</Money>
            <Modifications>
              <Modification>
                <AdditionalDeduction type="DISCOUNT">
                  <DeductionAmount>
                    <Money currency="USD">10.00</Money>
                  </DeductionAmount>
                </AdditionalDeduction>
              </Modification>
              <Modification>
                <AdditionalDeduction type="DISCOUNT">
                  <DeductionPercent percent="20"/>
                </AdditionalDeduction>
              </Modification>
              <Modification>
                <AdditionalCost>
                  <Money currency="USD">30.00</Money>
                </AdditionalCost>
              </Modification>
              <Modification>
                <AdditionalCost>
                  <Percentage percent="20"/>
                </AdditionalCost>
              </Modification>
            </Modifications>
          </UnitPrice>
          <Description xml:lang="en">Laptops</Description>
          <UnitOfMeasure>EA</UnitOfMeasure>
          <Classification domain="unspsc">43211503</Classification>
          <Classification domain="MaterialGroup">29</Classification>
          <ManufacturerPartID></ManufacturerPartID>
          <ManufacturerName></ManufacturerName>
          <URL></URL>
          <LeadTime>2</LeadTime>
        </ItemDetail>
        <ShipTo>
          <Address
            addressID="3000"
            addressIDDomain="buyerLocationID"
            isoCountryCode="US">
            <Name xml:lang="en" >Plant 3000</Name>
          </Address>
        </ShipTo>
      </ItemIn>
      <ReferenceDocumentInfo lineNumber = "10">
        <DocumentInfo documentID = "PR1234"
          documentType = "Requisition"
```

```
          documentDate = "2015-11-07T07:03:34-05:00">
        </DocumentInfo>
      </ReferenceDocumentInfo>
      <ReferenceDocumentInfo lineNumber = "3">
        <DocumentInfo documentID = "RFQ2345"
          documentType = "RFQ"
          documentDate = "2015-11-07T07:03:34-05:00">
        </DocumentInfo>
      </ReferenceDocumentInfo>
    </ContractItemIn>
  </ContractRequest>
</Request>
```

11.3.1 ContractRequestHeader

`ContractRequestHeader` is the header element for `ContractRequest`. It has the following attributes:

Attribute	Description
`contractID` (required)	Contract ID in the source buyer system for this request.
`type`	Identifies whether the contract is value-based or quantity-based. Possible values are `"value"` or `"quantity"`.
`createDate`	The date and time the contract was created or published.
`agreementDate`	The date and time the contract was created. This is different from the contract's effective date and expiry date.
`effectiveDate` (required)	Date the contract is available for ordering or releases.
`expirationDate`	Date the contract is no longer available.
`xml:lang` (required)	The language or locale in which the `ContractRequest` content is written.
`operation`	The operational mode of the `ContractRequest`. Possible values are: • `new`—Identifies a new contract transaction. • `update`—Identifies an update to an existing transaction. The `DocumentInfo` element can be used to indicate the contract in the external system. • `delete`—Cancels an existing contract. The delete request should be an exact duplicate of the original request.

`ContractRequestHeader` has the following elements:

Element	Description
`LegalEntity` (required)	A legal entity in the external system. It has an `IdReference` element.
`OrganizationID` (required)	Provides credentials for the organization ID.
`OrganizationalUnit`	Identifies the Purchase Unit or Purchase group in the external system. It has an `IdReference` element.

Element	Description
`PaymentTerm`	Defines a payment term in an invoice or order. Payment term can be the net term (without discount) or discount term (with discount).
`QuoteRequestReference`	Reference to a quote request originated in the external system.
`MaxAmount`	The maximum amount for the contract.
`MinAmount`	The minimum amount for the contract.
`MaxReleaseAmount`	The contractual maximum quantity per release of a contract.
`MinReleaseAmount`	The contractual minimum quantity per release of a contract.
`Contact`	Supplies additional Address or Location information for the requesting company.
`Comments`	Any additional comments about the contract request.
`DocumentInfo`	Contract ID managed in the external system. Included if the operation is `"update"`.
`ParentContractInfo`	Parent contract ID from the external system if the current contract is part of a hierarchy.
`TermsOfDelivery`	Optional shipping terms (incoTerms) as defined by the International Chamber of Commerce.
`Extrinsic`	Additional information about the contract request header.

11.3.2 ContractItemIn

`ContractItemIn` represents a contract line item to be sent to an external system. It has the following elements:

Element	Description
`MaxAmount`	The maximum amount for an item.
`MinAmount`	The minimum amount for an item.
`MaxReleaseAmount`	The contractual maximum quantity for an item per release (order).
`MinReleaseAmount`	The contractual minimum quantity for an item per release (order).
`MaxQuantity`	The maximum quantity for an item.
`MinQuantity`	The minimum quantity for an item.
`MaxReleaseQuantity`	The contractual maximum quantity for an item per release (order).
`MinReleaseQuantity`	The contractual minimum quantity for an item per release (order).
`TermsOfDelivery`	Optional shipping terms (incoTerms) as defined by the International Chamber of Commerce.
`ItemIn` (required)	An item from the source buyer system.
`ReferenceDocumentInfo`	Optional reference document info for this line item. For example, the Requisition or RFQ in the external system.

11.4 ContractStatusUpdateRequest

`ContractStatusUpdateRequest` contains the status update for a contract, including whether the contract was created or updated successfully.

Here is an example of `ContractStatusUpdateRequest`:

```
<Request deploymentMode="production">
  <ContractStatusUpdateRequest>
    <Status xml:lang="en-US" code="200” text="OK">Succeeded</Status>
    <ContractStatus type="created">
      <ContractIDInfo contractID="CW2009">
        <IdReference identifier="55000000" domain="SAPAgreementId"/>
      </ContractIDInfo>
      <ContractItemStatus>
        <ItemStatus type="created">
          <ReferenceDocumentInfo lineNumber="1"/>
        </ItemStatus>
        <IdReference identifier="010" domain="SAPLineNumber"/>
      </ContractItemStatus>
      <ContractItemStatus>
        <ItemStatus type="created">
          <ReferenceDocumentInfo lineNumber="2"/>
        </ItemStatus>
        <IdReference identifier="020" domain="SAPLineNumber"/>
      </ContractItemStatus>
    </ContractStatus>
  </ContractStatusUpdateRequest>
</Request>
```

11.4.1 Status

Status of a Response or Message. It has the following attributes:

Attribute	Description
`code` (required)	HTTP or cXML-specific status code.
`text` (required)	Textual version of the status code.
`xml:lang`	The language or locale in which the `ContractStatusUpdateRequest` content is written..

11.4.2 ContractStatus

`ContractStatus` contains item-level status updates for a contract. It has the following attribute:

Attribute	Description
`type` (required)	Type of the contract status, for example, `"created"`.

`ContractStatus` has the following elements:

Element	Description
`ContractIDInfo` (required)	The contract ID information created/updated in the source buyer system.
`ContractItemStatus`	Represents a line item in a contract status update request.
`Comments`	Optional field for communicating arbitrary comments or description of an item.

11.4.3 Extrinsic

Optional additional information about the contract status.

12 Later Status Changes

cXML allows entities to set the status of purchase orders and line items within them.

Overview of Status [page 229]

StatusUpdateRequest [page 229]

ConfirmationRequest [page 236]

OrderStatusRequest [page 249]

ShipNoticeRequest [page 251]

ReceiptRequest [page 271]

12.1 Overview of Status

After the `OrderRequest` transaction has completed, suppliers and intermediate servers might need to communicate additional information back to the buying organization. In addition, after a buying organization receives an invoice, it might need to communicate back to the supplier about invoice status. The transactions described in this chapter are used for that purpose. These transactions share some common semantics and elements.

Like the response to an `OrderRequest` (see Response to an OrderRequest [page 162]), none of these transactions includes a specific `Response` element. Instead, the returned document contains a nearly empty `Response` (only a `Status`). Each returned document has the form:

```
<cXML payloadID="9949494@supplier.com"
        timestamp="2000-01-12T18:39:09-08:00" xml:lang="en-US">
    <Response>
        <Status code="200" text="OK"/>
    </Response>
</cXML>
```

The returned code is “200” only if the operation completed successfully.

12.2 StatusUpdateRequest

This transaction informs an earlier node about changes in the processing status of an order, invoice, or service sheet.

One change is of particular significance: when an intermediate hub successfully transmits a document onward, it can inform the original sender or a previous hub about that success. Transitions through various queues and processing steps at a supplier or hub might also be significant to the buying organization.

Order-processing partners (such as fax or EDI service providers) send `StatusUpdateRequest` transaction messages to network commerce hubs to set purchase order status. It affects the order status indicator on the hub, which is visible to both buyers and suppliers. Additionally, suppliers can send this transaction to allow buying organizations to see the status of document processing within the supplier's organization.

Buying organizations use `StatusUpdateRequest` to update the status of invoices on network commerce hubs, which can in turn forward them to suppliers.

The `StatusUpdateRequest` updates the processing status of a single `OrderRequest` document. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML xml:lang="en-US"
        payloadID="0c30050@supplierorg.com"
        timestamp="2000-01-08T23:00:06-08:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN00000123</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN00000456</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN00000123</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Supplier's Super Order Processor</UserAgent>
        </Sender>
    </Header>
    <Request>
        <StatusUpdateRequest>
            <DocumentReference
                payloadID="0c300508b7863dcclb_14999"/>
            <Status code="200" text="OK" xml:lang="en-US">Forwarded
                to supplier</Status>
        </StatusUpdateRequest>
    </Request>
</cXML>
```

This request contains only a `DocumentReference` and a `Status` element. The `Status` can communicate a later transport error encountered by an intermediate hub. The semantics of this element are identical to a `Status` that might have been returned in the initial HTTP response to an `OrderRequest` document.

The 200/OK code is especially important when documents are stored and forwarded. This code indicates that a supplier has begun processing the `OrderRequest` or a hub has forwarded the document. The recipient should expect no further `StatusUpdateRequest` documents after 200/OK arrives.

Suppliers and hubs utilizing the `StatusUpdate` transaction must return code 201/Accepted when an `OrderRequest` is queued for later processing. After it sends 200/OK (in the immediate `Response` to an `OrderRequest` or a later `StatusUpdateRequest`), the server should send no further `StatusUpdate` transactions for that order. Errors later in processing might lead to exceptions to this rule.

12.2.1 DocumentReference

The `DocumentReference` element associates a status update with a particular `OrderRequest` or `InvoiceDetailRequest` document. It repeats a required attribute of the earlier document and adds one optional identifier generated by the supplier. For example:

```
<DocumentReference
    payloadID="0c300508b7863dcclb_14999"/>
```

`DocumentReference` contains no elements, but has the following attribute:

Attribute	Description
`payloadID` (required)	A unique number with respect to space and time that is used for logging purposes to identify documents. This value should not change in the case of retry attempts. The recommended implementation is: datetime.process id.random number@hostname Taken directly from the `cXML` element of the `OrderRequest` or `InvoiceDetailRequest` document.

`DocumentReference` is optional. `StatusUpdateRequest` documents for invoices can use `InvoiceIDInfo` elements within `InvoiceStatus` elements to identify the invoices.

12.2.2 PaymentStatus

The `PaymentStatus` element contains the status of a PCard transaction. The status update includes information such as the success of the transaction, transaction ID, authorization ID, order ID, total, tax, shipping information, and the time stamp of the original submission.

A `StatusUpdateRequest` document is sent to a supplier in response to a `ConfirmationRequest` with `type="RequestToPay"` to a network hub. This `ConfirmationRequest` invokes a payment service where the network hub requests a payment service provider to perform a point of sale transaction against the PCard listed in the purchase order and return the status of the transaction. The network hub then sends the transaction status back to the supplier in a `StatusUpdateRequest` document. For example:

```
<StatusUpdateRequest>
    <DocumentReference payloadID="0c300508b7863dcclb_14999"/>
    <Status code="0" text="Approved">Approved</Status>
    <PaymentStatus orderID="PC100" transactionTimestamp="2000-01-08T10:00:06-
        08:00" type="Sale" transactionID="V20000212000" authorizationID="PN123">
        <PCard number="1234567890123456" expiration="2003-03-31"/>
        <Total>
            <Money currency="USD">500.00</Money>
        </Total>
        <Shipping>
            <Money currency="USD">20.00</Money>
            <Description xml:lang="en">shipping charge</Description>
        </Shipping>
        <Tax>
            <Money currency="USD">40.00</Money>
            <Description xml:lang="en">CA Sales Tax</Description>
        </Tax>
```

```
    </PaymentStatus>
</StatusUpdateRequest>
```

The `PaymentStatus` element contains the required `PCard` and `Total` element, and optionally `Shipping`, `Tax`, and `Extrinsic` elements.

The `PCard` element contains two attributes that specify the number of the PCard and its expiration date.

`PaymentStatus` has the following attributes

Attribute	Description
`orderID` (required)	Identifies the referenced order. It is copied from the ConfirmationRequest or the OrderRequest.
`transactionTimeStamp` (required)	Specifies the time when the payment transaction was submitted.
`type` (required)	Specifies the type of PCard transaction. Possible values: • `Authorization`—Authorizes the PCard. No charge is made. There is one authorization per order. • `Settlement`—Transfers the funds secured by a previous authorization transaction. • `Sale`—Initiates a charge to the PCard. • `Credit`—Initiates a credit against the original charge. Compensates for an order that did not meet buyer expectations, to make adjustments to an account that was overcharged, or to credit an account for items returned by a buyer.
`transactionID`	Assigned to the transaction by the payment processing gateway.
`authorizationID`	The authorization code for the transaction provided by the bank.

12.2.3 SourcingStatus

The `SourcingStatus` element provides update information for a RFQ sourcing transaction, `PunchOutSetupRequest` document with `operation="source"`.

```
<StatusUpdateRequest>
    <DocumentReference payloadID="123345678.RFQID:1234456787" />
    <Status code="200" text="OK">Approve Request</Status>
    <SourcingStatus action="approve" xml:lang="en"/>
</StatusUpdateRequest>
```

The `action` attribute identifies the update type for the transaction. Can be “approve”, “cancel”, or “deny”. The body of the `SourcingStatus` element can contain human-readable information about the new state of the RFQ.

12.2.4 InvoiceStatus

When using `StatusUpdateRequest` for invoices, include the `InvoiceStatus` element.

```
<StatusUpdateRequest>
```

```
    <Status code="201" text="OK">Approved</Status>
    <InvoiceStatus type="reconciled">
        <InvoiceIDInfo invoiceID="INV123" invoiceDate="2005-04-20T23:59:20-07:00"/>
    </InvoiceStatus">
</StatusUpdateRequest>
```

`InvoiceStatus` has the following attribute:

Attribute	Description
`type` (required)	Refers to the action taken by the buying organization on the invoice. Possible values: • `processing`—The invoice was received by the buying organization and is being processed. • `reconciled`—The invoice successfully reconciled. The amounts in the invoice have not yet been paid. • `rejected`—The invoice failed reconciliation. The buying organization is rejecting the invoice. The Comments element should contain free text explaining why the invoice was rejected, and the actions the supplier should take. The supplier can then resubmit a corrected invoice (a new invoice document with a new invoice number). • `paying`—The invoice has been approved for payment and is in the payment process. • `paid`—The invoice amounts have been paid by the buying organization.

12.2.4.1 InvoiceIDInfo

Use the `InvoiceIDInfo` element if the `DocumentReference` element is omitted. It identifies a specific invoice document by invoice ID and date, not by `payloadID` as required by `DocumentReference`.

`InvoiceIDInfo` has the following attributes:

Attribute	Description
`invoiceID` (required)	A supplier-generated identifier for the Invoice. This value is the `invoiceID` attribute that was in the `InvoiceDetailRequestHeader` of the invoice.
`invoiceDate`	Date and time the invoice was created.

12.2.4.2 PartialAmount

The `PartialAmount` element allows buying organizations to specify different amounts paid than the amounts specified in invoices. If invoices are paid in full, do not include `PartialAmount`. The existence of `PartialAmount` alerts the supplier to read the Comments elements which should contain more explanations on the differences.

12.2.5 DocumentStatus

Provides a status update for a document, such as a service sheet or an order confirmation.

`DocumentStatus` has the following attribute:

Attribute	Description
`type` (required)	Describes the type of document status. When updating a service sheet (`ServiceEntryRequest`), possible values are: • `approved`—The buying organization has approved the service sheet. • `canceled`—The buying organization has received the service sheet and has canceled it.. • `processing`—The buying organization has received the service sheet and is processing it. • `rejected`—The buying organization has rejected the service sheet. The `Comments` element should contain free text explaining why the service sheet was rejected and the actions the supplier should take. The supplier can resubmit a corrected service sheet (for example, a new `ServiceEntryRequest` document with a new `serviceEntryID`). When updating an order confirmation (`ConfirmationRequest`), the only possible value is `ConfirmationStatusUpdate`.

Here is an example of a `DocumentStatus` for a service sheet:

```
<Request>
    <StatusUpdateRequest>
        <DocumentReference payloadID="ss123456"></DocumentReference>
        <Status code="200" text="”OK></Status>
        <DocumentStatus type="approved">
            <DocumentInfo documentID="SES-1-A"
                documentType="ServiceEntryRequest"
                documentDate="2016-01-18T21:03:20-07:00 ">
            </DocumentInfo>
            <Comments>This service sheet has been approved.</Comments>
        </DocumentStatus>
    <StatusUpdateRequest>
</Request>
```

Here is an example of a `DocumentStatus` for an order confirmation:

```
<Request>
    <StatusUpdateRequest>
        <DocumentReference payloadID="oc123456" />
        <Status code="200" text="OK" />
        <DocumentStatus type="ConfirmationStatusUpdate">
            <!-- Status from the buyer's backend, lineNumber refers to the OC -->
            <ItemStatus type="rejected" code="out-of-tolerance">
                <ReferenceDocumentInfo lineNumber="1" />
                <Comments>Some back-ordered items have an
                    out-of-tolerance delivery date.</Comments>
            </ItemStatus>
            <ItemStatus type="approved">
                <ReferenceDocumentInfo lineNumber="2" />
            </ItemStatus>
        </DocumentStatus>
    <StatusUpdateRequest>
</Request>
```

12.2.5.1 DocumentInfo

Identifies an earlier document known to the system. It has the following attributes:

Attribute	Description
`documentID` (required)	The ID of a document known to the system.
`documentType` (required)	The document type. For a `StatusUpdateRequest` for a service sheet, `type` is `ServiceEntryRequest`.
`documentDate`	The date when the referenced document was created.

12.2.5.2 ItemStatus

Contains detailed information about an item when a buyer sends a `StatusUpdateRequest` in response to a `ConfirmationRequest`. For example, it could contain information from a back-end procurement system.

`ItemStatus` has the following attributes:

Attribute	Description
`type` (required)	Specifies the item status. Possible values: • `rejected`—The item was rejected. • `accepted`—The item was accepted.
`code`	Optional code for the item status from the back-end system.

`ItemStatus` has the following elements:

Element	Description

`ReferenceDocumentInfo` (required)	Contains information about a referenced document. It has two optional attributes:
	• `lineNumber`—Line number of an item in the referenced document
	• `status`—Status used to refer to the referenced document. Possible values are:
	  ○ `created`
	  ○ `released`
	  ○ `open`
	  ○ `completed`
	  ○ `closed`
	  ○ `cancelled`
	`ReferenceDocumentInfo` has the following elements:
	• `DocumentInfo` | `DocumentReference`
	• `DateInfo`
	• `Contact`
	• `Extrinsic`

Element	Description
`Comments`	Optional field for communicating arbitrary comments about the item status.

12.2.5.3 Comments

Optional field for communicating arbitrary comments about the document status.

12.2.6 Extrinsic

The `Extrinsic` element allows inclusion of additional information about the status of a document being updated.

12.3 ConfirmationRequest

This transaction provides detailed status updates on a specific Order Request. It extends the simple acknowledgment of an order, provided by `StatusUpdateRequest`, to a more detailed item level confirmation and ship notification.

> **Note**
>
> The DTD for this transaction is contained in `Fulfill.dtd` rather than `cXML.dtd`.

No specific Response document is required for this transaction. Servers must respond to a `ConfirmationRequest` with a generic `Response` document.

A document is one of the following types, specified by the type attribute of the `ConfirmationHeader` element: "`accept`," "`allDetail`," "`detail`," "`backordered`," "`except`," "`reject`," "`requestToPay`," and "`replace`." With a type of "`detail`", you can update portions of a purchase order, such as prices, quantities, and delivery dates, reject portions, and add tax and shipping information. Only the line items mentioned are changed. With a type of "`allDetail`", you can update all information of specified line items without rejecting or accepting the order. You can apply the confirmation to the entire order request using the types "`accept`", "`reject`", and "`except`". "`allDetail`" and "`detail`" update individual lines, they do not accept or reject the entire order.

A `ConfirmationRequest` with `type="requestToPay"` invokes a payment service where the network hub requests a payment service provider to perform a point of sale transaction against the PCard listed in the purchase order and return the status of the transaction. The network hub then sends the transaction status back to the supplier in a `StatusUpdateRequest` document.

The following example shows a `ConfirmationRequest` element that is of type "`accept`".

```
<ConfirmationRequest>
    <!-- Without the confirmID, it remains possible to update this
    confirmation. An update would refer (in the OrderReference element) to the same
    OrderRequest document, would describe the status of the same items, and would
```

```
    point to this document through its DocumentReference element. However, the
    confirmID makes the update much more explicit.-->
    <ConfirmationHeader type="accept" noticeDate="2000-10-12T18:39:09-08:00"
        confirmID="C999-234" invoiceID="I1010-10-12">
        <Shipping>
            <Money currency="USD">2.5</Money>
            <Description xml:lang="en-CA">FedEx 2-day</Description>
        </Shipping>
        <Tax>
            <Money currency="USD">0.19</Money>
            <Description xml:lang="en-CA">CA Sales Tax</Description>
        </Tax>
        <Contact role="shipFrom">
            <Name xml:lang="en-CA">Workchairs, Vancouver</Name>
            <PostalAddress>
                <Street>432 Lake Drive</Street>
                <City>Vancouver</City>
                <State>BC</State>
                <PostalCode>B3C 2G4</PostalCode>
                <Country isoCountryCode="CA">Canada</Country>
            </PostalAddress>
            <Phone>
                <TelephoneNumber>
                    <CountryCode isoCountryCode="CA">1</CountryCode>
                    <AreaOrCityCode>201</AreaOrCityCode>
                    <Number>9211132</Number>
                </TelephoneNumber>
            </Phone>
        </Contact>
        <Comments xml:lang="en-CA">Look's great</Comments>
    </ConfirmationHeader>
    <!-- The orderID and orderDate attributes are not required in the
        OrderReference element. -->
    <OrderReference orderID="DO1234">
        <DocumentReference payloadID="32232995@hub.acme.com" />
    </OrderReference>
</ConfirmationRequest>
```

Multiple "`detail`" `ConfirmationRequest` documents can refer to a single purchase order, but they must not refer to common line items.

To perform a substitution, include a `ConfirmationItem` element to specify the item to be replaced, then provide an `ItemIn` element for the replacement. Only use `ItemIn` elements for substitutions. You should then wait for a corresponding change order from the buyer before shipping.

The `ConfirmationRequest` element is a request to add confirmation information to the data known about an order at the receiving server. It can contain three elements: `ConfirmationHeader`, `OrderReference`, and an optional `ConfirmationItem`. If the Confirmation Request type specified in the `ConfirmationHeader` is either "`detail`" or "`except`", you can include `ConfirmationItem` elements to update specific line items from a purchase order.

While suppliers send multiple confirmations for a purchase order, each confirmation must mention a line item only once. In addition, a line item must not be mentioned in more than one confirmation request. Multiple confirmations are allowed, and sensible, only for "`allDetail`" or "`detail`". Only one confirmation per order is allowed for "`accept`", "`except`", or "`reject`". When a confirmation with one of these types arrives, the receiving system must discard all previous confirmations for the purchase order.

`ConfirmationItem` elements can appear in any order within the `ConfirmationRequest` document. However, listing the `lineNumber` elements in ascending order is preferred. Again, no line item can appear more than once within a `ConfirmationRequest` element.

The `ConfirmationRequest` can include the `OrderStatusRequestReference` and `OrderStatusRequestIDInfo` as optional elements to explicitly reference the `OrderStatusRequest` associated to the `ConfirmationRequest`.

Related Information

OrderStatusRequest [page 249]

12.3.1 OrderReference

The `OrderReference` element provides a clear reference to a purchase order. While the contained `DocumentReference` provides an unambiguous reference, the additional attributes of the `OrderReference` allow the `ConfirmationRequest` and `ShipNoticeRequest` to be viewed independently. The `OrderReference` contains a `DocumentReference` element and two attributes: `orderID` and `orderDate`.

`OrderReference` has the following attributes:

Attribute	Description
`orderID`	Specifies the buyer system `orderID` for the confirmation, that is, the PO number. When used, it must be copied directly from the referenced `OrderRequest` `OrderRequestHeader` element.
`orderDate`	Specifies the date and time the `OrderRequest` was created. If present, it must be copied directly from the referenced `OrderRequest` `OrderRequestHeader` element.

Related Information

DocumentReference [page 254]

12.3.2 ConfirmationHeader

The `ConfirmationHeader` element contains information that is common to all items contained in the `ConfirmationRequest`. It has the following attributes:

`ConfirmationHeader` has the following attributes:

Attribute	Description
`confirmID`	A supplier-specified optional identifier for the document assigned by the supplier. The attribute is user-visible and secondary to the document's `PayloadID`. This value does not vary as a particular confirmation is updated. That is, documents with `operation="update"` describing the status of the same items in the same order share a `confirmID` with the original ConfirmationRequest with `operation="new"`. When the `confirmID` does not appear in an `operation="new"` ConfirmationRequest, it must not appear in a corresponding `operation="update"` document. The `DocumentReference` element contained in the update's `ConfirmationHeader` and the `payloadID` attribute of the original or previous update link the two documents.
`operation`	Specifies whether the confirmation is new, or an update to a previous confirmation. Possible values: • `new`—Default value. No previous confirmation request has been sent. • `update`—Updates a previous confirmation request. The `confirmID` must match a previous request's `confirmID`.

Attribute	Description
`type` (required)	Specifies the type of confirmation. Possible values: • `accept`—Accepts the entire order as described in the referenced purchase order. A document of this type can contain `ConfirmationItem` elements. They must contain only `ConfirmationStatus` elements of `type="accept"`. • `allDetail`—Updates only specific line items. Line items not mentioned retain their current status. Unlike the `"detail"` type, this type of confirmation includes all information known by the supplier, whether or not it differs from the data provided in the original `OrderRequest` document. This confirmation is compatible with current EDI and order entry tools, which commonly send buyers a snapshot of an order in supplier's systems. Due to the reconciliation issues caused by confirmations of this type, it is recommended that this type be considered as a "bridge" strategy for the short term. This confirmation must contain `ConfirmationItem` elements and `ConfirmationStatus` elements must have types `"allDetail"`, `"reject"`, or `"unknown"`. Do not include `"accept"` or `"detail"` `ConfirmationStatus` types because they could conflict. • `detail`—Updates individual line items. Line items not mentioned retain their current states. This document type should include only information that differs from the information in the purchase order. Do not include the variations described in an earlier `ConfirmationRequest` in later `ConfirmationRequest` documents that restore information provided in the purchase order. For example, the Tax element might appear in the `ConfirmationStatus` of one `ConfirmationRequest` but not in an update to that confirmation. This signifies that the purchase order contained the correct charge. This document type must contain `ConfirmationItem` elements and `ConfirmationStatus` elements can have any type except `"allDetail"`. • `backordered`—Sets the entire purchase order to backordered status. The supplier does not have the items in stock, but will ship them when they are available. • `except`—Accepts the entire purchase order with exceptions. Line items not mentioned are as described in the purchase order. This document type must contain `ConfirmationItem` elements and `ConfirmationStatus` elements can have any type except `"allDetail"`.
`noticeDate` (required)	Specifies the date and time the confirmation document was created.
`invoiceID`	Optional supplier-generated identifier for an invoice associated with the items described in this confirmation. It is identical to the Invoice Number that appears at the top of a physical invoice.

Attribute	Description
incoTerms	Specifies optional shipping terms defined by the International Chamber of Commerce. These terms inform the buyer which portion of the shipping charges are their responsibility. Possible values: • cfr—Cost and freight. • cif—Cost, insurance, and freight. • cip—Carriage and insurance paid to. • cpt—Carriage paid to. • daf—Delivered at frontier. • ddp—Delivered duty paid. • ddu—Delivered duty unpaid. • deq—Delivered ex quay (duty paid). • des—Delivered ex ship. • exw—Ex works. • fas—Free alongside ship. • fca—Free carrier. • fob—Free on board vessel.
version	The version number for this confirmation. It should start with 1 and should be incremented by 1 for each subsequent version (2,3,4...).

The `ConfirmationHeader` element can contain the following elements:

- `DocumentReference`
- `Tax`
- `Shipping`
- `Total`
- `Contact`
- `Hazard`
- `Comments`
- `IdReference`
- `Extrinsic`

If the `ConfirmationHeader` is either, `"allDetail"`, `"detail"` or `"except"`, you can include `ConfirmationItem` elements to update specific line items from a purchase order.

The following example shows a `ConfirmationRequest` of type `"except"`:

```
<ConfirmationRequest>
    <!-- Without the confirmID, it remains possible to update the original
confirmation.
    This update refers (in the OrderReference element) to the same OrderRequest
    document, describes the status of the same items and refers to the original
    confirmation document in the DocumentReference element. However, the confirmID
    makes the update much more explicit.
    Note: The noticeDate changes to match the time of the update and not the
original
    confirmation time.-->
    <ConfirmationHeader type="except" noticeDate="2000-10-13T18:39:09-08:00"
            confirmID="C999-234" operation="update"
```

```
            invoiceID="I1102-10-13">
        <DocumentReference payloadID="1233444-2001@premier.workchairs.com" />
        <Total>
            <Money currency="USD">190.60</Money>
        </Total>
        <Shipping>
            <Money currency="USD">2.5</Money>
            <Description xml:lang="en-CA">FedEx 2-day</Description>
        </Shipping>
        <Tax>
            <Money currency="USD">0.19</Money>
            <Description xml:lang="en-CA">CA Sales Tax</Description>
        </Tax>
        <Contact role="shipFrom">
            <Name xml:lang="en-CA">Workchairs, Vancouver</Name>
            <PostalAddress>
                <Street>432 Lake Drive</Street>
                <City>Vancouver</City>
                <State>BC</State>
                <PostalCode>B3C 2G4</PostalCode>
                <Country isoCountryCode="CA">Canada</Country>
            </PostalAddress>
            <Phone>
                <TelephoneNumber>
                    <CountryCode isoCountryCode="CA">1</CountryCode>
                    <AreaOrCityCode>201</AreaOrCityCode>
                    <Number>9211132</Number>
                </TelephoneNumber>
            </Phone>
        </Contact>
        <Comments xml:lang="en-CA">Look's great, but for the price.</Comments>
    </ConfirmationHeader>
    <!-- The orderID and orderDate attributes are not required in the OrderReference
    element. -->
    <OrderReference orderID="DO1234">
        <DocumentReference payloadID="32232995@hub.acme.com" />
    </OrderReference>
    <ConfirmationItem lineNumber="1" quantity="10">
        <UnitOfMeasure>EA</UnitOfMeasure>
        <ConfirmationStatus quantity="10" type="detail" shipmentDate="2000-10-14"
            deliveryDate="2000-10-19">
            <UnitOfMeasure>EA</UnitOfMeasure>
            <UnitPrice>
                <Money currency="USD">1.64</Money>
            </UnitPrice>
            <Comments xml:lang="en-CA">Very sorry. There's been a slight
            (30 cents) price increase for that colour and it will be one day late.
            </Comments>
        </ConfirmationStatus>
    </ConfirmationItem>
</ConfirmationRequest>
```

12.3.2.1 DocumentReference

The `DocumentReference` element should appear only when `operation` is `"update"`. It should reference the most recent `ConfirmationRequest` document for this particular confirmation, usually indicated by a common `confirmID`. For example, when a confirmation is created, updated, and then updated again, the final document should contain a `DocumentReference` referring to the previous `ConfirmationRequest` with `operation="update"`. That document, in turn, refers to the original `operation="new"` `ConfirmationRequest` document.

12.3.2.2 Tax and Shipping

`Tax` and `Shipping` amounts can be updated and included in the confirmation with new values without any corresponding line item information.

12.3.2.3 Total

The `Total` value should match the OrderRequest document value unless a `ConfirmationItem` describes a new `UnitPrice` or `quantity`. It is not necessary to copy this information from the OrderRequest document: although permissible, Total, Tax, and Shipping information should not be included if they match those amounts in the original order.

The `Total` element also contains the `Modifications` element which stores any modification to the original price or shipping price of the item. This element can store a set of one or more `Modification` elements.

The `Modification` element contains details of the allowances and charges applicable at the header-level. For more information, see Total [page 106].

12.3.2.4 Contact

The `Contact` element should be used primarily to add new information about an order. It is not necessary to copy this information from the `OrderRequest` document.

`Contact role values` include:

Attribute	Description
`technicalSupport`	Technical support
`customerService`	Customer service
`sales`	Sales
`shipFrom`	Starting point for shipments related to this order
`shipTo`	Copies the ShipTo element from the `OrderRequest` document
`payTo`	Where payment for this order should be sent
`billTo`	Copies the BillTo element from the `OrderRequest` document
`supplierCorporate`	Supplier at corporate

Elements in the `Contact` list can appear in any order. A contact role must not appear more than once within a `ConfirmationHeader` element.

12.3.2.5 Hazard

Elements in the `Hazard` list can appear in any order. The same hazard should not be listed more than once in a `ConfirmationHeader` element. Each hazard listed at this level should apply to the entire order or all items mentioned in the confirmation. A `ConfirmationRequest` that updates the status of a single line item should not include `Hazard` elements in the `ConfirmationItem` element. See Hazard [page 268] for more information.

12.3.2.6 Comments

The `Comments` element can contain additional information about the status of the overall order, or the portion described in this confirmation, such as payment terms, additional details on shipping terms and clarification of the status. For status information, terms such as “backordered”, “shipped”, and “invalid” might be appropriate. All such data are intended for human use.

12.3.2.7 IdReference

Defines an ID reference. The identifier/domain pair should be unique within each trading partner relationship (a buying organization and a supplier).

`IdReference` has the following attributes:

Attribute	Description
`identifier` (required)	The unique identifier of the `IdReference` within the domain. If `domain` is `supplierReference`, `identifier` can be one of the following values: • Internal Supplier Number—This is the most common scenario. It represents the document number created by the internal supplier ERP system. • Contract Number—The contract number can be used to identify that a specific outbound document is related to a specific contract. • Internal criteria—Sometimes the supplier can enter a customized value in the field Supplier Reference Number. For example, it can be the name of the person in charge of the follow-up of the transaction.
`domain` (required)	The domain of the `IdReference`. Possible values are: `accountID`, `bankRoutingID`, `accountPayableID`, `accountReceivableID`, `bankAccountID`, `ibanID`, `abaRoutingNumber`, `bankNationalID`, `isoBicID`, `swiftID`, `bankBranchID`, `federalTaxID`, `stateTaxID`, `provincialTaxID`, `vatID`, `gstID`, and `taxExemptionID`. `supplierTaxID` is deprecated and will be treated as `federalTaxID`. Other possible values could be `1099ID`, `courtRegisterID`, `supplierReference`, `governmentNumber`, `documentName`, and so on.

IdReference has the following elements:

Element	Description
Creator	The creator of this IdReference.
Description	Textual description of the IdReference, for human readability.

12.3.2.8 Extrinsic

The Extrinsic element list can be used to insert additional data about the order for application consumption. These elements can include pre-defined keywords and values affecting workflow in the receiving system.

Elements in the Extrinsic list can appear in any order. An extrinsic type must not appear more than once within a ConfirmationHeader element. A type must not be mentioned both in this list and in a particular ConfirmationStatus element. The ConfirmationHeader must not contain a default extrinsic value overridden at the lower level.

12.3.3 ConfirmationItem

The ConfirmationItem element completely describes the status of a specific line item. The ConfirmationItem element can contain the following elements: UnitOfMeasure, ConfirmationStatus, Contact, and Hazard. ConfirmationStatus can occur more than once, and only Contact is optional.

ConfirmationItem has the following attributes:

Attribute	Description
quantity (required)	Specifies how many items were ordered. Expressed in units given in the UnitOfMeasure element. Matches the quantity value for the line item's ItemOut element in the corresponding OrderReference element.
lineNumber (required)	Position, counting from 1, of the item in an order. Matches the corresponding line item, ItemOut, in the document referenced by the OrderReference element.
parentLineNumber	The line number of the corresponding parent line item. This attribute is applicable only for a line item with itemType="item".
itemType	Specifies whether the line item is a grouped item having child items or an independent line item. Possible values are “composite” to identify an item group or “item” to identify an independent line item. This attribute is applicable only for a line item with an item group.
compositeItemType	Specifies whether a parent item uses group-level pricing. Possible values are "groupLevel" or "itemLevel".

You can use more than one ConfirmationRequest document to update the status of an entire order, but only mention a particular line item in one document and in only one ConfirmationItem within that document.

12.3.3.1 Contact

Use `Contact` elements in the `ConfirmationItem` to describe contacts specific to the item. The elements can be in any order. If you specify a particular Contact role, specify it in the `ConfirmationItem` or `ConfirmationHeader` but not both. Do not specify the role more than once within a `ConfirmationItem`.

List elements in the Contact list in any order. Do not add a `Contact role` attribute more than once within a `ConfirmationItem` element.

12.3.3.2 Hazard

See Hazard [page 268].

12.3.3.3 ConfirmationStatus

The `ConfirmationStatus` element provides the status of a specific line item or portion thereof. Quantities at this level must sum to the quantity in the containing `ConfirmationItem`. Use a consistent `UnitOfMeasure` in the `ConfirmationItem` element and its contained `ConfirmationStatus` element. In a substitution, you can use a different `UnitOfMeasure` in the `ItemDetail` contained within the `ItemIn` element.

When accepting or rejecting an item, include only a `UnitOfMeasure` element in the `ConfirmationStatus` element.

Use an `ItemIn` element only to recommend a substitution. With a substitution, you must match the quantity of the `ItemIn` element to that of the containing `ConfirmationStatus`, unless the `UnitOfMeasure` has changed. This requires an `ItemDetail` element within the `ItemIn` element.

The `ConfirmationStatus` element also contains the `Modifications` element. The `Modification` element contains details of the allowances and charges applicable at the line-item level. For more information, see Total [page 106].

The following example shows a `Modification` element:

```
<ConfirmationItem quantity = "3" lineNumber = "1">
    <UnitOfMeasure>DZ</UnitOfMeasure>
    <ConfirmationStatus type = "unknown" quantity = "1">
        <UnitOfMeasure>DZ</UnitOfMeasure>
    </ConfirmationStatus>
    <ConfirmationStatus type = "accept" quantity = "2">
        <UnitOfMeasure>DZ</UnitOfMeasure>
        <UnitPrice>
        <Money currency = "USD">47</Money>
            <Modifications>
                <Modification>
                    <OriginalPrice>
                        <Money currency = "USD">45.00</Money>
                    </OriginalPrice>
                    <AdditionalDeduction>
                        <DeductionAmount>
                        <Money currency = "USD">5.00</Money>
                        </DeductionAmount>
```

```
                    </AdditionalDeduction>
                    <ModificationDetail
                        name = "Allowance"
                        startDate = "2012-08-03T10:15:00-08:00"
                        endDate = "2013-11-30T10:15:00-08:00">
                        <Description xml:lang = "en-US">Contract Allowance
                        <Description>
                    </ModificationDetail>
                </Modification>
            </Modifications>
        </UnitPrice>
        <Tax>
            <Money currency = "USD">7.0</Money>
            <Description xml:lang = "en">Tax</Description>
            <TaxDetail category = "Other">
                <TaxAmount>
                    <Money currency = "USD">5.0</Money>
                </TaxAmount>
            </TaxDetail>
            <TaxDetail category = "QST">
                <TaxAmount>
                    <Money currency = "USD">2.0</Money>
                </TaxAmount>
            </TaxDetail>
        </Tax>
    </ConfirmationStatus>
</ConfirmationItem>
```

You can update `UnitPrice`, `Tax` and `Shipping` amounts in the `ConfirmationStatus` element without a complete part substitution. It is not necessary to copy this information from the `OrderRequest` document. Do not include `UnitPrice`, `Tax`, and `Shipping` if they match those in the original `ItemOut` element. You can also update the `PriceBasisQuantity` in the `ConfirmationStatus` element if you are confirming an order containing quantity-based pricing.

When the type is `"accept"`, `"allDetail"`, or `"detail"`, you can add tax or shipping amounts not mentioned in the original order. Use the `"accept"` type when these additions are the only changes to the order. Use the `"detail"` type to indicate a substitution if there is an `ItemIn` element, a price change if there is a `UnitPrice` element, or a delayed shipment if there is a `deliveryDate` attribute. The `"allDetail"` type requires reconciliation software to determine what has changed since the original order.

Use the `Comments` element to add information about the status of this portion of the item. Terms such as `"backordered"`, `"shipped"`, and `"invalid"` might be sensible. All such data is intended for human use.

Alternately, use the `Extrinsic` element list to insert additional data about this particular item portion for application consumption. These elements can include pre-defined keywords and values affecting workflow in the receiving system.

Elements in the `Extrinsic` list can appear in any order. An extrinsic attribute value must not appear more than once within a `ConfirmationStatus` element. A type must not be mentioned both in this list and in the overall `ConfirmationHeader` element. The `ConfirmationHeader` must not contain a default extrinsic value overridden at this lower level.

`ConfirmationStatus` has the following attributes:

Attribute	Description
`quantity` (required)	Specifies how many items have this status. Expressed in the units specified in the `UnitOfMeasure` element.

Attribute	Description
`type` (required)	Specifies the status of this portion of the order. Possible values: • `accept`—Accept this portion as described in the referenced `ItemOut` element. • `allDetail`—Accept this portion of the line item as detailed in the contents of this `ConfirmationStatus` element. These contents completely describe what will be shipped. Unlike the "detail" type, this confirmation type includes all information known by the supplier, whether or not it differs from the data provided in the original `OrderRequest` document. This type is provided for compatibility with current EDI and order entry tools, which commonly send the buyer a snapshot of an order in the supplier's systems. Due to the reconciliation issues caused by confirmations of this type, it is recommended that you use this type as a "bridge" strategy suitable only for the short term. Allowed only in documents whose `ConfirmationHeader` type is `"allDetail"`. • `detail`—Accept this portion with the changes detailed in the `ConfirmationStatus` element. At least one of the `UnitPrice`, `Shipping`, `Tax`, or `ItemIn` elements, or the `deliveryDate` attribute must be present. This is a substitution if there is an `ItemIn` element, a price change if there is a `UnitPrice` element, or a delayed shipment if there is a `deliveryDate` attribute. • `reject`—Reject this portion of the line item. • `requestToPay`—Requests payment for this portion of the line item. It initiates a request to the financial institution to begin the settlement process of the portion of the line item. This type is allowed in documents with overall request (`ConfirmationHeader`) type `"requestToPay"`. • `unknown`—The status of this portion of the line item is not known at the time of this confirmation. This line item status provides a placeholder while the supplier does further research. Update confirmations can also reset the status of a line item portion to `"unknown"` when an earlier confirmation incorrectly accepted or rejected that portion. Allowed only in documents whose `ConfirmationHeader` type is `"allDetail"`, `"detail"`, or `"except"`. • `backordered`—Sets this portion of the line item to backordered status. The supplier does not have the items in stock, but will ship them when they are available.
`shipmentDate`	Specifies the date and time this shipment is expected to leave the supplier. Use the `ConfirmationStatus` element to include this information if the type is `"accept"`, `"allDetail"`, or `"detail"`.
`deliveryDate`	Specifies the new date and time this shipment is expected to arrive. Do not include if the value matches the `requestedDeliveryDate` attribute, if any, in the corresponding `OrderRequest` document. Otherwise, use the `ConfirmationStatus` element to include this information if its type is `"accept"`, `"allDetail"`, or `"detail"`.

SupplierBatchID

See SupplierBatchID or Batch [page 269].

12.4 OrderStatusRequest

Buyers use the `OrderStatusRequest` document to ask suppliers for status reports on orders not yet fulfilled. Buyers can request information from suppliers on the status of the order, delivery date, current location of the shipped items, or any other related information regarding purchase orders previously sent by them.

`OrderStatusRequest` documents contain the following elements:

- `OrderStatusRequestHeader`
- `OrderStatusRequestItem`

12.4.1 OrderStatusRequestHeader

The `OrderStatusRequestHeader` element stores the reference information about the `OrderStatusRequest` document.

The `OrderStatusRequestHeader` element has the following elements:

Element	Description
`OrderReference` `OrderIDInfo`	The reference to the purchase order. You can specify either the `OrderReference` or `OrderIDInfo` information.
`Contact`	The contact information of the buyer. This is a mandatory field.
`Comments`	This element stores the comments from the buyer. This is an optional field
`Extrinsic`	Any extrinsic sent by the buyer. This is an optional field.

