
# cXML User's Guide

**VERSION 1.2.008**

**NOVEMBER, 2002**

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# Table of Contents

# Preface

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

## 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
- Buying communities
- 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 Chapter 1, “Introduction to cXML.”
- **Web Programmers—**Web programmers who implement e-commerce sites should read all chapters.

- **PunchOut Site Administrators**—Web engineers experienced with PunchOut Websites should read Appendix A, “New Features in cXML 1.2.008.”

## 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, and appears between angle brackets. | *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. | There is one line in ReportMeta.csv for each report in the system. |
| *AaBbCc123* | The names of books. | For more information, see *Acme Configuration Overview*. |

# Chapter 1
# Introduction to cXML

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

This chapter provides an overview of cXML. It discusses the following topics:



## 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. But, applications can extract and use data from XML documents more easily than from HTML ones, because in XML, all 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 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. For more information, see “Getting cXML DTDs” on page 23.

# 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
- PunchOut
- Purchase Orders

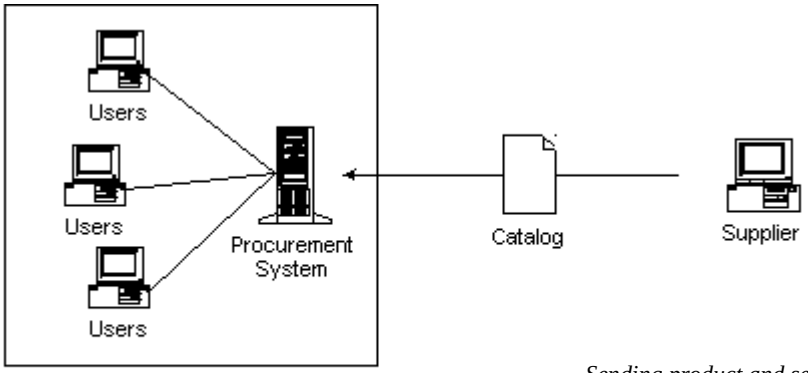
The following subsections describe these cXML documents.

## 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.




*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.

## 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
- PunchOut Chaining
- Provider PunchOut

### *Procurement PunchOut*

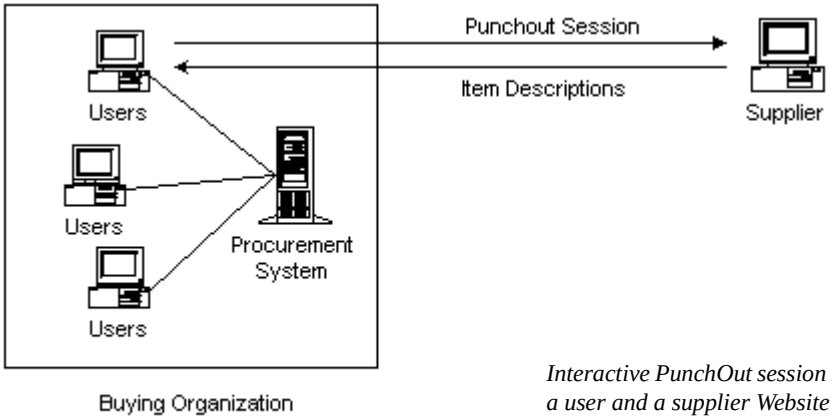
Procurement PunchOut gives suppliers an alternative to static catalog files. PunchOut sites are live, interactive catalogs running on a Website.

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 more information:

Chapter 4, "Implementing PunchOut."

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.




*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.


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*

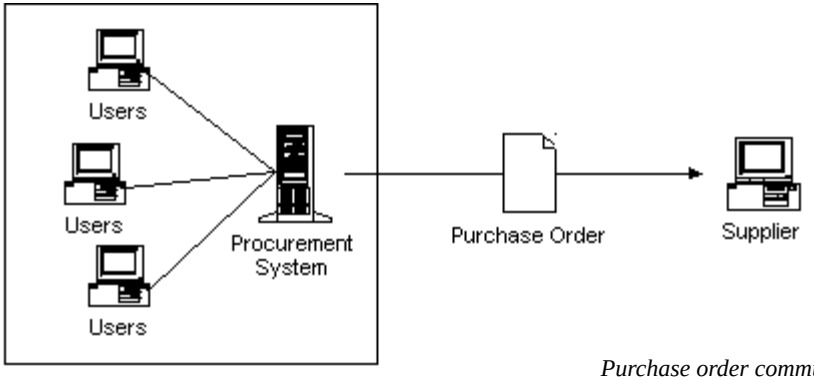
Provider PunchOut enables applications to punch out to a remote applications that supply services to the originating application, such as credit card validation, user authentication, or self-registration.

## Purchase Orders

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

For more information:

Chapter 6, “Receiving cXML Purchase Orders.”




*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.

# Types of Applications that Use cXML

cXML can be used by any e-commerce application. It is currently used by buying organizations, vertical and horizontal buying communities, suppliers, and application vendors. 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 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.

For more information:

Chapter 4, "Implementing PunchOut."

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

For more information:

Chapter 6, "Receiving cXML Purchase Orders."

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.

## 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.

## cXML DTDs

Because cXML is an XML language, a set of Document Type Definitions (DTDs) thoroughly define it. These DTDs are text files that describes 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 |

where <*version*> is the full cXML version number, such as 1.2.008.

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. Documents generated by these applications must point to the DTDs at cXML.org, not the local ones.

# 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** support 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.

## 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.

## XML Utilities

Utilities for editing and validating XML files are available for free and for purchase on the Web. The following listing 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

- **Extensibility** from TIBCO Software. A Java-based XML Schema and DTD editor, with an intuitive tree-based graphical user interface.

  www.tibco.com/solutions/products/extensibility

- **XML Spy** from Altova. A tool for maintaining DTDs and XML files with a grid, source and browser view.

  www.icon-is.com

- **XMetaL** from Softquad Software. A customizable XML authoring tool.

  www.softquad.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.xmlsoftware.com
www.xml.com

# Chapter 2
# cXML Basics

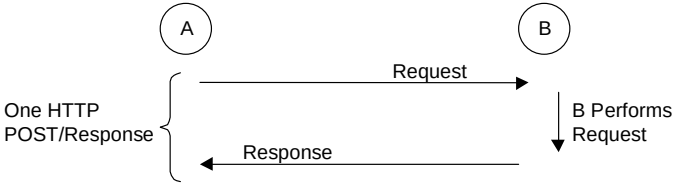
This chapter describes the basic protocol and data formats of cXML. It contains information needed to implement all transactions.

## 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.

### 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:




*A 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.

## 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.

## 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/1.2.008/cXML.dtd">
<cXML xml:lang="en-US"
      payloadID="1234567.4567.5678@test.ariba.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. See “cXML DTDs” on page 22 for more information about cXML DTDs.

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.

## 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 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"?>
…
```

### *Attachment Transmission*

The cXML protocol supports attachment of external files through MIME. For example, buyers often need to clarify purchase orders with supporting memos, drawings, or faxes. Procurement applications can attach files of any type to OrderRequest documents by using MIME. The XML document contains only references to external MIME parts sent within one multipart MIME envelope.

When sending an OrderRequest that references external files, the referenced files can either reside on a server accessible by the supplier, or they can be transmitted along with the cXML document. This second option requires the use of a multipart MIME envelope. One cXML requirement for this envelope (over the basics described in RFC 2046 “Multipurpose Internet Mail Extensions Part Two: Media Types”) is the inclusion of Content-ID headers with each attached file.

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"?>
…
--something unique
Content-type: image/jpeg
Content-ID: <uniqueCID@cxml.org>
…
--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=<uniqueCIDmain@cxml.org>

--something unique
Content-type: text/xml; charset="UTF-8"
Content-ID: <uniqueCIDmain@cxml.org>

<?xml version="1.0" encoding="UTF-8"?>
…
```

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

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

www.hunnysoft.com/mime
www.rad.com/networks/1995/mime/mime.htm

For more information about attaching external files to purchase orders, see “Attachment” on page 127.