The `OrderStatusRequestHeader` element has the following attributes:

Attribute Name	Description
`orderStatusRequestID` (required)	The system ID of the buyer sending the `OrderStatusRequest`. This is an internal unique number for the buyer.
`orderStatusRequestDate` (required)	The date and time when the `OrderStatusRequest` was created by the buyer.

The following example shows an `OrderStatusRequestHeader` element:

```
<OrderStatusRequestHeader orderStatusRequestID="osrFor_order02_08.20"
orderStatusRequestDate="2013-02-06T16:09:26-08:00">
    <OrderReference orderID="order02_08.20" orderDate="2013-02-06T16:09:26-08:00">
        <DocumentReference  payloadID="order02_08.20@cvbuyer.com"/>
    </OrderReference>
    <Contact role="soldTo" addressID='AA20'>
        <Name xml:lang="en">Lisa Dollar</Name>
        <PostalAddress name='default'>
            <DeliverTo>Lisa Dollar</DeliverTo>
            <Street>100 Castro Street</Street>
```

```
            <City>Mountain View</City>
            <State>CA</State>
            <PostalCode>95035</PostalCode>
            <Country isoCountryCode="US">United States</Country>
            <Extrinsicname='POBox'></Extrinsic>
            <Extrinsicname='houseNumber'></Extrinsic>
            <Extrinsicname='building'></Extrinsic>
        </PostalAddress>
        <Email name='default'>ldollar@workchairs.com</Email>
        <Phone name='work'>
            <TelephoneNumber>
                <CountryCode isoCountryCode="US">1</CountryCode>
                <AreaOrCityCode>650</AreaOrCityCode>
                <Number>9990000</Number>
            </TelephoneNumber>
        </Phone>
    </Contact>
    <Contact role='from' addressID='0030105956'>
        <Name xml:lang="en">Lisa Dollar</Name>
        <PostalAddressname='default'>
            <DeliverTo>Lisa Dollar</DeliverTo>
            <Street>100 Castro Street</Street>
            <City>Mountain View</City>
            <State>CA</State>
            <PostalCode>95035</PostalCode>
            <Country isoCountryCode''US'>United States</Country>
        </PostalAddress>
        <Email name='default'>ldollar@workchairs.com</Email>
        <Phone name='work'>
        <TelephoneNumber>
        <CountryCode isoCountryCode='US'>1</CountryCode>
        <AreaOrCityCode>650</AreaOrCityCode>
        <Number>9990000</Number>
        </TelephoneNumber>
    </Phone>
</Contact>
        <Comments>Is there any news about our order?</Comments>
    </OrderStatusRequestHeader>
```

12.4.2 OrderStatusRequestItem

The `OrderStatusRequestItem` element stores information regarding a specific line item. This element contains the following elements: `ItemReference`, `Comments`.

The following example shows an `OrderStatusRequestItem` element:

```
<OrderStatusRequestItem>
    <ItemReference lineNumber="10">
        <ItemID>
            <SupplierPartID>10</SupplierPartID>
        </itemID>
    </ItemReference>
    <Comments>We did not receive the requested quantity.</Comments>
</OrderStatusRequestItem>
```

12.4.2.1 ItemReference

The `ItemReference` element has the following elements::

Element	Description
`ItemID`	The part ID of the line item in the `OrderStatusRequest`.
`IDReference`	The unique reference to the part number for the line item in the `OrderStatusRequest`.
`Classification`	The recommended commodity classification code for the line item.
`Description`	Description of the line item.

The `ItemReference` element has the `lineNumber` attribute which is a mandatory field. This line number corresponds to the line number available in the `OrderRequest`.

12.5 ShipNoticeRequest

Suppliers use the `ShipNoticeRequest` document to send shipment information about orders. This transaction describes a single shipment and can contain portions of multiple orders as well as hazard information for the entire shipment or individual line items.

> **Note**
>
> The DTD for this transaction is contained in `Fulfill.dtd` rather than `cXML.dtd`.

`ShipNoticeRequest` can contain the following elements:

- `ShipNoticeHeader`
- `ShipControl`
- `ShipNoticePortion`

`ShipNoticeRequest` documents do not provide updates to tax and shipping amounts. This information should be transmitted with `ConfirmationRequest` documents. If necessary, you can send a `ConfirmationRequest` with `operation="update"` with this information after the shipment has been delivered.

`ConfirmationRequest` and `ShipNoticeRequest` documents with `operation="update"` must include all relevant information from the original `OrderRequest` document.

The following example shows a `ShipNoticeRequest` element:

```
<ShipNoticeRequest>
    <ShipNoticeHeader shipmentID="S2-123" noticeDate="2000-10-14T18:39:09-08:00"
        shipmentDate="2000-10-14T08:30:19-08:00"
        deliveryDate="2000-10-18T09:00:00-08:00">
        <Contact role="shipFrom">
            <Name xml:lang="en-CA">Workchairs, Vancouver</Name>
            <PostalAddress>
                <Street>432 Lake Drive</Street>
                <City>Vancouver</City>
                <State>BC</State>
```

```
                <PostalCode>B3C 2G4</PostalCode>
                <Country isoCountryCode="CA">Canada</Country>
            </PostalAddress>
            <Phone>
                <TelephoneNumber>
                    <CountryCode isoCountryCode="CA">1</CountryCode>
                    <AreaOrCityCode>201</AreaOrCityCode>
                    <Number>9211132</Number>
                </TelephoneNumber>
            </Phone>
        </Contact>
        <Comments xml:lang="en-CA">Got it all into one shipment.</Comments>
    </ShipNoticeHeader>
    <ShipControl>
        <CarrierIdentifier domain="SCAC">FDE</CarrierIdentifier>
        <CarrierIdentifier domain="companyName">Federal Express</CarrierIdentifier>
        <ShipmentIdentifier>8202 8261 1194</ShipmentIdentifier>
    </ShipControl>
    <ShipNoticePortion>
    <!-- The orderID and orderDate attributes are not required in the OrderReference
        element. -->
        <OrderReference orderID="DO1234">
            <DocumentReference payloadID="32232995@hub.acme.com" />
        </OrderReference>
    </ShipNoticePortion>
</ShipNoticeRequest>
```

The `ShipNoticeRequest` element contains information about a ship notice common to all contained items. It is not necessary to copy this information from the `OrderRequest` document. The `Contact` element should be used primarily to add new information about an order.

The `ShipNoticeRequest` element contains three elements: `ShipNoticeHeader`, `ShipControl`, and `ShipNoticePortion`. All are required, and both `ShipNoticePortion` and `ShipControl` can occur more than once.

Shipments with multiple responsible carriers are described in one of two ways:

1. A single carrier or third-party logistics provider creates a tracking identifier that can be used to retrieve information about the entire trip. Suppliers send such information in a single `ShipControl` element.
2. Each segment requires a separate tracking number. Suppliers send such information with one `ShipControl` element per segment.

`ShipControl` elements must appear in the order the shipment will travel. The first such element must not have an explicit starting date, the `ShipControl startDate` attribute must not be present, and that carrier's control must begin at the shipment's origination time specified by the `ShipNoticeHeader shipmentDate` attribute value. All later `ShipControl` elements must have increasing, or later, starting dates specified by the `ShipControl startDate` attribute value.

`ShipNoticePortion` elements can appear in any order. A particular order, with `ShipNoticePortion`, `OrderReference`, or `DocumentReference payloadID` attribute value, must not appear more than once in a `ShipNoticeRequest` element.

Note

Many elements and attributes in the `ShipNoticeRequest` and `ShipNoticeHeader` elements are optional only for the `operation="delete"` case. For other operations, one or more `ShipControl` and `ShipNoticePortion` elements must appear in a `ShipNoticeHeader` element.

12.5.1 ShipNoticeHeader

The `ShipNoticeHeader` element contains information about a ship notice common to all contained items. The `ShipNoticeHeader` element can contain the following elements: `ServiceLevel`, `DocumentReference`, `Contact`, `Hazard`, `Comments`, `TermsofDelivery`, `IdReference`, `Comments`, `Extrinsic`, `RequestedDeliveryDate`, and `Dimension`, all of which are optional.

`ShipNoticeHeader` has the following attributes:

Attribute	Description
`shipmentID` (required)	A supplier-specified optional identifier for the document. The attribute is user-visible and secondary to the document's `PayloadID`. This value does not vary as a particular ship notice is deleted. That is, `"delete"` documents describing the same shipment share a `shipmentID` with the original `"new"` `ShipNoticeRequest`.
`operation`	This optional attribute specifies whether the `ShipNoticeRequest` document is new or an update to a previous ship notice. Possible values: • `new`—Default value. No previous ship notice has been sent. • `update`—Updates a previous ship notice request. Allows a supplier to correct an error in a ship notice or to add additional information learned later. In either case, an "update" document must be complete: all data from the original should be discarded by the recipient. The `shipmentID` must match a previous request's `shipmentID`. • `delete`—Removes the changes described in the previous new or updated `ShipNoticeRequest` from the state of the shipment. Only use when the supplier discards a planned shipment or incorrectly sends a `ShipNoticeRequest` about an order that will not take place. The `shipmentID` must match a previous request's `shipmentID`. If the operation is not `"new"`, explicitly or by default, you must also include in the `ShipNoticeRequest` a `DocumentReference` element in the `ShipNoticeHeader` element. See DocumentReference [page 254] for more information on this element. This effectively sequences multiple versions of a ship notice.
`noticeDate` (required)	Specifies the date and time the `ShipNoticeRequest` document was created.
`shipmentDate`	The date and time the shipment left the supplier. You must specify this attribute in all `ShipNoticeRequest` documents except when the `operation` is `"delete"`.
`deliveryDate`	Specifies the date and time this shipment is expected to arrive. While this value can default to the `requestedDeliveryDate` of a single order, that attribute is optional in an `OrderRequest` document, and the `ShipNoticeRequest` can refer to multiple `OrderRequest` documents. You must include this attribute in all `ShipNoticeRequest` documents except when the `operation` is `"delete"`.

Attribute	Description

shipmentType	Use this attribute to specify if the type of ship notice was actual or estimated. Specify "actual" to indicate an actual ship notice and "planned" for an estimated ship notice.
	
	When you specify "actual", you must enter the actual shipping date. If you specify "planned", you must enter the estimated shipping date. For example:
	
	`<ShipNoticeRequest>`
	`  <ShipNoticeHeader shipmentType="planned"`
	`  deliveryDate="2012-09-28T12:00:00+05:30"`
	`  shipmentDate="2012-09-27T12:00:00+05:30"`
	`  noticeDate="2012-09-27T21:30:29+05:30"`
	`  operation="new"`
	`  shipmentID="ID00099">`

fulfillmentType	The type of fulfillment for which this shipment notice is created. Possible values are "partial" if all the items are not being shipped and "complete" if the whole order is being shipped.

requestedDeliveryDate	Specifies the desired date of delivery. In many cases, it can reflect the time (or time frame) when the buyer is able and willing to receive the goods. For example:
	
	`<ShipNoticeHeader shipmentType="planned"`
	`  shipmentID="S89823-123"`
	`  operation="new”`
	`  noticeDate="2001-10-14"`
	`  shipmentDate="2001-10-14T08:30:19-08:00`
	`  deliveryDate="2001-10-18T09:00:00-08:00"`
	`  requestedDeliveryDate="2001-10-18T09:00:00-08:00" >`

12.5.1.1 ServiceLevel

Specifies a language-specific string for the service level code. One or more `ServiceLevel` elements must appear in all `ShipNoticeRequest` documents, except when `operation="delete"` is specified. Each `ServiceLevel` must contain a single string corresponding to the level of service, such as `"overnight"`, provided by the carrier for this shipment. When multiple `ServiceLevel` elements appear, all must describe the same level of service in different languages or locales. No two `ServiceLevel` elements can have the same `xml:lang` attribute. Elements in such a list can appear in any order.

It has the required attribute `xml:lang`. For more information, see xmlLangCode [page 48].

12.5.1.2 DocumentReference

The contained `DocumentReference` element appears only when the operation is `"update"` or `"delete"`. In that case, the `DocumentReference` element references the most recent ShipNoticeRequest document for this particular ship notice, usually indicated by a common `shipmentID`. For example, when a ship notice is created, updated, and then updated again, the final document should contain a `DocumentReference` referring to the

previous `ShipNoticeRequest` with `operation="update"`. That document, in turn, refers to the original `operation="new" ShipNoticeRequest` document.

12.5.1.3 Contact

`Contact roles` can include: `technicalSupport`, `customerService`, `sales`, `shipFrom` (starting point for this shipment), `shipTo` (should echo the `ShipTo` element from the `OrderRequest` documents), `buyerCorporate` (details the supplier has about the buying organization), and `supplierCorporate`. Generally, it is not necessary to copy information from the various `OrderRequest` documents: the `Contact` element should be used primarily to add information about an order.

Elements in the `Contact` list can appear in any order. A `Contact role` attribute value must not appear more than once within a `ShipNoticeHeader` element.

12.5.1.4 Hazard

See Hazard [page 268].

12.5.1.5 Comments

Use the `Comments` element to include additional information about the shipment. In the `ShipNoticeHeader` element, that information must be common to all contained items and routes. All such data must be intended for human use.

You can specify up to three `Comments` elements to specify the following additional information to the ship notice:

- To specify the reason for shipment
- To specify the transit directions
- Any additional information for the shipment

See the example in IdReference [page 257].

12.5.1.6 TermsOfTransport

Specifies shipping terms regarding the transportation of the goods.

The following example shows a `TermsOfTransport` element:

```
<TermsOfTransport>
    <SealID>1231</SealID>
    <SealingPartyCode>6645</SealingPartyCode>
    <EquipmentIdentificationCode>34535</EquipmentIdentificationCode>
    <TransportTerms value=”Other”>Contract Terms</TransportTerms>
    <Dimension quantity="0.4" type="grossWeight">
```

```
        <UnitOfMeasure>MTR</UnitOfMeasure>
    </Dimension>
    <Dimension quantity="0.4" type="grossVolume">
        <UnitOfMeasure>MTR</UnitOfMeasure>
    </Dimension>
</TermsOfTransport>
```

`TermsOfTransport` has the following elements:

SealID

Specifies the unique ID of the seal. A seal is used to preserve the integrity of a transport or cargo shipment. Seals come in a variety of different forms, but share one common characteristic; a unique ID given by the owner or the responsible party. The `SealID` is used to internationally track a container, truck, vessel, or other cargo property when in transit.

SealingPartyCode

Specifies the company code for the party that assigned the `SealID`. The party is typically the owner of the goods or the freight forwarder that loaded the cargo.

EquipmentIdentificationCode

Specifies the equipment identification code. This is mainly for internal transport and storage purposes. The packing equipment is marked with unique codes in order to monitor and manage movement and storage location. The code can be temporarily or permanent.

TransportTerms

For more information on `TransportTerms`, see TermsofDelivery [page 117].

Dimension Element

Specifies a single dimension for the packaging of the item. For more information, see Dimension [page 158].

Extrinsic Element

Any extrinsic for the `TermsOfTransport` element.

12.5.1.7 TermsofDelivery

This element allows you to add the `TermsofDelivery` element to the `ShipNoticeHeader` element to specify terms of delivery at the header level. For more information, see TermsofDelivery [page 117].

12.5.1.8 Packaging

For more information, see Packaging [page 157].

12.5.1.9 Extrinsic

Alternately, use the `Extrinsic` element list to insert additional data about the shipment for application consumption. These elements can include pre-defined keywords and values affecting workflow in the receiving system.

Elements in the `Extrinsic` list can appear in any order. An extrinsic type, `Extrinsic name` attribute value, must not appear more than once within a `ShipNoticeHeader` element. A type must not be mentioned both in this list and in a particular `ShipControl` or `ShipNoticePortion` element. The `ShipNoticeHeader` must not contain a default extrinsic value overridden at either lower level.

12.5.1.10 IdReference

To specify the government issued shipping ID, document name and supplier reference number.

For example:

```
<ShipNoticeHeader>
    <Contact role="shipTo">
        <Name xml:lang="en">Acme</Name>
        <PostalAddress>
            <Street>123Anystreet</Street>
            <City>Sunnyvale</City>
            <State>AL</State>
            <PostalCode>35762</PostalCode>
            <Country isoCountryCode="US">United States</Country>
        </PostalAddress>
    </Contact>
    <Comments type="ReasonForShipment" xml:lang="en-US">Low
    availability at warehouse</Comments>
    <Comments type="TransitDirection" xml:lang="en-US">East</Comments>
```

```
    <Comments xml:lang="en-US">Comments to the buyer</Comments>
    <TermsOfDelivery>
        <TermsOfDeliveryCode value="DeliveryCondition">
        </TermsOfDeliveryCode>
    <ShippingPaymentMethod value="Prepaid-BySeller">
    </ShippingPaymentMethod>
    <TransportTerms value="Other">Contract Terms</TransportTerms>
    <Comments type="TermsOfDelivery" xml:lang="en-US">Delivery at the
    doorstep</Comments>
    <Comments type="Transport" xml:lang="en-US">As per the contract
    </Comments>
    </TermsOfDelivery>
    <Extrinsic name="invoiceNumber">INV1561</Extrinsic>
    <IdReference identifier="US12345" domain="governmentNumber">
    </IdReference>
    <IdReference identifier="Partial Shipment" domain="documentName">
    </IdReference>
    <IdReference identifier="ASN001" domain="supplierReference">
    </IdReference>
</ShipNoticeHeader>
```

12.5.2 ShipControl

Specifies the carrier responsible for some portion of the shipment. A `ShipControl` element contains the `CarrierIdentifier`, `ShipmentIdentifier`, `TransportInformation, PackageIdentification`, `Route`, `Contact`, `Comments`, and `Extrinsic` elements.

The shipment is tracked using the identifiers provided at this level. Those identifiers should be valid from the `startDate` of one `ShipControl` element or the shipment's `shipmentDate` until the `startDate` of the next.

`ShipControl` has the following attribute:

Attribute	Description
`startDate`	Specifies the date and time this shipment started this part of the route. Required for all `ShipControl` elements after the first. This attribute must not appear in the first `ShipControl` element because it would duplicate the `ShipNoticeHeader's shipmentDate` attribute.

12.5.2.1 CarrierIdentifier

Identifies the carrier that will transport this shipment. The `CarrierIdentifier` list can include multiple identifiers for the same carrier. Elements in this list can appear in any order. A particular identification domain (`CarrierIdentifier@domain` attribute value) must not appear more than once in a `ShipControl` element. The identification provided by all elements of the `CarrierIdentifier` list must correspond to the same company.

There is one attribute, called `domain`, which specifies the domain in which `CarrierIdentifier` value has meaning. For example, “SCAC” for Standard Carrier Alpha Code, or the legal company name.

Recognized domains include the following:

Value	Description
company name	The legal name for this company. In some cases, this can also be provided in a `Contact` element with role `"carrierCorporate"`. Using a `Contact` element should be reserved for cases in which additional detail about the carrier must be conveyed.
`SCAC`	Standard Carrier Alpha Code. www.nmfta.org/pages/scac
`IATA`	International Air Transport Association. www.iata.org
`AAR`	Association of American Railroads. www.aar.org
`UIC`	International Union of Railways. www.uic.org
`EAN`	European Article Numbering. upc-ean-information.com
`DUNS`	Dun and Bradstreet's Data Universal Numbering System. www.dnb.com

12.5.2.2 ShipmentIdentifier

A tracking number defined by the carrier that appears on the shipment that can be used to obtain additional detail about the shipment. Has meaning in the domain described by the `CarrierIdentifier` values in the containing `Route` element.

Different carriers have different names for shipment identifiers. This is commonly called a way bill number, a pro number, and also a bill of lading. They all represent tracking numbers.

`ShipmentIdentifier` has the following attributes:

Attribute	Description
`domain`	Specifies more precisely what kind of identifier this is. Likely values include `trackingNumber` and `billOfLading`.
`trackingNumberDate`	The date when the carrier creates the tracking number for this shipment. Required if you have specified a carrier.
`trackingURL`	Carrier URL that can be used to track the shipment in conjunction with the tracking number.

The following example shows a `ShipmentIdentifier` that specifies the `trackingNumberDate` for the carrier:

```
<ShipControl>
    <CarrierIdentifier domain="companyName">BlueDart</CarrierIdentifier>
    <ShipmentIdentifier trackingNumberDate="2012-09-27 12:00:00
        Asia/Calcutta">99345</ShipmentIdentifier>
</ShipControl>
```

The following example shows a `ShipmentIdentifier` that specifies the `trackingURL` used to track the shipment along with the tracking number:

```
<ShipControl>
    <CarrierIdentifier domain="companyName">DHL</CarrierIdentifier>
    <ShipmentIdentifier trackingURL="http://www.dhl.com/cgi-bin/tracking.pl?AWB=1234
        &TID=CP_ENG&FIRST_DB=US">62396</ShipmentIdentifier>
</ShipControl>
```

12.5.2.3 PackageIdentification

Specifies the identifiers that appear on the containers, skids, boxes, or packages that constitute the shipment. The range of numbers described is inclusive at both extremes.

`PackageIdentification` has the following attributes:

Attribute	Description
`rangeBegin` (required)	Specifies the earliest number that appears on the separate elements in this shipment.
`rangeEnd` (required)	Specifies the highest number that appears on the separate elements in this shipment. Must be greater than or equal to `rangeBegin`.

12.5.2.4 Route

If present, `Route` elements must be in the order the shipment will travel.

Specifies how the shipment will travel on this segment. If two `ShipmentIdentifier` values are present, the second defines the end of a contiguous and inclusive range of numbers that appear on the shipment. `Route` can contain a `Contact` element.

The only `Contact` role should be "`carrierCorporate`", which details the contact information the supplier has about the carrier organization, `"shipFrom"`, and `"shipTo"`.

Each carrier within a segment controlled by a third-party logistics provider provides tracking information to that provider externally. The `ShipNoticeRequest` includes tracking information at the `ShipControl` level only.

A `Route` element can describe only a single mode of travel. If described at all, each mode of a multi-modal route must be described by a separate `Route` element. It is not necessary to describe every leg of the journey to the buyer's `ShipTo` location.

The `"carrierCorporate"` role is relevant at this level only when a third party is providing tracking information across multiple carriers. A `Contact` element with role `"shipFrom"` must appear in all `Route` elements after the first. `Route` elements are not required to describe the entire travel under a specific carrier's control. They can describe a discontinuous stream of events, starting and ending at different times and locations.

Elements in the `Contact` list can appear in any order. A `Contact role` attribute value must not appear more than once within a `Route` element.

`Route` has the following attributes:

Attribute	Description
`method` (required)	Qualifier identifying the transportation type code. Possible values are: • `ship`—Transportation by boat (ocean). • `rail`—Transportation by rail. • `motor`—Transportation by land motor craft (common carrier). • `air`—Transportation by flight. • `mail`—Provided for practical reasons, despite the fact that mail is not a genuine mode of transport. In many countries, the value of merchandise exported and imported by mail is considerable, but the exporter or importer concerned would be unable to state by which mode postal items had passed the national border. • `multimodal`—Provided for practical reasons, despite the fact that multimodal transport is not a genuine mode of transport. It can be used when goods are carried by at least two different modes from a place at which the goods are taken in charge by a transport operator to a place designated for delivery, on the basis of one transport contract. (Operations of pick-up and delivery of goods carried out in the performance of a unimodal transport, as defined in such a contract, shall not be considered as multimodal transport.) • `fixedTransport`—Applies to installations for continuous transport such as pipelines, ropeways and electric power lines. • `inlandWater`—Used only in such cases where the application of waterborne transport is reported separately than maritime transport. • `unknown`—Can be used when the mode is not known or when information on it is not available at the time of issuing the document concerned.

Attribute	Description
means	Particular vessel, vehicle or other device used for transport of goods. The value of means depends on the value of method. When the value of method is "ship", the possible values of means are: • cargoVessel—Vessel designed to carry general cargo. • unitCarrier—Vessel designed to carry unit loads. • bulkCarrier—Vessel designed to carry bulk cargo. • tanker—Vessel solely equipped with tanks to carry cargo. • liquefiedGasTanker—Tanker designed to carry liquefied gas. • otherSpecialTanker—Tanker designed to carry other special liquids. • cargoAndPassengerVessel—Vessel designed to carry cargo and passengers. • otherVessel—Sea-going vessel, not otherwise specified. • fishingBoat—Vessel designed for fishing. • floatingStructure—Any floating structure. When the value of method is "rail", the possible values of means are: • train—One or more rail wagons pulled or pushed by one or more locomotive units, or self-propelled, that move over rail tracks. • freightTrain—Train for carrying freight. When the value of method is "motor", the possible values of means are: • truck—Automotive vehicle designed for hauling loads. • tractor—Automotive vehicle with an engine designed for pulling. • van—Closed automotive vehicle designed for carrying freight. • carCarrier—Automotive vehicle designed for carrying motorcars. • shovelLoader—Automotive vehicle designed for shovelling sand and other bulk material. • straddleCarrier—Automotive vehicle designed for lifting and transporting containers. • mobileCrane—Automotive vehicle with cargo crane. • bus—Automotive vehicle designed for carrying more than 8 passengers including the driver. • car—Automotive vehicle designed to carry a small number of passengers. • taxi—Automotive vehicle licensed to ply for hire. When the value of method is "air", the values for means are specified in the IATA (International Air Transport Association) publication Standard Schedules Information Manual (SSIM) under the section "ATA/IATA Aircraft Types". The referenced codes cover all aircraft that are flown, or are soon to be flown, for commercial scheduled or chartered services only, or have been announced by the manufacturer and for which airline orders have been placed. When the value of method is "multimodal", this means there are multiple segments, and each may have different mode and means. Therefore, the only possible value for means is "unknown". When the value of method is "fixedTransport", the possible values of means are: • unknown—Fixed transport installation of unknown type. • pipeline—A line of one or more pipes for continuous transport of liquid or gas commodity. • powerline—A line of one or more cables or wires for continuous transport of electricity.

Attribute	Description
	When the value of `method` is "`inlandWater`", the possible values of `means` are: • `unknownVessel`—Vessel of unknown type. • `motorFreighter`—Motorized vessel designed for carrying general cargo. • `motorTanker`—Motorized vessel designed for carrying liquid cargo. • `containerVessel`—Vessel designed for carrying containers. • `gasTanker`—Vessel with tanks designed for carrying gas. • `tug`—Vessel designed to push or pull another vessel. • `barge`—Lighter designed for carrying general cargo. • `pushTow`—Vessel designed for pushing/towing, facilitating the movement of one or more cargo barges. • `fishingBoat`—Vessel designed for fishing. • `bunkerShip`—Vessel designed for carrying and delivering bunkers. When the value of `method` is either "`mail`" or "`unknown`", there are no specific values of `means` defined.
`startDate`	Specifies the date and time this shipment started this part of the trip. Required in all `Route` elements after the first.
`endDate`	Specifies the date and time this shipment ended this part of the trip. Must come after `startDate`. If any `Route` elements follow, the `startDate` of that element must not precede this value.

12.5.2.5 TransportInformation

See ShipTo/BillTo [page 109].

12.5.2.6 Contact

The most common `Contact` roles in this element are:

Value	Description
`carrierCorporate`	Details the contact information the supplier has about the carrier organization.
`shipFrom`	A `Contact` element with role "`shipFrom`" must appear in all `ShipControl` elements after the first. This role must not appear in the first `ShipControl` element because it would duplicate that role in the overall `ShipNoticeHeader` element.

Do not use `role="shipTo"` with this element because it would duplicate information in the following `ShipControl` element or that `role` in the `ShipNoticeHeader`. Control passes from one carrier to another at a particular location and estimated time.

List the elements in `Contact` in any order. A `Contact role` attribute value must not appear more than once within a `ShipControl` element.

12.5.2.7 Comments

The `Comments` element can contain additional information about the shipment while under the control of this carrier. In the context of the `ShipControl` element, that information must be common to all contained routes or made clear which `Route` is affected. All such data must be intended for human use.

12.5.2.8 Extrinsic

Alternately, the `Extrinsic` element list can be used to insert additional data about this carrier or their period of responsibility for application consumption. These elements can include pre-defined keywords and values affecting workflow in the receiving system.

Elements in the `Extrinsic` list can appear in any order. An `Extrinsic name` attribute value must not appear more than once within a `ShipControl` element. The same type must not be mentioned both in this list and in the overall `ShipNoticeHeader` element. The `ShipNoticeHeader` must not contain a default extrinsic value overridden at this lower level.

12.5.3 ShipNoticePortion

Contains purchase order and item information. Specifies what will be in the shipment. It contains five elements, `OrderReference`, `ShipNoticeItem`, `MasterAgreementReference, MasterAgreementIDInfo, Contact, Comments, and Extrinsic`. All but `OrderReference` are optional. It contains two attributes: `quantity` and `lineNumber`.

12.5.3.1 OrderReference

A particular `OrderRequest` specified in the `OrderReference` element must be mentioned in at most one `ShipNoticePortion` element. While multiple shipments can be sent for one order, a ship notice must mention each order only once.

If a `ShipNoticePortion` element contains no `ShipNoticeItem` elements, the entire referenced order is included in the shipment. This simplifying option prevents inclusion of hazard and packaging information.

`OrderReference` has the following attributes:

Attribute	Description
`orderID`	Specifies the buyer system `orderID` for the ship notice, that is, the PO number. When used, it must be copied directly from the referenced `OrderRequest` document's `OrderRequestHeader` element.
`orderDate`	Specifies the date and time the `OrderRequest` was created. The date format is yyyy-mm-dd per international ISO standard 8601.

12.5.3.2 MasterAgreementReference

An optional field. Can contain a reference to the master agreement from which the release is derived.

12.5.3.3 MasterAgreementIDInfo

An optional field. Can contain the ID of the master agreement from which the release is derived.

12.5.3.4 Contact

Any `Contact` elements provided at this level describe contacts specific to this portion of the order. The `ShipNoticeHeader` description mentions roles appropriate at this level as well, though `shipFrom`, `shipTo`, `buyerCorporate`, and `supplierCorporate` information should not vary at this level. A particular `Contact role` must not appear in both the `ShipNoticePortion` and `ShipNoticeHeader` elements. Therefore, roles such as "`technicalSupport`", "`customerService`", and "sales" are most appropriate within the `ShipNoticePortion`.

Elements in the `Contact` list can appear in any order. A `Contact role` attribute value must not appear more than once within a `ShipNoticePortion` element.

12.5.3.5 Comments

The `Comments` element can contain additional information about the order in this shipment. In this context (the `ShipNoticePortion` element), that information must be common to all contained items or make it clear which `ShipNoticeItem` is affected. All such data must be intended for human use.

12.5.3.6 Extrinsic

Alternately, the `Extrinsic` element list can be used to insert additional data about this order for application consumption. These elements can include pre-defined keywords and values affecting workflow in the receiving system.

Elements in the `Extrinsic` list can appear in any order. An `Extrinsic name` attribute value must not appear more than once within a `ShipNoticePortion` element. A type must not be mentioned both in this list and in the overall `ShipNoticeHeader` element. The `ShipNoticeHeader` must not contain a default extrinsic value overridden at this lower level.

12.5.3.7 ShipNoticeItem

The portion of a specific line item that is part of this shipment. Each line item from an order must be mentioned in at most one `ShipNoticeItem` element. `ShipNoticeItem` contains the following elements:

`ShipNoticeItem` has the following attributes:

Attribute	Description
`quantity` (required)	Specifies how many items were ordered. Expressed in units given in the `UnitOfMeasure` element. Matches the quantity value for the line item's `ItemOut` element in the corresponding `OrderReference` element.
`lineNumber` (required)	Position, counting from 1, of the item in an order. Matches the corresponding line item, `ItemOut`, in the document referenced by the `OrderReference` element.
`parentLineNumber`	The line number of the corresponding parent line item. This attribute is applicable only for a line item with `itemType="item"`.
`shipNoticeLineNumber`	Ship notice line number related to this item. Used when there are multiple ship notice line items for a single purchase order line items.
`itemType`	Specifies whether the line item is a grouped item having child items or an independent line item. Possible values are `"composite"` to identify an item group or `"item"` to identify an independent line item. This attribute is applicable only for a line item with an item group.
`compositeItemType`	Specifies whether a parent item uses group-level pricing. Possible values are `"groupLevel"` or `"itemLevel"`.

12.5.3.7.1 ItemID

See ItemID [page 93].

12.5.3.7.2 ShipNoticeItemDetail

This element contains detailed information about an item. The item details in a ship notice are inherited from the purchase order that is referenced. For ship notices without reference to a purchase order, item details can be retrieved from this element.

An example of `ShipNoticeItemDetail`:

```
<ShipNoticeItemDetail>
    <Description type=”CU” xml:lang="en">Computer Video Cables
    </Description>
        <UnitOfMeasure>EA</UnitOfMeasure>
        <Classification domain="UNSPSC">43173610</Classification>
        <ManufacturerPartID>JJ11P29</ManufacturerPartID>
    <Dimension quantity="0.4" type="grossWeight">
        <UnitOfMeasure>MTR</UnitOfMeasure>
```

```
    </Dimension>
    <Dimension quantity="0.4" type="grossVolume">
        <UnitOfMeasure>MTR</UnitOfMeasure>
    </Dimension>
    <Extrinsic name="PR No.">PR1026</Extrinsic>
</ShipNoticeItemDetail>
```

UnitPrice

Price per unit of the item. Optional modifications, such as changes due to discounts, may be provided.

Description

Brief description of the item.

UnitOfMeasure

Must be a n UN/CEFACT (Recommendation 20) unit of measure code. See UnitOfMeasure [page 48]

PriceBasisQuantity

Defines the quantity on which `UnitPrice` is based. See PriceBasisQuantity [page 289].

Classification

A group of similar categories.

ManufacturerPartID

ID with which the item's manufacturer identifies the item.

ManufacturerName

Name of the item's manufacturer.

Dimension

Dimensions of the item. See Dimension Element [page 256].

ItemDetailIndustry

Industry-specific item detail information. See ItemDetailIndustry [page 125].

Extrinsic

Contains any additional information related to this object.

12.5.3.7.3 UnitOfMeasure

For more information, see UnitOfMeasure [page 48].

12.5.3.7.4 Packaging

Each line item could be packaged into multiple boxes. Hence the `Packaging` element at the line item level could correspond with multiple packages belonging to that line item. For more information, see Packaging [page 157].

12.5.3.7.5 Hazard

The `Hazard` element provides a textual description and optional codes about hazards inherent in both an item and an overall shipment. A hazard for an entire shipment can be due to either identical hazards for all items or to hazards inherent in shipping the various products together. It can also include detailed handling requirements.

List elements in the `Hazard` list in any order. Do not list the same hazard more than once in a `ConfirmationItem`, or `ShipNoticeHeader`. Each hazard listed at this level, in a ConfirmationItem element, must apply to this specific line item. A `ConfirmationRequest` that updates the status of a single line item should not include `Hazard` elements in the `ConfirmationItem` element. Each hazard listed at this level, in a `ShipNoticeHeader` element, should apply to the entire shipment, or to all items contained in this shipment. A `ShipNoticeRequest` for a single line item should not include `Hazard` elements in the `ShipNoticeItem` element.

There are two elements: `Description`, and `Classification`. `Classification` is optional and can occur more than once.

The `Description` element list, if provided, should include detailed handling requirements. Elements in this list can appear in any order. A description locale specified by the `xml:lang` attribute must not appear more than once. When more than one `Description` element is present, each must contain translations of a common description.

`Classification` elements can appear in any order. A `Classification domain` attribute must not appear more than once in a `Hazard` element.

All listed `Classification` elements and the `Description`, if provided, must relate to a single hazard. Additional hazards must use separate `Hazard` elements.

The following `Classification domain` values are expected in this context:

Value	Description
`UNDG`	United Nations Dangerous Goods
`IMDG`	International Marine Organization Dangerous Goods
`NAHG`	North American Hazardous Goods

12.5.3.7.6 SupplierBatchID or Batch

You can specify an optional `SupplierBatchID` or `Batch` element to identify the batch of goods.

`SupplierBatchID` specifies the batch number for goods made or manufactured at the same time (sometimes called “lot number” or “variant”). For example, a supplier can assign a batch number to a batch of computer hard drives.

`Batch` specifies batch information for material or goods produced in a single manufacturing run. See Batch [page 162].

12.5.3.7.7 AssetInfo

The `AssetInfo` element provides asset tag numbers or serial numbers for individual items in a shipment of goods. The buyer might want to know this information before receiving the shipment. This element can include the following attributes:

Attribute	Description
`tagNumber`	Specifies a buyer-specific asset tag number identfier for the item. In order for the supplier to assign asset tag numbers on behalf of the buyer, the buyer and supplier must agree in advance which asset tag numbers the supplier should use and how they should be assigned.
`serialNumber`	Specifies the serial number of the item.

Attribute	Description
`location`	Specifies the location of the item. Even though all attributes for `AssetInfo` are optional, the element should not be used unless at least one attribute is specified. If more than one attribute is specified, they should all refer to the properties of the same item.

12.5.3.7.8 TermsofDelivery

You can add the `TermsofDelivery` element to the `ShipNoticItem` element to specify terms of delivery at the line-item level. For more information, see TermsofDelivery [page 117].

12.5.3.7.9 OrderedQuantity

For more information, see OrderedQuantity [page 160].

12.5.3.7.10 ShipNoticeItemIndustry

This element is a grouping for industry-specific fields.

ShipNoticeItemRetail

Retail-specific field details that can be grouped together for ship notices.

`ShipNoticeItemRetail` has the following child elements:

- `BestBeforeDate`
  For more information, see BestBeforeDate [page 161].
- `ExpiryDate`
  Specifies a date after which the goods become un-sellable/unusable. This element has a mandatory `date` attribute.
- `FreeGoodsQuantity`
  For more information, see FreeGoodsQuantity [page 160].
- `PromotionDealID`
  For more information, see PromotionalDealID [page 156].
- `PromotionVariantID`
  Promotion ID for a promotional offer made for a variant of the item in a ship notice.

12.5.3.7.11 ComponentConsumptionDetails

Contains detailed information about consumption of components in the manufacturing of final product. See ComponentConsumptionDetails [page 395].

12.5.3.7.12 Extrinsic

Any information related to the `ShipNoticeItem`.

12.6 ReceiptRequest

`ReceiptRequest` represents details about a receipt against a purchase order or a master agreement sent from a buying organization to a supplier. You can use it for any portion of all or selected line items from single or multiple purchase orders.

> **Note**
>
> The DTD for this transaction is contained in `Fulfill.dtd` rather than `cXML.dtd`.

`ReceiptRequest` has the following elements:

Element	Description
`ReceiptRequestHeader` (required)	Contains header information for this receipt. See ReceiptRequestHeader [page 271].
`ReceiptOrder` (required)	Defines information related to a purchase order or master agreement. See Receipt-Order [page 272].
`Total` (required)	Summary total amount of all receipt line item amounts.

12.6.1 ReceiptRequestHeader

`ReceiptRequestHeader` contains header information for this receipt. It has the following attributes:

Attribute	Description
`receiptID` (required)	A buyer-generated unique identifier for this receipt.

Attribute	Description
`receiptDate` (required)	The date and time the items or services were received by the buying organization. This date and time should be earlier than the document's timestamp.
`operation` (required)	The operation described by this receipt document. Must be "`new`".

`ReceiptRequestHeader` has the following optional elements:

Element	Description
`ShipNoticeIDInfo`	Contains the Delivery Note of the buyer's goods receipt, which defaults to the supplier's ship notice ID.
`Comments`	Contains comments associated with this object.
`Extrinsic`	Contains any additional information related to this object.

The following example shows a `ReceiptRequestHeader` that includes `ShipNoticeIDInfo`:

```
<Request deploymentMode="production">
    <ReceiptRequest>
        <ReceiptRequestHeader operation="new"
receiptDate="2015-04-16T12:00:00+02:00" receiptID="DNS124">
            <ShipNoticeIDInfo shipNoticeDate="2016-04-12T00:00-05:00"
shipNoticeID="asn-1234">
            </ShipNoticeIDInfo>
        </ReceiptRequestHeader>
        ...
    </ReceiptRequest>
</Request>
```

12.6.2 ReceiptOrder

`ReceiptOrder` defines information related to a purchase order or master agreement. A `ReceiptRequest` document may contain multiple `ReceiptOrder` elements.

`ReceiptOrder` has the following attribute:

Attribute	Description
`closeForReceiving`	Set to "`yes`" to indicate whether the underlying order or master agreement should be closed for receiving on approval of this receipt. It is false (`no`), by default.

`ReceiptOrder` has the following elements:

Element	Description
`ReceiptOrderInfo` (required)	Contains the reference information of the purchase order or master agreement. See ReceiptOrderInfo [page 273].

Element	Description
`ReceiptItem` (required)	Defines a receipt line item using information from the purchase order or master agreement. See ReceiptItem [page 273].

12.6.2.1 ReceiptOrderInfo

`ReceiptOrderInfo` contains the reference information of the purchase order or master agreement. The various content options are, in order of preference: `OrderReference`, `MasterAgreementReference`, `MasterAgreementIDInfo`, or `OrderIDInfo`.

Element	Description
`OrderReference`	A reference to the purchase order containing the items or services being received.
`MasterAgreementReference`	A reference to the master agreement containing the items or services being received.
`OrderIDInfo`	The buyer ID of the corresponding purchase order.
`MasterAgreementIDInfo`	The buyer ID of the corresponding master agreement.

12.6.2.2 ReceiptItem

`ReceiptItem` defines a receipt line item using information from the purchase order or master agreement.

When providing receipt line item information, follow these guidelines:

- If this receipt is against a release order, specify both the release order and the master agreement.
- If the receipt is against a no-release master agreement, specify only the master agreement.
- If the receipt is against a purchase order, specify the purchase order.

`ReceiptItem` has the following attributes:

Attribute	Description
`receiptLineNumber` (required)	A buyer-defined ID for the current line item. It must be unique across all receipt line items of the same `ReceiptRequest` document.

Attribute	Description

`quantity`
(required)
	The quantity received for the current receipt line.
	Negative values in the `quantity` attribute indicate corrective action against an order that was received or returned with errors. For example, if there is an order that has one line item with the quantity as 20, and you originally specified the received quantity as 20; later found out the received quantity was only 15 and not 20, you can do a negative receiving to correct this mistake.
	`<ReceiptItem receiptLineNumber="1"`
	`quantity="-5"`
	`type="received">`

`type`	To indicate if the buyer has received or returned the items from the supplier. This attribute can have the following values:
	• `received:` Indicates the goods have been received by the buyer.
	For example:
	`<ReceiptItem`
	`receiptLineNumber="1" quantity="20"`
	`type="received">`
	• `returned:` Indicates the goods have been returned by the buyer.
	For example:
	`<ReceiptItem`
	`receiptLineNumber="1" quantity="10"`
	`type="returned">`

`parentReceiptLineNumber`	Line number of the parent line item in the receipt request.
`itemType`	Specifies whether the line item is a grouped item having child items or an independent line item. Possible values are "`composite`" to identify an item group or "`item`" to identify an independent line item. This attribute is applicable only for a line item with an item group.
`compositeItemType`	Specifies whether a parent item uses group-level pricing. Possible values are "`groupLevel`" or "`itemLevel`".
`completedIndicator`	Set to "`yes`" to indicate that a component ship notice item is considered closed and no more component receipts are expected for it.

`ReceiptItem` has the following elements:

Element	Description
`ReceiptItemReference` (required)	Indicates the line number of a referenced line item.
`UnitRate` (required)	The amount to be paid per unit of specified measure.

Element	Description
`ReceivedAmount` (required)	Money amount of goods or services received for the receipt line item. The total received amount must equal to `quantity` x `UnitRate`.
`AssetInfo`	Contains optional asset data for each quantity of each receipt line item.
`DeliveryAddress`	Address where goods are received.
`Comments`	Contains comments associated with this object.
`Extrinsic`	Contains any additional information related to this object.

13 Invoices

The cXML InvoiceDetail transaction enables suppliers to send invoices to buying organizations or marketplaces. This transaction supports invoice details for a wide variety of business scenarios, including standard invoices, credit memos, line-item credit memos, debit memos, and receipts.

Overview of Invoices [page 276]

InvoiceDetailRequest [page 279]

Response [page 312]

Invoice Status Update [page 313]

Example Invoices [page 314]

13.1 Overview of Invoices

Suppliers use cXML invoices to bill buying organizations or marketplaces for provided products or services. Invoices can be generated against any portion of any line items from single or multiple purchase orders. The `InvoiceDetail` transaction supports cancel invoices, credit memos, line-item credit memos, debit memos, and receipts.

Invoices describe purchase orders, line items, partners involved, accounting distribution, payment terms, discounts, shipping and special handling, taxes, deposit and prepayment, and remittance information.

Suppliers send invoices to commerce network hubs. Commerce network hubs route invoices to the buying organization by either querying the buying organization's `ProfileResponse` or by looking up routing information in the buying organization's network account.

The cXML `InvoiceDetailRequest` document represents an invoice. After a receiving system accepts an invoice document, it responds with a generic cXML Response.

After buying organizations begin processing invoices, they send `StatusUpdateRequest` documents to notify the commerce network hub about their reconciliation progress. The commerce network hub can forward these documents to suppliers.

13.1.1 Early InvoiceRequest Document

Previously, cXML support for invoicing was provided by the `InvoiceRequest` document, which contained less detail than `InvoiceDetailRequest` and did not support line item or summary invoices.

`InvoiceRequest` is deprecated in cXML 1.2.011. All cXML invoice projects should implement `InvoiceDetailRequest`.

13.1.2 Debit and Credit Amounts

In invoices, positive amounts are debits the buying organization owes the supplier; negative amounts are credits issued by the supplier to the buying organization. For example, the supplier can specify a `SubtotalAmount` of -50 USD to issue a credit of fifty US dollars to the buying organization. Debit can be used in both standard invoices and debit memos. Credit can be used in standard invoices, credit memos, and line-item credit memos.

For PCard-enabled purchase orders, suppliers can request payment by using either invoices or the request-to-pay functionality provided by `ConfirmationRequest` documents.

Related Information

ConfirmationRequest [page 236]

13.1.3 Shipping Information

Invoices can include shipping information such as shipping charges, dates, from/to addresses, and carrier IDs. One of the reasons invoices support shipping information is because it can affect the final prices and taxes for orders shipped internationally.

The shipping information in invoices is not meant to be a substitute for sending `ShipNoticeRequest` documents.

13.1.4 Types of Invoices

`InvoiceDetailRequest` has the features and flexibility to support most business scenarios.

13.1.4.1 Individual and Summary Invoices

cXML supports both individual and summary invoices:

Invoice Category	Description
Individual Invoice	Applies against a single purchase order.
Summary Invoice	Applies against multiple purchase orders.

13.1.4.2 Invoice Level

cXML supports both header and detailed invoices:

Invoice Level	Description
Header Invoice	Applies against the entirety of one or more purchase orders, without describing their line items. Specify `isHeaderInvoice="yes"` and use `InvoiceDetailHeaderOrder` elements, which do not contain line-item information.
Detailed Invoice	(Line-item level invoice) Applies against specific line items from one or more purchase orders. Leave out `isHeaderInvoice` and use `InvoiceDetailOrder` elements, which contain line-item information.

13.1.4.3 Invoice Purpose

Use the `InvoiceDetailRequestHeader` attributes to specify the purpose of the invoice.

Invoice Purpose	Description
Standard Invoice	Request for payment after providing products or services. Specify `purpose="standard"` and `operation="new"`.
Credit Memo	Specifies credit to a buying organization. Specify `purpose="creditMemo"` and `operation="new"`. Must be a header invoice. Amounts must be negative.
Line-Item Credit Memo	Specifies credit to a buying organization. Specify `purpose="lineLevelCreditMemo"` and `operation="new"`. Must not be a header invoice. Amounts must be negative.
Debit Memo	Specifies debit to a buying organization. Specify `purpose="debitMemo"` and `operation="new"`. Must be a header invoice. Amounts must be positive.
Information Only	Provides a record of charges, similar to a receipt. No action is expected. Specify `isInformationOnly="yes"` and `operation="new"`.
Cancel Invoice	Cancels a previously sent invoice. Specify `operation="delete"`.

13.1.5 Invoice DTD

The cXML standard uses multiple DTDs to optimize the performance of validating parsers. The `InvoiceDetail` transaction is defined in a separate DTD named `InvoiceDetail.dtd`, available at:

```
http://xml.cXML.org/schemas/cXML/<version>/InvoiceDetail.dtd
```

13.2 InvoiceDetailRequest

`InvoiceDetailRequest` documents represent invoices.

The structure of the `InvoiceDetailRequest` document is:

```
<Request>
    <InvoiceDetailRequest>
        <InvoiceDetailRequestHeader>
            header information
        </InvoiceDetailRequestHeader>
        <InvoiceDetailHeaderOrder>
            order-level invoice information
        </InvoiceDetailHeaderOrder>
        . . .
    or
        <InvoiceDetailOrder>
            detailed line-item information
        </InvoiceDetailOrder>
        . . .
        <InvoiceDetailSummary>
            invoice summary
        </InvoiceDetailSummary>
    </InvoiceDetailRequest>
</Request>
```

`InvoiceDetailOrder` elements are for detailed (line-item level) invoices and `InvoiceDetailHeaderOrder` elements are for header invoices. Invoices must not contain both types of elements. Both types of elements contain invoice lines.

All invoice line level amounts must add up to the total specified in `InvoiceDetailSummary`.

13.2.1 InvoiceDetailRequestHeader

Defines header information that applies to the entire invoice.

`InvoiceDetailRequestHeader` has the following attributes:

Attribute	Description
`invoiceID` (required)	A supplier-generated identifier for the Invoice. Identical to the Invoice Number that appears at the top of a physical Invoice.

Attribute	Description
`isInformationOnly`	Indicates whether the buying organization needs to take action. Possible values: • `yes`—Invoice is for the buying organization's information only (no action needs to be taken by the buying organization). • Not specified—(default) Invoice is functional. The buying organization needs to take action upon receiving this document (submit payment or accept credit).
`purpose`	Purpose of the invoice. Possible values: • `standard`—(default) A standard billing statement from the supplier to the buying organization. • `creditMemo`—A credit memo for issuing credit to the buying organization. `isHeaderInvoice` must be yes. Also, the element `InvoiceDetailSummary/DueAmount` must be a negative amount. • `debitMemo`—A debit memo for billing a balance owed by the buying organization. `isHeaderInvoice` must be yes. Also, the element `InvoiceDetailSummary/DueAmount` must be a positive amount. • `lineLevelCreditMemo`—A line-item credit memo for issuing credit to the buying organization. `isHeaderInvoice` must be false (not specified). Also, the element `InvoiceDetailSummary/DueAmount` must be a negative amount.
`operation`	How this document is acting on the invoice. Possible values: • `new`—(default) Creates a new invoice. • `delete`—Cancels an existing invoice. The `PayloadID` of the existing invoice must be specified in a `DocumentReference`.
`invoiceDate` (required)	Date and time Invoice was created (should be earlier than the cXML timestamp).
`invoiceOrigin`	Indicates the originator of the invoice for categorization. Possible values: • `supplier` — Invoice originated by supplier. • `buyer` — Invoice originated by buying organization. • Not specified — Invoice origin is unknown.
`isERS`	Whether the invoice is an Evaluated Receipt Settlement (ERS) invoice. The only possible value is `"yes"`. If not specified, the invoice is a regular invoice.

13.2.1.1 InvoiceDetailHeaderIndicator

Defines indicators that describe overall attributes of the invoice. By default, all indicators are false.

`InvoiceDetailHeaderIndicator` has the following attributes:

Attribute	Description
`isHeaderInvoice`	Category of the invoice. Possible values: • `yes`—Header invoice. Invoice uses InvoiceDetailHeaderOrder, which contains header level invoice information without item details. • Not specified—Detail invoice. Invoice uses InvoiceDetailOrder, which contains item details.

Attribute	Description
`isVatRecoverable`	`yes`—The entire invoice is VAT (Value Added Tax)-recoverable.

13.2.1.2 InvoiceDetailLineIndicator

Indicates the presence of invoicing details at invoice line level (in `InvoiceDetailItem`, `InvoiceDetailServiceItem`, or `InvoiceDetailOrderSummary`). By default, all indicators are false.

If this element indicates that invoicing details exist at invoice line level, invoice lines that do not provide such information are assumed to have values of zero, or "not available" for that information.

`InvoiceDetailLineIndicator` has the following attributes:

Attribute	Description
`isTaxInLine`	`yes`—Tax (`Tax`) is provided at invoice line level. If header tax is specified, it will be ignored.
`isSpecialHandlingInLine`	`yes`—Special handling (`InvoiceDetailLineSpecialHandling`) is provided at invoice line level.
`isShippingInLine`	`yes`—Shipping (`InvoiceDetailLineShipping`) is provided at invoice line level.
`isDiscountInLine`	`yes`—Discount (`InvoiceDetailDiscount`) is provided at invoice line level.
`isAccountingInLine`	`yes`—Accounting distribution (`Distribution`) is provided at invoice line level. If `isHeaderInvoice` is true, this indicator must not be specified, because `Distribution` is available only at item level.

13.2.1.3 InvoicePartner

Defines a party involved in invoicing, including the issuer of the invoice and the person sold to.

Invoices support `InvoicePartner` because the `Contact` element alone does not support the wide variety of reference identifiers involved in invoicing.

Do not use this element to specify ship from or ship to; instead, use `InvoiceDetailShipping`.

Contact

Contact information of the invoice partner. Allowed contact roles are `from`, `issuerOfInvoice`, `soldTo`, `billTo`, `billFrom`, and `remitTo`.

> **Note**
>
> `from` and `issuerOfInvoice` must be synonymous.

IdReference

Defines an ID reference. The identifier/domain pair should be unique within each trading partner relationship (a buying organization and a supplier).

`IdReference` has the following attributes:

Attribute	Description
`identifier` (required)	The unique identifier of the `IdReference` within the domain.
`domain` (required)	The domain of the `IdReference`. Possible values: • `abaRoutingNumber` • `accountID` • `accountName` • `accountPayableID` • `accountReceivableID` • `accountType` • `bankRoutingID` • `branchName` • `contactPerson` • `departmentName` • `federalTaxID` • `gstID` • `ibanID` • `provincialTaxID` • `reference` • `stateTaxID` • `supplierTaxID` • `swiftID` • `taxExemptionID` • `vatID` Values can be application-specific, such as `1099ID` or `courtRegisterID`.

`IdReference` has the following elements:

Element	Description
`Creator`	The creator of the `IdReference` (for example, the name of the bank, shipper, or other organization).
`Description`	Textual description of the `IdReference` for human readability.

Related Information

PaymentPartner/IdReference [page 189]

13.2.1.4 DocumentReference

Identifies an earlier `InvoiceDetailRequest` document. If `operation="delete"`, `DocumentReference` is required and it must reference the original `InvoiceDetailRequest` document (with `operation="new"`). In all other situations, `DocumentReference` is optional.

`DocumentReference` has the following attribute:

Attribute	Description
`payloadID` (required)	The `payloadID` attribute of another cXML document.

13.2.1.5 InvoiceDetailShipping

The shipping details of the invoice.

`InvoiceDetailShipping` has the following attribute:

Attribute	Description
`shippingDate`	The date and time this shipment leaves the supplier.

Contact

The ship from and ship to addresses. Both ship from and ship to must be specified. See Contact [page 112].

CarrierIdentifier

This list can include multiple identifiers for the same carrier. Elements in this list can appear in any order. An identification domain (`CarrierIdentifier` domain) must not appear more than once in an `InvoiceDetailShipping` element. All identification provided by elements of one `CarrierIdentifier` list must correspond to the same company.

`CarrierIdentifier` has the following attribute:

Attribute	Description
`domain` (required)	Domain for this value. Possible values: • `companyName`—The legal name for this company. In some cases, this could also be provided in a Contact element with role "carrierCorporate". That option should be reserved for cases in which additional detail about the carrier appears in this element. • `SCAC`—Standard Carrier Alpha Code. www.nmfta.org/pages/scac • `IATA`—International Air Transport Association. www.iata.org • `AAR`—Association of American Railroads. www.aar.org • `UIC`—International Union of Railways. www.uic.org • `EAN`—European Article Numbering. upc-ean-information.com • `DUNS`—D&B's Data Universal Numbering System. www.dnb.com

ShipmentIdentifier

The tracking number of this shipment. See ShipmentIdentifier [page 259].

DocumentReference

Identifies an earlier `ShipNoticeRequest`.

For more information, see DocumentReference [page 283].

13.2.1.6 ShipNoticeIDInfo

See ShipNoticeIDInfo [page 295].

13.2.1.7 InvoiceDetailPaymentTerm (deprecated)

`InvoicedetailPaymentTerm` is deprecated in cXML 1.2.011, in favor of PaymentTerm [page 284].

13.2.1.8 PaymentTerm

Defines a payment term in an invoice or order. `PaymentTerm` defines either the net term (without discount) or the discount term (with discount).

`PaymentTerm` has the following attribute:

Attribute	Description
`payInNumberOfDays`	The number of days after invoice date to pay in full.

Discount

The percentage or amount of the discount term. The discount rate applies if the invoice total is paid within the time specified by `payInNumberOfDays`. Positive rates denote discounts and negative rates denote penalties. Do not use a percentage sign (%) or divide by 100; for example “2” means 2%.

Do not use the `Discount` element if the `PaymentTerm` is a net term.

Extrinsic

Specifies additional information related to this payment term. This can include `ValueDate` and `DiscountTermsDueDate`

13.2.1.9 Period

The period over which the services were rendered. `Period` has the following attributes:

Attribute	Description
`startDate`	The starting date of the service.
`endDate`	The ending date of the service.

13.2.1.10 Comments

Any comments for the invoice.

13.2.1.11 IdReference

Defines an ID reference. See IdReference [page 244].

13.2.1.12 Extrinsic

Specifies additional information related to the invoice. You must ensure that you do not duplicate anything in `InvoiceDetailRequestHeader` or `InvoiceDetailRequest`.

13.2.2 InvoiceDetailOrder

Defines the invoice information of an order with item details, used only when `isHeaderInvoice` is false (not specified).

An invoice line is an `InvoiceDetailItem` or an `InvoiceDetailServiceItem` and its invoice line number is specified by the `invoiceLineNumber` attribute.

13.2.2.1 InvoiceDetailOrderInfo

Defines information related to the corresponding purchase order, including order reference and related master agreement reference, if any. Applications use this information to match the invoice with the corresponding purchase order or master agreement. The more definitive the reference, the more likely applications can successfully perform document matching.

`InvoiceDetailOrderInfo` can contain several possible elements for referring to documents. `OrderReference` is strongly recommended, but if that information is not available, use `MasterAgreementReference`, `MasterAgreementIDInfo`, `OrderIDInfo`, or `SupplierOrderInfo`, in that order.

OrderReference

The reference to the purchase order being invoiced.

MasterAgreementReference

Defines a reference to an earlier `MasterAgreementRequest` document. This element identifies the master agreement of the release order to be invoiced.

`MasterAgreementReference` has the following attributes:

Attribute	Description
`agreementID`	The ID number of a master agreement known to the buying organization's system.
`agreementDate`	The date and time the master agreement request was created.

Attribute	Description
`agreementType`	Indicates whether the referenced agreement is a scheduling agreement release.

MasterAgreementIDInfo

Defines the buying organization's ID number of the corresponding master agreement if the order being invoiced is a release. This element identifies the master agreement of the contract or release order to be invoiced.

`MasterAgreementIDInfo` has the following attributes:

Attribute	Description
`agreementID` (required)	The ID number of a master agreement known to the buying organization's system.
`agreementDate`	The date and time the master agreement request was created.
`agreementType`	Indicates whether the referenced agreement is a scheduling agreement release.

`MasterAgreementIDInfo` has the following element:

Element	Description
`IdReference`	Specifies additional IDs for the master agreement.

OrderIDInfo

Identifies a purchase order known to the buying organization.

`OrderIDInfo` has the following attributes:

Attribute	Description
`orderID` (required)	The ID of a purchase order (purchase order number) known to the buying organization.
`orderDate`	The date and time the purchase order was created.

SupplierOrderInfo

Defines supplier sales order information related to a purchase order.

`SupplierOrderInfo` has the following attribute:

Attribute	Description
`orderID` (required)	Supplier sales order ID of the purchase order.
`orderDate`	The date and time of the sales order.

13.2.2.2 InvoiceDetailItem

Defines an invoice line item.

The buying organization might require information provided here to match the information provided in the purchase order. For example, the buying organization might require there to be no change in the `UnitOfMeasure` value.

`InvoiceDetailItem` has the following attributes:

Attribute	Description
`invoiceLineNumber` (required)	Supplier defined ID for the current invoice line. Should be unique across all invoice lines within an invoice.
`quantity` (required)	The quantity being invoiced for the line item.
`referenceDate`	The reference date for the blanket order or contract item. The usage of this attribute is optional in most cases, and must be defined by the trading partners involved in the transaction. Procurement software might use this date in reconciling an invoice against a blanket order or contract.
`inspectionDate`	The date when the transfer of goods or the delivery of services occurs according to legal tax definitions. The usage of this attribute is optional in most cases, and must be defined by the trading partners involved in the transaction.
`parentInvoiceLineNumber`	Specifies the line number of the corresponding parent line item. This attribute is applicable only for a line item with `itemType="item"`.
`itemType`	Specifies whether the line item is a grouped item having child items or an independent line item. Possible values: `"composite"` to identify an item group or `"item"` to identify an independent line item. This attribute is applicable only for a line item with an item group.
`compositeItemType`	Specifies whether a parent item uses group-level pricing. Possible values are `"groupLevel"` or `"itemLevel"`.
`reason`	Specifies the reason for a line-item credit memo. The only possible value for reason is `"return"`, which means the credit memo is for a return item.

UnitOfMeasure

The line item's unit of measure. See UnitOfMeasure [page 48].

UnitPrice

The unit price.

PriceBasisQuantity

The quantity-based pricing for a line item. Quantity-based pricing allows the unit price of an item to be based on a different price unit quantity than 1. In addition to quantity-based pricing, Unit Conversion Pricing allows unit of measure conversion in the pricing calculation, when the unit of measure on the order differs from the pricing unit of measure.

`PriceBasisQuantity` has the following attributes:

Attribute	Description
`quantity` (required)	The price unit quantity for the unit price. This is a mandatory field.
`conversionFactor` (required)	The value used to convert the ordered unit of measure to the price unit while calculating the unit price of the item. This is a mandatory field.

`PriceBasisQuantity` has the following elements:

Element	Description
`UnitOfMeasure`	The unit of measure specified for quoted unit price. This element must exist in the `PriceBasisQuantity` element.
`Description`	This field can store any information for the `PriceBasisQuantity` element. It can be used to stores the unit conversion values provided by the supplier. This is an optional element.

InvoiceDetailItemReference

Defines all references related to an invoice line item.

`InvoiceDetailItemReference` has the following attributes:

Attribute	Description
`lineNumber` (required)	The purchase order line number of current line item, copied from the `OrderRequest`.
`serialNumber` (deprecated)	The product serial number for the current line item. This attribute was deprecated in cXML 1.2.009. Use `SerialNumber` elements, instead.

`InvoiceDetailItemReference` has the following elements:

Element	Description
`ItemID`	The supplier part number of current line item, from the `OrderRequest`. See ItemID [page 93].
`Description`	The line item description, from the `OrderRequest`. This is a mandatory field.
`Classification`	Commodity classification of the service. This is a mandatory field and can appear in any order. This element has the domain attribute.
`ManufacturerPartID`	The manufacturer part number.
`ManufacturerName`	The name of the manufacturer.
`Country`	The country of origin of the product listed in the line item.
`SerialNumber`	A serial number that uniquely identifies an accountable item that is being invoiced. You can include multiple `SerialNumber` elements; the number of `SerialNumber` elements should match the invoice item quantity. Use `SerialNumber` elements instead of the `InvoiceDetailItemReference` serialNumber attribute, which was deprecated in cXML 1.2.009.
`SupplierBatchID`	See SupplierBatchID or Batch [page 269].
`InvoiceDetailItemReferenceIndustry`	Item-detail information specific to the retail industry.
`InvoiceDetailItemReferenceRetail`	Specifies the details for the retail industry. Contains the following elements: • `EANID`—Specifies an ID assigned to a manufacturer's product according to the International Article Numbering Association or UPC (Universal Product Code) for an article. This is an optional element. • `EuropeanWasteCatalogueID`—Specifies a unique ID for articles listed in the EU Waste Catalogue (EWC) if it requires special handling. This is an optional element. • `Characteristics`—Specifies detailed information about an item that can be used across several different industries. This is an optional element.

ReceiptLineItemReference

Reference to the receipt line related to this line item. It has the following attribute:

Attribute	Description
`receiptLineNumber` (required)	Specifies the receipt line number of the current line item, copied from `ReceiptRequest`.

ShipNoticeLineItemReference

Reference to the ship notice line related to this line item. It has the following attribute:

Attribute	Description
`shipNoticeLineNumber` (required)	Specifies the ship notice line number of the current line item, copied from `ShipNoticeRequest`.

ServiceEntryItemReference

Explicitly references the related `ServiceEntryRequest` for the invoice.

`ServiceEntryItemReference` has the following attributes:

Attribute	Description
`serviceLineNumber` (required)	Refers to the line number in the related `ServiceEntryRequest` for the item.
`serviceEntryID`	The ID for the related `ServiceEntryRequest`. If present, it must be copied from the `ServiceEntryRequestHeader`.
`serviceEntryDate`	The date and time when the supplier created the service sheet. It present, it must be copied from the `ServiceEntryRequestHeader`.

`ServiceEntryItemReference` has the following element:

Element	Description
`DocumentReference`	The DocumentReference element identifies an earlier ServiceEntryRequest document. `DocumentReference` has the following attribute: **Attribute** — **Description** `payloadID` (required) — The value of the payloadID attribute for the earlier `ServiceEntryRequest`.

ServiceEntryItemIDInfo

References the related `ServiceEntryRequest` for the invoice.

`ServiceEntryItemIDInfo` has the following attributes:

Attribute	Description
`serviceLineNumber` (required)	Refers to the line number in the related `ServiceEntryRequest` for the item.
`serviceEntryID` (required)	The ID for the related `ServiceEntryRequest`.
`serviceEntryDate`	The date and time when the supplier created the service sheet.

`ServiceEntryItemIDInfo` has the following element:

Element	Description
`IdReference`	References a unique identifier for the service sheet. It has the following attributes: Attribute: `identifier` (required) — The unique identifier for the service sheet. Attribute: `domain` (required) — The domain or context in which the identifier has meaning.

SubtotalAmount

The invoice subtotal of the current line item: `UnitPrice` times quantity.

Tax

The tax for the line item. Ignored if `isTaxInLine` is false (not specified). `Tax` has the following elements:

Element	Description
`Money` (required)	The amount owed for tax.
`Description` (required)	Textual description of the tax.
`TaxDetail`	Detailed information about the tax.

Element	Description
`Distribution`	Represents the breakdown of one overall amount into sub-amounts. It is the the combination of a `Charge` against an `Accounting` element.
`Extrinsic`	Additional information related to `Tax`. This information should not duplicate any information in `Tax`.

`TaxDetail` has the following attributes:

Attribute	Description
`purpose`	The purpose of the tax. For example, `"tax"` or `"custom duty"`.
`category` (required)	The category of the tax. For example, `"sales"`, `"usage"`, `"vat"`, `"gst"` or `"withholdingTax"`. If the category is `"withholdingTax"`, you can additionally specify the `"withholdingTaxType"` extrinsic. Possible values: • `ISR` • `IVA`
`percentageRate`	The tax rate percentage. Do not include a percent symbol (%).
`isVatRecoverable`	Set to `"true"` if the tax amount is recoverable.
`taxPointDate`	The date on which VAT becomes due
`paymentDate`	The date on which payment must be made (used only for transactions in France).
`isTriangularTransaction`	Set to `"true"` to indicate that the transaction occurred between three parties in three different countries, but the movement of goods did not follow the invoicing route. Add a `Contract` element with `role="subsequentBuyer"` to identify the subsequent buying organization in triangular transactions.
`exemptDetail`	When the tax rate is zero percentage, regulations may require that suppliers specify if the tax is required, or if the goods or services are exempt from taxations. Possible values: • `zeroRated`—This indicates the goods and services are taxable, but the tax rate is zero percent. • `exempt`—This indicates the goods and services are tax exempt.

`TaxDetail` has the following elements:

Element	Description
`TaxableAmount`	The amount that is taxable.
`TaxAmount` (required)	The amount of tax.

Element	Description
`TaxLocation`	The locale in which the tax applies.
`Description`	Textual description of the tax.
`TriangularTransactionLawReference`	Reference to the relevant EU law covering the VAT for triangular transactions. For example, “VAT - EC Article 28 Simplification Invoice”.

`TaxRegime`	Specifies the tax classification related to the type of supplier activities and commodities in invoices. Suppliers pay taxes based on the tax regime.
	
	This is an optional element.
	
	An invoice can have one or more tax regimes but suppliers can associate only one tax regime in the TaxDetail element. This element is applicable to all countries.
	
	For example:
	
	`<Tax>`
	`  <Money currency = "USD">1.87</Money>`
	`  <Description xml:lang = "en-US"/>`
	`  <TaxDetail category = "vat" percentageRate = "2" taxPointDate = "2013-06-19T00:00:00+05:30">`
	`  <TaxableAmount>`
	`  <Money currency = "USD">93.60</Money>`
	`  </TaxableAmount>`
	`  <TaxAmount>`
	`  <Money currency = "USD">1.87</Money>`
	`  </TaxAmount>`
	`  <Description xml:lang = "en-US"/>`
	`  <TaxRegime>Regimen de Asalariados</TaxRegime>`
	`  </TaxDetail>`
	`</Tax>`

`Extrinsic`	Additional information related to `TaxDetail`. This information should not duplicate any information in `TaxDetail`.

InvoiceDetailLineSpecialHandling

`InvoiceDetailLineSpecialHandling` contains the special handling information for the line item. Ignored if `isSpecialHandlingInLine` is false (not specified). It has the following elements:

Element	Description
`Description`	Contains an optional description of the charge.
`Money` (required)	Monetary amount of the special handling charge.
`Distribution`	Represents the breakdown of one overall amount into sub-amounts. It is the the combination of a `Charge` against an `Accounting` element.

InvoiceDetailLineShipping

`InvoiceDetailLineShipping` contains the shipping information for the line item. Ignored if `isShippingInLine` is false (not specified). It has the following elements:

Element	Description
`InvoiceDetailShipping` (required)	The shipping details. See InvoiceDetailShipping [page 283].
`Money` (required)	Monetary amount of the shipping charge.
`Distribution`	Represents the breakdown of one overall amount into sub-amounts. It is the the combination of a `Charge` against an `Accounting` element.

ShipNoticeIDInfo

Specifies additional reference IDs for shipment related IDs (for example, DispatchAdviceID, ReceivingAdviceID, DeliveryNoteId, ProofOfDeliveryID, IdReference). This element has the following attributes:

Attribute	Description
`shipNoticeID` (required)	Specifies the unique ID for the shipping document that identifies the physical conveyance/transport of goods.
`shipNoticeDate`	Specifies the date and time of the ship notice.

`ShipNoticeIDInfo` has the following element:

Attribute	Description
`IdReference`	Specifies shipment-related document identifiers. For example, DispatchAdviceID, ReceivingAdviceID, DeliveryNoteID, or ProofOfDeliveryID.

GrossAmount

The `SubtotalAmount` plus taxes, shipping, and special handling charges for the line item.

InvoiceDetailDiscount

The discount for the line item. Ignored if `isDiscountInLine` is false (not specified). It has the following attribute:

Attribute	Description
`percentageRate`	The discount rate as a percentage. Positive rates denote discounts and negative rates denote penalties. Do not include a percentage sign (%) or divide by 100. For example, "2" means 2%.

`InvoiceDetailDiscount` has the following elements:

Element	Description
`Money` (required)	Monetary amount of the discount.
`Distribution`	Represents the breakdown of one overall amount into sub-amounts. It is the the combination of a `Charge` against an `Accounting` element.

InvoiceItemModifications

Specifies the additional Charges, Allowances, and their taxes that are incurred for the total landed cost of the goods and service for an invoice item.

This element can store one or more `Modification` elements. For more information on the `Modification` element, see Total [page 106].

TotalCharges

The total sum of all the charges applied on the goods and services. This can appear at the line-item and summary in an invoice.

TotalAllowances

The total sum of all the allowances applied on the goods and services. This can appear at the line item and summary in an invoice.

TotalAmountWithoutTax

For more information, seeTotalAmountWithoutTax [page 311].

NetAmount

The `GrossAmount` minus discounts for the line item.

Distribution

Accounting information generated by the buying organization, such as cost center or general ledger category. This information should be copied from the `OrderRequest`. Ignored if `isAccountingInLine` is false (not specified).

Packaging

Details about the packaging of the line item. See Packaging [page 157].

InvoiceDetailItemIndustry

Specifies the categories for various industries.

`InvoiceDetailItemIndustry` has the following elements:

Element	Description
`InvoiceDetailItemRetail`	Specifies the information about the retail industry. This element has the following elements: • `AdditionalPrices` Additional prices for the retail industry-specific item. This element has the following optional elements: • `UnitGrossPrice` The gross price per unit. This element has `Money` and the PriceBasisQuantity [page 289] element. • `InformationalPrice` Price excluding allowances or charges, and taxes. The price is for information purposes only. This element has the `Money` and PriceBasisQuantity [page 289] element. • `InformationalPriceExclTax` Price excluding taxes. The price is for information purposes only. This element has the `Money` and PriceBasisQuantity [page 289] element. • `UnitNetPriceCorrection` The new price to correct the unit net price. This element has the `Money` and PriceBasisQuantity [page 289] element. • `TotalRetailAmount` Total retail amount or the retail industry-specific item. This element has the `Money` element. • `ItemIndicator` Indicator for the product or item level. This element has the following attributes: **Attribute** / **Description** `domain` (required) — Specifies the type of the Indicator. Possible values: ○ `InvoiceUnitIndicator`—Indicator to specify the unit for invoicing (“price per unit”) ○ `ConsumerUnitIndicator`—This indicator is set if the specified unit is used from the consumer/consumption process. For example, “gallons” or “liters”. ○ `ReturnableContainerIndicator`—This indicator is set if the packaging/container is returned to the sender and will be used again later. ○ `TradeUnitIndicator`—Indicator set if the specified unit is used to describe the trading unit (for instance “barrel” for oil) ○ `DutyIndicator`—Indicator to specify that the current line item has a special fee. ○ `CommisionIndicator`—Indicator to specify the actual position/line item has a provision.

Element	Description
	<table><tr><th>Attribute</th><th>Description</th></tr><tr><td>`value` (required)</td><td>Specifies the value of the indicator.</td></tr></table> • `PromotionDealID` An ID assigned by the supplier for a special promotional activity. See PromotionalDealID [page 156]. • `PromotionVariantID` An ID for the item used as a promotional variant number. See PromotionalVariantID [page 156].

Comments

Textual comments for the line item.

Extrinsic

Additional information related to the line item. You must ensure that you do not duplicate anything in or `InvoiceDetailOrder`.

13.2.2.3 InvoiceDetailServiceItem

`InvoiceDetailServiceItem` specifies a service being invoiced. It has the following attributes:

Attribute	Description
`invoiceLineNumber` (required)	Supplier defined ID for the current invoice line. Should be unique across all invoice lines within an invoice.
`quantity`	The quantity being invoiced for the line item. For service items, quantity represents the number of units of service rendered. For example, 2 hours of service, where `UnitOfMeasure` is "HUR"
`referenceDate`	The reference date for the service item. This can indicate the date at which the service line item is being invoiced.
`inspectionDate`	The date when the transfer of goods or the delivery of services occurs according to legal tax definitions. The usage of this attribute is optional in most cases, and must be defined by the trading partners involved in the transaction.
`parentInvoiceLineNumber`	To specify the line number of the corresponding parent line item. This field is applicable only for a line item with `itemType="item"`.

Attribute	Description
`itemType`	To specify if the line item is a grouped item having child items or an independent line item. The `ItemType` attribute can contain two values: “composite” to identify an item group or “item” to identify an independent line item. This field is applicable only for a line item with an item group.

InvoiceDetailServiceItemReference

`InvoiceDetailServiceItemReference` defines all references related to a service line item in this invoice. It has the following attribute:

Attribute	Description
`lineNumber`	The line number of current line item on the master agreement. This value is required if the item being invoiced is part of a detailed master agreement that specifies detailed pricing terms at the line item or commodity level. It is optional if the item being invoiced is part of a master supplier agreement or blanket purchase order which do not contain detailed line item pricing information.

`InvoiceDetailServiceItemReference` has the following elements:

Element	Description
`Classification`	Commodity classification of the service.
`ItemID`	The Supplier’s part number for the service.
`Description`	Description of the service.

ServiceEntryItemReference

`ServiceEntryItemReference` explicitly references the related `ServiceEntryRequest` for the invoice. It has the following attributes:

Attribute	Description
`serviceLineNumber` (required)	Refers to the line number in the related `ServiceEntryRequest` for the item.
`serviceEntryID`	The ID for the related `ServiceEntryRequest`. If present, it must be copied from the ServiceEntryRequestHeader.
`serviceEntryDate`	The date and time when the supplier created the service sheet. It present, it must be copied from the `ServiceEntryRequestHeader`.

`ServiceEntryItemReference` has the following element:

Element	Description
`DocumentReference` (required)	Identifies an earlier `ServiceEntryRequest` document. `DocumentReference` has the following attribute: **Attribute** — **Description** `payloadID` (required) — The value of the `payloadID` attribute for the earlier `ServiceEntryRequest`.

ServiceEntryItemIDInfo

References the related `ServiceEntryRequest` for the invoice. `ServiceEntryItemIDInfo` has the following attributes:

Attribute	Description
`serviceLineNumber` (required)	Refers to the line number in the related `ServiceEntryRequest` for the item.
`serviceEntryID` (required)	The ID for the related `ServiceEntryRequest`.
`serviceEntryDate`	The date and time when the supplier created the service sheet.

`ServiceEntryItemIDInfo` has the following element:

Element	Description
`IdReference`	References a unique identifier for the service sheet. It has the following attributes: **Attribute** — **Description** `identifier` (required) — The unique identifier for the service sheet. `domain` (required) — The domain or context in which the identifier has meaning.

SubtotalAmount

The subtotal amount of the service item. If unit price and invoiced quantity are specified, then subtotal should be the product of them.

Period

The period during which the service was rendered. See Period [page 285].

UnitRate

The rate at which the service item is charged. In cXML version 2.1.011 or later, use the `UnitRate` element rather than `UnitOfMeasure` and `UnitPrice`, because `UnitRate` includes the rate code. For some services, such as temporary labor, `UnitRate` is required.

`UnitRate` represents the amount to be paid per unit of time (or of some other measure). In the case of multiple `UnitRates`, each `UnitRate` should include a `TermReference` to distinguish it from others. `TermReference` is a generic base element that identifies the definition of the `UnitRate` in question. See UnitRate [page 129].

UnitOfMeasure (deprecated)

`UnitOfMeasure` is deprecated in cXML 1.2.011, and should not be used in new cXML documents. Use `UnitRate` instead. `UnitOfMeasure` is the unit of measure for the service. For example, HUR for per hour or MON for per month.

UnitPrice (deprecated)

`UnitPrice` is deprecated in cXML 1.2.011, and should not be used in new cXML documents. Use `UnitRate` instead. `UnitPrice` is the price, per unit of measure.

Tax

The tax for the line item. Ignored if `isTaxInLine` is false (not specified). See Tax [page 292]

GrossAmount

The `SubtotalAmount` plus taxes, shipping, and special handling charges for the line item.

InvoiceDetailDiscount

The discount for the line item. Ignored if `isDiscountInLine` is false (not specified). See InvoiceDetailDiscount [page 296].

InvoiceItemModification

Specifies the additional charges, allowances, and their taxes that are incurred for the total landed cost of the goods and service for an invoice item.

This element can store one or more `Modification` elements. For more information on the `Modification` element, see Total [page 106].

TotalCharges

The total sum of all the charges applied on the goods and services. This can appear at the line-item and summary in an invoice.

TotalAllowances

The total sum of all the allowances applied on the goods and services. This can appear at the line item and summary in an invoice.

NetAmount

The `GrossAmount` minus discounts for the line item.

Distribution

Accounting information generated by the buying organization, such as cost center or general ledger category. This information should be copied from the `OrderRequest`. Ignored if `isAccountingInLine` is false (not specified).

Comments

Textual comments for the line item.

InvoiceLaborDetail

Contains information about an item related to temporary labor. It has the following elements:

Element	Description
`Contractor`	The contractor whose work is being invoiced.
`JobDescription`	A text description of the job being performed.
`Supervisor`	Specifies contact information for the person who supervises the contractor.
`WorkLocation`	The address of the place where the work is performed.
`InvoiceTimeCardDetail`	Invoice details about a temporary labor service. The pay code for this invoice line item is in the `UnitRate` of the containing `InvoiceDetailServiceItem`.
`TimeCardReference`	Provides a clear reference to a prior `TimeCard` cXML document. TimeCardReference has the following attribute: **Attribute** — **Description** `timeCardID` — Unique ID for the timecard as sent on the `TimeCard` document during `TimeCardInfoRequest` or `TimeCardRequest`. See TimeCard Transaction [page 211]
`TimeCardIDInfo`	Defines the unique ID of the timecard known to the buyer and supplier systems. `TimeCardIDInfo` has the following attribute: **Attribute** — **Description** `timeCardID` (required) — Unique ID for the timecard as sent on the `TimeCard` document during `TimeCardInfoRequest` or `TimeCardRequest`. See TimeCard Transaction [page 211]

Extrinsic

Additional information related to this line item. Do not duplicate information in `InvoiceDetailItem` or `InvoiceDetailOrder`.

Use `Extrinsic` elements to specify line item related attributes such as service location, overtime/regular, and union/non- union.

For simple attributes such as overtime/regular, use a simple name, value pair, for example:

```
<Extrinsic name="serviceType">Temporary</Extrinsic>.
```

For structured attributes such as service location, use a structured element, for example:

```
<Extrinsic name="serviceLocation">
    <Contact role="serviceLocation">
        <Name>XYZ Inc</Name>
        <PostalAddress>
            <Street>123 Easy St</Street>
            <City>Sunnyvale</City>
            <State>California</State>
            <PostalCode>94089</PostalCode>
            <Country isoCountryCode="US">USA</Country>
        </PostalAddress>
    </Contact>
</Extrinsic>
```

13.2.2.4 InvoiceDetailReceiptInfo

Contains reference information of the receipt.

The following cXML excerpt shows an invoice with a reference to a receipt:

```
<InvoiceDetailOrder>
  <InvoiceDetailOrderInfo>
    <OrderReference orderID="po123">
      <DocumentReference payloadID="po123-2014-10-13"></DocumentReference>
    </OrderReference>
  </InvoiceDetailOrderInfo>
  <InvoiceDetailReceiptInfo>
    <ReceiptReference receiptDate="2014-10-13T14:02:00-07:00" receiptID="grn4567">
      <DocumentReference payloadID="grn4567-2014-10-13"></DocumentReference>
    </ReceiptReference>
  </InvoiceDetailReceiptInfo>
  <InvoiceDetailItem invoiceLineNumber="1" quantity="10">
    <UnitOfMeasure>PK</UnitOfMeasure>
    <UnitPrice>>Money currency="USD">31.20</Money></UnitPrice>
    <InvoiceDetailItemReference lineNumber="1">
      <ItemID><SupplierPartID>AX4518</SupplierPartID></ItemID>
      <Description xml:lang="en">BULLNOSE SHELVES 4 PK</Description>
      <ManufacturerPartID>AX4518</ManufacturerPartID>
      <ManufacturerName>20008496</ManufacturerName>
    </InvoiceDetailItemReference>
    <SubtotalAmount><Money currency="USD">312.00</Money></SubtotalAmount>
    <GrossAmount><Money currency="USD">312.00</Money></GrossAmount>
    <NetAmount><Money currency="USD">312.00v/Money></NetAmount>
    <Distribution>
      <Accounting name="DistributionCharge">
        <AccountingSegment id="2323">
          <Name xml:lang="en">Cost Center</Name>
          <Description xml:lang="en">Western Region Sales</Description>
        </AccountingSegment>
        <AccountingSegment id="23456">
          <Name xml:lang="en">G/L Account</Name>
          <Description xml:lang="en">Entertainment</Description>
        </AccountingSegment>
```

```
      </Accounting>
      <Charge>
        <Money currency="USD">312.00</Money>
      </Charge>
    </Distribution>
    <ReceiptLineItemReference receiptLineNumber="4"/>
  </InvoiceDetailItem>
  ...
</InvoiceDetailOrder>
```

`InvoiceDetailReceiptInfo` has the following elements:

ReceiptReference

Reference to the receipt being invoiced.

ReceiptIDInfo

Buyer system receipt ID.

13.2.2.5 InvoiceDetailShipNoticeInfo

Contains reference information of the ship notice.

The following cXML excerpt shows an invoice with a reference to a ship notice:

```
<InvoiceDetailOrder>
  <InvoiceDetailOrderInfo>
    <OrderReference orderID="po123">
      <DocumentReference payloadID="po123-2014-10-13"></DocumentReference>
    </OrderReference>
  </InvoiceDetailOrderInfo>
  <InvoiceDetailShipNoticeInfo>
    <ShipNoticeReference shipNoticeDate="2014-10-13T14:02:00-07:00"
shipNoticeID="asn7890">
      <DocumentReference payloadID="asn7890-2014-10-13"></DocumentReference>
    </ShipNoticeReference>
  </InvoiceDetailShipNoticeInfo>
  <InvoiceDetailItem invoiceLineNumber="1" quantity="10">
    <UnitOfMeasure>PK</UnitOfMeasure>
    <UnitPrice>>Money currency="USD">31.20</Money></UnitPrice>
    <InvoiceDetailItemReference lineNumber="1">
      <ItemID><SupplierPartID>AX4518</SupplierPartID></ItemID>
      <Description xml:lang="en">BULLNOSE SHELVES 4 PK</Description>
      <ManufacturerPartID>AX4518</ManufacturerPartID>
      <ManufacturerName>20008496</ManufacturerName>
    </InvoiceDetailItemReference>
    <SubtotalAmount><Money currency="USD">312.00</Money></SubtotalAmount>
    <GrossAmount><Money currency="USD">312.00</Money></GrossAmount>
    <NetAmount><Money currency="USD">312.00v/Money></NetAmount>
    <Distribution>
      <Accounting name="DistributionCharge">
        <AccountingSegment id="2323">
```

```
          <Name xml:lang="en">Cost Center</Name>
          <Description xml:lang="en">Western Region Sales</Description>
        </AccountingSegment>
        <AccountingSegment id="23456">
          <Name xml:lang="en">G/L Account</Name>
          <Description xml:lang="en">Entertainment</Description>
        </AccountingSegment>
      </Accounting>
      <Charge>
        <Money currency="USD">312.00</Money>
      </Charge>
    </Distribution>
    <ShipNoticeLineItemReference shipNoticeLineNumber="2"/>
  </InvoiceDetailItem>
  ...
</InvoiceDetailOrder>
```

`InvoiceDetailShipNoticeInfo` has the following elements:

ShipNoticeReference

Reference to the ship notice being invoiced.

ShipNoticeIDIDInfo

Buyer system ship notice ID.

13.2.3 InvoiceDetailHeaderOrder

Defines the header invoice information of a purchase order, without item details, used only when `isHeaderInvoice="yes"`.

In this case, an invoice line is an `InvoiceDetailHeaderOrder` and its invoice line number is specified by the `invoiceLineNumber` attribute.

13.2.3.1 InvoiceDetailOrderInfo

Defines information related to the corresponding purchase order. See InvoiceDetailOrderInfo [page 286]

13.2.3.2 InvoiceDetailOrderSummary

Defines header level summary info of an order in an invoice line.

`InvoiceDetailOrderSummary` has the following attribute:

Attribute	Description
`invoiceLineNumber` (required)	Supplier defined ID for the current invoice line. It should be unique across all invoice lines of the same `InvoiceDetailRequest`.
`inspectionDate`	The date when the transfer of goods or the delivery of services occurs according to legal tax definitions. The usage of this attribute is optional in most cases, and must be defined by the trading partners involved in the transaction.

SubtotalAmount

The invoice subtotal of the this order.

Period

The period over which the services were rendered. See Period [page 285].

Tax

The tax for this order. Ignored if `isTaxInLine` is false (not specified). See Tax [page 292].

InvoiceDetailLineSpecialHandling

`InvoiceDetailLineSpecialHandling` contains the special handling information for this order. Ignored if `isSpecialHandlingInLine` is false (not specified). See InvoiceDetailLineSpecialHandling [page 294].

InvoiceDetailLineShipping

`InvoiceDetailLineShipping` contains the shipping information for this invoice line. Ignored if `isShippingInLine` is false (not specified). See InvoiceDetailLineShipping [page 295].

GrossAmount

The `SubtotalAmount` plus taxes, shipping, and special handling charges.

InvoiceDetailDiscount

The discount for the line item. Ignored if `isDiscountInLine` is false (not specified). See InvoiceDetailDiscount [page 296].

NetAmount

The `GrossAmount` minus discount amount.

Comments

Textual comments for the line item.

Extrinsic

Additional information related to the line item. Should not duplicate anything in `InvoiceDetailOrderSummary` or `InvoiceDetailHeaderOrder`.

13.2.4 InvoiceDetailSummary

Defines the summary information of an invoice.