## 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@test.ariba.com
      timestamp="1999-03-31T18:39:09-08:00">
```

cXML has the following attributes:

| | |
|---|---|
| **version** (deprecated) | This attribute was deprecated in cXML 1.2.007; do not use it in new cXML documents.<br>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** (optional) | 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** | 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.<br>The recommended implementation is:<br>datetime.process id.random number@hostname |
| **timestamp** | The date and time the message was sent, in ISO 8601 format. This value should not change for retry attempts.<br>The format is YYYY-MM-DDThh:mm:ss-hh:mm (for example, 1997-07-16T19:20:30+01:00). |

### *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.

### *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, 2002-04-14T13:36:00-08:00 corresponds to April 14, 2002, 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/xmlsdk30/htm/xmrefxmldatatypes.asp
- The original XML Data proposal to the Word Wide Web Consortium (W3C), www.w3c.org/TR/1998/NOTE-XML-data-0105

## 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 &#174;</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.



### ▼ To handle 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:
   a. If you are using a cxml-urlencoded hidden field, convert all double quotes to ".
   b. 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 ®.
   c. 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='&#174;&#xAE;&apos;"&#34;&quot;&amp;&lt;>&gt;'>
&#174;&#xAE;'&apos;"&#34;&quot;&amp;&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='&amp;#174;&amp;#xAE;&amp;apos;&#34;&amp;#34;
&amp;quot;&amp;amp;&amp;lt;>&amp;gt;'>&amp;#174;&amp;#xAE;'&amp;apos;
&#34;&amp;#34;&amp;quot;&amp;amp;&amp;lt;>&amp;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='&amp;#174;&amp;#174;&amp;apos;&#34;&#34;&#34;
&amp;amp;&amp;lt;&amp;gt;&amp;gt;'>&amp;#174;&amp;#174;"&#34;&#34;&#34;
&amp;amp;&amp;lt;&amp;gt;&amp;gt;</Money>">
```

or the XML document:

```
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE Money SYSTEM 'SpecialChars.dtd'>
<Money alternateAmount='&#174;&#174;&apos;"""&amp;&lt;&gt;&gt'>
&#174;&#174;"""&amp;&lt;&gt;&gt;</Money>
```

## 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@ariba.com</Identity>
            <SharedSecret>abracadabra</SharedSecret>
        </Credential>
        <UserAgent>Ariba Network 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.

### *From*

This element identifies the originator of the cXML request. It can optionally contain more than one Credential element, allowing requestors to identify themselves using multiple identification methods. This use of multiple credentials is analogous to sending both SMTP and X.400 addresses in an e-mail message.

### *To*

This element identifies the destination of the cXML request. Like the From element, it can contain more than one Credential to help identify the target.

### *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.

### *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.

### *Credential*

This element contains identification and authentication values.

Credential has the following attributes:

| | |
|---|---|
| **domain** | Specifies the type of credential. This attribute allows documents to contain multiple types of credentials for multiple authentication domains.<br>For messages sent on 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 (optional)** | 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 element. The Identity element states who the Credential represents, while the optional authentication elements verify the identity of the party.

The SharedSecret element is used when the Sender has a username/password combination that the requester recognizes.

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

## 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

Request has the following attribute:

| | |
|---|---|
| **deploymentMode** (optional) | Indicates whether the request is a test request or a production request. Allowed values are "production" (default) or "test". |

## 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

### *Status*

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

Status has the following attributes:

| | |
|---|---|
| **code** | The status code of the request. For example, 200 represents a successful request. See the table of codes, below. |
| **text** | The text of the status message. This text aids user readability in logs, and is a canonical string for the error in English. |
| **xml:lang** (optional) | 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 this Request, although the returned Response might contain application warnings or errors. Specifically, the cXML Request itself generated no errors or warnings. However, this status does not reflect any errors or warnings that might be generated afterwards by the application itself. |
| 201 | Accepted | Some processing might not yet have completed.<br>As mentioned in "StatusUpdateRequest" on page 139, the client should expect later StatusUpdate transactions if this status is returned in response to an OrderRequest. |
| 204 | No Content | All Request information was valid and recognized. The server has no Response data of the type requested.<br>In a PunchOutOrderMessage, this status indicates that the PunchOut session ended without change to the shopping cart (or client requisition). |
| 400 | Bad Request | Request unacceptable to the server, although it parsed correctly. |

| Status | Text | Meaning |
|---|---|---|
| 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. |
| 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. |

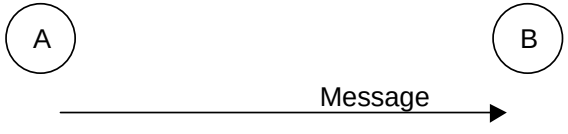
For status codes related to catalog uploading, see "Response" on page 219.

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



## 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.




*One-Way Message (Asynchronous)*

In this case, a possible scenario would be:

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

In the One-Way model, A and 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 on page 32. 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.

## 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:

| | |
|---|---|
| **deploymentMode** (optional) | Indicates whether the request is a test request or a production request. Allowed values are “production” (default) or “test”. |
| **inReplyTo** (optional) | 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. |

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.

## 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*

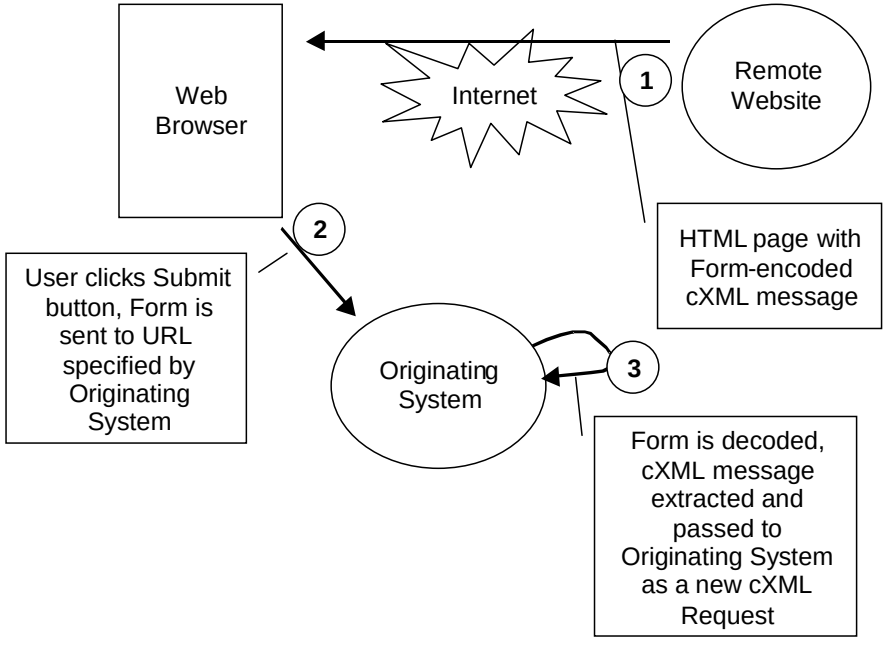
Procurement applications pull information using one-way HTTP communication. The one type of transaction that uses one-way HTTP communication is GetPendingRequest, discussed on page 223.

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.

### 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/1.2.008/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.

## 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.

## 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” on page 32.

### *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.

## 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 is used by the UnitPrice, Total, Shipping, Charge, and Tax elements. There are 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>
```

# Chapter 3
# Profile Transaction

The Profile transaction is used to retrieve 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.

The Profile transaction enables one party to query another for cXML capabilities. On both ends, 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 integrations between applications, making the capabilities of cXML servers available to client systems.

The Profile Response 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.

A ProfileRequest is generally pulled by the network no more than once every 24 hours, and less if no request is sent to that supplier within a particular window.

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 Order Requests. To obtain information about where to send any document, send a ProfileRequest document to the server.

## 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>
   <ProfileRequest />
</cXML>
```

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

## 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:

| | |
|---|---|
| **effectiveDate** | The date and time when these services became available. Dates should not be in the future. |

| | |
|---|---|
| **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. |



## 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:

| | |
|---|---|
| **name** | 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.<br>Currently defined values for name are service, attachments, changes, and requestNames. |

### *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.

### *OrderRequest*

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.

For more information about cXML document attachments, see “Wrapping Layers” on page 30.

### *SessionStatusRequest*

If the requestName of a Transaction is "SessionStatusRequest," an Option element with name="requestNames" must be specified within that Transaction element. There is no default. This 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.

## 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:

| | |
|---|---|
| **requestName** | A specific request that this server accepts at the given URL. Values can be the name of any Request document defined by cXML. |

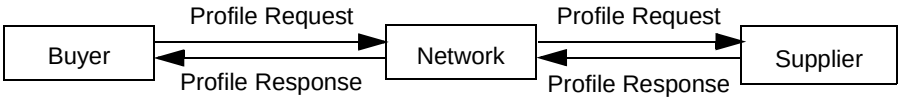


# Scenarios

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.

## From Buyer to Supplier

A Profile Request document is sent from a buyer to a supplier through a commerce network hub. The network commerce hub queries a supplier once a day, and caches the information to use in profile responses in reply to profile requests about a particular supplier.



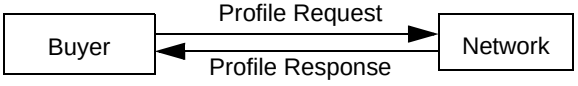

The supplier returns in the Profile Response the following possible transactions that it can support:

- OrderRequest
- PunchOutSetupRequest

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

## From Buyer to the Network

A Profile Request document is sent from a buyer to the network.




The network can return in the Profile Response the following possible transactions that it can support:

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

Profile Request document sample:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.008/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>Ariba Marketplace 7.5</UserAgent>
      </Sender>
   </Header>
   <Request>
      <ProfileRequest />
   </Request>
</cXML>
```

Profile Response document sample:

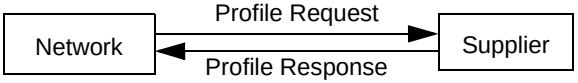
```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.008/cXML.dtd">

<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>
```

## From a Network to Supplier

A Profile Request is sent from a network commerce hub to a supplier. The Network commerce hub queries a supplier once a day, and then caches the information to use in profile responses in reply to profile requests about a particular supplier.




The supplier can return in the Profile Response document the following possible transactions that it supports:

- OrderRequest
- PunchOutSetupRequest

Profile Request sample:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.008/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>Ariba Marketplace 7.5</UserAgent>
        </Sender>
      </Header>
      <Request>
        <ProfileRequest />
      </Request>
    </cXML>
```

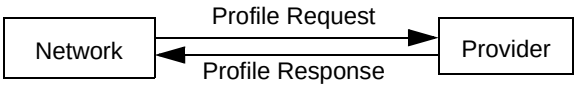
Profile Response sample:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cXML.org/schemas/cXML/1.2.008/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>
```

## From the Network to Service Provider

A Profile Request is sent from the network commerce hub to service provider partners. Routing service providers need to specify if one or two Profile Reponses will be returned, since profile information can be returned for both the service provider and downstream supplier accounts.

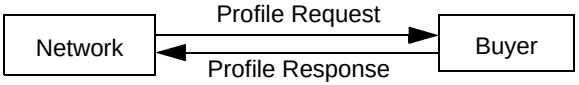



The service provider can return in the Profile Response document the following possible transactions that it supports:

- ProviderSetupRequest
- SessionStatus
- OrderRequest

## From a Network to Buyer

A Profile Request is sent from a network commerce hub to a buyer. The Network commerce hub queries a buyer once a day, and then caches the information. Later, this information about the buyer is used in profile responses in reply to profile requests from providers and suppliers.

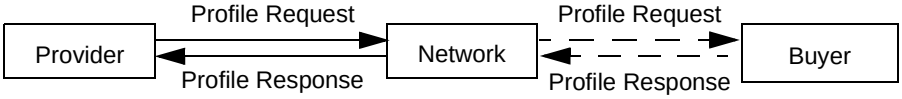



A buyer can return in the Profile Response document the following possible transactions that it supports:

- StatusUpdateRequest
- InvoiceRequest

## From Service Provider to Buyer

A Profile Request is sent from a service provider to a buyer and routed through the network. This scenario is a replacement for the Followup element. The network queries a buyer once a day, and then caches the information. Later, this information about the buyer is used in profile responses in reply to profile requests from providers.




The network commerce hub can return in the Profile Response document to the service provider the following possible transactions that it supports on behalf of a buyer's account:

- StatusUpdateRequest
- InvoiceRequest

# Chapter 4
# Implementing PunchOut

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.

This chapter shows how suppliers can modify a Website to support PunchOut. It discusses the following topics:





## 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.

### 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. (See “Content Delivery Strategy” on page 21 for a list of commodities that are well suited for PunchOut.)

### *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.

### *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.

## 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.

### *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" on page 21? 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.

### *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

### *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<br>2-3 weeks with contractors |
| Transactive site with XML infrastructure | 3 weeks with in-house IT staff<br>3-4 weeks with contractors |
| Transactive site without XML infrastructure | 4 weeks with in-house IT staff<br>4-5 weeks with contractors |

### *Understanding XML*

The first step to becoming PunchOut enabled is to understand XML. For an explanation of XML, see "cXML, an XML Implementation" on page 15. 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). For a list of XML tools, see “XML Utilities” on page 24.

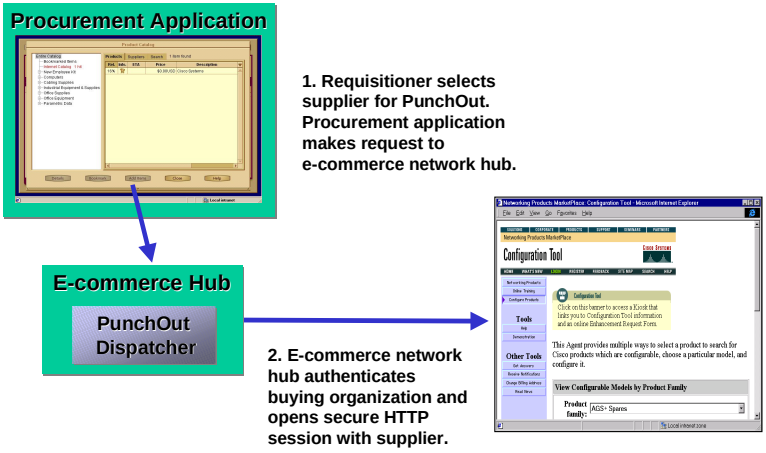
# PunchOut Event Sequence

A PunchOut session is composed of several distinct steps.

## 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:




**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:

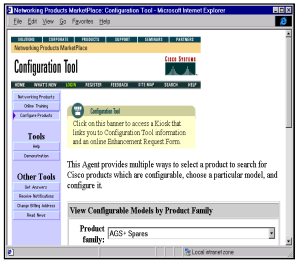
- **create** – Initiates a new PunchOut session
- **edit** – Re-opens a PunchOut session for editing
- **inspect** – Re-opens a PunchOut session for inspection (no changes can be made to the data)
- **source** – Initiates a PunchOut session for a RFQ (Request for Quote) create/edit session in a sourcing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

## 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.**

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.

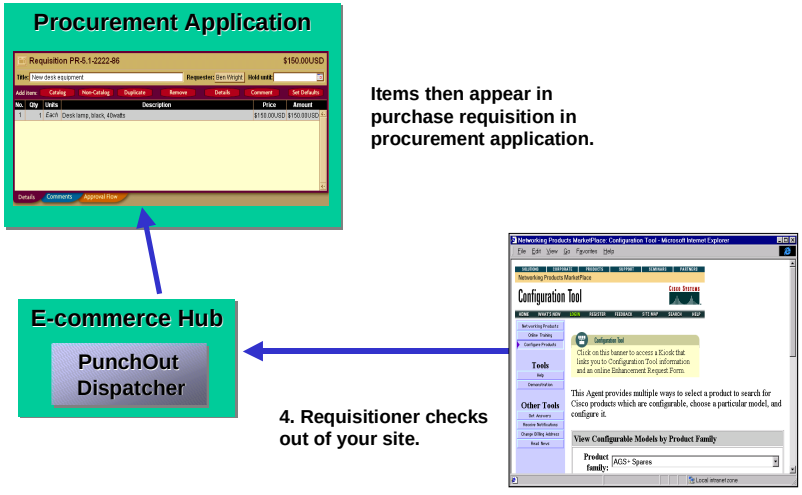
- Views of normalized data for comparing products based on price, features, or availability (for example, MRO products)
- Views of attributes unique to a particular commodity (for example, printed materials, chemical and reagents, or services)
- Real-time pricing, inventory, and availability checking
- 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.

## 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:



**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.

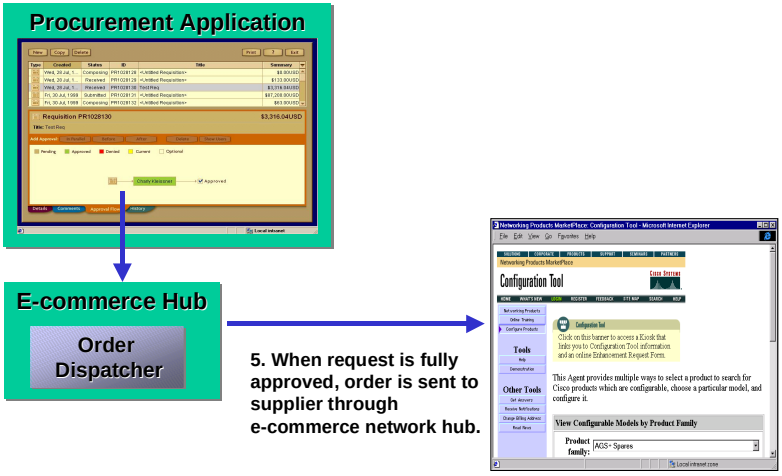
If users, including approvers, later need to edit any of the items in a purchase requisition, the supplier can allow them to "re-PunchOut" to the supplier's Website. The procurement application sends back the contents of the original shopping cart to the supplier's Website, and users make any changes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

## 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:




**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.

Purchase orders are discussed in detail in Chapter 6, "Receiving cXML Purchase Orders."

# PunchOut Documents

There are four types of cXML documents:

- PunchOut Index Catalog
- PunchOutSetupRequest
- PunchOutSetupResponse
- PunchOutOrderMessage

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.

## 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:

*Type of cXML document and URL of DTD*

*The supplier's identifier for the PunchOut item*

*URL of the PunchOut Website (launch page) if not configured elsewhere*

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE Index SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.008/cXML.dtd">
<Index>
    <SupplierID domain="DUNS">83528721</SupplierID>
    <IndexItem>
        <IndexItemPunchout>
            <ItemID>
                <SupplierPartID>5555</SupplierPartID>
            </ItemID>
            <PunchoutDetail>
                <Description xml:lang="en-US">Desk Chairs</Description>
                <Description xml:lang="fr-FR">Chaises de Bureau</Description>
                <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.

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.

### *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.

### *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.

## 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/1.2.008/cXML.dtd">
<cXML xml:lang="en-US" payloadID="933694607118.1869318421@jlee"
timestamp="2002-08-15T08:36:47-07:00">
    <Header>
        <From>                                          Originator (buying organization)
            <Credential domain="DUNS">
                <Identity>65652314</Identity>
            </Credential>
        </From>
        <To>                                            Destination (supplier)
            <Credential domain="DUNS">
                <Identity>83528721</Identity>
            </Credential>
        </To>
        <Sender>                                        Previous relaying entity (Ariba SN in this case)
            <Credential domain="AribaNetworkUserId">
                <Identity>sysadmin@ariba.com</Identity>
                <SharedSecret>abracadabra</SharedSecret>
            </Credential>
            <UserAgent>Ariba Buyer 7.0.4 (build 1802, 04/03/2001)</UserAgent>
        </Sender>
    </Header>
    <Request>
        <PunchOutSetupRequest operation="create">   Type of request
            <BuyerCookie>1CX3L4843PPZO</BuyerCookie>
            <Extrinsic name="UserEmail">jsmith</Extrinsic>
            <Extrinsic name="UniqueName">John_Smith</Extrinsic>
            <Extrinsic name="CostCenter">610</Extrinsic>
            <BrowserFormPost>                       Destination for final PunchOutOrderMessage
                <URL>https://aribaorms:2600/punchout?client=NAwl4JsLliuo</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>
            <SelectedItem>                          Item selected by user
                <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 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.

### *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/1.2.008/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="AribaNetworkUserId">
                    <Identity>sysadmin@ariba.com</Identity>
                    <SharedSecret>abracadabra</SharedSecret>
                </Credential>
                <UserAgent>Ariba ORMS 6.1</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://aribaorms:2600/punchout?client=NAwl4JsLIiuo</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.

### *Authentication by an E-commerce Hub*

All 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.

### *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.

### *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.

## 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/1.2.008/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>
```