13.2.4.1 SubtotalAmount

Sum of line item quantities multiplied by unit price.

13.2.4.2 Tax

Total tax information. See Tax [page 292].

This element also includes the taxes on allowances and charges at both the header-level and line-item level for the line-items in an invoice. For more information, see Total [page 106].

Suppliers can add a maximum of three tax elements for the charges added to credit memos.

13.2.4.3 SpecialHandlingAmount

`SpecialHandlingAmount` is the total special handling charge. It has the following elements:

Element	Description
`Money` (required)	Monetary amount of the special handling charge.
`Description`	Contains an optional description of the charge.
`Distribution`	Represents the breakdown of one overall amount into sub-amounts. It is the the combination of a `Charge` against an `Accounting` element.

13.2.4.4 ShippingAmount

`ShippingAmount` is the total shipping charge. It has the following elements:

Element	Description
`Money` (required)	Monetary amount of the shipping charge.
`Distribution`	Represents the breakdown of one overall amount into sub-amounts. It is the the combination of a `Charge` against an `Accounting` element.

13.2.4.5 GrossAmount

Sum of subtotal, taxes, special handling charges, and shipping charges, before discounts.

13.2.4.6 InvoiceDetailDiscount

The total discount or penalty applied in the invoice. See InvoiceDetailDiscount [page 296].

13.2.4.7 InvoiceHeaderModifications

Specifies the additional charges, allowances, and their taxes that are incurred for the total landed cost of the goods and services at the invoice header-level.

This element can store one or more `Modification` elements. For more information on the Modification element, see Total [page 106].

13.2.4.8 TotalCharges

The total sum of all the charges applied on the goods and services. This can appear at the line-item and summary in an invoice.

13.2.4.9 TotalAllowances

The total sum of all the allowances applied on the goods and services. This can appear at the line item and summary in an invoice. For more information on allowance and charges, see Total [page 106].

13.2.4.10 TotalAmountWithoutTax

This element is used to summarize the total invoice amount without tax. The total amount includes:

- SubTotal
- Shipping Amount
- Special Handling
- Charges

Allowances and Discounts are subtracted from the sum of the above four amounts.

This element does not include taxes.

13.2.4.11 NetAmount

Total `GrossAmount` minus discounts.

13.2.4.12 DepositAmount

Total deposit or prepayment amount.

13.2.4.13 DueAmount

Total amount due and payable: `NetAmount` minus `DepositAmount`. If `purpose="creditMemo"`, this amount must be negative. If `purpose="debitMemo"`, this amount must be positive.

13.2.4.14 InvoiceDetailSummaryIndustry

`InvoiceDetailSummaryIndustry` contains summary-level information for the industry-specific data. It has the following element:

InvoiceDetailSummaryRetail

`InvoiceDetailSummaryRetail` specifies the retail industry-specific data. It has the following element:

Element	Description
`AdditionalAmounts`	Specifies the summary amount for all the retail industry-specific fields.

`AdditionalAmounts` has the following elements:

Element	Description
`TotalRetailAmount`	Specifies the total retail value of all items. The element has the `Money` element.
`InformationalAmount`	Specifies the information price, excluding allowances or charges, and taxes. This price is only for informational purposes. The element has the `Money` element.
`GrossProgressPaymentAmount`	Specifies the gross monetary amount paid (or to be paid) at intervals. The element has the `Money` element.
`TotalReturnableItemsDeposit Amount`	Specifies the deposit amount charged for returnable items. For example, boxes, containers, pallets, etc. The element has the `Money` element.
`GoodsAndServicesAmount`	Specifies the total amount paid for goods and services excluding deposits for returnable goods. The element has the `Money` element.
`ExactAmount`	Specifies the exact amount derived from 'sum' information. The element has the `Money` element.

13.3 Response

Immediately after receiving an invoice, the receiving system should respond with a generic cXML Response document, for example:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/InvoiceDetail.dtd">
<cXML timestamp="2001-10-31T23:07:22-08:00"
payloadID="1004598442900-8367273815197467070@10.10.13.100">
    <Response>
        <Status code="201" text="Accepted">Acknowledged</Status>
    </Response>
</cXML>
```

Related Information

Status [page 39]

13.4 Invoice Status Update

After buying organizations receive invoices, they can perform reconciliation to match the charges within them to amounts within purchase orders or master agreements. They can then set invoice status to indicate whether charges reconciled successfully.

Buying organizations update the status of invoices by sending `StatusUpdateRequest` documents to commerce network hubs, which can forward them to suppliers.

`StatusUpdateRequest` documents for invoices contain `InvoiceStatus` elements. Invoice status can be processing, reconciled, rejected, paying, or paid, which refers to the action taken by the buying organization on the invoice:

InvoiceStatus type	Description
`processing`	The invoice was received by the buying organization and is being processed.
`canceled`	The invoice was received by the buying organization and was canceled.
`reconciled`	The invoice reconciled. The amounts in the invoice have not yet been paid.
`rejected`	The invoice failed to reconcile. The buying organization is rejecting the invoice. The `Comments` element should contain free text explaining why the invoice was rejected, and the actions the supplier should take. The supplier can resubmit a corrected invoice (a new invoice document with a new invoice number).
`paying`	The invoice is in the payment process or has been partially paid.
`paid`	The invoice amounts have been paid by the buying organization.

The `PartialAmount` element enables buying organizations to specify different amounts paid than the amounts specified in invoices. `PartialAmount` should not appear for invoices that are paid in full. The existence of `PartialAmount` alerts the supplier to read the `Comments` elements, which should explain the differences.

The `DocumentReference` within the `StatusUpdateRequest` must refer to the `InvoiceDetailRequest` document. The `Status` element should have status code 200.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2001-09-05T16:34:28-07:00"
payloadID="999732868377--6819563659113021 07@10.11.128.161">
    <Header>
        <From>
            <Credential domain="AribaNetworkUserId">
                <Identity>jill@buyerorg.com</Identity>
            </Credential>
        </From>
        <To>
```

```
            <Credential domain="AribaNetworkUserId">
                <Identity>jack@supplierorg.com</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="AribaNetworkUserId">
                <Identity>jill@buyerorg.com</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Procurement Application V1.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <StatusUpdateRequest>
            <DocumentReference payloadID="Inv123"></DocumentReference>
            <Status code="200" text=""></Status>
            <InvoiceStatus type="paid">
                <PartialAmount>
                    <Money currency="USD">10.99</Money>
                </PartialAmount>
            <Comments>This charge is paid, minus $2.00 due to missing items.
            </Comments>
            </InvoiceStatus>
        </StatusUpdateRequest>
    </Request>
</cXML>
```

Related Information

StatusUpdateRequest [page 229]

13.5 Example Invoices

The following examples illustrate several types of invoices.

- Standard Header Invoice [page 314]
- Standard Detail Invoice [page 317]
- Service Invoice [page 320]
- Marketplace Invoice [page 324]

13.5.1 Standard Header Invoice

This example shows a header invoice against a single purchase order.

```
<?xml version="1.0" encoding="UTF-8"?> <!DOCTYPE cXML SYSTEM "http://xml.cXML.org/
schemas/cXML/1.2.020/InvoiceDetail.dtd">
<cXML timestamp="2009-03-10T16:23:01-07:00" payloadID="Mar102009_0447pm">
    <Header>
        <From>
            <Credential domain="AribaNetworkUserID">
```

```
                <Identity>jack@supplierorg.com</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="AribaNetworkUserID">
                <Identity>jill@buyerorg.com</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="AribaNetworkUserID">
                <Identity>jack@supplierorg.com</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Supplier’s Super Invoice Generator</UserAgent>
        </Sender>
    </Header>
    <Request>
        <InvoiceDetailRequest>
            <InvoiceDetailRequestHeader invoiceDate="2009-03-09T00:00:00-07:00"
                invoiceID="Mar102009_0447pm" purpose="creditMemo"
                operation="new" invoiceOrigin="supplier">
                <InvoiceDetailHeaderIndicator isHeaderInvoice="yes" />
                <InvoiceDetailLineIndicator isTaxInLine="yes" isShippingInLine="yes"
                        isSpecialHandlingInLine="yes" isDiscountInLine="yes" />
                <InvoicePartner>
                    <Contact role="billTo">
                        <Name xml:lang="en-US">Buyer Headquarters</Name>
                        <PostalAddress>
                            <Street>111 Main Street</Street>
                            <City>Anytown</City>
                            <State>CA</State>
                            <PostalCode>94089</PostalCode>
                            <Country isoCountryCode="US">United States
                            </Country>
                        </PostalAddress>
                    </Contact>
                </InvoicePartner>
                <InvoicePartner>
                    <Contact role="remitTo">
                    <Name xml:lang="en-US">Supplier Accts. Receivable</Name>
                    <PostalAddress>
                        <Street>One Bank Avenue</Street>
                        <City>Any City</City>
                        <State>CA</State>
                        <PostalCode>94087</PostalCode>
                        <Country isoCountryCode="US">United States</Country>
                    </PostalAddress>
                    </Contact>
                    <IdReference identifier="123456789" domain="bankRoutingID" />
                    <IdReference identifier="3456" domain="accountID" />
                </InvoicePartner>
                <Comments xml:lang="en-US">This is an invoice for DO789</Comments>
            </InvoiceDetailRequestHeader>
            <InvoiceDetailHeaderOrder>
                <InvoiceDetailOrderInfo>
                    <OrderReference>
                        <DocumentReference payloadID="99576652.982.090.136" />
                    </OrderReference>
                </InvoiceDetailOrderInfo>
                <InvoiceDetailOrderSummary invoiceLineNumber="1">
                    <SubtotalAmount>
                        <Money currency="USD">5000.00</Money>
                    </SubtotalAmount>
                    <Tax>
                        <Money currency="USD">500.00</Money>
                        <Description xml:lang="en-US">State Tax</Description>
                    </Tax>
                    <InvoiceDetailLineSpecialHandling>
```

```
                <Money currency="USD">110.00</Money>
            </InvoiceDetailLineSpecialHandling>
            <InvoiceDetailLineShipping>
                <InvoiceDetailShipping>
                    <Contact role="shipFrom" addressID="1000487">
                        <Name xml:lang="en">Main Shipping Dock</Name>
                        <PostalAddress name="default">
                            <Street>15 Oak Road</Street>
                            <City>Bigtown</City>
                            <State>CA</State>
                            <PostalCode>95032</PostalCode>
                            <Country isoCountryCode="US">United States
                            </Country>
                        </PostalAddress>
                        <Email name="default">shipper@supplierorg.com
                        </Email>
                        <Phone name="work">
                            <TelephoneNumber>
                                <CountryCode isoCountryCode="US">1
                                </CountryCode>
                                <AreaOrCityCode>888</AreaOrCityCode>
                                <Number>1234567</Number>
                            </TelephoneNumber>
                        </Phone>
                    </Contact>
                    <Contact role="shipTo" addressID="1000487">
                        <Name xml:lang="en">Main Receiving</Name>
                        <PostalAddress name="default">
                            <DeliverTo>Jason Lynch</DeliverTo>
                            <Street>77 Nowhere Street</Street>
                            <City>Industrial Town</City>
                            <State>CA</State>
                            <PostalCode>95035</PostalCode>
                            <Country isoCountryCode="US">United States
                            </Country>
                        </PostalAddress>
                        <Email name="default">jlynch@buyerorg.com</Email>
                        <Phone name="work">
                            <TelephoneNumber>
                                <CountryCode isoCountryCode="US">1
                                </CountryCode>
                                <AreaOrCityCode>999</AreaOrCityCode>
                                <Number>3582000</Number>
                            </TelephoneNumber>
                        </Phone>
                    </Contact>
                </InvoiceDetailShipping>
                <Money currency="USD">200.00</Money>
            </InvoiceDetailLineShipping>
            <GrossAmount>
                <Money currency="USD">5810.00</Money>
            </GrossAmount>
            <InvoiceDetailDiscount percentageRate="10">
                <Money currency="USD">581.00</Money>
            </InvoiceDetailDiscount>
            <NetAmount>
                <Money currency="USD">5229.00</Money>
            </NetAmount>
            <Comments>This a Standard Header Level Invoice</Comments>
        </InvoiceDetailOrderSummary>
    </InvoiceDetailHeaderOrder>
    <InvoiceDetailSummary>
        <SubtotalAmount>
            <Money currency="USD">5000.00</Money>
        </SubtotalAmount>
        <Tax>
            <Money currency="USD">500.00</Money>
            <Description xml:lang="en-US">State Tax</Description>
```

```
                </Tax>
                <SpecialHandlingAmount>
                    <Money currency="USD">110.00</Money>
                    <Description xml:lang="en">Invoice Surcharge</Description>
                </SpecialHandlingAmount>
                <ShippingAmount>
                    <Money currency="USD">200.00</Money>
                </ShippingAmount>
                <GrossAmount>
                    <Money currency="USD">5810.00</Money>
                </GrossAmount>
                <InvoiceDetailDiscount percentageRate="10">
                    <Money currency="USD">581.00</Money>
                </InvoiceDetailDiscount>
                <NetAmount>
                    <Money currency="USD">5229.00</Money>
                </NetAmount>
                <DepositAmount>
                    <Money currency="USD">1000.00</Money>
                </DepositAmount>
                <DueAmount>
                    <Money currency="USD">4229.00</Money>
                </DueAmount>
            </InvoiceDetailSummary>
        </InvoiceDetailRequest>
    </Request>
</cXML>
```

13.5.2 Standard Detail Invoice

This example shows a detail invoice for two line items in a single purchase order. It contains payment terms that define discounts for early payment and penalties for late payment. It also contains the buying organization's accounting information copied from the purchase order.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/InvoiceDetail.dtd">
<cXML payloadID="Oct102001_1204pm" timestamp="2001-04-20T23:59:45-07:00">
    <Header>
        From, To, and Sender credentials
    </Header>
    <Request>
        <InvoiceDetailRequest>
            <InvoiceDetailRequestHeader invoiceID="Oct102001_1204pm"
                    purpose="standard" operation="new"
                    invoiceDate="2001-04-20T23:59:20-07:00">
                <InvoiceDetailHeaderIndicator/>
                <InvoiceDetailLineIndicator isTaxInLine="yes” isShippingInLine="yes"
                        isAccountingInLine="yes"/>
                <InvoicePartner>
                    Sell To contact information
                </InvoicePartner>
                <InvoicePartner>
                    Remit To contact information
                </InvoicePartner>
                <PaymentTerm payInNumberOfDays="10">
                    <Discount>10</Discount>
                </PaymentTerm>
                <PaymentTerm payInNumberOfDays="20">
                    <Discount>5</Discount>
                </PaymentTerm>
                <PaymentTerm payInNumberOfDays="30">
                    <Discount>0</Discount>
```

```
            </PaymentTerm>
            <PaymentTerm payInNumberOfDays="40">
                <Discount>-5</Discount>
            </PaymentTerm>
            <PaymentTerm payInNumberOfDays="50">
                <Discount>-9</Discount>
            </PaymentTerm>
        </InvoiceDetailRequestHeader>
        <InvoiceDetailOrder>
            <InvoiceDetailOrderInfo>
                <OrderReference>
                    <DocumentReference payloadID="99576652.982.090.136"/>
                </OrderReference>
                <MasterAgreementReference>
                    <DocumentReference payloadID="99576652.980.000.423"/>
                </MasterAgreementReference>
                <SupplierOrderInfo orderID="DO1234"></SupplierOrderInfo>
            </InvoiceDetailOrderInfo>
            <InvoiceDetailItem invoiceLineNumber="1" quantity="1">
             <UnitOfMeasure>EA</UnitOfMeasure>
                <UnitPrice><Money currency="USD">15.40</Money></UnitPrice>
                <InvoiceDetailItemReference lineNumber="1">
                    <ItemID>
                        <SupplierPartID>TEX08134</SupplierPartID>
                    </ItemID>
                    <Description xml:lang="en">
                        Texas Instruments Superview Calculator -
                        12-Digit Print/Display
                    </Description>
                    <SerialNumber>45993823469876</SerialNumber>
                </InvoiceDetailItemReference>
                <SubtotalAmount>
                    <Money currency="USD">15.40</Money>
                </SubtotalAmount>
                <Tax>
                    <Money currency="USD">1.54</Money>
                    <Description xml:lang="en">total item tax</Description>
                    <TaxDetail purpose="tax" category="sales"
                        percentageRate="8">
                        <TaxableAmount>
                            <Money currency="USD">15.40</Money>
                        </TaxableAmount>
                        <TaxAmount>
                            <Money currency="USD">1.23</Money>
                        </TaxAmount>
                        <TaxLocation xml:lang="en">CA</TaxLocation>
                    </TaxDetail>
                    <TaxDetail purpose="tax" category="sales"
                        percentageRate="2">
                        <TaxableAmount>
                            <Money currency="USD">15.40</Money>
                        </TaxableAmount>
                        <TaxAmount>
                            <Money currency="USD">0.31</Money>
                        </TaxAmount>
                        <TaxLocation xml:lang="en">US</TaxLocation>
                    </TaxDetail>
                </Tax>
                <InvoiceDetailLineShipping>
                    <InvoiceDetailShipping>
                        Ship From and Ship To contact information
                    </InvoiceDetailShipping>
                    <Money currency="USD">2.00</Money>
                </InvoiceDetailLineShipping>
                <GrossAmount>
                    <Money currency="USD">18.94</Money>
                </GrossAmount>
                <NetAmount>
```

```
                    <Money currency="USD">18.94</Money>
                </NetAmount>
                <Distribution>
                    <Accounting name="Buyer assigned accounting code 15">
                        <AccountingSegment id="ABC123456789">
                            <Name xml:lang="en">Purchase</Name>
                            <Description xml:lang="en">Production Control
                            </Description>
                        </AccountingSegment>
                    </Accounting>
                    <Charge>
                        <Money currency="USD">18.94</Money>
                    </Charge>
                </Distribution>
                <Distribution>
                    <Accounting name="Buyer assigned accounting code 16">
                        <AccountingSegment id="ABC000000001">
                            <Name xml:lang="en">Trade</Name>
                            <Description xml:lang="en">Misc (Expensed)
                            </Description>
                        </AccountingSegment>
                    </Accounting>
                    <Charge>
                        <Money currency="USD">18.94</Money>
                    </Charge>
                </Distribution>
            </InvoiceDetailItem>
            <InvoiceDetailItem invoiceLineNumber="2" quantity="1">
                 <UnitOfMeasure>PK</UnitOfMeasure>
                <UnitPrice><Money currency="USD">4.95</Money></UnitPrice>
                <InvoiceDetailItemReference lineNumber="2">
                    <ItemID>
                        <SupplierPartID>PENCIL123</SupplierPartID>
                    </ItemID>
                    <Description xml:lang="en">
                        One dozen wood #2 pencils with eraser
                    </Description>
                </InvoiceDetailItemReference>
                <SubtotalAmount>
                    <Money currency="USD">4.95</Money>
                </SubtotalAmount>
                <Tax>
                    <Money currency="USD">0.50</Money>
                    <Description xml:lang="en">total item tax</Description>
                    <TaxDetail purpose="tax" category="sales"
                        percentageRate="8">
                        <TaxableAmount>
                            <Money currency="USD">0.40</Money>
                        </TaxableAmount>
                        <TaxAmount>
                            <Money currency="USD">4.95</Money>
                        </TaxAmount>
                        <TaxLocation xml:lang="en">CA</TaxLocation>
                    </TaxDetail>
                    <TaxDetail purpose="tax" category="sales"
                        percentageRate="2">
                        <TaxLocation xml:lang="en">US</TaxLocation>
                        <TaxableAmount>
                            <Money currency="USD">4.95</Money>
                        </TaxableAmount>
                        <TaxAmount>
                            <Money currency="USD">0.10</Money>
                        </TaxAmount>
                    </TaxDetail>
                </Tax>
                <InvoiceDetailLineShipping>
                    <InvoiceDetailShipping>
                        Ship From and Ship To contact information
```

```
                        </InvoiceDetailShipping>
                        <Money currency="USD">1.00</Money>
                    </InvoiceDetailLineShipping>
                    <GrossAmount>
                        <Money currency="USD">6.45</Money>
                    </GrossAmount>
                    <NetAmount>
                        <Money currency="USD">6.45</Money>
                    </NetAmount>
                </InvoiceDetailItem>
            </InvoiceDetailOrder>
            <InvoiceDetailSummary>
                <SubtotalAmount>
                    <Money currency="USD">20.35</Money>
                </SubtotalAmount>
                <Tax>
                    <Money currency="USD">2.04</Money>
                    <Description xml:lang="en">total tax</Description>
                    <TaxDetail purpose="tax" category="sales" percentageRate="8">
                        <TaxableAmount>
                            <Money currency="USD">20.35</Money>
                        </TaxableAmount>
                        <TaxAmount>
                            <Money currency="USD">1.63</Money>
                        </TaxAmount>
                        <TaxLocation xml:lang="en">CA</TaxLocation>
                    </TaxDetail>
                    <TaxDetail purpose="tax" category="sales" percentageRate="2">
                        <TaxableAmount>
                            <Money currency="USD">20.35</Money>
                        </TaxableAmount>
                        <TaxAmount>
                            <Money currency="USD">0.41</Money>
                        </TaxAmount>
                        <TaxLocation xml:lang="en">US</TaxLocation>
                    </TaxDetail>
                </Tax>
                <ShippingAmount>
                    <Money currency="USD">3.00</Money>
                </ShippingAmount>
                <GrossAmount>
                    <Money currency="USD">25.39</Money>
                </GrossAmount>
                <NetAmount>
                    <Money currency="USD">25.39</Money>
                </NetAmount>
                <DueAmount>
                    <Money currency="USD">25.39</Money>
                </DueAmount>
            </InvoiceDetailSummary>
        </InvoiceDetailRequest>
    </Request>
</cXML>
```

13.5.3 Service Invoice

The following invoice is for both regular items and service items.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/InvoiceDetail.dtd">
<cXML payloadID="combo-1@supplier.com" timestamp="2001-04-20T23:59:45-07:00">
    <Header>
        From, To, and Sender credentials
```

```
    </Header>
    <Request deploymentMode="test">
        <InvoiceDetailRequest>
            <InvoiceDetailRequestHeader
                invoiceID="123456"
                purpose="standard"
                operation="new"
                invoiceDate="2001-04-20T23:59:20-07:00">
                <InvoiceDetailHeaderIndicator/>
                <InvoiceDetailLineIndicator
                    isTaxInLine="yes"
                    isShippingInLine="yes"
                    isAccountingInLine="yes"/>
                <InvoicePartner>
                    <Contact role="soldTo" addressID="B2.4.319">
                        <Name xml:lang="en">Mike Smith</Name>
                            Postal address, email address, phone,
                            and fax information
                    </Contact>
                </InvoicePartner>
                <InvoicePartner>
                    <Contact role="remitTo" addressID="Billing">
                        <Name xml:lang="en">Lisa King</Name>
                            Postal address, email address, phone,
                            and fax information
                    </Contact>
                    <IdReference identifier="00000-11111"
                        domain="accountReceivableID">
                        <Creator xml:lang="en">Supplier ERP</Creator>
                    </IdReference>
                    <IdReference identifier="123456789" domain="bankRoutingID">
                        <Creator xml:lang="en">Supplier Bank</Creator>
                    </IdReference>
                </InvoicePartner>
                <lPaymentTerm payInNumberOfDays="10">
                    <Discount>10</Discount>
                </PaymentTerm>
                <PaymentTerm payInNumberOfDays="20">
                    <Discount>5</Discount>
                </PaymentTerm>
                <PaymentTerm payInNumberOfDays="30">
                    <Discount>0</Discount>
                </PaymentTerm>
                <PaymentTerm payInNumberOfDays="40">
                    <Discount>-5</Discount>
                </PaymentTerm>
            </InvoiceDetailRequestHeader>
            <InvoiceDetailOrder>
                <InvoiceDetailOrderInfo>
                    <MasterAgreementIDInfo agreementID="MA-1234"/>
                </InvoiceDetailOrderInfo>
                <InvoiceDetailItem invoiceLineNumber="1" quantity="100">
                    <UnitOfMeasure>EA</UnitOfMeasure>
                    <UnitPrice>
                        <Money currency="USD">57.13</Money>
                    </UnitPrice>
                    <InvoiceDetailItemReference lineNumber="2">
                        <ItemID>
                            <SupplierPartID>TOW08134</SupplierPartID>
                        </ItemID>
                        <Description xml:lang="en">Roll Towel Series 2000
                        </Description>
                    </InvoiceDetailItemReference>
                    <SubtotalAmount>
                        <Money currency="USD">5713</Money>
                    </SubtotalAmount>
                    <Tax>
                        <Money currency="USD">287</Money>
```

```
                <Description xml:lang="en">total item tax</Description>
                <TaxDetail purpose="tax" category="State sales tax"
                    percentageRate="8">
                    <TaxableAmount>
                        <Money currency="USD">5713</Money>
                    </TaxableAmount>
                    <TaxAmount>
                        <Money currency="USD">200</Money>
                    </TaxAmount>
                    <TaxLocation xml:lang="en">CA</TaxLocation>
                </TaxDetail>
            </Tax>
            <GrossAmount>
                <Money currency="USD">6000</Money>
            </GrossAmount>
            <NetAmount>
                <Money currency="USD">6000</Money>
            </NetAmount>
        </InvoiceDetailItem>
        <InvoiceDetailServiceItem invoiceLineNumber="2"
            quantity="100">
            <InvoiceDetailServiceItemReference lineNumber="1">
                <Classification domain="UNSPC">76111501</Classification>
                <Description xml:lang="en">
                    Window cleaning services at $30/hour
                </Description>
            </InvoiceDetailServiceItemReference>
            <SubtotalAmount>
                <Money currency="USD">3000.00</Money>
            </SubtotalAmount>
            <Period startDate="2001-02-01T12:00:00-00:00"
                    endDate="2001-03-30T12:00:00-00:00"/>
            <UnitOfMeasure>HUR</UnitOfMeasure>
            <UnitPrice>
                <Money currency="USD">30</Money>
            </UnitPrice>
            <Distribution>
                <Accounting name="Buyer assigned accounting code 1">
                    <AccountingSegment id="ABC123456789">
                        <Name xml:lang="en">Facilities</Name>
                    <Description xml:lang="en">Facilities</Description>
                    </AccountingSegment>
                </Accounting>
                <Charge>
                    <Money currency="USD">3000</Money>
                </Charge>
            </Distribution>
            <Extrinsic name="serviceLocation">
                <Contact role="serviceLocation">
                    <Name xml:lang="en">Jerry Seinfeld : NEW YORK</Name>
                    <PostalAddress>
                        <Street>2345 S. SAN PEDRO</Street>
                        <City>New York</City>
                        <State>NY</State>
                        <PostalCode>10002</PostalCode>
                        <Country isoCountryCode="US">USA</Country>
                    </PostalAddress>
                </Contact>
            </Extrinsic>
        </InvoiceDetailServiceItem>
            <!--- timecard invoice service line item -->
        <InvoiceDetailServiceItem invoiceLineNumber="3" quantity="12">
            <InvoiceDetailServiceItemReference lineNumber = "1">
                <Classification domain = "UNSPC">80111604</Classification>
                <Description xml:lang = "en">Assistant AA101</Description>
            </InvoiceDetailServiceItemReference>
            <SubtotalAmount>
                <Money currency = "USD">1200</Money>
```

```
                    </SubtotalAmount>
                    <Period startDate = "2001-04-01T12:00:00-00:00"
                            endDate = "2001-04-30T12:00:00-00:00"/>
                    <UnitRate>
                        <Money currency = "USD">100.00</Money>
                        <UnitOfMeasure>HUR</UnitOfMeasure>
                        <TermReference termName=”payCode” term=”regular”/>
                    </UnitRate>
                    <GrossAmount>
                        <Money currency = "USD">1200</Money>
                    </GrossAmount>
                    <NetAmount>
                        <Money currency = "USD">1200</Money>
                    </NetAmount>
                    <InvoiceLaborDetail>
                        <Contractor>
                            <ContractorIdentifier domain="ContractorId">
                                Contr1234
                            </ContractorIdentifier>
                            <Contact>
                                <Name>John Doe</Name>
                            </Contact>
                        </Contractor>
                    <JobDescription>
                        Assistant left-handed broom closet monitor.
                    </JobDescription>
                    <Supervisor>
                        <Contact>
                            <Name>Jill Hill</Name>
                        </Contact>
                    </Supervisor>
                <InvoiceTimeCardDetail>
                    <TimeCardIDInfo timeCardID="TC123”>
                </InvoiceTimeCardDetail>
            </InvoiceLaborDetail>
        </InvoiceDetailServiceItem>
            </InvoiceDetailOrder>
            <InvoiceDetailOrder>
                <InvoiceDetailOrderInfo>
                    <MasterAgreementIDInfo agreementID="MA-1235"/>
                </InvoiceDetailOrderInfo>
                    <!---  milestone invoicing -->
                <InvoiceDetailServiceItem invoiceLineNumber="4">
                    <InvoiceDetailServiceItemReference lineNumber="1">
                        <Classification domain="UNSPC">78102694</Classification>
                        <Description xml:lang="en">
                            Market Research preliminary analysis
                        </Description>
                    </InvoiceDetailServiceItemReference>
                    <SubtotalAmount>
                        <Money currency="USD">5000</Money>
                    </SubtotalAmount>
                </InvoiceDetailServiceItem>
            </InvoiceDetailOrder>
            <InvoiceDetailSummary>
                <SubtotalAmount>
                    <Money currency="USD">13713</Money>
                </SubtotalAmount>
                <Tax>
                    <Money currency="USD">287</Money>
                    <Description xml:lang="en">total tax</Description>
                        <TaxDetail purpose="tax"
                            category="State sales tax"
                            percentageRate="8">
                            <TaxableAmount>
                                <Money currency="USD">5713</Money>
                            </TaxableAmount>
                            <TaxAmount>
```

```
                                <Money currency="USD">200</Money>
                            </TaxAmount>
                            <TaxLocation xml:lang="en">CA</TaxLocation>
                        </TaxDetail>
                        <TaxDetail purpose="tax"
                            category="Federal sales tax"
                            percentageRate="2">
                            <TaxableAmount>
                                <Money currency="USD">5713</Money>
                            </TaxableAmount>
                        <TaxAmount>
                            <Money currency="USD">87</Money>
                        </TaxAmount>
                    </TaxDetail>
                </Tax>
                <GrossAmount>
                    <Money currency="USD">14000.00</Money>
                </GrossAmount>
                <NetAmount>
                    <Money currency="USD">14000.00</Money>
                </NetAmount>
                <DueAmount>
                    <Money currency="USD">14000.00</Money>
                </DueAmount>
            </InvoiceDetailSummary>
        </InvoiceDetailRequest>
    </Request>
</cXML>
```

13.5.4 Marketplace Invoice

This example shows the header of an invoice sent to a marketplace. It illustrates how to generate correct credentials for a marketplace.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/InvoiceDetail.dtd">
<cXML payloadID="123344-2001@.supplierorg.com"
        timestamp="2001-04-20T23:59:45-07:00">
    <Header>
        <From>
            <!-- Supplier -->
            <Credential domain="AribaNetworkUserId">
                <Identity>chef@supplierorg.com</Identity>
            </Credential>
        </From>
        <To>
            <!-- Marketplace -->
            <Credential domain="AribaNetworkUserId" type="marketplace">
                <Identity>bigadmin@marketplace.org</Identity>
            </Credential>
            <!-- Marketplace Member Organization -->
            <Credential domain="AribaNetworkUserId">
                <Identity>admin@acme.com</Identity>
            </Credential>
        </To>
        <Sender>
            <!-- Supplier -->
            <Credential domain="AribaNetworkUserId">
                <Identity>chef@supplierorg.com</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Our Nifty Invoice Generator V1.0</UserAgent>
        </Sender>
```

```
    </Header>
    <Request>
        <InvoiceDetailRequest>
```

13.5.5 Line Item Credit Memo for a Return Item

This example shows a line item credit memo for a return item:

```
<InvoiceDetailRequest>
    <InvoiceDetailRequestHeader invoiceDate="2016-02-12T14:49:57-05:00"
        invoiceID="CM_2" invoiceOrigin="supplier" operation="new"
        purpose="lineLevelCreditMemo">
        ...
        <InvoiceDetailItem invoiceLineNumber="1" quantity="1"
            reason="return" >
        ...
        </InvoiceDetailItem>
        ...
    </InvoiceDetailRequestHeader>
</InvoiceDetailRequest>
```

13.5.6 Invoice with Accounting Distributions

This example shows an invoice with accounting distributions for tax, shipping, and handling.

```
<InvoiceDetailItem>
    ...
    <Tax>
        <Money currency="CAD">140.00</Money>
        <Description xml:lang="en">Sales Tax</Description>
        <TaxDetail percentageRate="21" category="sales">
            <TaxableAmount>
                <Money currency="USD">1111.00</Money>
            </TaxableAmount>
            <TaxAmount>
                <Money currency="USD">233.31</Money>
            </TaxAmount>
        </TaxDetail>
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">1111.00</Money>
            </Charge>
        </Distribution>
    </Tax>

    <InvoiceDetailLineSpecialHandling>
        <Money currency="USD">15.00</Money>
```

```
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">15.00</Money>
            </Charge>
        </Distribution>
    </InvoiceDetailLineSpecialHandling>

    <InvoiceDetailLineShipping>
        <Money currency="USD">5.00</Money>
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">5.00</Money>
            </Charge>
        </Distribution>
    </InvoiceDetailLineShipping>

    <InvoiceDetailDiscount>
        <Money currency="USD">10.00</Money>
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">10.00</Money>
            </Charge>
        </Distribution>
    </InvoiceDetailDiscount>

    ...

</InvoiceDetailItem>
<InvoiceDetailSummary>
    <SubtotalAmount>
        <Money alternateCurrency="" alternateAmount=""
            currency="USD">50.00</Money>
    </SubtotalAmount>
    <Tax>
        <Money alternateCurrency="" alternateAmount=""
            currency="USD">0.00</Money>
        <Description xml:lang="en">TotalTax</Description>
        <TaxDetail percentageRate="0.00" category="sales" purpose="" >
```

```
            <TaxableAmount>
                <Money alternateCurrency="" alternateAmount=""
                    currency="USD">62.00</Money>
            </TaxableAmount>
            <TaxAmount>
                <Money alternateCurrency="" alternateAmount=""
                    currency="USD">0.00</Money>
            </TaxAmount>
            <Description xml:lang="en">Sales tax level</Description>
        </TaxDetail>
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">1111.00</Money>
            </Charge>
        </Distribution>
    </Tax>
    <SpecialHandlingAmount>
        <Money alternateCurrency="" alternateAmount="" currency="USD">6.00</Money>
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">6.00</Money>
            </Charge>
        </Distribution>
    </SpecialHandlingAmount>
    <ShippingAmount>
        <Money alternateCurrency="" alternateAmount="" currency="USD">7.00</Money>
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">7.00</Money>
            </Charge>
        </Distribution>
    </ShippingAmount>
    <GrossAmount>
        <Money alternateCurrency="" alternateAmount=""
            currency="USD">63.00</Money>
    </GrossAmount>
    <InvoiceDetailDiscount>
        <Money alternateCurrency="" alternateAmount=""
```

```
            currency="USD">1.00</Money>
        <Distribution>
            <Accounting name="DistributionCharge">
                <AccountingSegment id="100">
                    <Name xml:lang="en">Percentage</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
                <AccountingSegment id="6460">
                    <Name xml:lang="en">Account</Name>
                    <Description xml:lang="en"></Description>
                </AccountingSegment>
            </Accounting>
            <Charge>
                <Money currency="USD">1.00</Money>
            </Charge>
        </Distribution>
    </InvoiceDetailDiscount>
    <NetAmount>
        <Money alternateCurrency="" alternateAmount=""
            currency="USD">62.00</Money>
    </NetAmount>
    <DueAmount>
        <Money alternateCurrency="" alternateAmount=""
            currency="USD">62.00</Money>
    </DueAmount>
</InvoiceDetailSummary>
```

14 Service Sheets

The CXML `ServiceEntryRequest` transaction allows suppliers to send descriptions of services provided to buying organizations or marketplaces. It also describes how buying organizations and marketplaces can send service sheet status messages to suppliers.

Overview of Service Sheets [page 329]

ServiceEntryRequest [page 329]

Service Sheet Status Updates [page 342]

14.1 Overview of Service Sheets

Suppliers use cXML service sheets to describe specific items that they fulfilled in response to a purchase order for services. Suppliers can generate service sheets against any line in a purchase order that requires a service sheet. Suppliers can specify either material goods or services in service entry sheet lines.

Service sheets describe purchase orders, line items, accounting distributions, and partners involved in fulfilling the service, `ServiceEntryRequest` documents do not provide updates to tax and shipping amounts. This information should be transmitted with `ConfirmationRequest` documents. If necessary, you can send a `ConfirmationRequest` with `operation="update"` with this information after the shipment has been delivered.

`ConfirmationRequest` documents with `operation="update"` must include all relevant information from the original `OrderRequest` document.

> **Note**
>
> The DTD for this transaction is contained in `Fulfill.dtd` rather than `cXML.dtd`.

14.2 ServiceEntryRequest

The `ServiceEntryRequest` element represents service sheets.

The structure of a `ServiceEntryRequest` document is:

```
<ServiceEntryRequest>
    <ServiceEntryRequestHeader>
        <PartnerContact/>
        (<DocumentReference/> | </DocumentInfo>)
        <ServiceEntryDetailLineIndicator/>
        <ServiceEntryDetailShipping/>
        <ShipNoticeIDInfo/>
```

```
        <PaymentTerm/>
        <Period/>
        <Comments/>
        <Extrinsic/>
    </ServiceEntryRequestHeader>
    <ServiceEntryOrder>
        <ServiceEntryOrderInfo/>
        <ServiceEntryItem>
            <ItemReference/>
            (<MasterAgreementReference/> | <MasterAgreementIDInfo/>)
            (<UnitRate/> | <UnitPrice/> | <UnitOfMeasure/> | <PriceBasisQuantity/>)
            <Period/>
            <SubtotalAmount/>
            <Tax/>
            <GrossAmount/>
            <ServiceEntryDetailLineSpecialHandling/>
            <ServiceEntryDetailLineShipping/>
            <ShipNoticeIDInfo/>
            <ServiceEntryDetailDiscount/>
            <ServiceEntryItemModifications/>
            <TotalCharges/>
            <TotalAllowances/>
            <TotalAmountWithoutTax/>
            <NetAmount/>
            <Distribution/>
            <Comments/>
            <Extrinsic/>
        </ServiceEntryItem>
    </ServiceEntryOrder>
    <ServiceEntrySummary>
        <SubtotalAmount/>
        <Tax/>
        <SpecialHandlingAmount/>
        <ShippingAmount/>
        <GrossAmount/>
        <ServiceEntryDetailDiscount/>
        <ServiceEntryHeaderModifications/>
        <ServiceEntrySummaryLineItemModifications/>
        <TotalCharges/>
        <TotalAllowances/>
        <TotalAmountWithoutTax/>
        <NetAmount/>
        <DepositAmount/>
        <DueAmount/>
    </ServiceEntrySummary>
</ServiceEntryRequest>
```

14.2.1 ServiceEntryRequestHeader

The `ServiceEntryRequestHeader` element describes header-level information for the service sheet and has the following attributes:

Attribute	Description
`serviceEntryDate` (required)	The date when the supplier created the service sheet, which should be earlier than the document's timestamp.
`serviceEntryID` (required)	A supplier-generated identification number for the service sheet.

Attribute	Description
supplierReferenceNumber	A reference to the supplier associated with the service sheet, which is implied.
operation	Specifies how the ServiceEntryRequest behaves. Possible values: • new—The ServiceEntryRequest creates a new service sheet. The default value is operation="new". • delete—The ServiceEntryRequest cancels an existing service sheet, which must be specified by referencing its payloadID in the DocumentReference element.

The ServiceEntryRequestHeader element can contain the following elements:

14.2.1.1 PartnerContact

You should use the PartnerContact element to add new information about the parties directly involved with the fulfillment, receipt, and validation of services described in the service sheet. This element is required.

The PartnerContact element can contain Contact elements with the following possible values for the role attribute:

Value	Description
fieldEngineer	The buying organization or marketplace entity that supervises the service.
fieldContractor	The supplier entity that provides the service.
requester	The buying organization or marketplace entity that ordered or approves the service.

List the Contact elements in a PartnerContact element in any order. A Contact role attribute value must not appear more than once within a ServiceEntryRequestHeader element.

14.2.1.2 DocumentReference

The DocumentReference element identifies an earlier ServiceEntryRequest document. Either DocumentReference or DocumentInfo is required if the ServiceEntryRequestHeader operation is delete.

DocumentReference has the following attribute:

Attribute	Description
payloadID (required)	The value of the payloadID attribute for the earlier ServiceEntryRequest.

If both DocumentReference and DocumentInfo are used, they must refer to the same ServiceEntryRequest.

14.2.1.3 DocumentInfo

The `DocumentInfo` element identifies an earlier `ServiceEntryRequest` document. Either `DocumentReference` or `DocumentInfo` is required if the `ServiceEntryRequestHeader operation` is `delete`. If both `DocumentReference` and `DocumentInfo` are used, they must refer to the same `ServiceEntryRequest`.

14.2.1.4 ServiceEntryDetailLineIndicator

The `ServiceEntryDetailLineIndicator` element provides header-level indicators indicating certain information is provided at service sheet line level (in `ServiceEntryItem`).

14.2.1.5 ServiceEntryDetailShipping

The `ServiceEntryDetailShipping` element provides the shipping details related to a service sheet. It is ignored if `isShippingInLine` is true.

14.2.1.6 ShipNoticeIDInfo

The `ShipNoticeIDInfo` element references shipment-related document identifiers.

14.2.1.7 PaymentTerm

Describes either the net term, the discount, or penalty term in an invoice.

14.2.1.8 Period

The `Period` element specifies he time period over which the supplier rendered the services.

`Period` has the following attributes:

Attribute	Description
`startDate` (required)	The start date for the service.

Attribute	Description
endDate (required)	The end date for the service.

14.2.1.9 Comments

The Comments element contains human-readable information that the supplier can send with the service sheet. This string data is not intended for the automated systems at buyer sites.

The Comments element can contain an Attachment element for including external files.

Attachment Element

Comments can attach external files to augment service sheets. The Attachment element appears within Comments, and it contains only a reference to the external MIME part of the attachment. All attachments should be sent in a single multipart transmission with the ServiceEntryRequest document. Even if this is not possible, the contentID provided by the Attachment element must be usable to retrieve the attachment.

For details about the transfer of attached files, see Attachments [page 27].

Attachment contains a single URL with scheme “cid:”. An attached file in a cXML document might appear as:

```
<Comments>
    <Attachment>
        <URL>cid: uniqueCID@cxml.org</URL>
    </Attachment>
    See the attached file for equipment specifications.
</Comments>
```

14.2.1.10 IdReference

Defines an ID reference. See IdReference [page 244].

14.2.1.11 Extrinsic

The Extrinsic element contains machine-readable information related to the service sheet, but not defined by the cXML protocol. In contrast, the Comments element passes information for human use.

Each named Extrinsic can appear only once within the list associated with the ServiceEntryRequestHeader and individual ItemReference elements (within the contained ServiceEntryItem elements). The same name must not appear in both the ServiceEntryRequestHeader list and any list associated with the

ItemReference elements. If the same Extrinsic name and value is repeated in all ItemReference lists, it should be moved to the ServiceEntryRequestHeader.

The Extrinsic element can also appear in the ItemOut, IndexItem, PunchOutSetupRequest, ContractItem, and PostalAddress elements. Extrinsic values are case-insensitive.

14.2.2 ServiceEntryOrder

The ServiceEntryOrder element describes details for the service entry sheet and can contain the following elements.

14.2.2.1 ServiceEntryOrderInfo

The ServiceEntryOrderInfo element refers to a prior OrderRequest document using either an OrderReference or OrderIDInfo element. OrderReference is strongly recommended, but if that information is not available, use OrderIDInfo.

OrderReference Element

The OrderReference element contains a DocumentReference element with a payloadID attribute that provides a specific reference to a prior OrderRequest.

The OrderReference element also includes the following two attributes, which might allow the ServiceEntryRequest to be viewed independently:

Attribute	Description
orderID	The ID from the buying organization or marketplace's purchase order. If present, it must be copied from the OrderRequestHeader.
orderDate	The date and time the purchase order was created. If present, it must be copied from the OrderRequestHeader.

OrderIDInfo Element

The OrderIDInfo element references a purchase order known to the buyer's system. It includes the following attributes:

Attribute	Description
orderID (required)	The ID of a purchase order known to the buyer's system.

Attribute	Description
`orderDate`	The date and time the purchase order was created.

14.2.2.2 ServiceEntryItem

The `ServiceEntryItem` element describes individual line items in a `ServiceEntryRequest`. It has the following attributes:

Attribute	Description
`serviceLineNumber` (required)	The supplier-defined ID for the current service line, which should be unique for every `ServiceEntryItem` in a `ServiceEntryRequest`.
`quantity` (required)	The quantity serviced for the current service line.
`type`	Specifies the type for the `ServiceEntryItem`. Possible values: • `material`—Material goods delivered as part of a service order. • `service`—Services delivered as part of a service order.
`referenceDate`	The reference date for the blanket order or contract item. The usage of this attribute is optional in most cases and must be defined by the trading partners involved in the transaction. Procurement software might use this date in reconciling an invoice against a blanket order or contract.
`inspectionDate`	The date when the transfer of goods or the delivery of services occurs according to legal tax definitions. The usage of this attribute is optional in most cases, and must be defined by the trading partners involved in the transaction.

`ServiceEntryItem` can contain the following elements.

ItemReference

The `ItemReference` element references the related item in the OrderRequest and is required. It has the following attribute:

Attribute	Description
`lineNumber` (required)	The purchase order line number referenced by the current service sheet line. For planned service sheet items, `lineNumber` refers to the corresponding purchase order line. For unplanned service sheet items, lineNumber refers to the parent purchase order line.

`ItemReference` can contain the following elements:

Element	Description
`ItemID`	The part number for the service line.
`IdReference`	A unique ID for the part number.
`Classification`	The classification code for the service line.
`Description`	A text description of the service line.

MasterAgreementReference

The `MasterAgreementReference` element references a contract master agreement for the release purchase order against which the service sheet is created.

`MasterAgreementReference` contains a `DocumentReference` element with a `payloadID` attribute that explicitly references a prior `MasterAgreementRequest` document.

The `MasterAgreementReference` element also includes the following two attributes to reference master agreements:

Attribute	Description
`agreementID`	The ID of a master agreement known to the buyer's system.
`agreementDate`	The date and time when the master agreement was created.
`agreementType`	The type of the master agreement being referenced, for example, `"scheduling_agreement"`.

MasterAgreementIDInfo

The `MasterAgreementIDInfo` defines the buyer system ID for the contract master agreement associated with the release purchase order against which the service sheet is created. It includes the following attributes:

Attribute	Description
`agreementID` (required)	The ID of a master agreement known to the buyer's system.
`agreementDate`	The date and time when the master agreement was created.
`agreementType`	The type of the master agreement being referenced, for example, `"scheduling_agreement"`.

UnitRate

The `UnitRate` element describes the rate charged for a service. Use of `UnitRate` is recommended over the `UnitOfMeasure` and `UnitPrice` pair because `UnitRate` includes the rate code. For some services, such as temporary labor, `UnitRate` is required.

`UnitRate` represents the amount charged per unit of time or some other measure. It can include the following elements:

Element	Description
`Money`	The money amount of the rate. See Money [page 48]
`UnitOfMeasure`	Describes the unit in which the service is provided. See UnitOfMeasure [page 48].
`PriceBasisQuantity`	The quantity on which the price is based. See PriceBasisQuantity [page 289].
`TermReference`	`TermReference` is a generic base element that identifies the definition of the `UnitRate` in question. See UnitRate [page 128].

In the case of multiple `UnitRate` elements, each `UnitRate` should include a `TermReference` to distinguish it from the others.

UnitOfMeasure (Deprecated)

The `UnitOfMeasure` element is the unit of measure for a service, such as HUR for hour or MON for month. It is always paired with `UnitPrice`. It is deprecated in cXML 1.2.011. Use `UnitRate` instead.

UnitPrice (Deprecated)

The `UnitPrice` element is the price per unit of measure for a service, and is always paired with `UnitOfMeasure`. It is deprecated in cXML 1.2.011. Use `UnitRate` instead.

PriceBasisQuantity

The quantity on which the price is based. See PriceBasisQuantity [page 289].

Period

The `Period` element specifies the time period over which the supplier rendered the services.

`Period` has the following attributes:

Attribute	Description
`startDate` (required)	The start date for the service.
`endDate` (required)	The end date for the service.

SubtotalAmount

The `SubtotalAmount` element describes the subtotal for the current item, either `UnitPrice` or `UnitRate` x serviced quantity. It contains a `Money` element. See Money [page 48].

Tax

The tax info for this line item. It is ignored if `isTaxInLine` is false. See Tax [page 292].

GrossAmount

The `SubtotalAmount` plus taxes, shipping, and special handling charges.

ServiceEntryDetailLineSpecialHandling

The special handling information for this line item. It is ignored if `isSpecialHandlingInLine` is false.

ServiceEntryDetailLineShipping

The shipping information for this line item. It is ignored if `isShippingInLine` is false.

ShipNoticeIDInfo

References shipment related document identifiers. See ShipNoticeIDInfo [page 295].

ServiceEntryDetailDiscount

The discount information for this line item. It is ignored if `isDiscountInLine` is false.

ServiceEntryItemModifications

The additional charges, allowances and their taxes that are incurred for the total landed cost of the goods and service contained in this service sheet item.

TotalCharges

The total sum of all the charges applied on the goods and services at the line item level in a service sheet.

TotalAllowances

The total sum of all the allowances applied on the goods and services at the line item level in a service sheet.

TotalAmountWithoutTax

The total sum of the subtotal, charges (including special handling charges and shipping charges), allowances (including discounts) applied at the line item level in a service sheet. This does not include taxes.

NetAmount

The `GrossAmount` minus the discount amount.

Distribution

The `Distribution` element defines how the cost of a service are distributed among various parties. See Distribution [page 131].

Comments

The `Comments` element contains human-readable information that the supplier can send with the service sheet. This string data is not intended for the automated systems at buyer sites.

The `Comments` element can contain an `Attachment` element for including external files.

Extrinsic

The `Extrinsic` element contains machine-readable information related to the service sheet, but not defined by the cXML protocol. In contrast, the `Comments` element passes information for human use.

14.2.2.3 ServiceEntrySummary

The `ServiceEntrySummary` element describes the sum of all `ServiceEntryItem Subtotal` amounts for the `ServiceEntryRequest`. It contains a `SubtotalAmount` element as well as several other optional elements.

SubtotalAmount

The sum of amounts for all quantities.

Tax

Total tax information. See Tax [page 292].

SpecialHandlingAmount

Special handling charge.

ShippingAmount

Shipping charge.

GrossAmount

Sum of subtotal, taxes, special handling charges, and shipping charges, before discounts

ServiceEntryDetailDiscount

The total discount applied in this `ServiceEntryRequest`. Its `percentageRate` attribute is ignored if `isDiscountInLine` is true.

ServiceEntryHeaderModifications

The additional charges, allowances and their taxes that are incurred for the total landed cost of the goods and services within the service sheet header. This value specified at the header-level is not the aggregated value towards the charges or allowances available for the line items.

ServiceEntrySummaryLineItemModifications

Summary of all modifications applied on the goods and services at the line item level in a service entry.

TotalCharges

The total sum of all the charges applied on the goods and services at the header-level and line item level in a service sheet.

TotalAllowances

The total sum of all the allowances applied on the goods and services at the header-level and line item level in a service sheet.

TotalAmountWithoutTax

The total sum of the subtotal, charges (including special handling charges and shipping charges), allowances (including discounts) applied at the header-level and line item level in a service sheet. This does not include taxes.

NetAmount

Gross amount minus discounts.

DepositAmount

Total deposit/prepayment amount.

DueAmount

Total amount due and payable. It equals `NetAmount` minus `DepositAmount`. If `ServiceEntryRequest@purpose` is "creditMemo" or "lineLevelCreditMemo", this amount must be negative. If `ServiceEntryRequest@purpose` is "debitMemo", this amount must be positive.

14.3 Service Sheet Status Updates

After buying organizations receive service sheets, they can approve or reject them, and can set the service sheet status accordingly.

Buying organizations update the status of a service sheet by sending `StatusUpdateRequest` documents to commerce network hubs, which can forward them to suppliers.

The `DocumentReference` element within the `StatusUpdateRequest` must refer to the `ServiceEntryRequest` document. The `Status` element should have status code `200`.

`StatusUpdateRequest` documents for service sheets contain a `DocumentStatus` element. Service sheet status can be processing, approved, or rejected, which refers to the action taken by the buying organization on the service sheet.

Related Information

DocumentStatus [page 233]

15 Catalogs

Catalogs are documents that convey product and service content to buying organizations. Suppliers use them to describe the products and services they offer and their prices.

Catalog Definitions [page 343]

Type Definitions [page 347]

Subscription Management Definitions [page 352]

Catalog Upload Transaction [page 361]

15.1 Catalog Definitions

The cXML catalog definitions consist of two main elements: `Supplier` and `Index`. These elements describe data intended for persistent or cached use within a hub or a buying organization's procurement system.

- `Supplier`—Contains basic data about the supplier, such as address, contact, and ordering information.
- `Index`—Describes data about the supplier's inventory of goods and services, such as description, part numbers, and classification codes.

The catalog `Contract` element was deprecated in cXML 1.2.008.

Note that `Index` uses several sub-elements to describe line items in suppliers' inventories. Suppliers can send either price information for caching within buyers' systems or PunchOut information to enable buyers to punch out to remote websites for pricing and other information.

These elements are unusual in cXML because they commonly appear as the top level element in a compliant XML document. In fact, `Index` rarely appears elsewhere in a cXML document.

15.1.1 Supplier

The `Supplier` element encapsulates a named supplier of goods or services. It must have a `Name` element and a `SupplierID` element. Additionally, it describes optional address and ordering information for the supplier:

```
<Supplier>
    <Name/>
    <SupplierID/>
    <SupplierLocation>
        <Address/>
        <OrderMethods>
            <OrderMethod>
                <OrderTarget/>
                <OrderProtocol/>
            </OrderMethod>
            <Contact/>
        </OrderMethod>
```

```
    </SupplierLocation>
</Supplier>
```

`Supplier` has the following attributes:

Attribute	Description
`corporateURL`	URL for supplier's website.
`storeFrontURL`	URL for website for shopping or browsing.

The following example shows an outline of the `Supplier` element:

```
<Supplier>
    <Name xml:lang="en-US">Workchairs </Name>
    <SupplierID domain="oracle107">29</SupplierID>
    <SupplierID domain="DUNS">76554545</SupplierID>
    <SupplierLocation>
        <Address>
            <Name xml:lang="en-US">Main Office</Name>
            <PostalAddress>
                …
            </PostalAddress>
        <Email>bobw@workchairs.com</Email>
        <Phone name="Office">
            …
        </Phone>
        <Fax name="Order">
            …
        </Fax>
        <URL>http://www.workchairs.com/Support.htm</URL>
        </Address>
        <OrderMethods>
            <OrderMethod>
                <OrderTarget>
                    <URL>http://www.workchairs.com/cxmlorders</URL>
                </OrderTarget>
            </OrderMethod>
            <Contact>
                <Name xml:lang="en-US">Mr. Smart E. Pants</Name>
                <Email>sepants@workchairs.com</Email>
                <Phone name="Office">
                    …
                </Phone>
            </Contact>
        </OrderMethods>
    </SupplierLocation>
</Supplier>
```

15.1.1.1 SupplierLocation

Some suppliers conduct business from more than one location. A `SupplierLocation` element can be used for each location. This element also encapsulates how that location does business or the ways that it can accept orders. A `SupplierLocation` element contains an `Address` and a set of `OrderMethods`.

OrderMethods and OrderMethod

The `OrderMethods` element is a grouping of one or more `OrderMethod` elements for the given `SupplierLocation` element. The position of `OrderMethods` in the list is significant—the first element is the preferred ordering method, the second element is the next priority, and so on in decreasing order of preference.

`OrderMethod` encapsulates ordering information in the form of an order target (such as phone, fax, or URL) and an optional protocol to further clarify the ordering expectations at the given target; for example, "cxml" for a URL target.

15.1.2 Index

This element is the root element for updating catalogs within buying organizations' procurement systems.

An `Index` element is associated with a single supplier. The `Index` element allows for a list of supplier IDs, where each ID is considered a synonym for that supplier.

The `Index` contains one or more `IndexItem` elements. The `IndexItem` element contains elements that add or delete from the buying organization's cached catalog. The following example shows an outline of an `Index` element:

```
<Index loadmode="Incremental">
    <SupplierID> ... </SupplierID>
    ...
    <IndexItem>
        <IndexItemAdd>
            <ItemID>
            ...
            </ItemID>
            <ItemDetail>
            ...
            </ItemDetail>
            <IndexItemDetail>
                <SearchGroupData>
                ...
                </SearchGroupData>
            ...
            </IndexItemDetail>
        </IndexItemAdd>
    </IndexItem>
    <IndexItem>
        <IndexItemDelete>
            <ItemID>
            ...
            </ItemID>
        </IndexItemDelete>
    </IndexItem>
    <IndexItem>
        <IndexItemPunchout>
            <ItemID>
            ...
            </ItemID>
            <PunchOutDetail>
                <SearchGroupData>
                ...
                </SearchGroupData>
            ...
            </PunchOutDetail>
```

```
        </IndexItemPunchout>
    </IndexItem>
</Index>
```

`Index` has the following attribute:

Attribute	Description
`loadmode`	The mode in which the target application should load the Index. Possible values: • `Full`—Completely replaces a previously loaded index. • `Incremental`—Imports the index on top of the existing index, replacing or deleting existing items and adding new items. The recommended application default is incremental.

15.1.2.1 IndexItem, IndexItemAdd, IndexItemDelete, and IndexItemPunchout

The `IndexItem` element is a container for the list of items in an index. It contains three types of elements:

- `IndexItemAdd`—Inserts a new item or updates an existing item in the index. It contains an `ItemID` element, an `ItemDetail` element, and an `IndexItemDetail` element.
- `IndexItemDelete`—Removes an item from the index. It contains an `ItemID` element identifying the item.
- `IndexItemPunchout`—Inserts an item for initiating puchout to the supplier's website. It contains a `PunchoutDetail` element and an `ItemID` element. It is similar to an `IndexItemAdd` element except that it does not require price information. Buyers acquire item details in real-time from the supplier's website.

ItemID

The basic `ItemID` element, which provides unique identification of an item. See ItemID [page 93].

ItemDetail

`ItemDetail` contains detailed information about an item, or all the data that a user might want to see about an item beyond the essentials represented in the `ItemID`. It must contain a `UnitPrice`, a `UnitOfMeasure`, one or more `Description` elements, and a `Classification`, and it can optionally contain a `ManufacturerPartID`, a `ManufacturerName`, a `URL`, a `LeadTime`, and any number of `Extrinsic` elements. See ItemDetail [page 93].

The optional `LeadTime` element describes the number of days needed for the buyer to receive the product. For example:

```
<LeadTime>14</LeadTime>
```

Note that in an `IndexItemAdd` element, duplicate `LeadTime` information might come from both `ItemDetail`, where it is optional, and `IndexItemDetail`, where it is mandatory. If the `LeadTime` elements are defined in both cases, then they should be identical.

In the context of an `IndexItemAdd`, `Extrinsic` elements extend information about a particular item. These extensions should not be transmitted to a supplier within an `OrderRequest`, because the supplier can retrieve the same data using the unique `ItemID`.

IndexItemDetail

The `IndexItemDetail` element contains index-specific elements that define additional aspects of an item, such as `LeadTime`, `ExpirationDate`, `EffectiveDate`, `SearchGroupData`, or `TerritoryAvailable`.

PunchoutDetail

`PunchoutDetail` is similar to `ItemDetail`, except it requires only one or more `Description` elements and a `Classification`. It can also contain `UnitPrice`, `UnitOfMeasure`, `URL`, `ManufacturerName`, `ManufacturerPartID`, `ExpirationDate`, `EffectiveDate`, `SearchGroupData`, `TerritoryAvailable`, `LeadTime`, and `Extrinsic` elements. Price values are approximate; users can punch out to the supplier's website to obtain the current pricing information.

`PunchoutDetail` has the following attribute:

Attribute	Description
`punchoutLevel`	Specifies how the procurement application should present the PunchOut item to users. This attribute can have the value store, aisle, shelf, or product. Procurement applications might display these items differently, depending on how they are tagged by suppliers. For example, they might display store-level items differently than product-level items.

Use `punchoutLevel="aisle"` for top level product categories; for example, Computer Accessories or Electrical Component Supplies. Use `punchoutLevel="shelf"` for similar products from which a user would choose while shopping; for example, if multiple manufacturers make the same product or a single product is available in multiple configurations. Use `punchoutLevel="product"` for specific items that appear by themselves on PunchOut site pages.

15.2 Type Definitions

Types allow type providers such as content aggregators, suppliers, and marketplaces to extend root catalog item definitions and to define named groupings of commodity-specific attributes such as parametric types.

Types are named collections of named attributes. Each attribute is further defined in terms of a type, that is, types can contain other types. Types can also derive from or extend other types.

Type definitions describe supplemental catalog attributes and parametric data types. They provide a rich framework for defining parametric types, and they allow the definition and standardization of parametric types from type provider organizations independent of index data.

Use the `SearchGroupData` and `SearchDataElement` elements to specify the actual parametric data for a given catalog item. `SearchGroupData` must reference a defined type, and `SearchDataElement` specifies data for each type attribute within that type.

A `TypeDefinition` document contains a `TypeProvider` element and either `Type` or `PrimitiveType` elements.

15.2.1 TypeProvider

`TypeProvider` specifies the provider of the types being defined, identified by a name and one or more IDs (for example, NetworkId or DUNS).

`TypeProvider` has the following attribute:

Attribute	Description
`name` (required)	The canonical name used to reference the type provider when fully qualifying the name of a type (for example, in a `SearchGroupData` element reference).

15.2.1.1 Name

The `Name` element is for localized display purposes, allowing different names to be provided per locale.

15.2.1.2 OrganizationID

Unique identifier for the type provider organization.

15.2.2 Type

`Type` elements are named elements containing one or more `TypeAttribute` elements. Types can extend (or derive from) other types, thus inheriting their parents' `TypeAttribute` elements.

There is one important distinction between type inheritance and standard object-oriented inheritance models: child `TypeAttributes` cannot override parent `TypeAttributes`.

It is illegal to define a `TypeAttribute` of the same name as a parent `TypeAttribute`.

Type has the following attributes:

Attribute	Description
`name` (required)	Canonical name of the type.

Attribute	Description
`extends`	Name of the type that is being extended.

15.2.2.1 Name

`Type` names are always scoped by `TypeProvider` names, allowing for the existence of multiple type taxonomies. Applications should respect the following notation for a fully-qualified type name outside a defined `TypeProvider` scope:

```
Type Provider Name:Type Name
```

For example, if an organization named Acme provides a type definition named Pipes, that type would be referenced as `"Acme:Pipes"` in `SearchGroupData` names.

15.2.2.2 Description

You can provide names in multiple locales through the optional `Description` element list. The `ShortName` element within that `Description` should be used to provide an alternative locale specific name for the type. The required `name` attribute should be used within the `SearchGroupData` element to reference a given type.

15.2.3 TypeAttribute

`TypeAttribute` elements define attributes within a type. The `name` attribute is required and is the name used in the `SearchDataElement` element. Optional `Name` elements provide locale-specific alternative names for this attribute.

`TypeAttribute` elements themselves are of a named type, as indicated by the `"type"` attribute. The name can be another `Type`, or a `PrimitiveType`, defined below.

Attribute	Description
`name` (required)	Specifies the canonical name of this attribute.

Attribute	Description
`type` (required)	Specifies the data type of this attribute. Possible values: • `integer`—A whole number, with no fraction. • `string`—A group of characters with words that can be individually indexed for free text searching. • `literal`—A group of characters with words that cannot be individually indexed for free text searching. • `double`—A floating point number. • `date`—A date of the form yyyy-mm-dd; for example, 2002-01-25 • `boolean`—A Boolean value; yes, no, 1, 0, true, false, t, or f.
`shortTag`	Alias for this attribute.
`mappedFrom`	Specifies the name of another object in the system that implicitly defines this attribute.
`isRequired`	Indicates whether this attribute requires a (non-empty) value.
`isRequiredForOrdering`	Indicates that the value for an attribute must be provided (usually by the requisitioner) before the item can be included in an order for the supplier. Typically used for ad-hoc or partially specified catalog items.
`isRefinable`	Indicates whether this attribute is refinable in search queries.
`isSearchable`	Indicates whether this attribute is searchable in search queries.
`isCollection`	Indicates whether this attribute allows repeating values.
`isCaseSensitive`	Indicates whether this attribute preserves letter case. This property applies only to attributes of type string or literal. It has no effect on numeric, boolean, or date attributes, nor does it apply to attributes of complex type.
`isInKey`	Indicates whether this attribute is part of the unique key for the type.
`isInFreeTextSearch`	Indicates whether this attribute should be indexed to be a candidate in a free-text (All) query.
`isHidden`	Indicates whether this attribute is displayed to users.
`isSortable`	Indicates whether this attribute can be sorted.
`isReadOnly`	Indicates whether values assigned to this attribute are frozen and cannot be changed by the receiving application.
`unit`	Specifies the unit of this attribute, if applicable. For example, if the `TypeAttribute` is of a `PrimitiveType` with a scalar type of `"integer"`, this unit might be `"IN"` to indicate inches.

15.2.3.1 Name

Localized name of the `TypeAttribute`.

15.2.3.2 Description

Localized description of the `TypeAttribute`.

15.2.3.3 EnumerationValue

`EnumerationValue` allows you to optionally specify a set of one or more valid data values for the `TypeAttribute`.

For example:

```
<TypeAttribute name="COLOR"
        type="Name"
        isRefinable="yes">
    <Name xml:lang="en">Color</Name>
    <EnumerationValue>Red</EnumerationValue>
    <EnumerationValue>Yellow</EnumerationValue>
    <EnumerationValue>Black</EnumerationValue>
</TypeAttribute>
```

15.2.3.4 Range

`Range` allows you to optionally specify a range of valid data values for the `TypeAttribute`. It contains `RangeBegin`, `RangeEnd`, or both.

For example:

```
<TypeAttribute name="WEIGHT"
        type="Number"
        isRefinable="yes">
    <Name xml:lang="en">Weight</Name>
    <Range>
        <RangeBegin>12</RangeBegin>
        <RangeEnd inclusive="no">100</RangeEnd>
    </Range>
</TypeAttribute>
```

Both `RangeBegin` and `RangeEnd` can optionally specify the attribute `inclusive="no"`, which excludes the specified beginning or ending value as legal values.

15.2.4 PrimitiveType

`PrimitiveType` is a named scalar type, where the list of recognized scalar types is given above. These types are building blocks for defining simple `TypeAttributes`. For example a `PrimitiveType` could define a `TypeAttribute` that is a string of length 255.

`PrimitiveType` has the following optional attributes:

Attribute	Description
`name` (required)	The name for a `TypeAttribute`.
`type` (required)	The scalar type. Possible values are `"integer"`, `"string"`, `"literal"`, `"double"`, `"date"`, and `"boolean"`.
`min`	The minimum length for a `TypeAttribute` of `scalarType` `"string"` or `"literal"`.
`max`	The maximum length for a `TypeAttribute` of `scalarType` `"string"` or `"literal"`.
`maxPrecision`	The maximum precision for a `TypeAttribute` of `scalarType` `"double"`.
`maxScale`	The maximum scale for a `TypeAttribute` of `scalarType` `"double"`.

15.3 Subscription Management Definitions

Intermediaries such as network commerce hubs can manage supplier information and catalogs used by procurement systems.

This section describes request-response elements for managing supplier data and catalogs. In all cases, the requests are initiated by the procurement system.

This section discusses:

- Supplier Data [page 352]
- Supplier Profile Information [page 355]
- Catalog Subscriptions [page 358]

15.3.1 Supplier Data

Supplier data management uses three types of transactions:

- SupplierList – Returns the names of suppliers with which the buyer has relationships.
- SupplierData – Returns supplier details.
- SupplierChange – Returns the names of suppliers whose information has changed.

15.3.1.1 SupplierListRequest

`SupplierListRequest` requests a list of the suppliers with whom the buyer has established trading relationships.

```
<Request>
    <SupplierListRequest/>
</Request>
```

15.3.1.2 SupplierListResponse

`SupplierListResponse` lists the suppliers with whom the buyer has established trading relationships.

```
<Response>
    <Status code="200" text="OK"/>
    <SupplierListResponse>
        <Supplier corporateURL=http://www.workchairs.com
                storeFrontURL="http://www.workchairs.com">
            <Name xml:lang="en-US">Workchairs, Inc.</Name>
            <Comments xml:lang="en-US">this is a cool company</Comments>
            <SupplierID domain="DUNS">123456</SupplierID>
        </Supplier>
        <Supplier corporateURL=http://www.computersRus.com
                storeFrontURL="http://www.computersRus.com">
            <Name xml:lang="en-US">Computers R us</Name>
            <Comments xml:lang="en-US">another cool company</Comments>
            <SupplierID domain="DUNS">123456789</SupplierID>
        </Supplier>
    </SupplierListResponse>
</Response>
```

15.3.1.3 SupplierDataRequest

`SupplierDataRequest` requests data about a supplier.

```
<Request>
    <SupplierDataRequest>
        <SupplierID domain="DUNS">123456789</SupplierID>
    </SupplierDataRequest>
</Request>
```

15.3.1.4 SupplierDataResponse

`SupplierDataResponse` contains data about a supplier.

```
<Response>
    <Status code="200" text="OK"/>
    <SupplierDataResponse>
        <Supplier corporateURL=http://www.workchairs.com
                storeFrontURL="http://www.workchairs.com">
            <Name xml:lang="en-US">Workchairs, Inc.</Name>
            <Comments xml:lang="en-US">this is a cool company</Comments>
            <SupplierID domain="DUNS">123456</SupplierID>
            <SupplierLocation>
                <Address>
                    <Name xml:lang="en-US">Main Office</Name>
                    <PostalAddress>
                        <DeliverTo>Bob A. Worker</DeliverTo>
                        <Street>123 Front Street</Street>
                        <City>Toosunny</City>
                        <State>CA</State>
                        <PostalCode>95000</PostalCode>
                        <Country isoCountryCode="US">USA</Country>
                     </PostalAddress>
```

```
                    <Email>bobw@workchairs.com</Email>
                    <Phone name="Office">
                        <TelephoneNumber>
                            <CountryCode
                                isoCountryCode="US">1</CountryCode>
                            <AreaOrCityCode>800</AreaOrCityCode>
                            <Number>5551212</Number>
                        </TelephoneNumber>
                    </Phone>
                    <Fax name="Order">
                        <TelephoneNumber>
                            <CountryCode
                                isoCountryCode="US">1</CountryCode>
                            <AreaOrCityCode>408</AreaOrCityCode>
                            <Number>5551234</Number>
                        </TelephoneNumber>
                    </Fax>
                    <URL>http://www.workchairs.com/Support.htm</URL>
                </Address>
                <OrderMethods>
                    <OrderMethod>
                        <OrderTarget>
                            <URL>http://www.workchairs.com/cxmlorder</URL>
                        </OrderTarget>
                        <OrderProtocol>cXML</OrderProtocol>
                    </OrderMethod>
                </OrderMethods>
            </SupplierLocation>
        </Supplier>
    </SupplierDataResponse>
</Response>
```

For information about the `Supplier` element, see Supplier [page 343].

15.3.1.5 SupplierChangeMessage

This element is for notification of changes to supplier data.

This message relies on the GetPending transaction. The buying organization sends a `GetPendingRequest` to query for waiting messages. If the network commerce hub has a message waiting, it includes it within the `GetPendingResponse`.

```
<Message>
    <SupplierChangeMessage type="new">
        <Supplier corporateURL=http://www.workchairs.com
                storeFrontURL="http://www.workchairs.com">
            <Name xml:lang="en-US">Workchairs, Inc.</Name>
            <Comments xml:lang="en-US">this is a cool company</Comments>
            <SupplierID domain="DUNS">123456</SupplierID>
            <SupplierLocation>
                <Address>
                    <Name xml:lang="en-US">Main Office</Name>
                    <PostalAddress>
                        <DeliverTo>Bob A. Worker</DeliverTo>
                        <Street>123 Front Street</Street>
                        <City>Toosunny</City>
                        <State>CA</State>
                        <PostalCode>95000</PostalCode>
                        <Country isoCountryCode="US">USA</Country>
                    </PostalAddress>
                    <Email>bobw@workchairs.com</Email>
                    <Phone name="Office">
```

```
                        <TelephoneNumber>
                            <CountryCode
                            isoCountryCode="US">1</CountryCode>
                            <AreaOrCityCode>800</AreaOrCityCode>
                            <Number>5551212</Number>
                        </TelephoneNumber>
                    </Phone>
                    <Fax name="Order">
                        <TelephoneNumber>
                            <CountryCode
                            isoCountryCode="US">1</CountryCode>
                            <AreaOrCityCode>408</AreaOrCityCode>
                            <Number>5551234</Number>
                        </TelephoneNumber>
                    </Fax>
                    <URL>http://www.workchairs.com/Support.htm</URL>
                </Address>
                <OrderMethods>
                    <OrderMethod>
                        <OrderTarget>
                            <URL>http://www.workchairs.com/cxmlorder</URL>
                        </OrderTarget>
                        <OrderProtocol>cXML</OrderProtocol>
                    </OrderMethod>
                </OrderMethods>
            </SupplierLocation>
        </Supplier>
    </SupplierChangeMessage>
</Message>
```

Related Information

Get Pending/Data Download Transaction [page 369]

15.3.2 Supplier Profile Information

Supplier profile management uses three types of transactions:

- `OrganizationDataRequest` – Requests profile information for suppliers with which the buyer has relationships.
- `OrganizationDataResponse` – Returns supplier profile information.
- `OrganizationChangeMessage` – Returns profile information for suppliers whose profile has changed.

15.3.2.1 OrganizationDataRequest

`OrganizationDataRequest` requests profile information for suppliers with whom the buyer has established trading relationships.

```
<Request>
<OrganizationDataRequest>
            <OrganizationID>
```

```
                <Credential domain="NetworkID">
                    <Identity>AN01022222222222</Identity>
                </Credential>
                <Credential domain="DUNS">
                    <Identity>123456789</Identity>
                </Credential>
            </OrganizationID>
        </OrganizationDataRequest>
    </Request>
</cXML>
```

15.3.2.2 OrganizationDataResponse

`OrganizationDataResponse` returns profile information for suppliers with whom the buyer has established trading relationships.

```
<Response>
        <Status code="200" text="OK"/>
        <OrganizationDataResponse>
            <Organization>
                <Name xml:lang="en-US">Workchairs</Name>
                <Credential domain="NetworkID">
                    <Identity>AN01022222222222</Identity>
                </Credential>
                <Credential domain="DUNS">
                    <Identity>123456789</Identity>
                </Credential>
                <OrganizationRole name="supplier"/>
                <Address>
                    <Name xml:lang="en-US">Workchairs</Name>
                    <PostalAddress>
                        <Street>123 Front Street</Street>
                        <City>Toosunny</City>
                        <State>CA</State>
                        <PostalCode>95000</PostalCode>
                        <Country isoCountryCode="US">United States</Country>
                    </PostalAddress>
                    <Email>bobw@workchairs.com</Email>
                    <Phone>
                        <TelephoneNumber>
                        <CountryCode isoCountryCode="US">1</CountryCode>
                        <AreaOrCityCode>800</AreaOrCityCode>
                        <Number>555-1212</Number>
                        </TelephoneNumber>
                    </Phone>
                    <Fax>
                        <TelephoneNumber>
                        <CountryCode isoCountryCode="US">1</CountryCode>
                        <AreaOrCityCode>408</AreaOrCityCode>
                        <Number>555-1234</Number>
                        </TelephoneNumber>
                    </Fax>
                    <URL>http://www.workchairs.com/Support.htm</URL>
                </Address>
                <Person>
                    <Contact>
                        <Name xml:lang = "en-US">Joe Hannyman</Name>
                        <PostalAddress>
                            <Street>321 The Main Street</Street>
                            <City>Sunnyvale</City>
                            <State>CA</State>
                            <PostalCode>90488</PostalCode>
                            <Country isoCountryCode = "US">United States</Country>
```

```
                        </PostalAddress>
                        <Email>support@workchairs.com</Email>
                    </Contact>
                    <PersonRole name="buyerAccount"/>
                    <PersonRole name="supplierMasterAccount"/>
                </Person>
            </Organization>
            <Extrinsic name="OrderRoutingMethod">email</Extrinsic>
        </OrganizationDataResponse>
    </Response>
```

15.3.2.3 OrganizationChangeMessage

`OrganizationChangeMessage` returns updated profile information for suppliers with whom the buyer has established trading relationships.

```
<Message>
    <OrganizationChangeMessage type="update">
        <Organization>
            <Name xml:lang="en-US">BOISE CASCADE OFFICE PRODUCTS CORPORATION</Name>
            <Credential domain="NetworkID">
                <Identity>AN01000000125</Identity>
            </Credential>
            <Credential domain="DUNS">
                    <Identity>178923231</Identity>
            </Credential>
            <OrganizationRole name="supplier"/>
            <Address>
                <Name xml:lang="en-US">BOISE CASCADE OFFICE
                    PRODUCTS CORPORATION</Name>
                <PostalAddress>
                    <Street>800 W BRYN MAWR AVEEDI profile</Street>
                    <City>ITASCA</City>
                    <State>IL</State>
                    <PostalCode>60143</PostalCode>
                    <Country isoCountryCode="US">United States</Country>
                </PostalAddress>
                <Email>nramani@ariba.com</Email>
                <Phone name="">
                    <TelephoneNumber>
                        <CountryCode isoCountryCode="US">1</CountryCode>
                        <AreaOrCityCode></AreaOrCityCode>
                        <Number>555-555-5555</Number>
                    </TelephoneNumber>
                </Phone>
                <Fax name="">
                    <TelephoneNumber>
                        <CountryCode isoCountryCode="US">1</CountryCode>
                        <AreaOrCityCode></AreaOrCityCode>
                        <Number>666-666-6666</Number>
                    </TelephoneNumber>
                </Fax>
                <URL name="website1">http://main.url.com</URL>
            </Address>
        </Organization>
    </OrganizationChangeMessage>
</Message>
```

15.3.3 Catalog Subscriptions

Catalog subscription management uses four types of transactions:

- `SubscriptionList` – Returns the names of catalogs to which the buyer has subscribed.
- `SubscriptionContent` – Returns catalog contents.
- `SubscriptionChange` – Returns the names of catalogs that have changed.
- `SubscriptionStatusUpdateRequest` – Returns the catalog subscription status from the buyer.

15.3.3.1 Subscription

All catalog subscription transactions use the `Subscription` element to describe metadata about a catalog subscription.

For example:

```
<Subscription>
    <InternalID>1234</InternalID>
    <Name xml:lang="en-US">Q2 Prices</Name>
    <Changetime>2002-03-12T18:39:09-08:00</Changetime>
    <SupplierID domain="DUNS">123456789</SupplierID>
    <Format version="2.1">CIF</Format>
    <Description xml:lang="en-US">The best prices for software</Description>
</Subscription>
```

The elements within `Subscription` include:

- `InternalID`
  A unique ID internal to the intermediary. Contains an optional `domain` attribute.
- `Name`
  The name of the subscription.
- `ChangeTime`
  The date and time when any aspect of the subscription last changed.
- `SupplierID`
  The ID of the supplier.
- `Format`
  The format of the catalog.
- `Description`
  A description of the catalog.

15.3.3.2 SubscriptionListRequest

This element requests the buyer's current list of catalog subscriptions.

```
<Request>
    <SubscriptionListRequest/>
</Request>
```

15.3.3.3 SubscriptionListResponse

This element lists the buyer's current list of catalog subscriptions.

```
<Response>
    <Status code="200" text="OK"/>
    <SubscriptionListResponse>
        <Subscription>
            <InternalID>1234</InternalID>
            <Name xml:lang="en-US">Q2 Software Prices</Name>
            <Changetime>1999-03-12T18:39:09-08:00</Changetime>
            <SupplierID domain="DUNS">123456789</SupplierID>
            <Format version="2.1">CIF</Format>
            <Description xml:lang="en-US">The best prices for software</Description>
        </Subscription>
        <Subscription>
            <InternalID>1235</InternalID>
            <Name xml:lang="en-US">Q2 Hardware Prices</Name>
            <Changetime>1999-03-12T18:15:00-08:00</Changetime>
            <SupplierID domain="DUNS">555555555</SupplierID>
            <Format version="2.1">CIF</Format>
            <Description xml:lang="en-US">The best prices for hardware
            </Description>
        </Subscription>
    </SubscriptionListResponse>
</Response>
```

15.3.3.4 SubscriptionContentRequest

This element requests the contents of a subscribed catalog. The request includes the `InternalID` and `SupplierID` for the catalog.

```
<Request>
    <SubscriptionContentRequest>
        <InternalID>1234</InternalID>
        <SupplierID domain="DUNS">123456789</SupplierID>
    </SubscriptionContentRequest>
</Request>
```

15.3.3.5 SubscriptionContentResponse

This element contains the contents of a catalog. The catalog format can be either CIF (Catalog Interchange Format) or cXML. If it is CIF, it is base64 encoded and included as the content of a `CIFContent` element. If it is cXML, the `Index` element is directly included.

```
<Response>
    <Status code="200" text="OK"/>
    <SubscriptionContentResponse>
        <Subscription>
            <InternalID>1234</InternalID>
            <Name xml:lang="en-US">Q2 Software Prices</Name>
            <Changetime>1999-03-12T18:39:09-08:00</Changetime>
            <SupplierID domain="DUNS">123456789</SupplierID>
            <Format version="3.0">CIF</Format>
```

```
            <Description xml:lang="en-US">The best prices for software</Description>
        </Subscription>
        <SubscriptionContent filename="april_prices.cif">
            <CIFContent>
                <!-- base64 encoded data -->
                ABCDBBDBDBDBDB
                . . .
            </CIFContent>
        </SubscriptionContent>
    </SubscriptionContentResponse>
</Response>
```

15.3.3.6 SubscriptionChangeMessage

This element signals to the buyer's procurement system that a subscribed catalog has changed.

This message relies on the `GetPending` transaction. The buying organization sends a `GetPendingRequest` to query for waiting messages. If the network commerce hub has a message waiting, it includes it within the `GetPendingResponse`. For more information, see Get Pending/Data Download Transaction [page 369]

```
<Message>
    <SubscriptionChangeMessage type="new">
        <Subscription>
            <InternalID>1234</InternalID>
            <Name xml:lang="en-US">Q2 Software Prices</Name>
            <Changetime>1999-03-12T18:39:09-08:00</Changetime>
            <SupplierID domain="DUNS">123456789</SupplierID>
            <Format version="2.1">CIF</Format>
        </Subscription>
    </SubscriptionChangeMessage>
</Message>
```

The `type` attribute describes the type of change: `new`, `delete`, or `update`.

15.3.3.7 SubscriptionStatusUpdateRequest

This element requests the subscription status of a catalog. It enables buying organizations to send the catalog subscription status to suppliers through Ariba SN.

On a buying organization's system, a catalog can have various status updates from the time it is downloaded until it is activated. Each catalog status on the buying organization's system can be sent to the supplier using this element. Ariba SN receives and updates the subscription status of the catalog using the `InternalID`.

A `SubscriptionStatusUpdateRequest` includes the `InternalID` of the catalog, and the `SubscriptionVersion` and `SubscriptionStatus` elements.

```
<Request >
    <SubscriptionStatusUpdateRequest>
         <InternalID>1234</InternalID>
         <SubscriptionVersion versionNumber="2"//>>
         <SubscriptionStatus status="activated" />
    </SubscriptionStatusUpdateRequest>
  </Request>
```

SubscriptionVersion

This element stores the version number of the catalog.

When a supplier edits a catalog, Ariba SN creates a new version of the catalog and assigns a version number. This version number is used with the `InternalID` in all messages sent from the buyer to Ariba SN. This is an optional attribute. When it is not defined, Ariba SN uses the last published version of the catalog as the `InternalID`.

SubscriptionStatus

This element stores the status of the catalog. Catalog status values are: approved, rejected, validation error, deleted, received, validated, activated, deactivated, and changed.

15.4 Catalog Upload Transaction

The cXML Catalog Upload transaction enables suppliers to programmatically upload and publish catalogs on network commerce hubs.

The Catalog Upload transaction gives you an alternative to logging on to network hubs to interactively upload and publish catalogs. You can use it to automatically distribute updated catalogs whenever you change pricing or availability of your products or services.

The Catalog Upload transaction supports both CIF and cXML catalogs.

The Catalog Upload transaction consists of two cXML documents:

- `CatalogUploadRequest`
  Sent by suppliers to upload a catalog. It contains the catalog as an attachment and specifies whether the catalog is new or an update, and whether to automatically publish it after upload.
- `Response`
  Sent by the network commerce hub to acknowledge the receipt of a `CatalogUploadRequest`.

15.4.1 CatalogUploadRequest

The `CatalogUploadRequest` element contains all the information related to the catalog upload. The following example shows a `CatalogUploadRequest`:

```
<!-- begin MIME header -->
--kdflkajfdksadjfklasdjfkljdfdsfdkf
Content-type: text/xml; charset=UTF-8
Content-ID: <part1.PCO28.975529413484@saturn.workchairs.com>
<!-- end MIME header -->
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2000-12-28T16:56:03-08:00" payloadID="155556789@10.10.83.39">
    <Header>
```

```
        <From>
            <Credential domain="DUNS">
                <Identity>123456789</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkID">
            <!-- ID of network hub -->
                <Identity>AN01000000001</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="DUNS">
                <Identity>123456789</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>My Homemade Catalog Manager V2.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <CatalogUploadRequest operation="update">
            <CatalogName xml:lang="en">Winter Prices</CatalogName>
            <Description xml:lang="en">This catalog contains our premiere-level
            prices for office chairs and other durable furniture.</Description>
            <Attachment>
            <!-- ID of MIME attachment -->
                <URL>cid:part2.PCO28.975529413154@saturn.workchairs.com</URL>
            </Attachment>
            <Commodities>
                <CommodityCode>52</CommodityCode>
            </Commodities>
            <AutoPublish enabled="true"/>
            <Notification>
                <Email>judy@workchairs.com</Email>
                <URLPost enabled="true"/>
            </Notification>
        </CatalogUploadRequest>
    </Request>
</cXML>
<!-- begin MIME attachment header -->
--kdflkajfdksadjfklasdjfkljdfdsfdkf
Content-type: text/plain; charset=US-ASCII
Content-Disposition: attachment; filename=PremiereCatalog.cif
Content-ID: <part2.PCO28.975529413154@saturn.workchairs.com>
<!-- end MIME attachment header -->
Content-length: 364
CIF_I_V3.0
LOADMODE: F
CODEFORMAT: UNSPSC
CURRENCY: USD
SUPPLIERID_DOMAIN: DUNS
ITEMCOUNT: 3
TIMESTAMP: 2001-01-15 15:25:04
DATA
942888710,34A11,C11,"Eames Chair, Black Leather",11116767,400.00,EA,3,"Fast MFG",,,
400.00
942888710,56A12,C12,"Eames Ottoman, Black Leather",11116767,100.00,EA,3,"Fast
MFG",,,100.00
942888710,78A13,C13,"Folding Chair, Grey Stackable",11116767,25.95,EA,3,"Fast
MFG",,,25.95
ENDOFDATA
<!-- MIME trailer -->
--kdflkajfdksadjfklasdjfkljdfdsfdkf--
```

`CatalogUploadRequest` has the following attribute:

Attribute	Description
`operation` (required)	Specifies the type of upload to perform. Possible values: • `new`—Uploads a new catalog. A catalog with the same name must not exist. • `update`—Overwrites an exiting catalog. A catalog with the same name must exist.

`CatalogUploadRequest` contains the following elements.

CatalogName

`CatalogName` specifies the name of the uploaded catalog. This value is the user-visible name, not the file name of the catalog.

`CatalogName` has the following attribute:

Attribute	Description
`xml:lang` (required)	Specifies the language used for the catalog name. Language codes are defined in the XML 1.0 Specification (at www.w3.org/TR/1998/REC-xml-19980210.html). In the most common case, this includes an ISO 639 Language Code and, optionally, an ISO 3166 Country Code separated by a hyphen. The recommended cXML language code format is xx[-YY[-zzz]*] where xx is an ISO 639 Language code, YY is an ISO 3166 Country Code, and zzz is an IANA or private subcode for the language in question. Again, use of the Country Code is always recommended. By convention, the language code is lowercase and the country code is uppercase. This is not required for correct matching of the codes.

Description

`Description` briefly describes the catalog contents. Buying organizations can search and view this information.

`Description` has the following attributes:

Attribute	Description
`xml:lang` (required)	Specifies a language used for the catalog name. For more information, see the description of `xml:lang` for `CatalogName`, above.
`type` (required)	The qualifier of the description.

Attachment

`Attachment` specifies the URL of the attached catalog.

The `Attachment` element contains one `URL` element with the scheme "cid:".

For more information about attachments, see Attaching Your Catalog [page 365].

Commodities

`Commodities` specifies the top-level commodity codes for the items in your catalog. Buying organizations use these codes to search for new catalogs.

The `Commodities` element contains one or more `CommodityCode` elements.

Use two-digit UNSPSC (United Nations Standard Products and Services Code) segment codes.

For a list of UNSPSC segment codes, go to the UNSPSC website at www.unspsc.org.

AutoPublish

`AutoPublish` automatically publishes the catalog to buyers after upload.

You can automatically publish only if both of the following requirements are met:

1. A previous version of the catalog exists in your account and you are performing an `update` operation.
2. The previous version is in the "published" state. It must have been published private (with a list of buyers) or public.

`AutoPublish` has the following attribute:

Attribute	Description
`enabled` (required)	Specifies whether to automatically publish the catalog. Possible values: • `true`—Publishes the catalog. It must be an update to a previously published catalog. • `false`—Does not publish the catalog. You can log on to your account and manually publish the catalog.

Notification

`Notification` sends catalog-status notifications through e-mail or cXML POST. For examples of these messages, see Receiving Later Catalog Status [page 367].

`Notification` contains either one `Email` element or one `URLPost` element, or both elements.

`Email` specifies the mailbox to the newtork commerce hub e-mails status messages. You can use only one `Email` element, and it can contain only one e-mail address.

`URLPost` specifies whether the newtork commerce hub sends catalog status messages as cXML `StatusUpdateRequest` documents.

The URL destination of the `StatusUpdateRequest` is determined by your website's response to the ProfileRequest transaction. See Profile Transaction [page 50].

`URLPost` has the following attribute:

Attribute	Description
`enabled` (required)	Specifies whether the network sends catalog-status notifications through `StatusUpdateRequest`. Possible values: • `true`—Enables this feature. • `false`—Disables this feature.

15.4.1.1 Attaching Your Catalog

Send your catalog attached to the `CatalogUploadRequest` document. Large catalogs must be zipped to compress them before uploading.

Using a MIME envelope

Include the catalog file in the `CatalogUpdateRequest` as a MIME (Multipurpose Internet Mail Extensions) attachment. cXML contains only references to external MIME parts sent within one multipart MIME envelope.

The referenced catalog file must reside within a multipart MIME envelope with the cXML document. A cXML requirement for this envelope (over the basics described in RFC 2046 "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types") is the inclusion of Content-ID headers with the attached file.

> **Note**
>
> The cXML specification allows attachments to reside outside of the MIME envelope, but the Catalog Upload transaction does not support that attachment method.

The Attachment element contains only a reference to the external MIME part of the attachment. Attachment contains a single URL with the scheme "cid:".

Catalog files can be zipped to compress them.

Related Information

Attachment [page 115]

15.4.2 Response

After you send a `CatalogUploadRequest`, the network commerce hub replies with a standard cXML `Response` document:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="980306507433-6714998277961341012@10.10.83.39"
timestamp="2001-01-23T19:21:47-08:00">
    <Response>
        <Status code="201" text="Accepted">The catalog upload request is
            processing</Status>
    </Response>
</cXML>
```

The following table lists possible status codes:

Status	Text	Meaning
200	Success	The catalog-upload request succeeded.
201	Accepted	The catalog-upload request is processing.
461	Bad Commodity Code	The commodity code you assigned to the catalog is invalid.
462	Notification Error	No notification method (e-mail or URL) provided.
463	Bad Catalog Format	The zip file is invalid.
464	Bad Catalog	No catalog is attached, or more than one is attached.
465	Duplicate Catalog Name	The name of the catalog exists.
466	No Catalog to Update	The catalog to be updated does not exist.
467	Publish Not Allowed	You attempted to publish a catalog that was not previously published.
468	Catalog Too Large	The size of the uploaded file exceeds the 4 MB limit. Zip the catalog to compress it before uploading it.
469	Bad Catalog Extension	The file name of the catalog must have .cif, .xml, or .zip extensions.
470	Catalog Has Errors	The message is the status of the catalog. (HasErrors)
499	Document Size Error	The cXML document is too large.
561	Too Many Catalogs	You cannot upload more than a specific number of catalogs per hour.
562	Publish Disabled	Catalog publishing is temporarily unavailable due to scheduled maintenance. It will be back online by the specified date and time.
563	Catalog Validating	You attempted to update a catalog before validation finished on a previous version of the catalog.