## 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/1.2.008/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>
                        </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 PunchOutSetupRequest 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.

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/.

Classification lists the UNSPSC (Universal Standard Products and Services Classification) 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.

# 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
- Start Page
- Sender Page
- Order Receiver Page

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).

## 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;
        if ( 1.1 > parseFloat( cXMLvers )) {
                vers = "1.0";
                sysID = "cXML.dtd";
        } else {
                vers = "1.2";
        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%>&amp;amp;url="<%= url%>"&amp;amp;from=<%= fromUser%>&amp;amp;to=<%=
toUser%>&amp;amp;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.

## 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.

## 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+w
adt4101+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/1.2.008/cXML.dtd&quot;>
<cXML payloadID=&quot;<%= Now &"@"&
Request.ServerVariables("LOCAL_ADDR")%>&quot; timestamp=&quot;<%= Now
%>&quot;>
    <Header>
        <From>
            <Credential domain=&quot;ariba.com&quot;>
                <Identity><%= toUser%></Identity>
            </Credential>
        </From>
        <To>
            <Credential domain=&quot;ariba.com&quot;>
                <Identity><%= fromUser%></Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain=&quot;ariba.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.

### 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.

### 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.

### 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 Chapter 6, "Receiving cXML Purchase Orders."

## PunchOut Website Suggestions

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

### 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 (Universal Standard Products and Services Classification).
- 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.

## 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.

## 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.

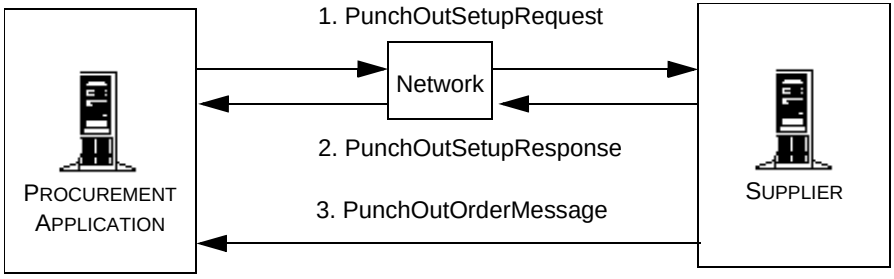
A key consideration during planning is the amount of effort required to implement a highly dynamic and customized PunchOut Website. The supplier needs to balance between customization and complexity—a complex Website takes longer to implement and maintain, but it could offer more value to users. It is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

## 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:






### 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. For information on using this feature, see “PunchOutOrderMessage” on page 99.

## PunchOutSetupRequest

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

### *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="AribaNetworkUserId">
            <Identity>sysadmin@ariba.com</Identity>
            <SharedSecret>abracadabra</SharedSecret>
        </Credential>
        <UserAgent>Ariba ORMS 6.1</UserAgent>
    </Sender>
</Header>
```

#### From

The buying organization originating the PunchOutSetupRequest.

#### To

The supplier destination of the PunchOutSetupRequest.

### Sender

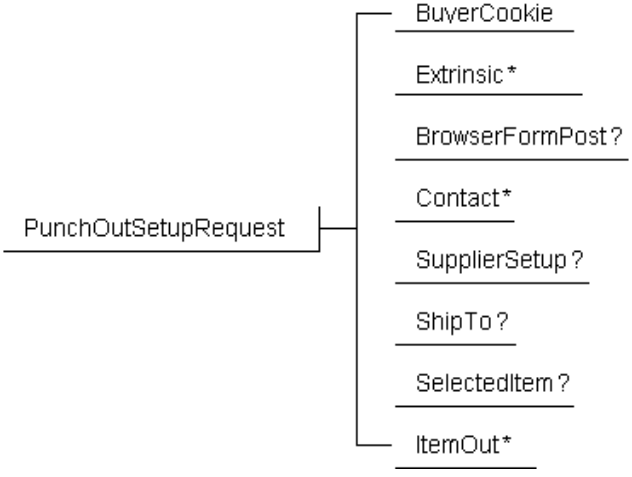
Authentication details of the buying organization including Identity, SharedSecret (password), and AribaNetworkId, which is specified by Credential domain. The SharedSecret is the supplier's password or login to the PunchOut site.

### UserAgent

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

## *PunchOutSetupRequest*

A PunchOutSetupRequest element is contained within the Request element. The following diagram shows the structure of the PunchOutSetupRequest element.




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.

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:

| | |
|---|---|
| **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” on page 122. The ItemOut element is discussed in “ItemOut” on page 128. 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" on page 101 and "Empty Shopping Carts" on page 102). This list can also describe items to be sourced. For more information, see "Sourcing" on page 93.

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.

### *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.

### *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.

### *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, and ContractItem elements. These contexts are described further elsewhere in this document.

### *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.

### *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.

### *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.

## 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>
```

### *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.

## 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 needs to 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>
        </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.

### *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.

### *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:

| | |
|---|---|
| **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 PunchOutSetupRequest transactions containing data from this PunchOutOrderMessage. If operationAllowed="create", subsequent PunchOutSetupRequests cannot edit these items: only a later OrderRequest can contain these items. In other words, the items cannot be edited and only a new order can be created.

Otherwise, if operationAllowed is something other than "create", the procurement application can later inspect or edit the shopping cart by initiating subsequent PunchOutSetupRequest transactions with the appropriate operation and the ItemOut elements corresponding to the ItemIn list returned in this PunchOutOrderMessage. Support for edit implies support for inspect. The procurement application can always use the items in a subsequent OrderRequest.

The quoteStatus attribute is used for an 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.

### *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 cancelled 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 cancelled the session without making any change and no change should be made to the requisition in the procurement application.

### *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:

| | |
|---|---|
| **quantity** | 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** (optional) | 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. |

The optional elements are ShipTo, Shipping, and Tax, which are the same elements as those specified in PunchOutOrderMessage, above.

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.

### ItemID

This element uniquely identifies the item to the remote Website. It is the only element required to return to the remote Website to re-identity the item in later PunchOut sessions.

ItemID contains two elements: SupplierPartID and SupplierPartAuxiliaryID. Only SupplierPartID is required. SupplierPartAuxiliaryID helps the 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.

### 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.

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).

Description

This element 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.

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>
```

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.

### 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. 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>
    </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>
```

# Chapter 5
# Path Routing

In complex relationships between buyers and suppliers, a document might be routed through several intermediary systems before reaching the end supplier. Path Routing enables documents to be routed by and copied to intermediary systems such as marketplaces, and commerce network hubs.

This chapter discusses path routing in terms of:



## 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.

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.