For other possible status codes, see Status [page 39].

15.4.2.1 Receiving Later Catalog Status

If you include the `Notification` element to request later catalog-status notification, the network sends a message when the catalog reaches its final status. The possible final catalog states are:

- `Validated`: The catalog contains no syntax errors.
- `BadZipFormat`: The zip format is incorrect.
- `HasErrors`: The catalog contains syntax errors, and it cannot be published.
- `Published`: The catalog has been published (private or public).

15.4.2.2 URLPost

The following example shows a `StatusUpdateRequest` notification sent by a network commerce hub:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2001-01-23T18:39:44-08:00"
payloadID="980303984882--3544419350291593786@10.10.83.39">
    <Header>
        <From>
            <Credential domain="NetworkID">
                <Identity>AN01000000001</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="DUNS">
                <Identity>123456789</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkID">
                <Identity>AN01000000001</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>ANValidator</UserAgent>
        </Sender>
    </Header>
    <Request>
        <StatusUpdateRequest>
            <DocumentReference
                payloadID="123456669131--123456789955555678 9@10.10.83.39">
            </DocumentReference>
            <Status text="Success" code="200">
                Validated
            </Status>
        </StatusUpdateRequest>
    </Request>
</cXML>
```

The possible status codes are:

Status Code	Meaning
200 Success	The catalog-upload request succeeded.
463 Bad Catalog Format	The zip file is invalid.

Status Code	Meaning
470 Catalog Has Errors	The message is the status of the catalog. (HasErrors)

16 Get Pending/Data Download Transaction

Some organizations do not have an HTTP entry point for receiving cXML documents posted by entities outside of their corporate firewalls. The cXML get pending and data download transactions enables these organizations to poll for waiting documents and download them.

Introduction to Get Pending/Data Download Transaction [page 369]

GetPendingRequest [page 369]

GetPendingResponse [page 370]

DataRequest [page 373]

DataResponse [page 373]

16.1 Introduction to Get Pending/Data Download Transaction

Client systems use the get pending and data download transactions to pull documents at their convenience. The get pending transaction indicates whether there are waiting documents. If there are waiting documents, they either appear in the response, or the client retrieves them with the data download transaction.

Examples of documents that depend on this polling for transmission are:

- `SupplierChangeMessage` – Notifies buying organizations about changes to supplier data.
- `SubscriptionChangeMessage` – Notifies buying organizations about changes to supplier catalogs.
- `DataAvailableMessage` – Notifies any organization about waiting documents that can be retrieved using the data download transaction.

16.2 GetPendingRequest

This element pulls a set of messages that are waiting for the requester. The `MessageType` element and the `lastReceivedTimestamp` and `maxMessages` attributes control the type and count of the fetched documents.

Attribute	Description
`lastReceivedTimestamp`	The timestamp of the most recent document received.
`maxMessages`	Maximum number of documents in a single response that the requester can handle.

Upon receiving the request, the receiver returns the oldest documents, of the specified types, with timestamps equal to or later than the specified timestamp. If there are multiple documents meeting this criterion, they are

returned, subject to the `maxMessages` attribute. The queuing system discards all pending documents of the specified message types with timestamps earlier than the specified timestamp.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="1105574416.19583@hydra.buyer.com"
timestamp="2005-01-13T00:00:16+00:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN13000000259</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="SystemID">
                <Identity>ERP01</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN13000000259</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Our Buyer App 1.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <GetPendingRequest lastReceivedTimestamp="2005-03-12T18:39:09-08:00"
            maxMessages="5">
            <MessageType>SubscriptionChangedMessage</MessageType>
        </GetPendingRequest>
    </Request>
</cXML>
```

16.3 GetPendingResponse

The server returns a `Response` document in the same HTTP connection. If the `Response` contains no `GetPendingResponse` document, no documents are waiting. If it contains a `GetPendingResponse` document, there are documents waiting.

16.3.1 No Documents Waiting

The following example indicates that there are no waiting documents of the requested message type:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2005-01-12T16:00:25-08:00"
payloadID="1105574420906--4512663440002882 75@10.10.13.125">
    <Response>
        <Status code="200" text="OK"/>
    </Response>
</cXML>
```

16.3.2 Documents Waiting

If there is a `GetPendingResponse` document, there are documents waiting. The `GetPendingResponse` document can contain waiting documents in-line or contain a `DataAvailableMessage` element that refers to waiting documents.

16.3.2.1 Documents In-Line

The server can send waiting document in-line in the `GetPendingResponse` document, in which case the client does not need to use the data download transaction.

The following example contains a waiting `SubscriptionChangeMessage` document:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2005-01-12T16:00:25-08:00"
payloadID="1105574420906--451266344000288275@10.10.13.125">
<Response>
    <Status code="200" text="OK"/>
        <GetPendingResponse>
            <cXML xml:lang="en-US"
                    payloadID="456778@hub.com"
                    timestamp=""2005-01-12T16:00:25-08:00">
                <Header>
                    <From>
                        <Credential domain="NetworkId">
                            <Identity>AN01000000001</Identity>
                        </Credential>
                    </From>
                    <To>
                        <Credential domain="NetworkId">
                            <Identity>AN13000000259</Identity>
                        </Credential>
                    </To>
                    <Sender>
                        <Credential domain="NetworkId">
                            <Identity>AN01000000001</Identity>
                        </Credential>
                    <UserAgent>Network Hub 2.0</UserAgent>
                    </Sender>
                </Header>
                <Message>
                    <SubscriptionChangeMessage type="new">
                        <Subscription>
                            <InternalID>1234</InternalID>
                            <Name xml:lang="en-US">Q2 Prices</Name>
                            <Changetime>2002-03-12T18:39:09-08:00</Changetime>
                            <SupplierID domain="DUNS">123456789</SupplierID>
                            <Format version="2.1">CIF</Format>
                        </Subscription>
                    </SubscriptionChangeMessage>
                </Message>
            </cXML>
        </GetPendingResponse>
    </Response>
</cXML>
```

Related Information

SupplierChangeMessage [page 354]
SubscriptionChangeMessage [page 360]

16.3.2.2 Documents Referenced through DataAvailableMessage

`GetPendingReponse` documents can refer to waiting documents with a `DataAvailableMessage` element, instead of including them in-line. This element contains an internal identifier, which the client uses to retrieve the documents. The client uses the data download transaction, which transports documents as Multipurpose Internet Mail Extensions (MIME) attachments, not embedded in cXML documents.

There are several reasons why servers might use the MIME attachment method used by the data download transaction instead of the in-line method used by the `GetPendingResponse` document:

- MIME can transport documents that use different DTDs or DTD versions than the `GetPendingResponse` document.
- MIME attachments are simpler to process than nested documents with multiple parent and child elements.
- MIME is better for large documents, which transport as separate files, rather than one very large document.

The following example contains a `DataAvailableMessage` element, which indicates that there documents waiting for retrieval through the data download transaction.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2005-01-12T16:00:18-08:00"
payloadID="1105574420906--4512663440002882 75@10.10.13.125">
    <Response>
        <Status code="200" text="OK"/>
        <GetPendingResponse>
            <cXML timestamp="2005-01-12T16:00:18-08:00"
                    payloadID="1105574420141-97739996026871570 9@10.10.13.125">
                <Header>
                    <From>
                        <Credential domain="NetworkId">
                            <Identity>AN01000000001</Identity>
                        </Credential>
                    </From>
                    <To>
                        <Credential domain="NetworkId">
                            <Identity>AN13000000259</Identity>
                        </Credential>
                    </To>
                    <Sender>
                        <Credential domain="NetworkId">
                            <Identity>AN01000000001</Identity>
                            <UserAgent>ANCXMLDispatcher</UserAgent>
                        </Credential>
                    </Sender>
                </Header>
                <Message>
                    <DataAvailableMessage>
                        <InternalID domain="PendingMessages">3738</InternalID>
                    </DataAvailableMessage>
                </Message>
```

```
            </cXML>
        </GetPendingResponse>
    </Response>
</cXML>
```

The `DataAvailableMessage` element contains an internal ID, which corresponds to one or more documents waiting for download. Use the data download transaction to retrieve them.

16.4 DataRequest

After you obtain a `DataAvailableMessage`, use its internal ID value to download the waiting documents by sending a cXML `DataRequest` document. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="1105574421.19583@hydra.buyer.com"
timestamp="2005-01-13T00:00:21+00:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN13000000259</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN01000000001</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN13000000259</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Our Buyer App 1.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <DataRequest>
            <InternalID domain="PendingMessages">3738</InternalID>
        </DataRequest>
    </Request>
</cXML>
```

16.5 DataResponse

The server responds with a cXML `DataResponse` document and the requested documents together in a MIME envelope in the same HTTP connection. The `Content-Type` HTTP header defines the MIME boundary.

The following `DataResponse` document has one `StatusUpdateRequest` document attached.

```
Content-Type: multipart/mixed; boundary="----=_Part_0_10550230.1105574425445"
------=_Part_0_10550230.1105574425445
Content-Type: text/xml; charset=UTF-8
```

```
Content-ID: <1105574425572.1197583259@cetus.hub.com>
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2005-01-12T16:00:25-08:00"
             payloadID="1105574425428-51679700953225634 27@10.10.13.103">
    <Response>
        <Status code="200" text="OK"/>
        <DataResponse>
            <Attachment>
                <URL>cid:1105574422695.1816707419@cetus.hub.com</URL>
            </Attachment>
        </DataResponse>
    </Response>
</cXML>
------=_Part_0_10550230.1105574425445
Content-Type: text/xml; charset=UTF-8
Content-ID: <1105574422695.1816707419@cetus.hub.com>
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="1105573919487--7116204576911739136@10.10.13.125"
            timestamp="2005-01-12T15:51:59-08:00">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN12000000259</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN13000000259</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN01000000001</Identity>
            </Credential>
            <UserAgent>Network Hub 2.0</UserAgent>
        </Sender>
    </Header>
    <Request deploymentMode="production">
        <StatusUpdateRequest>
            <DocumentReference payloadID="DO123@hydra.buyer.com"/>
            <Status code="200" message="OK"/>
        </StatusUpdateRequest>
    </Request>
</cXML>
------=_Part_0_10550230.1105574425445--
```

For more information on MIME attachments, see Attachments [page 27].

You do not need to authenticate documents downloaded through the data download transaction if they come from a trusted source.

17 Provider PunchOut Transaction

Provider PunchOut enables applications to punch out to a remote application that supplies some service to the originating application, such as credit card validation, single login, or self registration.

Message Flow [page 375]

ProviderSetupRequest Document [page 376]

ProviderSetupResponse Document [page 379]

ProviderDoneMessage Document [page 381]

17.1 Message Flow

cXML documents provide a means for the originator and the provider to communicate during Provider PunchOut. These cXML documents are `ProviderSetupRequest`, `ProviderSetupResponse`, and `ProviderDoneMessage` and are tailored specifically to handle the interaction between an originating application and a service provider. They pass details such as what service is to be provided, session information, the return URL of the originator, and status or followup information.

The order of cXML message flow in the Provider PunchOut transaction is shown in the following diagram.

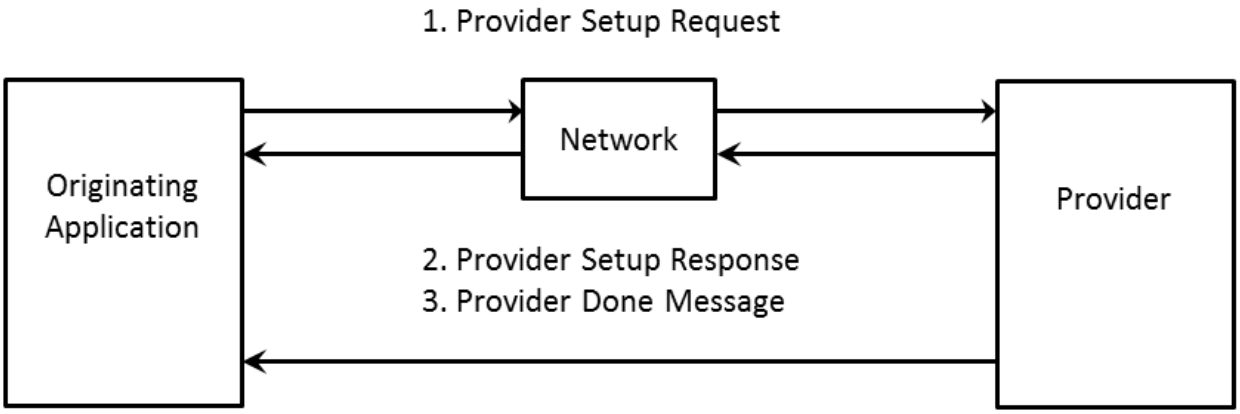


Figure 20: Provider PunchOut Transaction Message Flow

To initiate a Provider PunchOut, the originating application sends a `ProviderSetupRequest` document to the provider. This document includes credential information for the user and the user's organization, the return URL, and the service requested from the provider. To acknowledge the request, the provider sends a `ProviderSetupResponse` document to the originating application and includes a URL for the start page indicating where the user should be redirected. When the user has finished, the provider sends a `ProviderDoneMessage` document back to the originating application, indicating that the user has completed their session at the provider's site.

17.2 ProviderSetupRequest Document

The `ProviderSetupRequest` document initiates a Provider PunchOut transaction and passes several items of information to the provider, including information about the member organization and user, the return URL, and which service is being requested.

The document contains two sections, one specified by a `Header` element, the other by a `Request` element. The `Header` contains credential information about the user and the requesting organization and the Request contains the actual `ProviderSetupRequest` element that contains information needed to initiate the Provider PunchOut.

17.2.1 Header

The `Header` portion of the document contains addressing and authentication information. The following sample is the header portion taken from a `ProviderSetupRequest` document. The `UserAgent` element contains the digital signature of the provider; a string that corresponds to the application and the version making the request. For example, “www.triton.com” or “Procurement Application 7.0.” The two parties must agree on a common certificate format and authority.

```
<Header>
    <From>
    <!-- Triton Bank -->
        <Credential domain="NetworkId" type="marketplace">
            <Identity>AN01000001709</Identity>
        </Credential>
        <Credential domain="triton.com">
            <Identity>9999</Identity>
        </Credential>
    </From>
    <To>
    <!-- Marketplace -->
        <Credential domain="NetworkId">
            <Identity>AN01000000003</Identity>
        </Credential>
    </To>
    <Sender>
    <!-- Triton Bank -->
        <Credential domain="NetworkId">
            <Identity>AN01000001709</Identity>
            <SharedSecret>abracadabra</SharedSecret>
        </Credential>
        <UserAgent>www.triton.com</UserAgent>
    </Sender>
</Header>
```

Because the `Header` element is similar for each message type, see Header [page 34] for specifics on how to construct this portion of the message.

17.2.2 Request

The `Request` portion of the document contains a `ProviderSetupRequest`, which has several items of information about the transaction from the originator, including a cookie to track the session for the originator, a

return URL, what service is being requested from the provider, and other information contingent upon the type of service and the provider.

```
<Request>
    <ProviderSetupRequest>
        <OriginatorCookie>iTRk9bG49EJOGhJC</OriginatorCookie>
        <BrowserFormPost>
            <URL>https://www.triton.com/providerdone.asp</URL>
        </BrowserFormPost>
        <SelectedService>signin</SelectedService>
        <Extrinsic name="Brand">Triton</Extrinsic>
        <Extrinsic name="User">
            <Identity>0001</Identity>
        </Extrinsic>
        <Extrinsic name="QueryString">req=R532&login=gtou&</Extrinsic>
    </ProviderSetupRequest>
</Request>
```

The following table provides guidelines for the structure of the request section of the Provider PunchOut message.

Element	Instances	Parent Elements	Child Elements	Attributes
`ProviderSetupRequest`	1	`Request`	`OriginatorCookie`, `BrowserFormPost`, `SelectedService`, `Extrinsic`	None
`OriginatorCookie`	1	`ProviderSetupRequest`, `ProviderDoneMessage`	None	None
`BrowserFormPost`	0 or 1	`ProviderSetupRequest`	`URL`	None
`URL`	0 or 1	`BrowserFormPost`, `Followup`	None	None
`SelectedService`	1	`ProviderSetupRequest`	None	None
`Extrinsic`	Any	`ProviderSetupRequest`	Varies	`name`

The elements in the header section are:

17.2.2.1 Request

Contains a request to initiate a Provider PunchOut transaction, and in this case contains a `ProviderSetupRequest` element.

17.2.2.2 ProviderSetupRequest

A request from an originating application to a provider to initiate a transaction.

17.2.2.3 OriginatorCookie

`OriginatorCookie` is tied to the user's session on the requestor's site and is returned to the requestor later with the `ProviderDoneMessage`. This implements a one-time key allowing the user to return to the same session on the originating application.

17.2.2.4 BrowserFormPost URL

The originating application provides the `BrowserFormPost` location so that the provider can display a "Done" button, and provide information, such as a Status, at the end of the interactive session. Inclusion should lead to a `ProviderDoneMessage` document being sent from the provider at the end of each session. `URL` contains the location on the requestor's site to return the user when they have finished at the provider site.

17.2.2.5 SelectedService

Identifies the service requested by the originating application and offered by the provider.

17.2.2.6 Extrinsic

The extrinsics for the Provider PunchOut depend upon what service the provider supplies. Please see specific documentation for your specific ProviderSetupRequest.

> **Note**
>
> XML content, elements, and their attributes must be defined in the cXML DTD or XML escaped.

17.2.3 Sample

To demonstrate a typical `ProviderSetupRequest` document, the following is a request from a marketplace member named Triton Bank, to a marketplace.

```
<cXML timestamp="2000-07-11T15:03:14-07:00"
payloadID="963352994214--8721789825238347285@10.10.83.151”>
    <Header>
        <From>
            <Credential domain="NetworkId" type="marketplace">
                <Identity>AN01000001709</Identity>
            </Credential>
            <Credential domain="triton.com">
                <Identity>9999</Identity>
            </Credential>
        </From>
```

```
        <To>
            <Credential domain="NetworkId">
                <Identity>AN01000000003</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN01000001709</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>www.triton.com</UserAgent>
        </Sender>
    </Header>
    <Request>
        <ProviderSetupRequest>
            <OriginatorCookie>iTRk9bG49EJOGhJC</OriginatorCookie>
            <BrowserFormPost>
                <URL>https://www.triton.com/providerdone.asp</URL>
            </BrowserFormPost>
            <SelectedService>signin</SelectedService>
            <Extrinsic name="Brand">Triton</Extrinsic>
            <Extrinsic name="User>
                <Identity>0001</Identity>
            </Extrinsic>
            <Extrinsic name="QueryString">req=R532&login=gtou&</Extrinsic>
        </ProviderSetupRequest>
    </Request>
</cXML>
```

17.3 ProviderSetupResponse Document

The `ProviderSetupResponse` document notifies the originating application of the results of the request. Status and start page information is included.

```
<cXML payloadID="456789@marketplace.com"
    xml:lang="en-US" timestamp="2000-03-12T18:40:15-08:00">
    <Response>
        <Status code="200" text="OK"/>
        <ProviderSetupResponse>
            <StartPage>
                <URL>http://sun@marketplace.com/enter?23423SDFSDF23</URL>
            </StartPage>
        </ProviderSetupResponse>
    </Response>
</cXML>
```

The following table provides guidelines for the structure of the `ProviderSetupResponse` document of the Provider PunchOut transaction.

Element	Instances	Parent Elements	Child Elements	Attributes
`Response`	1	`cXML`	`Status`, `ProviderSetupResponse`	None
`Status`	1	`Response`	None	`code`, `text`
`ProviderSetupReponse`	1	`Response`	`StartPage`	None

Element	Instances	Parent Elements	Child Elements	Attributes
`StartPage`	1	`ProviderSetupReponse`	`URL`	None
`URL`	1	`StartPage`	None	None

17.3.1 Response

Contains the `Status` and `ProviderSetupResponse` elements.

17.3.2 Status

Provides information on the success or failure of the provider request. The content of the `Status` element can be any data needed by the requestor and can describe the error in more detail. `Status` has the following attributes:

Attribute	Description
`code` (required)	The status code of the request. This follows the HTTP status code model. For example, 200 represents a successful request.
`text` (required)	The text of the status message. This text aids user readability in logs, and it consists of canonical strings in English.
`xml:lang`	Specifies a language used for the provider request. See Locale Specified by xml:lang [page 31].

For a 200/OK status code, there might be no data. However, for a 500/Internal Server Error status code, it is strongly recommended that the actual XML parse error or application error be presented. This error allows better one-sided debugging and inter-operability testing.

The provider should not include the `ProviderSetupResponse` element unless the status code is in the 200 range. See Status [page 39] for a list of all possible status code values.

17.3.3 ProviderSetupResponse

If the request was successful, the `ProviderSetupResponse` element is included in the response document and contains the `StartPage` and `URL` elements which indicate where the user should be redirected.

17.3.4 StartPage URL

This element contains a `URL` element that specifies the URL to pass to the browser to initiate the Provider PunchOut browsing session requested in the `ProviderSetupRequest` element. This URL must contain enough state information to bind to a session context on the provider website.

17.3.5 Sample

The following ProviderSetupResponse document is in reply to Triton Bank from a provider from the previous ProviderSetupRequest section.

```
<cXML payloadID="456789@marketplace.com"
    xml:lang="en-US" timestamp="2000-03-12T18:40:15-08:00">
    <Response>
        <Status code="200" text="OK"/>
        <ProviderSetupResponse>
            <StartPage>
                <URL>http://sun@marketplace.com/enter?23423SDFSDF23</URL>
            </StartPage>
        </ProviderSetupResponse>
    </Response>
</cXML>
```

17.4 ProviderDoneMessage Document

The `ProviderDoneMessage` document contains any information the originating application must know about the completed operation at the provider site.

17.4.1 Header

The `ProviderDoneMessage Header` section is similar to the header sections in the `Request` and `Response` messages; however, because this message is sent with a Form Post, you should not include a `SharedSecret` in the `Sender` element. The `UserAgent` element contains the digital signature of the provider. The two parties must agree on a common certificate format and authority.

```
<Header>
    <From>
        <Credential domain="NetworkId">
            <Identity>AN01000000003</Identity>
        </Credential>
    </From>
    <To>
        <Credential domain="NetworkId">
            <Identity>AN01000001709</Identity>
        </Credential>
    </To>
    <Sender>
    <Credential domain="NetworkId">
        <Identity>AN01000000003</Identity>
    </Credential>
    <UserAgent>Purchase</UserAgent>
    </Sender>
</Header>
```

Because the `Header` element is similar for each message type, see Header [page 34] for the specifics on how to construct this portion of the message.

17.4.2 Message

The `Message` portion of the document contains the `ProviderDoneMessage` element, which contains any information requested by the originating application, and information to return to the user to their session at the originating application's site.

```
<Message>
    <Status code="200" text="OK"/>
    <ProviderDoneMessage>
        <OriginatorCookie>c546794949</OriginatorCookie>
        <ReturnData name="method">
            <ReturnValue>Triton.transact</ReturnValue>
            <Name xml:lang="en-US">Triton OM transact</Name>
        </ReturnData>
    </ProviderDoneMessage>
</Message>
```

The following table details guidelines for the structure of the message section of the `ProviderDoneMessage` document.

Element	Instances	Parent Elements	Child Elements	Attributes
`Message`	1	None	`Status`, `ProviderDoneMessage`	None
`Status`	1	`Message`	None	`text, code`
`ProviderDoneMessage`	1	`Message`	`OriginatorCookie`, `ReturnData`, `ReturnValue`, `Name`	None
`OriginatorCookie`	1	`ProviderDoneMessage`	None	None
`ReturnData`	Any	`ProviderDoneMessage`	`ReturnValue`, `Name`	name
`ReturnValue`	1	`ProviderSetupRequest`	None	None
`Name`	1	`BrowserFormPost`, `Followup`	None	xml:lang

The elements in the message section are:

17.4.3 OriginatorCookie

The same element that was passed in the original `ProviderSetupRequest` document. It must be returned here to allow the requesting application to match the `ProviderDoneMessage` document with an earlier `ProviderSetupRequest` document and return the user to the correct session.

17.4.4 ReturnData

Contains any information the originator must know about the completed operation at the provider site. The `name` attribute identifies the type (domain) of the `ReturnData` to the requestor.

17.4.5 ReturnValue

A value that is used by the originating application. This value depends on what service the provider supplies.

17.4.5.1 Name

An identifier for the data returned. Provides a description for the contents of the `ReturnData` element.

When displaying values, keep in mind that `Name` and `ReturnValue` have similar semantics, but different uses in the originating application.

17.4.6 Sample

The provider sends the following `ProviderDoneMessage` document, which notifies the originating application, Triton Bank, that the user has finished with their session on the provider site.

```
<cXML timestamp="2000-07-11T15:13:28-07:00"
payloadID="963353608827--3642656259900210849@10.10.83.151">
    <Header>
        <From>
        <!-- marketplace -->
            <Credential domain="NetworkId">
                <Identity>AN01000000003</Identity>
            </Credential>
        </From>
        <To>
            <!-- Triton bank -->
            <Credential domain="NetworkId">
                <Identity>AN01000001709</Identity>
            </Credential>
        </To>
        <Sender>
        <!-- marketplace -->
            <Credential domain="NetworkId">
                <Identity>AN01000000003</Identity>
            </Credential>
            <UserAgent>Purchase</UserAgent>
        </Sender>
    </Header>
    <Message>
        <Status code="200" text="OK"/>
        <ProviderDoneMessage>
            <OriginatorCookie>c546794949</OriginatorCookie>
            <ReturnData name="method">
                <ReturnValue>Triton.transact</ReturnValue>
```

```
                <Name xml:lang="en-US">Triton OM transact</Name>
            </ReturnData>
        </ProviderDoneMessage>
    </Message>
</cXML>
```

18 Supply Chain Collaboration

cXML provides several document types that allow buyers to collaborate with suppliers in supply-chain tasks such as ordering, invoicing, and shipping. The following subsections describe these cXML douments.

ProductActivityMessage [page 385]

ComponentConsumptionRequest [page 393]

ProductReplenishmentMessage [page 396]

18.1 ProductActivityMessage

The `ProductActivityMessage` element transmits inventory, consignment movement, and forecast information from the buyer's ERP system. The buyer-provided inventory summary view includes the issued components to the supplier. The provided information represents a snapshot of the component inventory and forecast situation at a certain point in time. The consignment movement information represents the movement of material from the consignment inventory to the customer inventory.

The `ProductActivityMessage` element has the following structure:

```
<ProductActivityMessage>
    <ProductActivityHeader/>
    <ProductActivityDetails>
        <ItemID/>
        <Description/>
        <LeadTime/>
        <Batch/>
        <Contact/>
        <Inventory/>
        <ConsignmentInventory/>
        <TimeSeries/>
        <ConsignmentMovement/>
        <SalesReport/>
        <Extrinsic/>
    </ProductActivityDetails>
<ProductActivityMessage>
```

Note

`ProductActivityDetails` can include the`Inventory` element instead of the `ConsignmentInventory` element.

`ProductActivityMessage` has the following attribute:

Attribute	Description
`subcontractingIndicator`	Indicates whether the data in the message is related to subcontracting (yes or no).

18.1.1 ProductActivityHeader

`ProductiActivityHeader` is the header element for the `ProductActivityMessage`. It has the following attributes:

Attribute	Description
`messageID` (required)	An identifier for this particular product activity message.
`creationDate`	The date and time this product activity message was created.

18.1.2 ProductActivityDetails

The `ProductActivityDetails` element represents a single component inventory, the product forecast details, or a consignment movement for that product. It has the following attribute:

Attribute	Description
`status`	Indicates whether the material used in the planning process is "`active`", "`inactive`", or "`deleted`".

18.1.2.1 ItemID

A unique identification of a component item in supplier backend system or buyer backend system. See ItemID [page 93].

18.1.2.2 Description

Description of the component.

18.1.2.3 LeadTime

Lead time in days.

18.1.2.4 Batch

Batch information of goods or material. The information includes ID and characteristics. See Batch [page 162].

18.1.2.5 Contact

The location from and to the product activity that is taking place. See Contact [page 112].

The only `Contact` roles appropriate for this element are "locationFrom" and "locationTo". The `IdReference` should have a `domain` attribute set to "buyerLocationID", "supplierLocationID", or "storageLocation", and it should have an `identifier` attribute set to the plant ID. The `Description` element should contain the plant description.

The following example shows a `Contact` element for `ProductActivityDetails`:

```
<Contact role="locationFrom">
    <Name xml:lang="en">Stanford</Name>
    <IdReference domain="buyerLocationID" identifier="0003">
    <Description xml:lang="en">Stanford</Description>
    </IdReference>
</Contact>
```

18.1.2.6 Inventory

Inventory that is in the possession of the buyer, and is owned and managed by the buyer.

`Inventory` has the following elements:

Element	Description
`SubcontractingStock-InTransferQuantity`	The quantity of inventory of stock that has been transferred to a vendor of type subcontracting using a special movement type. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`UnrestrictedUseQuantity`	The quantity of inventory that is unrestricted stock, which is the physical stock that is always available at a plant/storage location that can be consumed for stock movements and available for material requirements planning. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`BlockedQuantity`	The quantity of inventory that is blocked stock, which is not counted as unrestricted stock. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`QualityInspectionQuantity`	The quantity of inventory that is under quality inspection. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`PromotionQuantity`	The quantity of inventory that is reserved for promotions. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`StockInTransferQuantity`	The quantity of inventory that is moving between plants or from one company code to another. This element has a `quantity` attribute and a `UnitOfMeasure` element.

Element	Description
`IncrementQuantity`	The quantity used to increment (add to) stock. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`RequiredMinimumQuantity`	Minimum stock level at which the stock must be maintained. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`RequiredMaximumQuantity`	Maximum stock level at which the stock must be maintained. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`StockOnHandQuantity`	The calculated value of different Stock types dependent on the customer, location, and material. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`WorkInProcessQuantity`	Inventory that has begun the manufacturing process and is no longer included in raw materials inventory, but is not yet a completed product. On a balance sheet, work in progress (WIP) is considered to be an asset because money has been spent towards a completed product. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`IntransitQuantity`	The stock in transit is the quantity of a material that was withdrawn from the stock of the issuing plant but has not yet arrived at the receiving plant. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`ScrapQuantity`	The quantity represents the Scrap of a material that is expected to occur during production if the material is a component. This element has a `quantity` attribute and a `UnitOfMeasure` element.
`OrderQuantity`	Specifies the quantity range the customer must order. The trading partners are alerted if the order quantity is not within the required quantity range during order entry. This element has `minimum` and `maximum` attributes and a `UnitOfMeasure` element.
`DaysOfSupply`	Specifies how long stocks and receipts will cover the requirements, to avoid product shortages or stock levels that are too high. This element has `minimum` and `maximum` attributes. The system issues replenishment proposals when the days of supply falls above or below the threshold.

Here is an example of `Inventory`:

```
<Inventory>
    <UnrestrictedUseQuantity quantity="200">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </UnrestrictedUseQuantity>
    <BlockedQuantity quantity="100">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </BlockedQuantity>
    <QualityInspectionQuantity quantity="100">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </QualityInspectionQuantity>
    <StockInTransferQuantity quantity="50">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </StockInTransferQuantity>
```

```
    <RequiredMinimumQuantity quantity="100">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </RequiredMinimumQuantity>
    <RequiredMaximumQuantity quantity="2000">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </RequiredMaximumQuantity>
    <StockOnHandQuantity quantity="200">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </StockOnHandQuantity>
    <WorkInProcessQuantity quantity="100">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </WorkInProcessQuantity>
    <IntransitQuantity quantity="100">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </IntransitQuantity>
    <ScrapQuantity quantity="100">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </ScrapQuantity>
    <OrderQuantity minimum="10">
        <UnitOfMeasure>TOK</UnitOfMeasure>
    </OrderQuantity>
    <DaysOfSupply minimum="1" maximum="3"/>
</Inventory>
```

18.1.2.7 ConsignmentInventory

Inventory that is in the possession of the buyer, but is owned by the supplier.

`ConsignmentInventory` has the following elements:

- `SubcontractingStockInTransferQuantity`
- `UnrestrictedUseQuantity`
- `BlockedQuantity`
- `QualityInspectionQuantity`
- `PromotionQuantity`
- `StockInTransferQuantity`
- `IncrementQuantity`
- `RequiredMinimumQuantity`
- `RequiredMaximumQuantity`

18.1.2.8 TimeSeries

Forecast data. It has a `type` attribute. Possible `type` values are "demand" or "orderForecast".

`TimeSeries` has a single element, `Forecast`, which contains the following elements:

- `Period`
- `ForecastQuantity`
- `Extrinsic`

18.1.2.9 InventoryTimeSeries

`InventoryTimeSeries` provides inventory data in time intervals to support the transfer of projected stock, safety stock, and target stock levels generated by the buyer's planning system. It has the following attribute:

Attribute	Description
`type` (required)	Type of inventory. Possible values are: • `targetStock` • `projectedStock` • `safetyStock`

`InventoryTimeSeries` has the following element:

Element	Description
`TimeSeriesDetails` (required)	Contains product replenishment information regarding the quantity of a product for a specific time period.

The following example shows `InventoryTimeSeries` used with `ProductActivityDetails`:

```
<ProductActivityDetails>
    <ItemID>
        <SupplierPartID>SII99825</SupplierPartID>
        <BuyerPartID>II99825</BuyerPartID>
    </ItemID>
    <Description xml:lang="en">Door Hinge</Description>
    <LeadTime>1 </LeadTime>
    <Contact role="locationTo" addressID="35319">
        <Name xml:lang="en">Werk 0001</Name>
        <PostalAddress>
            <DeliverTo>Walldorf</DeliverTo>
            <Street>Hasso-Plattner-Ring 7</Street>
            <City>Walldorf</City>
            <Country isoCountryCode="DE">Germany</Country>
        </PostalAddress>
        <IdReference identifier="0001" domain="locationTo">
            <Description xml:lang="en">Werk 0001</Description>
        </IdReference>
    </Contact>
    <Contact role="BuyerPlannerCode">
        <Name xml:lang="en">PERSON 1</Name>
        <IdReference identifier="001" domain="BuyerPlannerCode">
            <Description xml:lang="en">PERSON 1</Description>
        </IdReference>
    </Contact>
    <TimeSeries type="orderForecast">
        <Forecast>
            <Period startDate="2015-07-20T00:00:00+02:00"
                endDate="2015-07-20T23:59:59+02:00"/>
            <ForecastQuantity quantity="110.0">
                <UnitOfMeasure>PCE</UnitOfMeasure>
            </ForecastQuantity>
        </Forecast>
    </TimeSeries>
    <InventoryTimeSeries type="projectedStock">
        <TimeSeriesDetails>
            <Period startDate="2015-07-20T00:00:00+02:00"
                endDate="2015-07-20T23:59:59+02:00"/>
            <TimeSeriesQuantity quantity="110.0">
                <UnitOfMeasure>PCE</UnitOfMeasure>
```

```
            </TimeSeriesQuantity>
            <  IdReference identifier="1" domain=""
        </TimeSeriesDetails>
    </InventoryTimeSeries>
    <InventoryTimeSeries type="targetStock">
        <TimeSeriesDetails>
            <Period startDate="2015-07-20T00:00:00+02:00"
                endDate="2015-07-20T23:59:59+02:00"/>
            <TimeSeriesQuantity quantity="110.0">
                <UnitOfMeasure>PCE</UnitOfMeasure>
            </TimeSeriesQuantity>
            <  IdReference identifier="1" domain=""/>
        </TimeSeriesDetails>
    </InventoryTimeSeries>
    <InventoryTimeSeries type="safetyStock">
        <TimeSeriesDetails>
            <Period startDate="2015-07-20T00:00:00+02:00"
                endDate="2015-07-20T23:59:59+02:00"/>
            <TimeSeriesQuantity quantity="110.0">
                <UnitOfMeasure>PCE</UnitOfMeasure>
            </TimeSeriesQuantity>
            <  IdReference identifier="1" domain=""/>
        </TimeSeriesDetails>
    </InventoryTimeSeries>
</ProductActivityDetails>
```

18.1.2.10 ConsignmentMovement

The consignment movement information for this product. `ConsignmentMovement` has the following elements:

- `ProductMovementItemIDInfo`
  A reference to the line item in a movement document.
- `InvoiceItemIDInfo`
  Line item of an invoice created by the buyer against the movement item.
- `MovementQuantity`
  Quantity moved in a consignment movement.
- `SubtotalAmount`
  Invoice subtotal of the current item.
- `UnitPrice`
  The price on which the charges are applied.

18.1.2.11 SalesReport

Contains information about a sales report at the item level.

`SalesReport` has the following attributes:

Attribute	Description
`salesDate`	Date of the sale.

Attribute	Description
`lineNumber` (required)	Line number of the item in the sales report.

`SalesReport` has the following elements:

Element	Description
`Period` (required)	Item sales start and end date.
`SalesQuantity` (required)	The quantity of an item that was sold.
`ReturnQuantity`	The quantity of an item that was returned.
`Total`	Sales report total for the line item.
`PromotionVariantID`	Specifies a specific ID if only one or some variants of an article are promoted. Product variant is a specific code that specifies the characteristic of a product (color, shape, and so on).
`Comments`	Comments associated with this sales report line item.

Here is an example of a `ProductActivityMessage` containing a `SalesReport`:

```
<ProductActivityMessage subcontractingIndicator="yes">
  <ProductActivityHeader messageID="DS_inv_001_PO"
    creationDate="2015-12-31T22:00:00-08:00">
  </ProductActivityHeader>
  <ProductActivityDetails>
    <ItemID>
      <SupplierPartID>DS_AX4518_PO</SupplierPartID>
      <BuyerPartID>DS_BPID3453_PO</BuyerPartID>
      <IdReference domain="" identifier="">
        <Creator xml:lang="EN">Creator</Creator>
        <Description type="VALVE CHECK-S30AI-0" xml:lang="EN"/>
      </IdReference>
    </ItemID>
    ...
    <SalesReport salesDate="20150923" lineNumber="2">
      <Period startDate="20150921" endDate="20150929" />
      <SalesQuantity quantity="10">
        <UnitOfMeasure>UOM</UnitOfMeasure>
      </SalesQuantity>
      <ReturnQuantity quantity="5">
        <UnitOfMeasure>UOM</UnitOfMeasure>
      </ReturnQuantity>
      <Total>
        <Money currency = "USD">20,000.00000</Money>
      </Total>
      <PromotionVariantID>0001-1112</PromotionVariantID>
      <Comments type="Comments1" xml:lang="en">Text 1</Comments>
      <Comments type="Comments2" xml:lang="en">Text 2</Comments>
    </SalesReport>
  </ProductActivityDetails>
</ProductActivityMessage>
```

18.1.2.12 Extrinsic

Use the `Extrinsic` element list to insert additional data about the `ProductActivityMessage` element.

18.2 ComponentConsumptionRequest

A `ComponentConsumptionRequest` is data sent by a supplier to the buyer to report the consumption of components during the manufacturing of an ordered item.

18.2.1 ComponentConsumptionHeader

`ComponentConsumptionHeader` contains information about this component consumption that is common to all contained portions. It has the following attributes:

Attribute	Description
`consumptionID` (required)	An identifier for this particular component consumption document.
`operation`	The operational mode of component consumption document. Defaults to `"new"`. Update and delete operations are not supported for this document.
`referenceDocumentID`	The identifier of reference Work Order for which the consumption is reported.
`creationDate`	The date and time this component consumption document was created.
`lastChangeDate`	The date and time this component consumption document was last modified.

`ComponentConsumptionHeader` has the following elements:

Comments

The `Comments` element list may contain additional information about this consumption document. All such data must be intended for human use. Elements in the `Comments` list may appear in any order. The xml:lang attribute may have the same value in multiple `Comments` elements in the list. The set of `Comments` with a particular `xml:lang` value should contain similar content to that for any other `xml:lang` value present in the list.

Extrinsic

Use the `Extrinsic` element list to insert additional data about the `ComponentConsumptionRequest` element.

18.2.2 ComponentConsumptionPortion

The `ComponentConsumptionPortion` element captures details of all component consumptions for a particular `OrderRequest` via the `OrderReference` or `MasterAgreementReference` element.

18.2.2.1 OrderReference

The `OrderReference` element can be used to identify the corresponding purchase order for which component consumption is reported. See OrderReference [page 238].

18.2.2.2 MasterAgreementReference

An optional field. Can contain a reference to the scheduling agreement if the component consumption is generated from a scheduling agreement release.

18.2.2.3 MasterAgreementIDInfo

An optional field. Can contain the ID of the scheduling agreement if the component consumption is generated from a scheduling agreement release.

18.2.2.4 ComponentConsumptionItem

The `ComponentConsumptionItem` element captures details of all consumption items for a given order reference. It has the following attributes:

Attribute	Description
`poLineNumber` (required)	Purchase order line number associated with this consumption item.
`completedIndicator`	Indicates whether consumption reporting is completed for a PO item (yes or no).

`ComponentConsumptionItem` has the following elements:

ItemID

A unique identification of a component item in supplier backend system or buyer backend system.