# 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.

## 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>
```

## Router Nodes

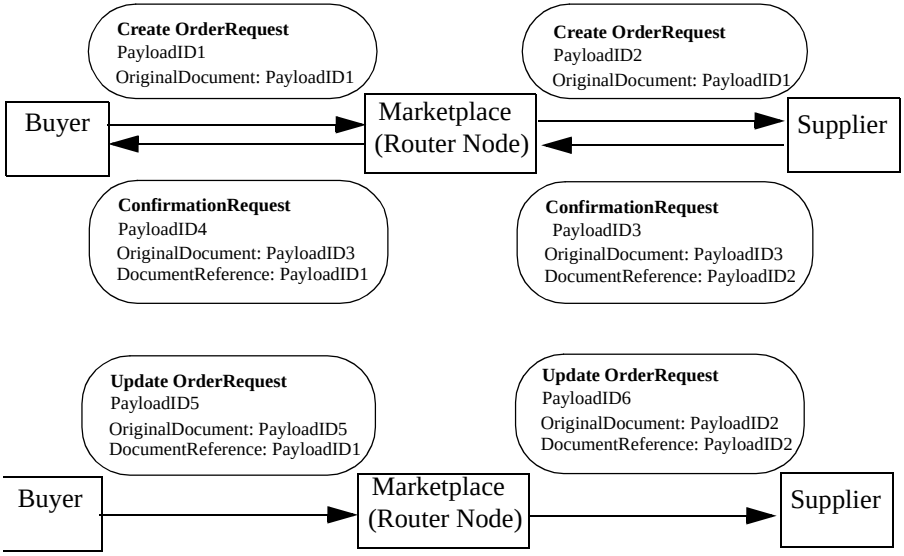
A router node creates a new version of the document it receives and routes it to the next node in the path. The routed document typically changes unit price, bill-to, or ship-to address information.

### *OriginalDocument Element*

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.

### *DocumentReference Element*

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:




### Copy Nodes

A copy node wants a copy of the document. For example, the following except illustrates a copy node:

```
<Node type="copy">
    <Credential domain="NetworkId">
        <Identity>AN01000000111</Identity>
    </Credential>
</Node>
```

## 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.

## 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>
```

## 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.

# Creating OrderRequests

When generating purchase orders, procurement applications split requisitions based on the Path and SupplierID of each of the ItemIn elements.

## 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.

## 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>Ariba SN</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>Ariba SN</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>
```

# Other Routable Documents

Follow-up documents such as PunchOutSetupRequest, ConfirmationRequest, and ShipNoticeRequest documents also use the Path element to route and copy documents.

## 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.

## 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.

# CopyRequest

Organizations that want to receive copies of purchase orders, but are not the primary recipients, are called *copy organizations*. They receive purchase orders within CopyRequest documents 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 copied document to the copy organization.

The following example lists a CopyRequest sent from a network commerce hub to a copy organization.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.007/cXML.dtd">
<cXML timestamp="2002-02-15T11:36:07-08:00" payloadID="1013801767090--
1438886535752667208@216.109.111.21">
    <Header>
        <From>
            <Credential domain="DUNS">
                <Identity>987654321</Identity>
            </Credential>
        </From>
        <To>
            <Credential domain="NetworkId">
                <Identity>AN00000123</Identity>
            </Credential>
        </To>
        <Sender>
            <Credential domain="DUNS">
                <Identity>987654321</Identity>
            <SharedSecret>abracadabra</SharedSecret></Credential>
            <UserAgent>ANCXMLOutDispatcher</UserAgent>
        </Sender>
    </Header>
    <Request>
        <CopyRequest>

            complete contents of copy document, such as an OrderRequest

        </CopyRequest>
    </Request>
</cXML>
```

# Chapter 6
# Receiving cXML Purchase Orders

This chapter 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

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 EDI (X.12 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.

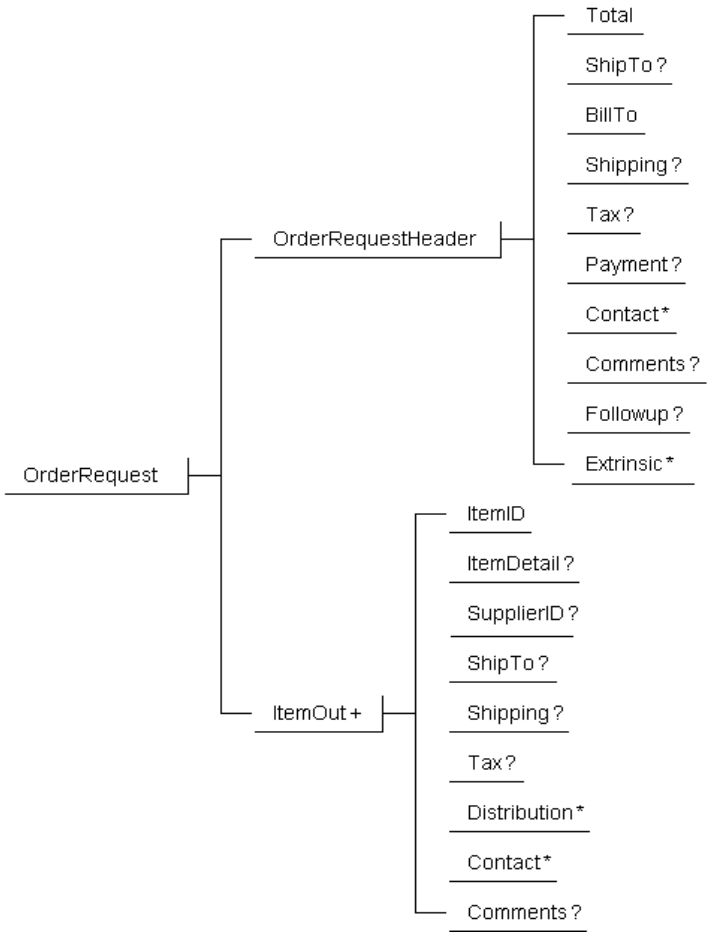
# Receiving Purchase Orders

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.

## OrderRequest

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

:



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.

The following example illustrates the structure of the OrderRequest element:

```
<OrderRequest>
    <OrderRequestHeader … >
        …
    </OrderRequestHeader>
    <ItemOut … >
        …
    </ItemOut>
    <ItemOut … >
        …
    </ItemOut>
</OrderRequest>
```

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/1.2.008/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>Ariba Network V1.1</UserAgent>
    </Sender>
</Header>
<Request>
    <OrderRequest>
        <OrderRequestHeader orderID="DO102880"
        orderDate="2000-08-03T08:49:09+07:00" type="new">
            <Total>
                <Money currency="USD">4688.00</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="US">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">US</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">12.34</Money>
    <Description xml:lang="en-us">FedEx 2-day</Description>
</Shipping>
<Tax>
    <Money currency="USD">10.74</Money>
    <Description xml:lang="en">CA State Tax</Description>
```

```
                    </Tax>
                    <Payment>
                        <PCard number="1234567890123456" expiration="2002-03-12"/>
                    </Payment>
                </OrderRequestHeader>
                <ItemOut quantity="2" >
                    <ItemID>
                        <SupplierPartID>220-3165</SupplierPartID>
                        <SupplierPartAuxiliaryID>E000028901</SupplierPartAuxiliaryID>
                    </ItemID>
                    <ItemDetail>
                        <UnitPrice>
                            <Money currency="USD">2344.00</Money>
                        </UnitPrice>
                        <Description xml:lang="en">Laptop Computer Notebook Pentium® II
                        processor w/AGP, 300 MHz, with 12.1&amp;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">4688.00</Money>
                        </Charge>
                    </Distribution>
                </ItemOut>
            </OrderRequest>
        </Request>
        </cXML>
```

## OrderRequestHeader

The following example shows an OrderRequestHeader in full detail:

```
<OrderRequestHeader
        orderID="DO1234"
        orderDate="1999-03-12T13:30:23+8.00"
        type="new"
        requisitionID="R1234"
        shipComplete="yes">
    <Total>
        <Money currency="USD">12.34</Money>
    </Total>
    <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">USA</Country>
            </PostalAddress>
        </Address>
    </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="US">USA</Country>
            </PostalAddress>
        </Address>
    </BillTo>
    <Shipping>
        <Money currency="USD">12.34</Money>
        <Description xml:lang="en-US">FedEx 2-day</Description>
    </Shipping>
    <Tax>
        <Money currency="USD">12.34</Money>
        <Description xml:lang="en">CA State Tax</Description>
    </Tax>
    <Payment>
        <PCard number="1234567890123456" expiration="1999-03-12"/>
    </Payment>
```

```
        <Contact role="purchasingAgent">
            <Name xml:lang="en-US">Mr. Smart E. Pants</Name>
            <Email>sepants@acme.com</Email>
            <Phone name="Office">
                <TelephoneNumber>
                    <CountryCode isoCountryCode="US">1</CountryCode>
                    <AreaOrCityCode>800</AreaOrCityCode>
                    <Number>555-1212</Number>
                </TelephoneNumber>
            </Phone>
        </Contact>
        <Comments xml:lang="en-US">
            Anything well formed in XML can go here.
        </Comments>
        <Followup>
            <URL>http://acme.com/cgi/orders.cgi</URL>
        </Followup>
    </OrderRequestHeader>
```

OrderRequestHeader has the following attributes:

| | |
|---|---|
| **orderID** | The identifier for this order. Analogous to the purchase order number. |
| **orderDate** | The date and time this order was placed, in ISO 8601 format. |
| **orderType** (optional) | Type of the order: regular or release (a release against a master agreement). |
| **type** (optional) | Type of the 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” on page 141. |
| **agreementID** (optional) | Buyer’s identifier for associated master agreement. |
| **agreementPayloadID** (optional) | cXML document payload ID for the associated master agreement. |
| **requisitionID** (optional) | 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. |
| **shipComplete** (optional) | A preference against partial shipments. The only allowed value is “yes”. By default, items are shipped when available.<br>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”. |

OrderRequestHeader and ItemOut (when extended with ItemDetail) contain similar information. Where OrderRequestHeader includes overall billing (BillTo) and payment (Payment) information, ItemOut instead describes the individual items (in ItemID, ItemDetail, 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. Comments and Tax elements can appear simultaneously at both levels. However, the different Comments elements should not duplicate information, and the header-level Tax element contains a total for the order, whereas the item-level Tax element contains the tax just for the item.

### *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 element.

### *ShipTo/BillTo*

These elements contain the addresses of the Ship To and Bill To 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.

The Address element contains an addressID attribute that 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">
```

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">USA</Country>
        </PostalAddress>
```

Country contains a human readable name. The isoCountryCode attribute value is the ISO country code from the ISO 3166 standard.

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

### *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.

### *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.

### *Payment*

This element 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.

### *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, and URL.

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

Buying organizations might choose to 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 attribute:

| | |
|---|---|
| **role** (optional) | The position of this person within the procurement process. |

Possible values for the role attribute:

| role value | Description |
|---|---|
| technicalSupport | Technical support contact |
| customerService | Customer service contact |
| sales | Sales contact |
| shipFrom | Starting point for shipments related to this order. |
| payTo | Where payment for this order should be sent. |
| buyerCorporate | Contact details the supplier has about the buying organization. |
| supplierCorporate | Contact details about the supplier. |

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.

### *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 US telephone number:

```
<TelephoneNumber>
    <CountryCode isoCountryCode="US">1</CountryCode>
    <AreaOrCityCode>800</AreaOrCityCode>
    <Number>555-1212</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.

### *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 “Attachment Transmission” on page 31.

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.

### *Followup*

Specifies the URL to which future StatusUpdateRequest documents should be posted. This location is the input location for any later documents that reference the current OrderRequest document.

The Followup element has been deprecated in favor of the Profile Transaction for order requests. See "ProfileRequest" on page 54 for more information.

### *Extrinsic*

This element contains machine-readable information related to the order, but not defined by the cXML protocol. It can appear anywhere within the OrderRequest document. 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 and ContractItem elements. These contexts are described later in this document. Extrinsic values are case-insensitive.

## ItemOut

The following example shows a minimum valid ItemOut element.

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

ItemOut has the following attributes:

| | |
|---|---|
| **quantity** | 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** (optional) | 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** (optional) | The buyer's requisition identifier for this line item. Must not be included if requisitionID is specified in the OrderRequestHeader. |
| **agreementItemNumer** (optional) | The buyer's master agreement identifier for the line item. |
| **requestedDeliveryDate** (optional) | The date item was requested for delivery, which allows item-level delivery dates in the OrderRequest. It must be in ISO 8601 format. |
| **isAdHoc** (optional) | 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.<br>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. |

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">USA</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">
            Anything valid in XML can go here.
        </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) 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” on page 125.

## 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:

| | |
|---|---|
| **name** | 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:

| | |
|---|---|
| **id** | 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*

This element 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.

| | |
|---|---|
| **currency** | The unique ISO standard three-letter currency code. For example, “USD” = United States Dollar. |

## 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.

## 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.

For more information about purchase order attachments, see “Attachment Transmission” on page 31.

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

www.hunnysoft.com/mime
www.rad.com/networks/1995/mime/mime.htm

# Chapter 7
# Master Agreements

This chapter describes the Master Agreement transaction. 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.

## 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>
```

## MasterAgreementRequestHeader Element

The MasterAgreementRequestHeader contains information about the Master Agreement common to all contained items.

MasterAgreementHeader has the following attributes:

| | |
|---|---|
| **agreementDate** | The date and time the agreement request was created. This is different from the effective and expiration date of the agreement. |
| **type** | Specifies whether the agreement refers to a value or quantity. |
| **effectiveDate** | Specifies the date the agreement is available for ordering or releases. |
| **expirationDate** | Specifies the date the agreement is no longer available |
| **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. |
| **parentAgreementPayloadID** | PayloadID for the corresponding parent document from which this agreement is derived. Optional. |
| **agreementID** | The procurement system agreementID for this request. |

MasterAgreementHeader can contain the following optional child elements:

| | |
|---|---|
| **MaxAmount** | (Optional) Contains the maximum amount for all line items in the Master Agreement. |
| **MinAmount** | (Optional) Contains the committed amount for all line items on the Master Agreement. |
| **MaxReleaseAmount** | (Optional) The contractual maximum amount per Release of this Master Agreement. |
| **MinReleaseAmount** | (Optional) The contractual minimum amount per Release of this Master Agreement. |
| **Contact** | (Optional) Use "Contact" element to supply any additional Address or Location information. |
| **Comments** | (Optional) Can contain additional information about the status of the overall Master Agreement. |
| **Extrinsic** | (Optional) Can be used to insert additional data about the MasterAgreement for application consumption. |

## AgreementItemOut Element

The AgreementItemOut element specifies the requirements of a particular line item that is part of the Master Agreement contract.

AgreementItemOut has the following attributes:

| | |
|---|---|
| **maxQuantity** | (Optional) Specifies the maximum quantity for this particular line Item. |
| **minQuantity** | (Optional) Specifies the minimum quantity for this particular line Item. |
| **maxReleaseQuantity** | (Optional) Specifies the maximum quantity per release for this particular line Item. |
| **minReleaseQuantity** | (Optional) Specifies the minimum quantity per release for this particular line Item. |

AgreementItemOut can contain the following child elements:

| | |
|---|---|
| **MaxAmount** | (Optional) Contains the maximum amount for this particular line Item. |
| **MinAmount** | (Optional) Contains the minimum amount for this particular line Item. |
| **MaxReleaseAmount** | (Optional) Indicates the item level maximum amount per release. |
| **MinReleaseAmount** | (Optional) Indicates the item level minimum amount per release. |
| **ItemOut** | A line item that is part of the master agreement. Required.<br>The lineNumber attribute in the ItemOut specifies the corresponding lineNumber on the Master Agreement in the Procurement Application.<br>The quantity attribute in the ItemOut should be set to “one” and ignored at the Master Agreement implementation processing stage. |

# Chapter 8
# Later Status Changes



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” on page 132), 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.

There are three types of status change transactions: StatusUpdateRequest, ConfirmationRequest, and ShipNoticeRequest.

## StatusUpdateRequest

This transaction informs an earlier node about changes in the processing status of an order or an invoice.

One change is of particular significance: when an intermediate hub successfully transmits an OrderRequest 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.

This request 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/1.2.008/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 an DocumentReference and a Status element. Both are required. 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.

## DocumentReference Element

The DocumentReference element associates a status update with a particular OrderRequest document and is used by the StatusUpdateRequest transaction. It contains enough information to associate the update request with a particular 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:

| | |
|---|---|
| **payloadID** | 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.<br>The recommended implementation is:<br>datetime.process id.random number@hostname<br>Taken directly from the cXML element of the OrderRequest document. |

## PaymentStatus Element

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, such as VeriSign, 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

| | |
|---|---|
| **orderID** | Identifies the referenced order. It is copied from the ConfirmationRequest or the OrderRequest. |
| **transactionTimeStamp** | Specifies the time when the payment transaction was submitted. |
| **type**<br>required | Specifies the type of PCard transaction. The value must be one of the following:<br>"Authorization" Authorizes the PCard. No charge is made. There is one authorization per order.<br>"Settlement" Transfers the funds secured by a previous authorization transaction.<br>"Sale" Initiates a charge to the PCard.<br>"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. |

## SourcingStatus Element

The SourcingStatus element provides update information for a RFQ sourcing transaction, PunchOutSetupRequest 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.

## InvoiceStatus Element

When using StatusUpdateRequest for invoices, include the InvoiceStatus element.

The InvoiceStatus type attribute refers to the action taken by the buying organization on the invoice. It can have the following values:

| | |
|---|---|
| "reconciled" | The invoice sucessfully 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 explaing 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). |
| "paid" | The invoice amounts have been paid by the buying organization. |

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.

## 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 six types, specified by the type attribute of the ConfirmationHeader element: “accept”, “allDetail”, “reject”, “except”, “detail”, and “requestToPay”. With a type of “detail”, you can update portions of an Order Request, 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 in one stroke.

A ConfirmationRequest with type="requestToPay" invokes a payment service where the network hub requests a payment service provider, such as VeriSign, 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="2000-10-12"
        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>921-1132</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@ariba.acme.com" />
    </OrderReference>
</ConfirmationRequest>
```

Multiple "detail" type Confirmation Requests can refer to a single Order Request, 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 an Order Request.

While multiple confirmations can be sent for one 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 when the Request type specified is “allDetail” or “detail”. Only one confirmation per order is allowed when the Request type is “accept”, “except”, or “reject”. When a confirmation with one of these types arrives, the receiving system must discard any and all previous confirmations for the order.

ConfirmationItem elements can appear in any order within the ConfirmationRequest. However, listing the lineNumber elements in ascending order is easily readable and preferred. Again, no line item can appear more than once within a ConfirmationRequest element.

## OrderReference Element

The OrderReference element provides a clear reference to a prior OrderRequest document. While the contained DocumentReference provides an unambiguous reference, the additional attributes of the OrderReference allow the ConfirmationRequest and ShipNoticeRequest to be viewed independently. Contains a DocumentReference element (see page 160) and two attributes: orderID and orderDate.