BuyerBatchID

An identifier from the buyer to identify the material/goods produced in a single manufacturing run.

SupplierBatchID

An identifier from the supplier to identify the material/goods produced in a single manufacturing run. See SupplierBatchID or Batch [page 269].

Contact

See Contact [page 112]. In the context of a `ComponentConsumptionItem`, the roles that are usually included are "BuyerParty", "ProductReceipentParty", "ShipFromLocation", or "ShipToLocation".

Comments

Optional arbitrary comments or description. See Comments [page 114].

ComponentConsumptionDetails

Captures details of component consumption for a given PO line item. `ComponentConsumptionDetails` has the following attributes:

Attribute	Description
`lineNumber`	The position of a component in the current consumption details.
`quantity` (required)	The quantity of component that is consumed.
`type`	Type of inventory movement that could cause the suppliers to not consume the material. Possible values are: • `blocked`—This inventory is not valuated and cannot be consumed. • `qualityRestricted`—This inventory is not qualified for unrestricted use and cannot be consumed in production. • `scrapped`—This inventory is out of date or material has been destroyed during logistics operation.

`ComponentConsumptionDetails` has the following elements:

- `Product`
  The supplier and buyer part ID of the component that is consumed.
- `UnitOfMeasure`
  See UnitOfMeasure [page 48].
- `BuyerBatchID`
  The batch ID provided by the buyer for the component that is consumed.
- `SupplierBatchID`
  The batch ID provided by the supplier for the component that is consumed. See SupplierBatchID or Batch [page 269].
- `ReferenceDocumentInfo`
  Contains information about a referenced document.
- `Extrinsic`
  Use the `Extrinsic` element list to insert additional data about the `ComponentConsumptionDetails` element.

Extrinsic

Use the `Extrinsic` element list to insert additional data about the `ComponentConsumptionItem` element.

18.2.2.5 Extrinsic

Use the `Extrinsic` element list to insert additional data about the `ComponentConsumptionPortion` element.

18.3 ProductReplenishmentMessage

Communicates the following types of messages to buyers:

- Manufacturing and planning-related information, including the processes for outsourced manufacturing
- Inventory details, including the processes for outsourced manufacturing and supplier-managed inventory
- Forecast confirmations, including critical information about the supplier's constraints

Here is an example of `ProductReplishmentMessage` used for production planning:

```
<Message deploymentMode="production">
  <ProductReplenishmentMessage>
    <ProductReplenishmentHeader
      messageID="ProductReplenishment_1001"
      creationDate="2016-01-01T12:00:00-00:00"/>
    <ProductReplenishmentDetails>
      <ItemID>
        <SupplierPartID>220-6338</SupplierPartID>
        <BuyerPartID>REEEA25</BuyerPartID>
      </ItemID>
```

```
      <Contact role="locationFrom">
        <Name xml:lang="en">ACME Supply, Inc.</Name>
        <PostalAddress name="default">
          <Street>5201 Great America Parkway</Street>
          <City>Santa Clara</City>
          <State>CA</State>
          <PostalCode>95054</PostalCode>
          <Country isoCountryCode="US">United States</Country>
        </PostalAddress>
        <IdReference identifier="1" domain="supplierLocationID">
          <Description xml:lang="en">ACME Supply, Inc.</Description>
        </IdReference>
      </Contact>
      <Contact role="locationTo">
        <Name xml:lang="en">XYZ Incorporated</Name>
        <PostalAddress name="default">
          <DeliverTo>Bob Liddell</DeliverTo>
          <Street>5201 Great America Parkway</Street>
          <City>Santa Clara</City>
          <State>CA</State>
          <PostalCode>95054</PostalCode>
          <Country isoCountryCode="US">United States</Country>
        </PostalAddress>
        <IdReference identifier="2" domain="buyerLocationID">
          <Description xml:lang="en">XYZ Incorporated</Description>
        </IdReference>
      </Contact>
      <ReplenishmentTimeSeries type="manufacturingOrder">
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
            endDate="2016-01-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="100">
            <UnitOfMeasure>TOK</UnitOfMeasure>
          </TimeSeriesQuantity>
          <IdReference identifier="1" domain="MoDocument"/>
        </TimeSeriesDetails>
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
            endDate="2016-02-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="100">
            <UnitOfMeasure>TOK</UnitOfMeasure>
          </TimeSeriesQuantity>
          <IdReference identifier="2" domain="MoDocument"/>
        </TimeSeriesDetails>
      </ReplenishmentTimeSeries>
      <ReplenishmentTimeSeries type="purchaseOrder">
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
            endDate="2016-01-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="100">
            <UnitOfMeasure>TOK</UnitOfMeasure>
          </TimeSeriesQuantity>
          <IdReference identifier="1" domain="PoDocument"/>
        </TimeSeriesDetails>
      </ReplenishmentTimeSeries>
      <ReplenishmentTimeSeries type="supplierForecast">
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
            endDate="2016-01-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="100">
            <UnitOfMeasure>TOK</UnitOfMeasure>
          </TimeSeriesQuantity>
          <IdReference identifier="1" domain="supplierForecast"/>
        </TimeSeriesDetails>
      </ReplenishmentTimeSeries>
      <ReplenishmentTimeSeries type="shipment">
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
```

```
            endDate="2016-01-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="100">
            <UnitOfMeasure>TOK</UnitOfMeasure>
          </TimeSeriesQuantity>
          <IdReference identifier="1" domain="ASN 1"/>
        </TimeSeriesDetails>
      </ReplenishmentTimeSeries>
    </ProductReplenishmentDetails>
  </ProductReplenishmentMessage>
</Message>
```

Here is an example of `ProductReplishmentMessage` used for inventory details:

```
<Message deploymentMode="production">
  <ProductReplenishmentMessage>
    <ProductReplenishmentHeader messageID="ProductReplenishment_2001"
      creationDate="2016-01-06T12:00:00-00:00"/>
    <ProductReplenishmentDetails>
      <ItemID>
        <SupplierPartID>220-6338</SupplierPartID>
        <BuyerPartID>REEEA25</BuyerPartID>
      </ItemID>
      <Contact role="locationFrom">
        <Name xml:lang="en">ACME Supply, Inc.</Name>
        <PostalAddress name="default">
          <Street>5201 Great America Parkway</Street>
          <City>Santa Clara</City>
          <State>CA</State>
          <PostalCode>95054</PostalCode>
          <Country isoCountryCode="US">United States</Country>
        </PostalAddress>
        <IdReference identifier="1" domain="supplierLocationID">
          <Description xml:lang="en">ACME Supply, Inc.</Description>
        </IdReference>
      </Contact>
      <Contact role="locationTo">
        <Name xml:lang="en">XYZ Incorporated</Name>
        <PostalAddress name="default">
          <DeliverTo>Bob Liddell</DeliverTo>
          <Street>5202 Great America Parkway</Street>
          <City>Santa Clara</City>
          <State>CA</State>
          <PostalCode>95054</PostalCode>
          <Country isoCountryCode="US">United States</Country>
        </PostalAddress>
        <IdReference identifier="2" domain="buyerLocationID">
          <Description xml:lang="en">XYZ Incorporated</Description>
        </IdReference>
      </Contact>
      <Contact role="inventoryOwner">
        <Name xml:lang="en">David</Name>
        <PostalAddress name="default">
          <Street>5203 Great America Parkway</Street>
          <City>Santa Clara</City>
          <State>CA</State>
          <PostalCode>95054</PostalCode>
          <Country isoCountryCode="US">United States</Country>
        </PostalAddress>
        <IdReference identifier="3" domain="inventoryOwnerID">
          <Description xml:lang="en">XYZ Incorporated</Description>
        </IdReference>
      </Contact>
      <Inventory>
        <UnrestrictedUseQuantity quantity="200">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </UnrestrictedUseQuantity>
        <BlockedQuantity quantity="100">
```

```
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </BlockedQuantity>
        <QualityInspectionQuantity quantity="100">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </QualityInspectionQuantity>
        <StockInTransferQuantity quantity="50">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </StockInTransferQuantity>
        <RequiredMinimumQuantity quantity="100">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </RequiredMinimumQuantity>
        <RequiredMaximumQuantity quantity="2000">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </RequiredMaximumQuantity>
        <StockOnHandQuantity quantity="200">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </StockOnHandQuantity>
        <WorkInProcessQuantity quantity="100">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </WorkInProcessQuantity>
        <IntransitQuantity quantity="100">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </IntransitQuantity>
        <ScrapQuantity quantity="100">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </ScrapQuantity>
        <OrderQuantity minimum="10">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </OrderQuantity>
        <DaysOfSupply minimum="1" maximum="3"/>
      </Inventory>
      <ConsignmentInventory>
        <UnrestrictedUseQuantity quantity="50">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </UnrestrictedUseQuantity>
        <BlockedQuantity quantity="10">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </BlockedQuantity>
        <QualityInspectionQuantity quantity="50">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </QualityInspectionQuantity>
      </ConsignmentInventory>
      <ReplenishmentTimeSeries type="projectedStock">
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
            endDate="2016-01-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="100">
            <UnitOfMeasure>TOK</UnitOfMeasure>
          </TimeSeriesQuantity>
          <IdReference identifier="1" domain="PsDocument"/>
          </TimeSeriesDetails>
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
            endDate="2016-01-03T12:00:00:00-00:00"/>
        <TimeSeriesQuantity quantity="200">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </TimeSeriesQuantity>
        <IdReference identifier="2" domain="PsDocument"/>
      </TimeSeriesDetails>
    </ReplenishmentTimeSeries>
    <ReplenishmentTimeSeries type="firmReceipt">
      <TimeSeriesDetails>
        <Period startDate="2016-01-03T12:00:00:00-00:00"
          endDate="2016-01-03T12:00:00:00-00:00"/>
        <TimeSeriesQuantity quantity="100">
          <UnitOfMeasure>TOK</UnitOfMeasure>
        </TimeSeriesQuantity>
        <IdReference identifier="1" domain="FrDocument"/>
```

```
      </TimeSeriesDetails>
    </ReplenishmentTimeSeries>
      <ReplenishmentTimeSeries type="plannedReceipt">
        <TimeSeriesDetails>
          <Period startDate="2016-01-03T12:00:00:00-00:00"
            endDate="2016-01-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="100">
            <UnitOfMeasure>TOK</UnitOfMeasure>
          </TimeSeriesQuantity>
          <IdReference identifier="1" domain="ASN 1"/>
        </TimeSeriesDetails>
      </ReplenishmentTimeSeries>
    </ProductReplenishmentDetails>
  </ProductReplenishmentMessage>
</Message>
```

Here is an example of `ProductReplishmentMessage` used for forecast confirmation:

```
<Message deploymentMode="production">
  <ProductReplenishmentMessage>
    <ProductReplenishmentHeader messageID="ProductReplenishment_3001"
      creationDate="2015-11-06T12:00:00-00:00"/>
    <ProductReplenishmentDetails>
      <ItemID>
        <SupplierPartID revisionID="">MATSupPART</SupplierPartID>
        <BuyerPartID>MATBuyPART</BuyerPartID>
      </ItemID>
      <Description type="" xml:lang="EN">
        VALVE CHECK -S30AI-0
      </Description>
      <Contact role="locationTo">
        <Name xml:lang="EN">Plant-Sunnyvale-5</Name>
        <IdReference domain="buyerLocationID" identifier="0001">
          <Description xml:lang="en"> Lima Plant</Description>
        </IdReference>
        <Extrinsic name=""/>
      </Contact>
      <ReplenishmentTimeSeries type="forecastConfirmation">
        <TimeSeriesDetails>
          <Period startDate="2015-11-03T12:00:00:00-00:00"
            endDate="2015-11-03T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="20">
            <UnitOfMeasure>EA</UnitOfMeasure>
          </TimeSeriesQuantity>
          <UpsideQuantity quantity="10">
            <UnitOfMeasure>EA</UnitOfMeasure>
          </UpsideQuantity>
        </TimeSeriesDetails>
        <TimeSeriesDetails>
          <Period startDate="2015-11-04T12:00:00:00-00:00"
            endDate="2015-11-04T12:00:00:00-00:00"/>
          <TimeSeriesQuantity quantity="40">
            <UnitOfMeasure>EA</UnitOfMeasure>
          </TimeSeriesQuantity>
          <UpsideQuantity quantity="20">
            <UnitOfMeasure>EA</UnitOfMeasure>
          </UpsideQuantity>
        </TimeSeriesDetails>
      </ReplenishmentTimeSeries>
      <Comments>Can supply Forecast given</Comments>
    </ProductReplenishmentDetails>
  </ProductReplenishmentMessage>
</Message>
```

18.3.1 ProductReplenishmentHeader

Contains the product replenishment header. It has the following attributes:

Attribute	Description
`messageID` (required)	Identifier for this product replenishment message.
`creationDate`	Date and time this product replenishment message was created.

18.3.2 ProductReplenishmentDetails

Contains product replenishment information for the product.

18.3.2.1 ItemID

A unique identification of a component item in the supplier back-end system or the buyer back-end system. See ItemID [page 93].

18.3.2.2 Description

Textual description of the component

18.3.2.3 LeadTime

Optional number of days needed for the buyer to receive the product.

18.3.2.4 Batch

An element carrying a batch information for material or goods produced in a single manufacturing run, such as buyer/supplier batch ID, production date, and property valuation.

18.3.2.5 Contact

Contact information for the supplier. You can specify more than one `Contact` element.

18.3.2.6 Inventory

Inventory that is in the possession of the buyer and is owned and managed by the buyer. See Inventory [page 387].

18.3.2.7 ConsignmentInventory

Inventory that is in the possession of the buyer but is owned by the supplier. See ConsignmentInventory [page 389].

18.3.2.8 ReplenishmentTimeSeries

The product replenishment quantity of a product for a specific time period. It has the following attribute:

Attribute	Description
`type` (required)	Type of replenishment order. Possible values are: • `manufacturingOrder`—An order that initiates the manufacturing process to track the status of manufacturing from Raw Material to Finished Goods status. • `purchaseOrder`—Subcontracting purchase order from the back-end ERP system. • `supplierForecast`—Forecast created by the supplier based on the Demand Supply situation in the back-end ERP system. Typically, the supplier creates the forecast for components based on the Finished Goods Demand. • `shipment`—Supplier shipment quantity from supplier's location and customer's location to ship the quantities requested. • `projectedStock`—Stock that is expected to be available in the location at the end of this day. • `firmReceipt`—Total quantity that the supplier wants to deliver to the customer in period so that the total demand from the customer is covered. • `plannedReceipt`—Total quantity that the supplier wants to deliver to the customer in a period so that the raw net demands of the buyer are covered. It is a planned quanitity that is subject to changes. • `forecastConfirmation`—Total quantity that the supplier wants to deliver to the customer in the period so that the total demand from the customer is covered.

`ReplishmentTimeSeries` has one or more `TimeSeriesDetails` elements. The `TimeSeriesDetails` element has the following elements:

- `Period`
  The start date and end date for the forecast response.
- `TimeSeriesQuantity`
  Contains the quantity associated with the given type of replenishment time series. It has a `UnitOfMeasure` element and a `quantity` attribute.
- `UpsideQuantity`
  Contains the quantity of inventory that the supplier can provide above and beyond the request demand. It has a `UnitOfMeasure` element and a `quantity` attribute.

- `IdReference`
  Defines an ID reference. The identifier/domain pair should be unique within each trading partner relationship (a buying organization and a supplier).
- `Extrinsic`
  Any additional information related to this object.

18.3.2.9 Comments

Comments provided for the part whose quantity is being committed.

18.3.2.10 Extrinsic

Any additional information related to the `ProductReplenishmentDetails`.

18.3.3 Extrinsic

Use the `Extrinsic` element list to insert additional data about the `ProductReplenishmentMessage` element.

19 Logistics

This section describes the documents that support logistics processes. The cXML elements for logistics are defined in a DTD named `Logistics.dtd`, available at:

http://xml.cXML.org/schemas/cXML/*<version>*/Logistics.dtd

Overview of Logistics [page 404]

TransportRequest [page 406]

TransportConfirmation [page 417]

Other Logistics Elements [page 423]

19.1 Overview of Logistics

The `Logistics.dtd` provides cXML elements that support logistics processes. A logistics provider can participate in the logistics workflow between buyers and sellers in domestic and international transactions. Logistics providers can receive transportation requests from buyers and sellers, and they can respond to, track, and report on those requests.

Logistics providers typically specialize in integrated operation, warehousing, and transportation services that can be scaled and customized to customers' needs based on market conditions and the demands and delivery service requirements for their products and materials. Often, these services go beyond logistics and include value-added services that integrate parts of the supply chain.

The cXML standard provides the following documents for logistics transactions:

- `TransportRequest`—A request made from one originating party to a logistics provider to arrange delivery for up to multiple consignments.
- `TransportConfirmation`—A response message sent from a logistics provider to an interested party (for example, the party requesting the transport), containing updates on the process for a transportation request.

19.1.1 Logistics Terms

This topic describes terms used in the logistics process.

Carrier	A firm that transports goods or people via land, sea, or air.
Consignee	The company to whom freight is shipped.
Consignment	Group of packages going from a Consignor (shipFrom) to a Consignee (shipTo). It has a single originating location and a single destination location.
Consignor	The company that sends freight.

Means of Transportation	The vehicle used for the transport of goods or persons, for example, an aircraft, truck, or vessel.
Mode of Transportation	The method of transport used for the conveyance of goods or persons, for example, by rail, by road, or by sea.
Package (or Dispatch Unit)	The minimum unit of cargo that will be handled. It contains a collection of material lines. A package may fully contain one or more material lines, or a material line may be contained in more than one package (in this case, each package contains just a part of the material line). In other words, there is a many-to-many relationship between packages and material lines. This information is supplied by the consignor. This is a physical layer of organizing packages. Example of package types include containers, boxes, pallets, and so on.
Party	A company involved in the transportation of goods.
Third-Party Logistics Provider (3PL)	A company that works with buyers and sellers to provide outsourced logistics services, which can include warehousing, transportation services, and other integrated supply chain management functions.
Transport Equipment	Material resources needed to facilitate the transport and handling of cargo. Transport equipment is not self-propelled. For example, it can be a container, trailer, or pallet.
Type of Means of Transportation	The type of vehicle used in the transport process, for example, wide body, tank truck, or passenger vessel.

19.1.2 Logistics Process

This topic describes a simple logistics workflow process.

1. The requesting party (either a Buyer or Supplier) sends a `TransportRequest` to a Third-Party Logistics Provider (3PL). The `TransportRequest` provides the 3PL the following information:
   - Details of the packages to transport: dimensions, packaging information, classification, temperature and hazard materials information. Optionally, the details of the material items as they are contained in their packages, as well as references to other documents (for example, Purchase Order, ShipNotice, and Invoice).
   - Details of any transportation equipment needed for carrying the goods
   - Pick-up and delivery locations, as well as the dates requested for such locations.
   - Mode of transportation.
   - Means of transportation.
   - The Shipment Identifier (Tracking Number), if it is known.
   - Optional information, such as the total value of the goods.
2. The 3PL examines the request and, based on their operational capabilities and agreements with the requestor, accepts or rejects it.
3. When a transportation event occurs in the shipment (such as collection, cancellation, scan at different locations, delivery, or return of goods), the 3PL sends a `TransportConfirmation` to the requestor, indicating the event and, if applicable, any updated information.

19.2 TransportRequest

The `TransportRequest` element defines a request made from one originating party to a logistics provider to arrange delivery for consignments.

The `TransportRequest` element has the following structure:

```
<TransportRequest>
    <TransportRequestHeader>
        <TransportPartner/>
        <Comments/>
        <Extrinsic/>
    </TransportRequestHeader>
    <Consignment>
        <ConsignmentHeader/>
        <ConsignmentLineDetail/>
        <TransportEquipment/>
    </Consignment>
    <TransportSummary>
        <FreightChargesAmount/>
        <SubtotalAmount/>
        <InsuranceValue/>
        <Dimension/>
        <Extrinsic/>
    </TranportSummary>
</TransportRequest>
```

`TransportRequest` has the following elements:

Element	Description
`TransportRequestHeader` (required)	Contains common information for all consignments. See TransportRequestHeader [page 409].
`Consignment` (required)	Describes a consignment, which is a collection of packages going from a single originating party to a single destination party. See Consignment [page 410].
`TransportSummary` (required)	Contains a summary of the data contained in all the consignments of this document. See TransportSummary [page 416].

The following example shows a `TransportRequest` document:

```
<Request>
    <TransportRequest>
        <TransportRequestHeader requestID="1"
            requestDate="2015-10-30T16:42:35-05:00"
            operation="new">
            <TransportPartner role="carrier">
                <Contact role="carrierCorporate">
                    <Name xml:lang="en_US">My Logistics Partner</Name>
                    <PostalAddress>
                        <Street>1234 Logistic St.</Street>
                        <City>Memphis</City>
                        <Country isoCountryCode="US"/>
                    </PostalAddress>
                    <IdReference identifier="AN02000000104" domain="NetworkID"/>
                </Contact>
            </TransportPartner>
        </TransportRequestHeader>
        <Consignment consignmentID="1">
```

```
            <ConsignmentHeader numberOfPackages="1">
                <TransportPartner role="shipFrom">
                    <Contact role="from">
                        <Name xml:lang="en_US">Originating Company</Name>
                        <PostalAddress>
                            <Street>123 Demo Street</Street>
                            <City>Demo City</City>
                            <Country isoCountryCode="US"/>
                        </PostalAddress>
                        <IdReference identifier="AN03000000104" domain="NetworkID"/>
                    </Contact>
                </TransportPartner>
                <TransportPartner role="shipTo">
                    <Contact role="to">
                        <Name xml:lang="en_US">Destination Company</Name>
                        <PostalAddress>
                            <Street>123 Second Demo Street</Street>
                            <City>Second Demo City</City>
                            <Country isoCountryCode="US"/>
                        </PostalAddress>
                        <IdReference identifier="AN02000000104" domain="NetworkID"/>
                    </Contact>
                </TransportPartner>
                <CommercialTerms incoterms="fob"/>
                <TransportRequirements></TransportRequirements>
                <Origin>
                    <Address>
                        <Name xml:lang="en_US">Originating Company</Name>
                        <PostalAddress>
                            <Street>123 Demo Street</Street>
                            <City>Demo City</City>
                            <State>CA</State>
                            <Country isoCountryCode="US"/>
                        </PostalAddress>
                    </Address>
                    <DateInfo type="requestedPickUpDate"
                        date="2015-11-03T17:00:00-05:00"/>
                </Origin>
                <Destination>
                    <Address>
                        <Name xml:lang="en_US">Destination Company</Name>
                        <PostalAddress>
                            <Street>123 Second Demo Street</Street>
                            <City>Second Demo City</City>
                            <State>FL</State>
                            <Country isoCountryCode="US"/>
                        </PostalAddress>
                    </Address>
                    <DateInfo type="requestedDeliveryDate"
                        date="2015-11-10T17:00:00-05:00"></DateInfo>
                </Destination>
                <Route method="motor" means="truck"/>
                <Comments type="line1" xml:lang="en_US">First line of
                    comments</Comments>
                <Comments type="line2" xml:lang="en_US">Second line of
                    comments</Comments>
            </ConsignmentHeader>
            <ConsignmentLineDetail lineNumber="1" numberOfPackages="1">
                <!-- This defines a root package, which is big box that will contain
                all the other packages -->
                <TransportPackage>
                    <Packaging>
                        <PackagingCode xml:lang="en_US">bigBox</PackagingCode>
                        <Description xml:lang="en_US">Standard Big Box</Description>
                        <PackagingLevelCode>outer</PackagingLevelCode>
                        <ShippingContainerSerialCode>0
                        </ShippingContainerSerialCode>
                    </Packaging>
```

```
                </TransportPackage>
                <TransportPackage>
                    <Packaging>
                        <PackagingCode xml:lang="en_US">regularBox</PackagingCode>
                        <Description xml:lang="en_US">Standard box</Description>
                        <PackagingLevelCode>inner</PackagingLevelCode>
                        <ShippingContainerSerialCode>1</ShippingContainerSerialCode>
                        <!-- Reference to root package (code 0) -->
                        <ShippingContainerSerialCodeReference>0
                        </ShippingContainerSerialCodeReference>
                    </Packaging>
                    <ItemInfo quantity="100">
                        <Description xml:lang="en_US">iPhone 6, 64GB,
                            Space Black</Description>
                        <ReferenceDocumentInfo lineNumber="1">
                            <DocumentInfo documentType="order"
                                documentID="PO-001"/>
                        </ReferenceDocumentInfo>
                        <ReferenceDocumentInfo lineNumber="1">
                            <DocumentInfo documentType="invoice"
                                documentID="INV-001"/>
                        </ReferenceDocumentInfo>
                        <ReferenceDocumentInfo lineNumber="1">
                            <DocumentInfo documentType="shipNotice"
                                documentID="SN-001"/>
                        </ReferenceDocumentInfo>
                        <UnitOfMeasure>UNIT</UnitOfMeasure>
                    </ItemInfo>
                </TransportPackage>
                <TransportPackage>
                    <Packaging>
                        <PackagingCode xml:lang="en_US">regularBox</PackagingCode>
                        <Description xml:lang="en_US">Standard box</Description>
                        <PackagingLevelCode>inner</PackagingLevelCode>
                        <ShippingContainerSerialCode>2
                        </ShippingContainerSerialCode>
                        <!-- Reference to root package (code 0) -->
                        <ShippingContainerSerialCodeReference>0
                        </ShippingContainerSerialCodeReference>
                    </Packaging>
                    <ItemInfo quantity="120">
                        <Description xml:lang="en_US">Galaxy S6, 64GB,
                            Black</Description>
                        <ReferenceDocumentInfo lineNumber="2">
                            <DocumentInfo documentType="order"
                                documentID="PO-001"/>
                        </ReferenceDocumentInfo>
                        <ReferenceDocumentInfo lineNumber="2">
                            <DocumentInfo documentType="invoice"
                                documentID="INV-001"/>
                        </ReferenceDocumentInfo>
                        <ReferenceDocumentInfo lineNumber="2">
                            <DocumentInfo documentType="shipNotice"
                                documentID="SN-001"/>
                        </ReferenceDocumentInfo>
                        <UnitOfMeasure>UNIT</UnitOfMeasure>
                    </ItemInfo>
                </TransportPackage>
            </ConsignmentLineDetail>
        </Consignment>
        <TransportSummary numberOfPackages="1"/>
    </TransportRequest>
</Request>
```

19.2.1 TransportRequestHeader

`TransportRequestHeader` is the header element for the transport request and contains common information for all consignments. It has the following attributes:

Attribute	Description
`operation`	Operation to perform. Currently, only "`new`" (the default) is supported, which creates a new transport request.
`requestID`	A user-supplied identifier for this transport request.
`requestDate`	User-supplied date and time when this document was created.

`TransportRequestHeader` has the following elements:

Element	Description
`TransportPartner`	Represents a party, or company, of the transport service. See TransportPartner [page 409].
`Comments`	Contains comments associated with this object.
`Extrinsic`	Contains any additional information related to this object.

19.2.1.1 TransportPartner

`TransportPartner` represents a party, or company, of the transport service. It has the following attribute:

Attribute	Description
`role` (required)	The role of the transport partner. Possible values are: • `shipFrom`—The originating party for this consignment. • `shipTo`—The destination party for this consignment. • `carrier`—The party in charge of carrying the goods.

`TransportPartner` has the following elements:

Element	Description
`Contact` (required)	Supplies additional Address or Location information for the requesting company.
`Extrinsic`	Contains any additional information related to this object.

19.2.2 Consignment

`Consignment` describes a consignment, which is a collection of packages going from a single originating party to a single destination party. It has one attribute:

Attribute	Description
`consignmentID` (required)	Identifier for this consignment.

19.2.2.1 ConsignmentHeader

`ConsignmentHeader` contains common information for all the packages of this consignment. It has the following optional attribute:

Attribute	Description
`numberOfPackages`	Total number of physical packages of this consignment.

`ConsignmentHeader` has the following elements:

Element	Description
`TransportPartner`	Represents a party, or company, of the transport service. See TransportPartner [page 409].
`Dimension`	Specifies a single dimension for the packaging of the item.
`CommercialTerms`	Defines the commercial terms of these goods. See CommercialTerms [page 411].
`NetAmount`	Total value of the goods in this consignment.
`ReferenceDocumentInfo`	Reference to legal documents related to this consignment.
`ShipmentIdentifier`	Identifier for this consignment as assigned by the carrier (if known).
`TransportRequirements`	Contains information about the transport service that is requested from the logistics provider. See TransportRequirements [page 411].
`Origin` (required)	Describes the origin location for the goods. See Origin [page 412].
`Destination` (required)	Describes the destination location for the goods. See Destination [page 412].
`Route`	Indicates the transport mode (method) and means for this consignment. No other `Route` data is needed for this context. See Route [page 412].

Element	Description
`TransportCondition`	Contains required conditions for the transport. See TransportCondition [page 413].
`Comments`	Contains comments associated with this object.
`Extrinsic`	Contains any additional information related to this object.

19.2.2.1.1 CommercialTerms

`CommercialTerms` defines the commercial terms of goods. It has the following attribute:

Attribute	Description
`incoterms` (required)	Contains the three-letter Incoterms 2010 edition code, in lower case, as defined by the International Chamber of Commerce (ICC). Possible values are: • `cfr`—Cost And Freight • `cif`—Cost Insurance And Freight • `cip`—Carriage And Insurance Paid • `cpt`—Carriage Paid • `daf`—Delivered At Frontier • `ddp`—Delivered Duty Paid • `ddu`—Delivered Duty Unpaid • `deq`—Delivered Ex Quay • `des`—Delivered Ex Ship • `exw`—Ex Works • `fas`—Free Alongside Ship • `fca`—Free Carrier • `fob`—Free On Board

19.2.2.1.2 TransportRequirements

`TransportRequirements` contains information about the transport service that is requested from the logistics provider. It has the following elements:

Element	Description
`Hazard`	Provides a textual description and optional codes about hazards inherent in both an item and an overall shipment.
`TransportTemperature`	Contains a temperature or temperature range that must be observed during transportation. See TransportTemperature [page 426].
`Classification`	Classification of the goods carried.

Element	Description
`Extrinsic`	Contains any additional information related to this object.

19.2.2.1.3 Origin

`Origin` describes the origin location for the goods. It has the following elements:

Element	Description
`Address` (required)	Contains the address of this location.
`DateInfo`	Contains dates applicable for this location. See DateInfo [page 424].
`Extrinsic`	Contains any additional information related to this object.

19.2.2.1.4 Destination

`Destination` describes the destination location for the goods.

Element	Description
`Address` (required)	Contains the address of this location.
`DateInfo`	Contains dates applicable for this location. See DateInfo [page 424].
`Extrinsic`	Contains any additional information related to this object.

19.2.2.1.5 Route

`Route` describes how the shipment will travel on this segment, indicating the transport mode (method) and the means for this consignment. Each carrier within a segment controlled by a third party logistics provider provides tracking information to that provider externally. See Route [page 260].

19.2.2.1.6 TransportCondition

`TransportCondition` contains required conditions for the transport. It has the following elements:

Element	Description
`Priority`	Priority indicator representing the "speed" of the service. The highest priority is an express service, while the lowest one is a mail service.
`Extrinsic`	Contains any additional information related to this object.

19.2.2.2 ConsignmentLineDetail

`ConsignmentLineDetail` contains a group of packages of a consignment. Each package may contain a single item on it. It has the following attributes:

Attribute	Description
`lineNumber` (required)	A sequential number for this line that is unique for this consignment.
`numberOfPackages` (required)	Total number of physical packages of this consignment.

`ConsignmentLineDetail` has the following elements:

Element	Description
`TransportPackage`	Describes the material items contained within a package. See TransportPackage [page 414].
`TransportRequirements`	Contains information about the transport service that is requested from the logistics provider. See TransportRequirements [page 411].
`TransportPlacement`	Describes how the packages are placed into transport equipment. See TransportPlacement [page 414].
`ReferenceDocumentInfo`	Reference to external documents.
`Comments`	Contains comments associated with this object.
`Extrinsic`	Contains any additional information related to this object.

19.2.2.2.1 TransportPackage

`TransportPackage` describes the material items contained within a package. It has the following elements:

Element	Description
`Packaging`	Contains details about the packaging of this line item.
`ItemInfo`	References a specific item and its relationship with a Purchase Order, Invoice, and Ship Notice. See ItemInfo [page 425].

19.2.2.2.2 TransportPlacement

`TransportPlacement` describes how the packages are placed into transport equipment. It has the following attributes:

Attribute	Description
`equipmentID` (required)	ID of the transport equipment.
`numberOfPackages` (required)	The quantity of packages placed into the equipment.

19.2.2.3 TransportEquipment

`TransportEquipment` defines a piece of transport equipment needed for this consignment. It has the following attributes:

Attribute	Description
`equipmentID` (required)	The identifier of this equipment. Must be unique for this consignment.

Attribute	Description
`type`	Type of this equipment. Possible values include: • `dimeCoatedTank` - A tank coated with dime. • `epoxyCoatedTank` - A tank coated with epoxy. • `pressurizedTank` - A tank capable of holding pressurized goods. • `refrigeratedTank` - A tank capable of keeping goods refrigerated. • `stainlessSteelTank` - A tank made of stainless steel. • `nonWorking40ftReeferContainer` - A 40 foot refrigerated container that is not actively controlling temperature of the product. • `euroPallet` - 80 x 120 cm. • `scandinavianPallet` - 100 x 120 cm. • `trailer` - Non self-propelled vehicle designed for the carriage of cargo so that it can be towed by a motor vehicle. • `nonWorking20ftReeferContainer` - A 20 foot refrigerated container that is not actively controlling temperature of the product. • `nonWorking30ftReeferContainer` - A 30 foot refrigerated container that is not actively controlling temperature of the product. • `nonWorking40ftReeferContainer` - A 40 foot refrigerated container that is not actively controlling temperature of the product. • `exchangeablePallet` - Standard pallet exchangeable following international convention. • `semiTrailer` - Non self-propelled vehicle without front wheels designed for the carriage of cargo and provided with a kingpin. • `tankContainer20ft` - A tank container with a length of 20 feet. • `tankContainer30ft` - A tank container with a length of 30 feet. • `tankContainer40ft` - A tank container with a length of 40 feet. • `refrigeratedTank20ft` - A refrigerated tank with a length of 20 feet. • `refrigeratedTank30ft` - A refrigerated tank with a length of 30 feet. • `refrigeratedTank40ft` - A refrigerated tank with a length of 40 feet. • `temperatureControllerContainer20ft` - Temperature-controlled container measuring 20 feet. • `temperatureControllerContainer30ft` - -Temperature-controlled container measuring 30 feet. • `temperatureControllerContainer40ft` - Temperature-controlled container measuring 40 feet. • `totebin` - A steel open top unit of about 1,5 * 1,5 * 2,5 meters for road transport of bulk cargo. • `dualTrailers` - Two trailers linked together one behind another and pulled by one tractor.
`numberOfEquipments`	The number of equipment units available.
`providedBy`	Indicates who provides this equipment. Possible values are: • `sender` • `receiver` • `carrier` • `other`

Attribute	Description
`status`	Indicates the status of the equipment after loading this consignment. Possible values are: • `full` • `empty`

`TransportEquipment` has the following elements:

Element	Description
`VehicleRegistration`	Contains the registration number of a vehicle and its country. See VehicleRegistration [page 416].
`Extrinsic`	Contains any additional information related to this object.

19.2.2.3.1 VehicleRegistration

`VehicleRegistration` contains the registration number of a vehicle and its country. It has the following element:

Element	Description
`RegistrationNumber` (required)	The vehicle registration number can be one of the following numbers: • License plate for cars and trucks. • Registration number for airplanes. • IMO number for ships.

19.2.3 TransportSummary

`TransportSummary` contains a summary of the data contained in all the consignments of this document. It has the following attribute:

Attribute	Description
`numberOfPackages` (required)	Total number of physical packages in this transport request.

`TransportSummary` has the following elements:

Element	Description
`FreightChargesAmount`	Contains the total of freight charges. See FreightChargesAmount [page 417].
`SubtotalAmount`	Taxable amount for the freight charges.

Element	Description
`InsuranceValue`	Contains the declared value of the goods for insurance purposes. See Insurance-Value [page 417].
`Dimension`	Total dimensions for the packages of all consignments.
`Extrinsic`	Contains any additional information related to this object.

19.2.3.1 FreightChargesAmount

`FreightChargesAmount` contains the total of freight charges. It has no attributes and one required element:

Element	Description
`Money` (required)	Monetary amount of the freight charges.

19.2.3.2 InsuranceValue

`InsuranceValue` contains the declared value of the goods for insurance purposes. It has no attributes and one required element:

Element	Description
`Money` (required)	Monetary amount of the declared value of the goods.

19.3 TransportConfirmation

The `TransportConfirmation` element contains a message sent from a logistics provider to an interested party (for example, the party requesting the transport), containing updates on the process for a transportation request.

The `TransportConfirmation` element has the following structure:

```
<TransportConfirmation>
    <TransportConfirmationHeader>
        <TransportPartner/>
        <Extrinsic/>
    </TransportConfirmationHeader>
    <TransportReference>
        <DocumentReference/>
    </TransportReference>
    <ConsignmentConfirmation>
        <ConsignmentConfirmationHeader/>
```

```
        <TransportEquipment/>
    </ConsignmentConfirmation>
</TransportConfirmation>
```

`TransportConfirmation` has the following elements:

Element	Description
`TransportConfirmationHeader` (required)	Contains common information that applies to the whole confirmation message. See TransportConfirmationHeader [page 421].
`TransportReference` (required)	Defines a reference to an earlier `TransportRequest` document. See TransportReference [page 421].
`ConsignmentConfirmation` (required)	Represents an update made to a previously existing consignment from the referenced `TransportRequest`. See ConsignmentConfirmation [page 422].

The following example shows a `TransportConfirmation` document with a status of "`accepted`":

```
<Request>
    <TransportConfirmation>
        <TransportConfirmationHeader operation="new"
            confirmationID="RES001" confirmationDate="2015-10-30">
            <TransportPartner role="carrier">
                <Contact role="carrierCorporate">
                    <Name xml:lang="en-US">My Logistics Partner</Name>
                    <PostalAddress>
                        <Street>1234 Logistic St.</Street>
                        <City>Memphis</City>
                        <Country isoCountryCode="US"/>
                    </PostalAddress>
                </Contact>
            </TransportPartner>
        </TransportConfirmationHeader>
        <TransportReference requestID="1"
            requestDate="2015-10-30T16:42:35-05:00">
            <DocumentReference payloadID="13770812585335@10.58.34.53"/>
        </TransportReference>
        <ConsignmentConfirmation consignmentID="1"
            consignmentStatus="accepted">
            <ConsignmentConfirmationHeader numberOfPackages="1">
                <Hazard>
                    <Classification domain="UNDG" code="ONU NUMBER"/>
                </Hazard>
                <Dimension quantity="10" type="grossWeight">
                    <UnitOfMeasure>TN</UnitOfMeasure>
                </Dimension>
                <Dimension quantity="23" type="grossVolume">
                    <UnitOfMeasure>m3</UnitOfMeasure>
                </Dimension>
                <ReferenceDocumentInfo>
                    <DocumentInfo documentType="formNumber"
                        documentID="FORM--001"/>
                </ReferenceDocumentInfo>
                <ReferenceDocumentInfo>
                    <DocumentInfo documentType="cte" documentID="CTE--001"
                        documentDate="2015-12-23T16:42:35-05:00"/>
                </ReferenceDocumentInfo>
                <ShipmentIdentifier domain="trackingNumber"
                    trackingNumberDate="2015-12-23T16:42:35-05:00"/>
                <OriginConfirmation>
                    <DateInfo type="expectedPickUpDate"
                        date="2015-12-23T16:42:35-05:00"></DateInfo>
```

```
                </OriginConfirmation>
                <DestinationConfirmation>
                    <DateInfo type="expectedDeliveryDate"
                        date="2016-01-21T13:24:42-05:00"></DateInfo>
                </DestinationConfirmation>
                <Extrinsic name="Beater PF Value">N12-2123</Extrinsic>
                <Extrinsic name="Beater Accredited Qtd">N12-2123</Extrinsic>
                <Extrinsic name="Extra Service Value">1212</Extrinsic>
                <Extrinsic name="License Value">N12-2123</Extrinsic>
            </ConsignmentConfirmationHeader>
            <TransportEquipment equipmentID="CONTAINER-001"
                numberOfEquipments="1" providedBy="carrier" type="container">
                <VehicleRegistration>
                    <RegistrationNumber>ANH-212</RegistrationNumber>
                </VehicleRegistration>
            </TransportEquipment>
        </ConsignmentConfirmation>
    </TransportConfirmation>
</Request>
```

The following example shows a `TransportConfirmation` document with a status of "`rejected`":

```
<Request>
    <TransportConfirmation>
        <TransportConfirmationHeader operation="new" confirmationID="RES001"
            confirmationDate="2015-10-30">
            <TransportPartner role="carrier">
                <Contact role="carrierCorporate">
                    <Name xml:lang="en-US">My Logistics Partner</Name>
                    <PostalAddress>
                        <Street>1234 Logistic St.</Street>
                        <City>Memphis</City>
                        <Country isoCountryCode="US"/>
                    </PostalAddress>
                </Contact>
            </TransportPartner>
        </TransportConfirmationHeader>
        <TransportReference requestID="1"
            requestDate="2015-10-30T16:42:35-05:00">
            <DocumentReference payloadID="1377081258533@10.58.34.53"/>
        </TransportReference>
        <ConsignmentConfirmation consignmentID="1" consignmentStatus="rejected"
            rejectionReason="MaterialBadConditioning">
            <ConsignmentConfirmationHeader numberOfPackages="1">
                <Comments type="rejectionComments" xml:lang="en-US">
                    not suitable packaging for goods to be transported
                </Comments>
            </ConsignmentConfirmationHeader>
        </ConsignmentConfirmation>
    </TransportConfirmation>
</Request>
```

The following example shows a `TransportConfirmation` document with a status of "`collected`":

```
<Request>
    <TransportConfirmation>
        <TransportConfirmationHeader operation="new" confirmationID="RES001"
            confirmationDate="2015-10-30">
            <TransportPartner role="carrier">
                <Contact role="carrierCorporate">
                    <Name xml:lang="en_US">My Logistics Partner</Name>
                    <PostalAddress>
                        <Street>1234 Logistic St.</Street>
                        <City>Memphis</City>
                        <Country isoCountryCode="US"/>
                    </PostalAddress>
```

```
                </Contact>
            </TransportPartner>
        </TransportConfirmationHeader>
        <TransportReference requestID="1"
            requestDate="2015-10-30T16:42:35-05:00">
            <DocumentReference payloadID="1377081258533@10.58.34.53"/>
        </TransportReference>
        <ConsignmentConfirmation consignmentID="1" consignmentStatus="collected">
            <ConsignmentConfirmationHeader numberOfPackages="1">
                <Dimension quantity="10" type="grossWeight">
                    <UnitOfMeasure>TN</UnitOfMeasure>
                </Dimension>
                <Dimension quantity="23" type="grossVolume">
                    <UnitOfMeasure>m3</UnitOfMeasure>
                </Dimension>
                <OriginConfirmation>
                    <DateInfo type="actualPickUpDate"
                        date="2015-12-23T16:42:35-05:00"></DateInfo>
                </OriginConfirmation>
                <DestinationConfirmation>
                    <DateInfo type="expectedDeliveryDate"
                        date="2016-01-21T13:24:42-05:00"></DateInfo>
                </DestinationConfirmation>
            </ConsignmentConfirmationHeader>
            <TransportEquipment equipmentID="1">
                <VehicleRegistration>
                    <RegistrationNumber>ANH-212
                    </RegistrationNumber>
                </VehicleRegistration>
            </TransportEquipment>
        </ConsignmentConfirmation>
    </TransportConfirmation>
</Request>
```

The following example shows a `TransportConfirmation` document with a status of "`collected`":

```
<Request>
    <TransportConfirmation>
        <TransportConfirmationHeader operation="new" confirmationID="RES001"
            confirmationDate="2015-10-30">
            <TransportPartner role="carrier">
                <Contact role="carrierCorporate">
                    <Name xml:lang="en_US">My Logistics Partner</Name>
                    <PostalAddress>
                        <Street>1234 Logistic St.</Street>
                        <City>Memphis</City>
                        <Country isoCountryCode="US"/>
                    </PostalAddress>
                </Contact>
            </TransportPartner>
        </TransportConfirmationHeader>
        <TransportReference requestID="1"
            requestDate="2015-10-30T16:42:35-05:00">
            <DocumentReference payloadID="1377081258533@10.58.34.53"/>
        </TransportReference>
        <ConsignmentConfirmation consignmentID="1" consignmentStatus="cancelled"
            rejectionReason="Unauthorized">
            <ConsignmentConfirmationHeader numberOfPackages="1">
                <Comments type="cancelation" xml:lang="en_US">
                    Not able to pickUp the goods
                </Comments>
            </ConsignmentConfirmationHeader>
        </ConsignmentConfirmation>
    </TransportConfirmation>
</Request>
```

19.3.1 TransportConfirmationHeader

`TransportConfirmationHeader` contains common information that applies to the whole confirmation message. It has the following attributes:

Attribute	Description
`operation`	Operation to perform. Currently, only "`new`" (the default) is supported, which creates a new confirmation.
`confirmationID`	User-supplied identifier for this confirmation.
`confirmationDate`	User-supplied date for this confirmation.