### *orderID Attribute*

Specifies the buyer system orderID for the confirmation, that is, the PO number. When used, it must be copied directly from the referenced OrderRequest document's OrderRequestHeader element.

### *orderDate Attribute*

Specifies the date and time the OrderRequest was created. If present, it must be copied directly from the referenced OrderRequest document's OrderRequestHeader.

## ConfirmationHeader Element

The ConfirmationHeader element contains information that is common to all items contained in the Confirmation Request. It has the following attributes:

- type
- noticeDate
- invoiceID
- operation
- ConfirmID
- incoTerms

The ConfirmationHeader element can contain the following elements:

- DocumentReference
- Tax
- Shipping
- Total
- Contact
- Hazard
- Comments
- Extrinsic

If the ConfirmationRequest type specified in the ConfirmationHeader (see page page 149) is either, "allDetail", "detail" or "except", you can include ConfirmationItem elements to update specific line items from an Order Request.

The following example shows a Confirmation Request 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="2000-10-13"
        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>921-1132</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@ariba.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>
```

### *type Attribute*

This required attribute specifies the type of confirmation.

| | |
|---|---|
| "accept" | Accept the entire order as described in the referenced OrderRequest document<br>A document of this type can contain ConfirmationItem elements. If ConfirmationItem elements are present in the ConfirmationRequest document, they must contain only ConfirmationStatus elements of type="accept". |
| "allDetail" | Update only those line items described in the included ConfirmationItem elements. Line items not mentioned specifically in this document 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.<br>An “allDetail” 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.<br>An “allDetail” confirmation must contain ConfirmationItem elements. The contained ConfirmationStatus elements must have types "allDetail", "reject", or "unknown". "accept" or "detail" ConfirmationStatus types are not allowed because they conflict with the requirements of this document type. |
| "reject" | Reject the entire order. Specify a reason for the rejection in the Comments element. A document of this type must not contain ConfirmationItem elements. |

| | |
|---|---|
| "detail" | Update individual line items as specified within the contained ConfirmationItem elements. Line items not mentioned specifically retain their current states. This document type should include only information that differs from the information in the original OrderRequest document.<br>Do not include the variations described in an earlier ConfirmationRequest in later ConfirmationRequest documents that restore information provided in the OrderRequest. 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 original OrderRequest actually contained the correct charge.<br>This document type must contain ConfirmationItem elements. The contained ConfirmationStatus elements can have any type except "allDetail". |
| "except" | Accept the entire order as described in the referenced OrderRequest document with exceptions listed within the ConfirmationItem elements. Accept line items not mentioned without change.<br>This document type must contain ConfirmationItem elements. The contained ConfirmationStatus elements can have any type except "allDetail". |
| "requestToPay" | This type of confirmation is for the supplier to request the initiation of payment transactions for either the whole order or some line items.<br>If the request contains no ConfirmationItem elements, the intent will be to initiate payment transaction on the total amount of all line items in the order, except those being rejected.<br>If the request contains ConfirmationItem elements, payment transaction will be initiated against the specified items and quantities.<br>A ConfirmationItem in this type of request does not have to describe the complete line item. It should only contain "requestToPay" ConfirmationStatus elements for new payment transactions. |
| "backordred" | Sets the entire order to backordered status. The supplier does not have the items in stock, but will ship them when they are available. |

### *noticeDate Attribute*

Specifies the date and time the confirmation document was created.

### *invoiceID Attribute*

The invoiceID attribute is an 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.

### *confirmID Attribute*

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 Attribute*

This optional attribute specifies whether the confirmation is new, or an update to a previous confirmation.

| | |
|---|---|
| "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. |

An "update" confirmation allows a supplier to correct an error in a confirmation or to add additional information learned later. In either case, an "update" document must be complete: all data from the original confirmation or a previous update should be discarded by the recipient.

The requirement that the confirmation be complete enables ConfirmationRequest information to expand. There are no restrictions on new items not yet referenced in an "update" ConfirmationRequest. New items must not have already been mentioned in another ConfirmationRequest unless all of the items from the other confirmation are now described in the consolidated document. This protocol does not support splitting confirmations (sending an "update" ConfirmationRequest document describing a subset of items in an earlier version), or partial consolidations of confirmations (sending an "update" ConfirmationRequest document that contains a subset of information from another confirmation).

An "update" ConfirmationRequest must contain the same confirmID, if any, as the previous version of the confirmation. This attribute is an unambiguous and a direct connection between all versions of the confirmation.

An "update" ConfirmationRequest must also include a DocumentReference element in the ConfirmationHeader. See “DocumentReference Element” on page 152 for more information on this element. This element sequences multiple versions of a confirmation and is the only link between those versions. See “confirmID Attribute” on page 151 for more of the implications of leaving out the attribute. Other confirmations discarded through consolidations as previously described are not explicitly referenced by the new, larger ConfirmationRequest document.

A confirmation can not be deleted; the protocol does not include a delete option for this request. Suppliers must replace incorrect or invalid confirmations with correct information. A type="unknown" ConfirmationStatus will reset such information to its original state. This covers the case of an error in accepting or rejecting an item that has not been researched.

### *incoTerms Attribute*

The incoTerms attribute 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. Allowed values include:

| | |
|---|---|
| "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 |

### *DocumentReference Element*

The DocumentReference element should appear only when operation is “update” (see page 151). 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 (see page 151).

### Tax and Shipping Elements

Tax and Shipping amounts can be updated and included in the confirmation with new values without any corresponding line item information.

### Total Element

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.

### Contact Element

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:

| | |
|---|---|
| "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.

### Hazard Element

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 Element” on page 169 for more information.

### *Comments Element*

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.

### *Extrinsic Element*

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.

## ConfirmationItem Element

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:

| | |
|---|---|
| **quantity** | 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. Required. |
| **lineNumber** | Position, counting from 1, of the item in an order. Matches the corresponding line item, ItemOut, in the document referenced by the OrderReference element. Required. |

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.

### Contact Element

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.

### Hazard Element

List elements in the Hazard list in any order. Do not list the same hazard more than once in a ConfirmationItem. 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.

### ConfirmationStatus Element

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.

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.

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.

### quantity Attribute

Specifies how many items have this status. Expressed in the units specified in the UnitOfMeasure element.

### type Attribute

Specifies the status of this portion of the order.

| | |
|---|---|
| "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.<br>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.<br>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. |
| "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.<br>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 Attribute

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 Attribute

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".

# 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="S89823-123" noticeDate="2000-10-14"
        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>921-1132</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@ariba.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 orgination 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.

## ShipNoticeHeader Element

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, and Extrinsic, all of which are optional.

### *ServiceLevel Element*

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.

### *DocumentReference Element*

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.

### *Contact Element*

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 to that known 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.

### Hazard Element

Elements in the Hazard list can appear in any order. The same hazard should not be listed more than once in a ShipNoticeHeader. 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.

### Comments Element

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.

### Extrinsic Element

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.

### shipmentID Attribute

A supplier-specified optional identifier for the document. The attribute is user-visible and secondary to the document's PayloadID. It is required.

This value does not vary as a particular ship notice is updated. That is, "update" or "delete" documents describing the same shipment share a shipmentID with the original "new" ShipNoticeRequest.

### *operation Attribute*

This optional attribute specifies whether the ShipNoticeRequest document is new or an update to a previous ship notice.

| | |
|---|---|
| "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 Element" on page 160 for more information on this element. This effectively sequences multiple versions of a ship notice.

### *noticeDate Attribute*

Specifies the date and time the ShipNoticeRequest document was created. Required.

### *shipmentDate Attribute*

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 Attribute*

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".

## ServiceLevel Element

Specifies a language-specific string for the service level code. Each ServiceLevel must contain a string in the specified language that corresponds to the level of service, such as "overnight", provided by the carrier for this shipment. It has the required attribute xml:lang (see page 83).

### *ShipControl Element*

Specifies the carrier responsible for some portion of the shipment. A ShipControl element contains the CarrierIdentifier, ShipmentIdentifier, 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.

#### CarrierIdentifier

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.

#### Route Element

If present, Route elements must be in the order the shipment will travel.

#### Contact Element

The most common Contact roles in this element are:

| | |
|---|---|
| "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 a "shipTo" role in this element because a Contact with role "shipTo" would always 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.

### *Comments Element*

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.

### *Extrinsic Element*

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.

### *startDate Attribute*

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.

## Route Element

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.