`TransportConfirmationHeader` has the following elements:

Element	Description
`TransportPartner`	Represents a party, or company, of the transport service. See TransportPartner [page 409].
`Extrinsic`	Contains any additional information related to this object.

19.3.2 TransportReference

`TransportReference` defines a reference to an earlier `TransportRequest` document. It has the following attributes:

Attribute	Description
`requestID`	The ID of a transport request known to the system of the party that created the `TransportRequest`.
`requestDate`	The date and time the transport request was created.

`TransportReference` has the following element:

Element	Description
`DocumentReference` (required)	References an earlier document, for example, a `TransportRequest`.

19.3.3 ConsignmentConfirmation

`ConsignmentConfirmation` represents an update made to a previously existing consignment from the referenced `TransportRequest`. It has the following attributes:

Attribute	Description
`consignmentID` (required)	Identifier for this consignment.
`consignmentStatus` (required)	The new status for this consignment. Possible values are: • `accepted` • `collected` • `rejected` • `cancelled`
`rejectionReason`	If the `consignmentStatus` is "`rejected`", then a reason must be provided in this attribute.

19.3.3.1 ConsignmentConfirmationHeader

`ConsignmentConfirmationHeader` contains common information for this consignment confirmation. It has the following optional attribute:

Attribute	Description
`numberOfPackages`	The updated package count, only if it needs to be updated.

`ConsignmentConfirmationHeader` has the following elements:

Element	Description
`Hazard`	Provides a textual description and optional codes about hazards inherent in both an item and an overall shipment.
`Dimension`	Specifies a single dimension for the packaging of the item.
`ReferenceDocumentInfo`	Contains information about a referenced document.
`ShipmentIdentifier`	A tracking number defined by the carrier that appears on the shipment that can be used to obtain additional detail about the shipment.
`OriginConfirmation`	Specifies additional dates to the origin location specified in the referenced `TransportRequest`. See OriginConfirmation [page 423].
`DestinationConfirmation`	Specifies additional dates to the destination location specified in the referenced `TransportRequest`. See DestinationConfirmation [page 423].

Element	Description
`Comments`	Contains comments associated with the consignment confirmation.
`Extrinsic`	Contains any additional information related to this object.

19.3.3.1.1 OriginConfirmation

`OriginConfirmation` specifies additional dates to the origin location specified in the referenced `TransportRequest`. It has the following elements:

Element	Description
`DateInfo`	Contains date information associated with a document or item. See DateInfo [page 424].
`Extrinsic`	Contains any additional information related to this object.

19.3.3.1.2 DestinationConfirmation

`DestinationConfirmation` specifies additional dates to the destination location specified in the referenced `TransportRequest`.

Element	Description
`DateInfo`	Contains date information associated with a document or item. See DateInfo [page 424].
`Extrinsic`	Contains any additional information related to this object.

19.3.3.2 TransportEquipment

`TransportEquipment` defines a piece of transport equipment needed for this consignment. See TransportEquipment [page 414].

19.4 Other Logistics Elements

This section lists other elements used by `TransportRequest` and `TransportConfirmation` elements.

DateInfo [page 424]

ItemInfo [page 425]
TransportIDInfo [page 425]
TransportTemperature [page 426]

19.4.1 DateInfo

`DateInfo` contains date information associated with a document or item. It is a child element of the following logistics elements:

- `Destination`
- `DestinationConfirmation`
- `Origin`
- `OriginConfirmation`
- `ReferenceDocumentInfo`

`DateInfo` has the following attributes:

Attribute	Description
`type` (required)	Date type. Possible values are: • `expectedShipmentDate`—Expected ship date for the material is used to determine when the supplier is expected to ship the material from their location. • `productionStartDate`—Production start date. • `productionFinishDate`—Production finish date. • `requestedPickUpDate`—Pick up date as requested by the party arranging the transport. • `expectedPickUpDate`—Date when the logistic provider expects to pick up the materials. • `actualPickUpDate`—Actual pick up date, as it has occurred. • `requestedDeliveryDate`—Delivery date as requested by the party arranging the transport. • `expectedDeliveryDate`—Expected delivery date for the material to be received at the partner location. • `actualDeliveryDate`—Actual delivery date of the goods.
`date` (required)	Date value.

`DateInfo` has the following element:

Element	Description
`Extrinsic`	Contains any additional information related to this object.

19.4.2 ItemInfo

`ItemInfo` references a specific item and its relationship with a Purchase Order, Invoice, and Ship Notice. It is a child element of `TransportPackage`, and it has the following attribute:

Attribute	Description
`quantity` (required)	The quantity included in the document.

`ItemInfo` has the following elements:

Element	Description
`ItemID`	Provides unique identification of an item.
`Description`	Contains a string that describes something.
`Classification`	Contains the recommended commodity classification code for the line item.
`ManufacturerPartID`	ID with which the item's manufacturer identifies the item.
`ManufacturerName`	Name of the item's manufacturer.
`Country`	The country of origin of the product listed in the line item.
`SupplierBatchID`	Specifies the batch number for goods made or manufactured at the same time.
`ReferenceDocumentInfo`	Contains information about a referenced document.
`UnitOfMeasure` (required)	Describes how the product is packaged or shipped. It must conform with UN/CEFACT Unit of Measure Common Codes.
`Extrinsic`	Contains any additional information related to the item.

19.4.3 TransportIDInfo

`TransportIDInfo` defines the ID of a transport request known to the system of the party that created it. It has the following attributes:

Element	Description
`requestID`	The ID of a transport request known to the system of the party that created it.
`requestDate`	The date and time the transport request was created.

19.4.4 TransportTemperature

`TransportTemperature` contains a temperature or temperature range that must be observed during transportation. It is a child element of `TransportRequirements`, and it has the following attributes:

Attribute	Description
`temperature`	The temperature to be observed if a range is not specified.
`maximum`	The upper limit to observe in a range.
`minimum`	The lower limit to observe in a range.

`TransportTemperature` has the following element:

Element	Description
`UnitOfMeasure` (required)	The unit of measure for the temperature. For example, "`CEL`" (degree Celsius), "`FAH`" (degree Fahrenheit), "`KEL`" (kelvin), or "`A48`" (degree Rankin).

20 Alternative Authentication Methods

cXML supports alternatives to the shared secret authentication method for verifying the sender of cXML documents.

Message Authentication Code (MAC) [page 427]

Auth Transaction [page 431]

20.1 Message Authentication Code (MAC)

Message Authentication Code (MAC) authentication allows the authentication of documents sent directly from a client to a server without passing through a trusted third party (such as a network commerce hub) for authentication. These documents contain a credential with an authentication code that can be interpreted only by the trusted third party and the receiving server, not by the sender.

The format of the `Credential` element containing the MAC is described in Credential [page 35].

20.1.1 Overview of MACs

The primary purpose of MACs is to convey receivers' shared secrets without revealing them to senders. MACs keep shared secrets secure by encoding them through a hash.

MACs are as secure as shared secrets. Senders must guard MACs as carefully as shared secrets. Compromising either piece of information could make trading partners vulnerable.

To use MAC authentication, both the trusted third party and the receiver must be able to compute MACs.

20.1.2 Computation Algorithm

MACs are created by an algorithm that combines data known by both the trusted third party and the receiver.

cXML specifies the use of the HMAC-SHA1 algorithm described in IETF RFC 2104, "HMAC: Keyed-Hashing for Message Authentication".

The HMAC-SHA1 algorithm provide the security required for cXML, and it has been formally proven to be as secure as the underlying hash algorithm.

For more information about IETF RFC 2104, see www.ietf.org/rfc/rfc2104.txt.

20.1.3 Creation and Expiration Dates

Creation and expiration dates add additional security to MACs.

If a MAC is stolen, changing the sender's shared secret has no effect. It is impractical to expect the sender to contact the receiver out-of-band to invalidate the MAC, because they might not have an established relationship. To address this problem, a creation date (`creationDate`) and an expiration date (`expirationDate`) are embedded in MACs. The expiration date limits the damage that can be result from a stolen MAC, because MACs eventually expire. The shorter the expiration period, the greater the security afforded. Receivers must reject MACs that are received after their expiration date.

Receivers can also reject unexpired MACs based on the amount of time that has elapsed since the creation date. For example, if a receiver receives a MAC that was created several years ago, but expires tomorrow, the receiver might not wish to accept the MAC. This decision is left with the implementors of the receiving systems.

It is mandatory for receivers to check that the creation date is in the past and the expiration date is in the future, and to reject it if either is not the case. However, it is optional for receivers to check whether the creation date is too long in the past.

Receivers must not only check that MACs are valid, but also that the data authenticated by MACs is acceptable. Specifically, receivers must validate that they wish to accept messages from the entities identified by the From and Sender credentials.

20.1.4 Computation Process

This section describes how to compute a MAC of `type="FromSenderCredentials"`. The inputs for this MAC type are known only by the trusted third party and the receiver.

The trusted third party uses this computation to generate `ProfileResponse Option` elements and the receiving server uses it to validate the `CredentialMac` element.

20.1.4.1 Assembling the Hash Inputs

The MAC function takes two inputs, the data input and the secret key input:

- The data input is the UTF-8-encoded byte representation of each value listed below, in order, after normalization, with each value terminated by a single null byte (0x00):

```
From/Credential@domain
From/Credential/Identity
Sender/Credential@domain
Sender/Credential/Identity
Sender/Credential/CredentialMac@creationDate
Sender/Credential/CredentialMac@expirationDate
```

- The secret key input is the cXML shared secret used between the receiver and the third party.

20.1.4.2 Normalizing the Inputs

Normalize the values listed above to remove differences in case and formatting before computation:

Value	Normalize by...	Normalized Example
`domain`	Use the lowercase version of the string, unless it is known to be case sensitive, for example, "AribaNetworkUserId". Note that "NetworkId" and "DUNS" are not case-sensitive.	`networkid`
`Identity`	Discard leading or trailing whitespace and use the lowercase version of the string.	`an9900000100`
`creationDate` `expirationDate`	No normalization needed, because they are in ISO8601 format described in Date, Time, and Other Data Types [page 32].	`2003-01-15T11:42:46-08:00`

Do not normalize the shared secret.

20.1.4.3 MAC Algorithm

The only supported MAC algorithm value is `"HMAC-SHA1-96"`, which corresponds to the HMAC-SHA1 algorithm, which produces a 160 bit (20 byte) output, and retaining only the left-most 96 bits (12 bytes). The 12 bytes are then base-64 encoded, yielding a 16-byte character string consisting only of characters in the set [A-Z a-z 0-9 +/].

To computer the MAC:

1. Concatenate the UTF-8-encoded byte representation of the following strings, each followed by a null byte (0x00). (The strings have been normalized as described above):
   "networkid", "an9900000100", "networkid", "an9900000100",
   "2003-01-15T08:42:46-08:00", "2003-01-15T11:42:46-08:00"
   The concatenation yields the following byte sequence:

   ```
   6e 65 74 77 6f 72 6b 69 64 00 61 6e 39 39 30 30
   30 30 30 31 30 30 00 6e 65 74 77 6f 72 6b 69 64
   00 61 6e 39 39 30 30 30 30 30 31 30 30 00 32 30
   30 33 2d 30 31 2d 31 35 54 30 38 3a 34 32 3a 34
   36 2d 30 38 3a 30 30 00 32 30 30 33 2d 30 31 2d
   31 35 54 31 31 3a 34 32 3a 34 36 2d 30 38 3a 30
   30 00
   ```

2. Use HMAC-SHA1 to hash the above sequence with the receiver's shared secret, for example, "abracadabra" (61 62 72 61 63 61 64 61 62 72 61), which yields:

   ```
   71 1e 89 a7 3e 7c 9e b8 97 11 10 cd 78 57 fd a0 94 da fd
   ```

   Do not terminate or normalize the shared secret.
3. Truncate the above result to 96 bits (12 bytes):

   ```
   71 1e 89 a7 3e 7c 9e b8 97 11 10 cd
   ```

   Truncation helps increase the security of the hash.
4. Base-64 encode the above result to yield the final result:

   ```
   cR6Jpz58nriXERDN
   ```

The trusted third party inserts the final result in `ProfileResponse` documents it sends to the entity that will be the client (document sender), and the client inserts it in a `CredentialMac` element in all direct communication to the server (document receiver).

20.1.5 ProfileResponse

The following cXML example shows a `ProfileResponse` sent from a trusted third party (such as a commerce network hub) to a client (such as a procurement application) so the client can send direct requests to the receiving server.

```
<cXML payloadID="1234567890@bighub.com"
    timestamp="2003-01-15T09:39:09-08:00" xml:lang="en-US">
    <Response>
        <Status code="200" text="OK"/>
        <ProfileResponse>
            <Option name="CredentialMac.type">FromSenderCredentials</Option>
            <Option name="CredentialMac.algorithm">HMAC-SHA1-96</Option>
            <Option name="CredentialMac.creationDate">2003-01-15T08:42:46
            -0800</Option>
            <Option name="CredentialMac.expirationDate">2003-01-15T11:42:46
            -0800</Option>
            <Option name="CredentialMac.value">cR6Jpz58nriXERDN</Option>
            <Transaction requestName="OrderRequest">
                <URL>https://service.hub.com/ANCXMLDispatcher.aw/ad/cxml</URL>
            </Transaction>
            <Transaction requestName="PunchOutSetupRequest">
                <URL>https://service.hub.com/AN/cxml</URL>
                <Option name="Direct.URL">https://bigsupplier.com/punchout</Option>
                <Option name="Direct.AuthenticationMethod.CredentialMac">Yes
                </Option>
                <Option name="Direct.AuthenticationMethod.Certificate">Yes</Option>
            </Transaction>
        </ProfileResponse>
    </Response>
</cXML>
```

Related Information

Profile Transaction [page 50]

20.1.6 CredentialMac

The following cXML document fragment shows an example `CredentialMac` element as it would be inserted by the client in documents sent directly to the server.

```
<cXML>
    <Header>
        <To>
            <Credential domain="DUNS">
                <Identity>049329048</Identity>
```

```
            </Credential>
        </To>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN9900000100</Identity>
            </Credential>
        </From>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN9900000100</Identity>
                <CredentialMac type="FromSenderCredentials"
                        algorithm="HMAC-SHA1-96"
                        creationDate="2016-01-15T08:42:46-0800">
                        expirationDate="2016-01-15T11:42:46-0800">
                    cR6Jpz58nriXERDN
                </CredentialMac>
                <UserAgent>Procure System 3.0</UserAgent>
            </Credential>
        </Sender>
    </Header>
   [. . .]
</cXML>
```

Related Information

Credential [page 35]

20.2 Auth Transaction

The Auth transaction allows receivers to validate organizations' credentials through a mutually trusted third party. It should be used to authenticate received documents that do not contain either a shared secret or a MAC.

The receiver encloses the credential of the sender (the principal) in an `AuthRequest` document and sends it to the trusted third party for validation.

If the principal attempts to authenticate using a client digital certificate, the receiver includes both the principal's credential and information about the principal's certificate in the `AuthRequest` document. (The receiver obtains this certificate information from its Webserver or SSL/TLS implementation.)

The trusted third party receives the `AuthRequest` and looks up the principal's credential to see if it is a recognized organization. If the principal's certificate information was included, the trusted third party makes sure the certificate is valid and that it matches the organization associated with the credential.

If the credential (and optional certificate) authenticates, the trusted third party responds with a positive `AuthResponse` that contains the validated credential. If the credential is invalid, the trusted third party responds with an empty cXML response of status 403 (Forbidden).

The receiver can cache the results of the Auth transaction until the expiration date indicated in the `AuthResponse`. During this period, if the principal presents the same credential and certificate, the receiver need not send another `AuthRequest`.

20.2.1 AuthRequest

A request sent to a mutually trusted third party to authenticate an entity.

The following example includes X509 certificate information, which comes from the requesting entity's client digital certificate.

```
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML timestamp="2000-12-28T16:56:03-08:00" payloadID="foo123@bigsupplier.com">
    <Header>
        <From>
            <Credential domain="NetworkId">
                <Identity>AN99000000092</Identity>
            </Credential>
         </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN99000000092</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="NetworkId">
                <Identity>AN99000000092</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>cXML application 2.0</UserAgent>
        </Sender>
    </Header>
    <Request>
        <AuthRequest>
            <Credential domain="DUNS">
                <Identity>12345</Identity>
            </Credential>
            <X509Data>
                <X509IssuerSerial>
                    <X509IssuerName>Verisign</X509IssuerName>
                    <X509SerialNumber>12345</X509SerialNumber>
                </X509IssuerSerial>
            </X509Data>
        </AuthRequest>
    </Request>
</cXML>
```

20.2.1.1 Credential

A cXML credential. See Credential [page 35].

20.2.1.2 X509Data

Describes the X.509 client certificate being used for authentication.

X509IssuerSerial

A container for the serial number and issuer name of the X.509 certificate.

`X509IssuerSerialChild` has the following elements:

- `X509IssuerName`
  The distinguished name of the issuer of the X.509 certificate. The distinguished name should be a string representation of an LDAP Distinguished Name, as described in RFC 2253. For example,
  `C=US, O="Mega Data Security, Inc.", OU=Secure Server CA`
- `X509SerialNumber`
  The serial number of the X.509 certificate.

X509SKI

The Subject Key Identifier of the X.509 certificate.

X509 SubjectName

The distinguished name of the subject of the X.509 certificate. This should be a string representation of an LDAP distinguished name, as described in RFC 2253.

X509Certificate

Contains the Base-64-encoded X.509v3 certificate.

X509CRL

Contains a Base-64-encoded X.509v3 Certificate Revocation List.

20.2.2 AuthResponse

Returns a list of valid credentials of the person entity in the `AuthRequest` document. Note that this response is for successful authentications only.

`AuthResponse` has the following attribute:

Attribute	Description
`expirationDate`	Specifies the time beyond which the information contained in the `AuthResponse` must be discarded. The inclusion of this attribute specifies that the receiver can cache the AuthResponse information until the `expirationDate`.

The absence of an `expirationDate` should be interpreted to forbid caching.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.014/cXML.dtd">
<cXML payloadID="234234@hub.com" timestamp="2001-01-25T15:19:07-08:00">
    <Response>
        <Status code="200" text="OK"/>
        <AuthResponse expirationDate="2002-12-31T09:00:00-08:00">
            <Credential domain="DUNS">
                <Identity>12345</Identity>
            </Credential>
        </AuthResponse>
    </Response>
</cXML>
```

21 cXML Digital Signatures

Any cXML request, response, or message can be signed using World Wide Web Consortium (W3C) XML Digital Signatures. Support for the XML Advanced Electronic Signature (XAdES) standard is also included.

Readers of this section should be familiar with electronic signature terminology and concepts such as asymmetric key pairs, certificates, and smart cards.

Digital Signature Overview [page 435]

Signing cXML Documents [page 436]

21.1 Digital Signature Overview

Digital signatures confirm the identity of the sender of an electronic document, and ensure that the document was not modified after it was generated by the signer. They consist of a series of bytes that contain cryptographic information, including the sender's public key and detailed information about the contents of the document being signed.

An XML digital signature—which is a specific arrangement of a digital signature—is an element that contains other information besides the cryptographic signature itself, including a list of what was signed, the signer's public key, and other attributes. A cXML signature is an XML digital signature of a certain form, as described later in this chapter.

XML Advanced Electronic Signature (XAdES) provides basic authentication and integrity protection.

W3C XML signatures and XAdES have many options designed to allow for flexibility. These options are described in the following resources:

For information about W3C XML digital signatures, see www.w3.org.

For information about XAdES, see uri.etsi.org/01903/v1.3.2.

21.1.1 Options for Signing

You can use a service to sign documents on your behalf, or you can implement the necessary hardware or software systems to sign the documents yourself. If you implement your own signing system, you must obtain a certificate signed by a Certificate Authority (CA) trusted by the receiver. Meeting receiver requirements might mean obtaining hardware that keeps the private key secret, such as a smart card or Hardware Security Module.

Note that signature and certificate requirements vary according to local laws and regulations. Prior to implementing a signing system, be sure you learn the requirements of the relevant locale.

21.2 Signing cXML Documents

A valid cXML digital signature is not just an XML signature, but an XML signature that uses particular options, has particular elements present, and signs (or does not sign) certain portions of the document.

21.2.1 cXML Digital Signatures

Note that namespace prefix conventions are used here when referring to elements that come from other specifications. All W3C XML Digital Signature elements use the `ds` prefix, and all XAdES elements use the `xades` prefix.

21.2.1.1 ds:Signature Element

The `cXML` element contains a space for the `ds:Signature` element after the `Request`, `Response`, or `Message` element. The `ds:Signature` element holds information about what is being signed, one or more signatures, and the keys used to create the signature or signatures. It also has a place to store additional information such as XAdES extensions or attachment manifests.

The `cXML` element also contains a space for the `signatureVersion` attribute.

Attribute	Description
`signatureVersion`	If present, `signatureVersion` implies that the document is digitally signed, that is, that the document contains a valid `ds:Signature` element immediately following the `Request`, `Response`, or `Message` element. If the document is signed, this attribute must be present. The only valid value for the attribute is `1.0`; other values are reserved for future use.
`Id`	This attribute can be used to call out an element and all its children as a target for signing. For example, if a document contains `<Request Id="foo">`, then in the digital signature `<Reference URI="#foo">` will refer to the `Request` element and all its children. If the document is signed, this attribute must be present.

The `Message`, `Request`, and `Response` elements contain an `Id` attribute.

Related Information

cXML Envelope [page 31]
cXML Basics [page 24]

21.2.1.2 cXMLSignedInfo

The `cXMLSignedInfo` element includes cXML-specific details about the signature, and has the following attributes:

Attribute	Description
`signatureVersion` (required)	Implies that the document is digitally signed, that is, that the document contains a valid `ds:Signature` element immediately following the `Request`, `Response`, or `Message` element. The only valid value for the attribute is `1.0`; other values are reserved for future use.
`payloadID` (required)	Used to establish links between documents. The `payloadID` in the `cXMLSignedInfo` element must be the same as the `payloadID` in the document's main `cXML` element.
`Id` (required)	Identifies this `cXMLSignedInfo` element for purposes of the signature. This attribute must always be present and should always have the value `"cXMLSignedInfo"`.

21.2.1.3 Signing Essentials

Because some information from the cXML header is significant, it must be signed. To sign these attributes from the header, repeat the information in a `cXMLSignedInfo` element placed within a `ds:Object` element. The `ds:Object` must be the first `ds:Object` in the signature. For example:

```
<ds:Object>
<cXMLSignedInfo Id="cXMLSignedInfo"
             signatureVersion="1.0"
             payloadID="xxx"/>
</ds:Object>
```

The value of the `Id` attribute must be `"cXMLSignedInfo"`. The values of the `signatureVersion` and `payloadID` attributes must exactly match the values specified in the `cXML` element, and the receiver of the document must verify this match. No transforms should be used in this `ds:Reference`. This element must be signed via the first `ds:Reference` object in the `ds:SignedInfo`, as follows:

```
<ds:Reference URI="#cXMLSignedInfo">
<ds:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1"/>
<ds:DigestValue>xxxxxxxxxxxxxxxxxxxxxxxxxxx</ds:DigestValue>
</ds:Reference>
```

The `Request`, `Response`, or `Message` element should be signed in its entirety. To do this, specify the string `"cXMLData"` as the value of the `Id` attribute on the `Request`, `Response`, or `Message` element and include a `ds:Reference` element with the URI `"#cXMLData"` in the `ds:SignedInfo`. No transforms should be applied to this reference. This `ds:Reference` must be the second `ds:Reference` in the `ds:SignedInfo`.

The `ds:KeyInfo` element should be present with a single `ds:X509Certificate` element. This should include the Base64 encoding of the DER representation of an X.509 certificate containing the public key corresponding to the private key used to sign the document.

21.2.1.4 Using XAdES

The use of XAdES is required for digital signatures. In the signature, `xades:QualifyingProperties` should be the second `ds:Object`. The `xades:SignedProperties` element and all its children must be signed by specifying "`XAdESSignedProps`" as the value for the Id attribute of `xades:SignedProperties` and including a `ds:Reference` with the URI "`#XAdESSignedProps`" and no transforms in the `ds:SignedInfo`. When using XAdES, the certificate referred to in the `xades:Cert` element must be the same as that contained in the `ds:KeyInfo` element, the Id attribute of the `ds:Signature` element must be set to `cXMLSignature` and the `Target` attribute of `xades:QualifyingProperties` must be `#cXMLSignature`.

21.2.1.5 Signing Attachments

If the document in question includes attachments, digital signatures can be used to sign just the document, or both the document and its attachments. Signatures are structured in such a way that if the attachments are discarded, the signature on the document itself can still be validated.

The attachments should be signed using `ds:Reference` elements in a `ds:Manifest` element included under a `ds:Object` contained in the signature. The `Id` attribute of the `ds:Manifest` element must be "AttachmentManifest". The `ds:Object` should occur immediately after the `ds:Object` containing the `xades:QualifyingProperties` element, if it is present. Otherwise, it should occur immediately after the `ds:Object` containing the `cXMLSignedInfo element`.

Each `ds:Reference` in the manifest should use a URI with the "`cid:`" scheme to refer to the attachments through their MIME `Content-Id`. The `ds:Manifest` element itself should be signed using a fragment URI reference included in the `ds:SignedInfo`. This requirement exists because a compliant XML signature implementation must validate all the `ds:Reference` elements under `ds:SignedInfo`. Base validation ensures that the manifest itself has not been corrupted, but will not validate the objects referred to in the manifest. This approach makes it possible to validate the document on its own if the attachments have been discarded. For example:

```
<ds:Object>
    <ds:Manifest Id="AttachmentManifest">
        <ds:Reference URI="cid:23482390498.34284203.part1@some.host.com">
            <ds:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1"/>
            <ds:DigestValue>P6ua59kKBLLtMBFE+IwPUgp2xqc=</ds:DigestValue>
        </ds:Reference>
        <ds:Reference URI="cid:23482390498.34284203.part2@some.host.com">
            <ds:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1"/>
            <ds:DigestValue>P6ua59kKBLLtMBFE+IwPUgp2xqc=</ds:DigestValue>
        </ds:Reference>
    </ds:Manifest>
</ds:Object>
```

21.2.2 Error Status Codes for Digital Signatures

The following table lists cXML digital signature status codes:

Status	Text	Meaning
475	Signature Required	The receiver is unwilling to accept the document because it does not have a digital signature.
476	Signature Verification Failed	The receiver is unable to validate the signature, possibly because the document was altered in transit, or the receiver does not support one or more algorithms used in the signature.
477	Signature Unacceptable	The signature is technically valid, but is not acceptable to the receiver for some other reason. The signature policies or certificate policies might be unacceptable, the type of certificate used might be unacceptable, or there might be some other problem.

21.2.3 Digital Signature Example

The following example shows a signed invoice. Note that the digest values and signature value are not correct, because parts of the invoice document have been abbreviated for this example.

```
<?xml version="1.0" ?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.0.11/InvoiceDetail.dtd">
<cXML payloadID="20030912.jdoe004@live.company.com" signatureVersion="1.0"
timestamp="200104-20T23:59:45-07:00">
  <Header>
    <From>
      <Credential domain="AribaNetworkUserId">
        <Identity>jdoe@company.com</Identity>
      </Credential>
      </From>
      <To>
        <Credential domain="AribaNetworkUserId">
          <Identity>smistry@company.com</Identity>
        </Credential>
      </To>
      <Sender>
        <Credential domain="AribaNetworkUserId">
          <Identity>jdoe@company.com</Identity>
          <SharedSecret>abracadabra</SharedSecret>
        </Credential>
        <UserAgent>Our Invoice Application 4.0</UserAgent>
      </Sender>
  </Header>
  <Request Id="cXMLData" deploymentMode="production">
    <InvoiceDetailRequest>
      <InvoiceDetailRequestHeader invoiceDate="2001-04-20T23:59:20-07:00"
                          invoiceID="123456-004" operation="new" purpose="standard">
        ...
      </InvoiceDetailRequestHeader>
      <InvoiceDetailOrder>
        ...
      </InvoiceDetailOrder>
      <InvoiceDetailSummary>
        ...
      </InvoiceDetailSummary>
    </InvoiceDetailRequest>
  </Request>
```

```
<ds:Signature xmlns:ds="http://www.w3.org/2000/09/xmldsig#" Id="cXMLSignature">
  <ds:SignedInfo>
    <ds:CanonicalizationMethod Algorithm="http://www.w3.org/TR/2001/
    REC-xml-c14n20010315"></ds:CanonicalizationMethod>
    <ds:SignatureMethod Algorithm="http://www.w3.org/2000/09/xmldsig#rsa-sha1">
    </ds:SignatureMethod>
    <ds:Reference URI="#cXMLSignedInfo">
      <ds:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1">
      </ds:DigestMethod>
      <ds:DigestValue>mxtVp6Rg9K5wo/c5BO88g7sZYEg=</ds:DigestValue>
      </ds:Reference>
      <ds:Reference URI="#cXMLData">
        <ds:DigestMethod Algorithm="http://www.w3.org/2000/09/xmldsig#sha1">
      </ds:DigestMethod>
        <ds:DigestValue>1uBJgSa3BXewh/1wsPDWCzn8Sgk=</ds:DigestValue>
      </ds:Reference>
      <ds:Reference URI="#XAdESSignedProps">
        <ds:DigestMethod
            Algorithm="http://www.w3.org/2000/09/xmldsig#sha1">
        </ds:DigestMethod>
        <ds:DigestValue>XIasOHckorH8fz/thdyZIZvV2yI=</ds:DigestValue>
      </ds:Reference>
    </ds:SignedInfo>
    <ds:SignatureValue>
nNfsBpc22u9aypYLvgE5cuiHVO077vnaolS76LoAuks9bAwLO0kz/nkTQfb2zKSQTy8jj6W/
TJGCQj691PlKBnIqaMPPN3k+hbi6A5cJHPRd3HNPexU5sSi4StTuxlWAiHe/
XEeBEeclu7K6sR4Rh1gzzELg05v21aRX4oVGbjk=</ds:SignatureValue>
    <ds:KeyInfo>
      <ds:X509Data>
        <ds:X509Certificate>
MIICgDCCAekCAw7cUTANBgkqhkiG9w0BAQQFADCBijELMAkGA1UEBhMCVV
w7cUTANBgkqhkiG9w0BAQQFADCBijELMAkGA1UEBhMCVVMxEzARBgNV
MIICgDCCAekCAw7cUTANBgkqhkiG9w0BAQQFADCBijELMAkGA1UEBhMCVV
w7cUTANBgkqhkiG9w0BAQQFADCBijELMAkGA1UEBhMCVVMxEzARBgNVBA
MIICgDCCAekCAw7cUTANBgkqhkiG9w0BAQQFADCBijELMAkGA1UEBhMCVV
zuRel/9tb8M95FuN5yR9GUGl5PgkzwuCQYobJqIcAs=</ds:X509Certificate>
        </ds:X509Data>
      </ds:KeyInfo>
      <ds:Object>
        <cXMLSignedInfo Id="cXMLSignedInfo"
          payloadID="20030912.rsmith004@live.hub.com" signatureVersion="1.0">
        </cXMLSignedInfo>
      </ds:Object>
      <ds:Object>
        <xades:QualifyingProperties xmlns:xades=
        "http://uri.etsi.org/01903/v1.1.1#"
        Target="#cXMLSignature">
        <xades:SignedProperties Id="XAdESSignedProps">
           <xades:SignedSignatureProperties>
             <xades:SigningTime>2003-09-30T18:32:27Z</xades:SigningTime>
               <xades:SigningCertificate>
                 <xades:Cert>
                   <xades:CertDigest>
                     <ds:DigestMethod
                         Algorithm="http://www.w3.org/2000/09/xmldsig#sha1">
                     </ds:DigestMethod>
                     <ds:DigestValue>LETnT8c7gvZqp3oVt8/BLOJpeeA=</ds:DigestValue>
                   </xades:CertDigest>
                   <xades:IssuerSerial>
                     <ds:X509IssuerName>EMAILADDRESS=an_ops@company.com,
                       CN=anrc.hub.com, O="Hub, Inc.", L=Mountain View,
                       ST=California, C=US</ds:X509IssuerName>
                     <ds:X509SerialNumber>973905</ds:X509SerialNumber>
                   </xades:IssuerSerial>
                 </xades:Cert>
               </xades:SigningCertificate>
           <xades:SignaturePolicyIdentifier>
             <xades:SignaturePolicyImplied>
```

```
              </xades:SignaturePolicyImplied>
            </xades:SignaturePolicyIdentifier>
          </xades:SignedSignatureProperties>
        </xades:SignedProperties>
      </xades:QualifyingProperties>
    </ds:Object>
  </ds:Signature>
</cXML>
```

22 New Features in cXML 1.2.030

This section describes the features introduced in cXML version 1.2.030.

22.1 Logistics Enhancements

The following cXML elements have been added to support logistics processes. These elements are defined in a DTD named `Logistics.dtd`, available at:

http://xml.cXML.org/schemas/cXML/*<version>*/Logistics.dtd

Element	Contained In	Description
`CommercialTerms`	`ConsignmentHeader`	Defines the commercial terms of these goods.
`Consignment`	`TransportRequest`	Describes a consignment, which is a collection of packages going from a single originating party to a single destination party.
`ConsignmentConfirmation`	`TransportConfirmation`	Represents an update made to a previously existing consignment from the referenced `TransportRequest`.
`ConsignmentConfirmationHeader`	`ConsignmentConfirmation`	Contains common information for this consignment confirmation.
`ConsignmentHeader`	`Consignment`	Contains common information for all the packages of this consignment.
`ConsignmentLineDetail`	`Consignment`	A group of packages of a consignment. Each package may contain a single item on it.
`Destination`	`ConsignmentHeader`	Describes the destination location for the goods.
`DestinationConfirmation`	`ConsignmentConfirmationHeader`	Specifies additional dates to the destination location specified in the referenced `TransportRequest`.
`FreightChargesAmount`	`TransportSummary`	Contains the total of freight charges.

Element	Contained In	Description
InsuranceValue	TransportSummary	Contains the declared value of the goods for insurance purposes.
ItemInfo*	TransportPackage	References a specific item and its relationship with a Purchase Order, Invoice, and Ship Notice.
Origin	ConsignmentHeader	Describes the origin location for the goods.
OriginConfirmation	ConsignmentConfirmationHeader	Specifies additional dates to the origin location specified in the referenced TransportRequest.
RegistrationNumber	VehicleRegistration	Contains the registration number of an entity, such as a vehicle.
TransportCondition	ConsignmentHeader	Contains required conditions for the transport.
TransportConfirmation	n/a	Contains a message sent from a logistics provider to an interested party (for example, the party requesting the transport), containing updates on the process for a transportation request.
TransportConfirmationHeader	TransportConfirmation	Contains common information that applies to the whole confirmation message.
TransportEquipment	Consignment, ConsignmentConfirmation	Defines a piece of transport equipment needed for this consignment.
TransportPackage	ConsignmentLineDetail	Describes the material items contained within a package.
TransportPartner	ConsignmentHeader, TransportConfirmationHeader, TransportRequestHeader	Represents a party, or company, of the transport service.
TransportPlacement	ConsignmentLineDetail	Describes how the packages are placed into transport equipment.
TransportRequest	n/a	A request made from one originating party to a logistics provider to arrange delivery for consignments.
TransportRequestHeader	TransportRequest	Contains common information for all consignments.
TransportRequirements	ConsignmentHeader, ConsignmentLineDetail	Contains information about the transport service that is requested from the logistics provider.

Element	Contained In	Description
`TransportSummary`	`TransportRequest`	Contains a summary of the data contained in all the consignments of this document.
`TransportTemperature`	`TransportRequirements`	Contains a temperature or temperature range that must be observed during transportation.
`VehicleRegistration`	`TransportEquipment`	Contains the registration number of a vehicle and its country.

* This element is common to several other cXML DTDs, including `cXML.dtd`.

22.2 Order Collaboration Returns Process Enhancements

Purchase Orders

The following attributes have been added to `ItemOut` to support return items:

- `isReturn`
- `returnAuthorizationNumber`

Line-Item Credit Memos

A new `reason` attribute has been added to the `InvoiceDetailItem` element. It specifies the reason for a line-item credit memo (`InvoiceDetailRequestHeader@purpose = "lineLevelCreditMemo"`). The only possible value for `reason` is `"return"`, which means the credit memo is for a return item.

22.3 PaymentProposalRequest Enhancements

The following elements were added to support enhancements to `PaymentProposalRequest` documents:

Element	Contained In	Description
`DiscountBasis`	`PaymentProposalRequest`	Defines the discount basis for the payable.
`TaxAdjustment`	`PaymentProposalRequest`	Defines the tax adjustment for the payable.
`TaxAdjustmentDetail`	`TaxAdjustment`	Defines the details of adjustments given over category and region.

The following optional child elements have been added to the `PaymentProposalRequest` element:

- `DiscountBasis`
- `Tax`
- `TaxAdjustment`

22.4 Invoice Reconciliation Enhancements

To support accounting distribution for taxes, shipping, and special handling charges at the invoice header and line item level in reconciled invoices, the optional `Distribution` child element was added to the following elements:

- `InvoiceDetailDiscount`
- `InvoiceDetailLineShipping`
- `InvoiceDetailLineSpecialHandling`
- `ShippingAmount`
- `SpecialHandlingAmount`
- `Tax`

22.5 Purchase Order Enhancements

External Links to Documents in AttachmentReference

The `ItemDetail` element has a new `AttachmentReference` child element.

The `AttachmentReference` element has the following changes:

- The existing `URL` element has been added as an optional child element of `AttachmentReference`. The URL is an external link to a referenced document on the buyer's system.
- A new `version` attribute was added to `AttachmentReference`. It specifies the version of the external source document.

Configurable Material

The `ItemDetailIndustry` element has a new attribute called `isConfigurableMaterial`, which indicates that the item is defined as a configurable material and therefore has product characteristics.

22.6 ProductActivityMessage Enhancements

The following element was added to support the transfer of projected stock, safety stock, and target stock levels generated by the buyer's planning system to support demand and supply planning:

Element	Contained In	Description
`InventoryTimeSeries`	`ProductActivityDetails`	Provides inventory data in time intervals.

The `ProductActivityDetails` element now has an optional `InventoryTimeSeries` child element. It also has a new optional `status` attribute, which indicates whether the material used in the planning process is active, inactive, or deleted.

22.7 TradeRequest Enhancements

The following enhancements have been made to `TradeRequest` elements:

TradeRequestHeader Enhancements

- The `tradeReferenceNumber` attribute is now called `tradeID`.
- The `tradeCreatedDate` attribute is now called `tradeDate`.
- The `projectedSettlementDate` attribute is now called `settlementDate`.

TradeRequestSummary Enhancements

- The `GrossAmount` child element is now called `OriginalAmount`.
- The `NetAmount` child element is now called `Amount`.
- A new `CreditApplied` child element was added.

TradeItem Enhancements

- The `GrossAmount` child element is now called `OriginalAmount`.
- The `NetAmount` child element is now called `Amount`.
- A new `lineNumber` attribute was added.

22.8 Receipt Enhancement

The `ReceiptRequestHeader` element has a new optional `ShipNoticeIDInfo` element, which means the receipt can now have a reference to the Packing Slip ID at the header level.

23 Revision History

The following table provides a brief history of the updates to this guide.

Month/Year of Update	Updated Chapter/Section	Short Description of Change
April 2015	n/a	Updated format and structure.
July 2015	PunchOut Transaction	Updated `ItemIn` and children.
	Purchase Orders	Updated `Total`, `ItemOut`, `ItemDetail`, `SupplierID`, `ScheduleLine`, and `Batch`.
	Payment	Updated `PaymentRemittanceRequest`, `PayableInfo`, and `AdjustmentAmount`.
	Later Status Changes	Updated topics for the following elements/attributes: • `ConfirmationItem` • `PayableInfo` • `TermsOfTransport` • `ShipNoticeItem` • `ShipNoticeItemDetail` • `SupplierBatchID/Batch` • `ComponentConsumptionDetails`
	Invoices	Updated `InvoiceDetailItem`, and created new topics for `InvoiceDetailReceiptInfo` and `InvoiceDetailShipNoticeInfo`.
	Service Sheets	Updated topics for the following elements: • `PartnerContact` • `ServiceEntryDetailLineIndicator` • `ServiceEntryDetailShipping` • `ShipNoticeIDInfo` • `PaymentTerm` • `ServiceEntryItem` • `ServiceEntrySummary`
	Supply Chain Collaboration	New chapter.
	New Features in cXML 1.2.026 and 1.2.028	Changed title of chapter, and added a section on new features in cXML 1.2.028.
August 2015	Later Status Changes and Invoices	Updated external links for `CarrierIdentifier`.
	Invoices	Updated list of domain values for `IdReference`.
January 2016	Introduction to cXML	Updated "cXML DTDs."

Month/Year of Update	Updated Chapter/Section	Short Description of Change
January 2016	PunchOut Transaction	Added `ItemIn@itemClassification` and `Classification@code`.
	Purchase Orders	Added or updated the following topics: • `OrderRequest` Documents • `OrderRequestHeader` • `OrderRequestHeader` > `Total` • `OrderRequestHeader` > `ControlKeys` • `OrderRequestHeader` > `TermsOfDelivery` • `OrderRequestHeader` > `OrderRequestHeaderIndustry` • `OrderRequest` Documents > `ItemOut` • `OrderRequest` Documents > `ItemOut` > `Tolerances` • `OrderRequest` Documents > `ItemOut` > `ControlKeys` • `OrderRequest` Documents > `ItemOut` > `ScheduleLine` • `OrderRequest` Documents > `ItemOut` > `ItemOutIndustry`
	Path Routing	Updated "Overview of Path Routing," "Copy Nodes," and `CopyRequest`.
	Payment	Added `TradeRequest`.
	Master Agreements and Contracts	Changed chapter title, and added the following topics: • `ContractRequest` • `ContractStatusUpdateRequest`
	Later Status Changes	Added or updated the following topics: • `StatusUpdateRequest` > `DocumentStatus` • `StatusUpdateRequest` > `DocumentStatus` > `DocumentInfo` • `StatusUpdateRequest` > `DocumentStatus` > `ItemStatus` • `StatusUpdateRequest` > `DocumentStatus` > `Comments` • `ConfirmationRequest` > `ConfirmationHeader` > `IdReference` • `ShipNoticeRequest` > `ShipControl` > `ShipmentIdentifier`
	Invoices	Added or updated the following topics: • `InvoiceDetailRequestHeader` • `InvoiceDetailRequest` > `InvoiceDetailRequestHeader` > `InvoiceDetailShipping` • `InvoiceDetailRequest` > `InvoiceDetailRequestHeader` > `IdReference`

Month/Year of Update	Updated Chapter/Section	Short Description of Change
January 2016	Service Sheets	Updated the following topics: • `ServiceEntryRequest` > `ServiceEntryRequestHeader` > `IdReference` • Service Sheet Status Updates
	Supply Chain Collaboration	Added or updated the following topics: • `ProductActivityMessage` • `ComponentConsumptionRequest` > `ComponentConsumptionPortion` > `ComponentConsumptionItem` > `ComponentConsumptionDetails` • `ProductActivityMessage` > `ProductActivityDetails` • `ProductActivityMessage` > `ProductActivityDetails` > `Inventory` • `ProductActivityMessage` > `ProductActivityDetails` > `SalesReport` • `ProductReplenishmentMessage`
	New Features in cXML 1.2.029	New chapter; removed "New Features in cXML 1.2.026 and 1.2.028."
May 2016	Introduction to cXML	Updated "cXML DTDs" topic.
	PunchOut Transaction	Updated `ItemIn` and its subtopics.
	Purchase Orders	Updated `ItemOut` and its subtopics.
	Payment	Added or updated `PaymentProposalRequest`, `DiscountBasis`, `TaxAdjustment`, `TaxAdjustmentDetail`, `TradeRequest`, `TradeRequestHeader`, `TradeRequestSummary`, and `TradeItem`.
	Later Status Changes	Added `ReceiptRequest` and its subtopics.
	Invoices	Updated `InvoiceDetailItem`, `InvoiceDetailServiceItem`, `InvoiceDetailOrderSummary`, `SpecialHandlingAmoung`, `Shipping Amount`, and "Example Invoices."
	Supply Chain Collaboration	Added or updated `ProductActivityDetails`, `ItemID`, and `InventoryTimeSeries`.
	Logistics	New chapter.
	cXML Digital Signatures	Updated `cXMLSignedInfo`.
	New Features in cXML 1.2.030	New chapter; removed "New Features in cXML 1.2.029."