### *method Attribute*

Identifies the transportation type code.

| | |
|---|---|
| "air" | Transportation by flight |
| "motor" | Transportation by land motor craft, common carrier |
| "rail" | Transportation by rail |
| "ship" | Transportation by boat; ocean |

Because shipments can travel through multiple segments with different methods, this attribute has no default.

### *startDate Attribute*

Specifies the date and time this shipment started this part of the trip. Required in all Route elements after the first.

### *endDate Attribute*

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.

## CarrierIdentitifier Element

Identifies the carrier that will transport this shipment. There is one attribute, called domain.

### *domain Attribute*

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:

| | |
|---|---|
| *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 |
| "IATA" | International Air Transport Association. www.iata.org |
| "AAR" | Association of American Railroads. www.aar.org |
| "UIC" | International Union of Railways. www.uic.asso.fr |
| "EAN" | European Article Numbering. www.ean-ucc.org |
| "DUNS" | Dun and Bradstreet's Data Universal Numbering System. www.dnb.com/dnbhome.htm |

## ShipmentIdentifier Element

An identifier 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.

Essentially, this is a tracking number. 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.

## PackageIdentification Element

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.

### *rangeBegin Attribute*

Specifies the earliest number that appears on the separate elements in this shipment.

### *rangeEnd Attribute*

Specifies the highest number that appears on the separate elements in this shipment. Must be greater than or equal to rangeBegin.

## ShipNoticePortion Element

Contains purchase order and item information. Specifies what will be in the shipment. It contains three elements, OrderReference, ShipNoticeItem, Contact, Comments, and Extrinsic. All but OrderReference are optional. It contains two attributes: quantity and lineNumber.

### *OrderReference Element*

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.

### *Contact Element*

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.

### *Comments Element*

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.

### *Extrinsic Element*

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.

## ShipNoticeItem Element

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 three elements: UnitOfMeasure (see page 49), Packaging, and Hazard.

Elements in the Hazard list can appear in any order. The same Hazard should not be listed more than once in a ShipNoticeItem. Each Hazard listed at this level (in a ShipNoticeItem element) must apply to this specific line item. A ShipNoticeRequest for a single line item should not include Hazard elements in the ShipNoticeItem element.

### *quantity Attribute*

Quantity specifies how many items were shipped. Expressed in units given in the UnitOfMeasure element.

### *lineNumber Attribute*

Position, counting from 1, of the item in an order. Matches the corresponding line item, ItemOut, in the document referenced by the OrderReference element.

### *Packaging Element*

Details about the packaging of this line item. The dimensions mentioned in the Dimension element list can appear in any order. The Packaging element contains one or more PackagingCode elements and optional Dimension element (see page 169). A particular Dimension type attribute value must not appear more than once in a Packaging element.

#### PackagingCode Element

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.

### Dimension Element

Specifies a single dimension for the packaging of the item.

- quantity attribute

  Specifies the size in this dimension. Expressed in the units given in the UnitOfMeasure element.

- type attribute

  Type of dimension. Supported values include:

| | |
|---|---|
| "length" | The length of the packaging. |
| "width" | The width of the packaging. |
| "height" | The height of the packaging. |
| "weight" | The weight of the packaging. |
| "volume" | The volume of the packaging |

## *Hazard Element*

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. 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:

| | |
|---|---|
| "UNDG " | United Nations Dangerous Goods |
| "IMDG" | International Marine Organization Dangerous Goods |
| "NAHG" | North American Hazardous Goods |

## OrderReference Element

The OrderReference element refers to a prior OrderRequest document. It contains a DocumentReference element.

### *orderID Attribute*

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 Attribute*

Specifies the date and time the OrderRequest was created. The date format is yyyy-mm-dd per international ISO standard 8601.

# Chapter 9
# 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, debit memos, and receipts.

This chapter discusses the InvoiceDetail transaction in terms of:





## Overview of Invoicing

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, 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.

## Early InvoiceRequest Document

Early 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 will be deprecated in the future; new cXML invoice projects should implement InvoiceDetailRequest.

## 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 both standard invoices and credit memos.

For Pcard-enabled purchase orders, suppliers should request payment by using the request-to-pay functionality provided by ConfirmationRequest documents (for more information, see “ConfirmationRequest” on page 144.) Suppliers should not use invoice documents in this case to request payment, but they can use them as information-only receipts.

## Shipping Information

Invoices can include shipping information such as shipping charges, dates, from/to addresses, and carrier IDs. Ones 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.

## Types of Invoices

InvoiceDetailRequest has the features and flexibility to support most business scenarios.

### 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. |

### 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.<br>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.<br>Leave out isHeaderInvoice and use InvoiceDetailOrder elements, which contain line-item information. |



### 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.<br>Specify purpose="standard" and operation="new". |
| Credit Memo | Specifies credit to a buying organization.<br>Specify purpose="creditMemo" and operation="new". Must be a header invoice. Amounts must be negative. |
| Debit Memo | Specifies debit to a buying organization.<br>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.<br>Specify isInformationOnly="yes" and operation="new". |
| Cancel Invoice | Cancels a previously sent invoice.<br>Specify operation="delete". |

## 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

# 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.

## InvoiceDetailRequestHeader

Defines header information that applies to the entire invoice.

InvoiceDetailHeader has the following attributes:

| | |
|---|---|
| **invoiceID** | A supplier-generated identifier for the Invoice. Identical to the Invoice Number that appears at the top of a physical Invoice. |
| **isInformationOnly** | Indicates whether the buying organization needs to take action:<br>yes — Invoice is for the buying organization's information only (no action needs to be taken by the buying organization).<br>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:<br>standard — (default) A standard billing statement from the supplier to the buying organization.<br>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.<br>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. |
| **operation** | How this document is acting on the invoice:<br>new — (default) Creates a new invoice.<br>delete — Cancels an existing invoice. The PayloadID of the existing invoice must be specified in a DocumentReference. |
| **invoiceDate** | Date and time Invoice was created (should be earlier than the cXML timestamp). |

## InvoiceDetailHeaderIndicator

Defines indicators that describe overall attributes of the invoice. By default, all indicators are false.

InvoiceDetailHeaderIndicator has the following attributes:

| | |
|---|---|
| **isHeaderInvoice** | Category of the invoice:<br>yes — Header invoice. Invoice uses InvoiceDetailHeaderOrder, which contains header level invoice information without item details<br>Not specified — Detail invoice. Invoice uses InvoiceDetailOrder, which contains item details. |
| **isVatRecoverable** | yes — The entire invoice is VAT (Value Added Tax)-recoverable. |

## InvoiceDetailLineIndicator

Indicates the presence of invoicing details at invoice line level (in InvoiceDetailItem 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:

| | |
|---|---|
| **isTaxInLine** | yes — Tax (Tax) is provided at invoice line level. |
| **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 nor be specified, because Distribution is available only at item level. |

## 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 issuerOfInvoice, soldTo, billTo, remitTo.

The from role has been deprecated.

### *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:

| | |
|---|---|
| **identifier** | The unique identifier of the IdReference within the domain. |
| **domain** | The domain of the IdReference. One of the following values:<br>accountID bankRoutingID accountPayableID<br>federalTaxID stateTaxID accountReceivableID<br>provincialTaxID vatID gstID<br>taxExemptionIS<br>Values can be application-specific, such as 1099ID or courtRegisterID.<br>supplierTaxID has been deprecated and is treated as federalTaxID. |

### *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.

## DocumentReference

Reference to 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.

## InvoiceDetailOrder

Defines the invoice information of an order with item details, used only when isHeaderInvoice is false (not specified). In this case, an invoice line is an InvoiceDetailItem and its invoice line number is specified by the invoiceLineNumber attribute.

## 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.

## 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 refering 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:

| | |
|---|---|
| **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. |

### *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:

| | |
|---|---|
| **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. |

### *OrderIDInfo*

Identifies a purchase order known to the buying organization.

OrderIDInfo has the following attributes:

| | |
|---|---|
| **orderID** | 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:

| | |
|---|---|
| **orderID** | Supplier sales order ID of the purchase order. |

## InvoiceDetailPaymentTerm

Defines a payment term offering a discount or a penalty.

InvoiceDetailPaymentTerm has the following attributes:

| | |
|---|---|
| **payInNumberOfDays** | The number of days after invoice date to pay in full. |
| **percentageRate** | Discount or penalty percentage that applies if paid within the time specified by payInNumberOfDays. Positive rates denote discounts and negative rates denote penalties. Do not include a percentage sign (%) or divide by 100; for example “2” means 2%. |

## InvoiceDetailOrderSummary

Defines header level summary info of an order in an invoice line.

InvoiceDetailOrderSummary has the following attribute:

| | |
|---|---|
| **invoiceLineNumber** | Supplier defined ID for the current invoice line. It should be unique across all invoice lines of the same InvoiceDetailRequest. |

### *SubtotalAmount*

The invoice subtotal of the this order.

### *Tax*

The tax for this order. Ignored if isTaxInLine is false (not specified).

### *InvoiceDetailLineSpecialHandling*

The special handling information for this order. Ignored if isSpecialHandlingInLine is false (not specified).

### *InvoiceDetailLineShipping*

The shipping information for this order. Ignored if isShippingInLine is false (not specified).

### *GrossAmount*

The SubtotalAmount plus taxes, shipping, and special handling charges.

### *InvoiceDetailDiscount*

The discount for this order. Ignored if isDiscountInLine is false (not specified).

### *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.

## InvoiceDetailLineShipping

Defines shipping information of the current invoice line.

### *InvoiceDetailShipping*

The shipping details.

### *Money*

The shipping amount.

## 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:

| | |
|---|---|
| **invoiceLineNumber** | 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. |

### *UnitOfMeasure*

The line item's unit of measure.

### *UnitPrice*

The unit price.

### *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).

### *InvoiceDetailLineSpecialHandling*

The special handling information for the line item. Ignored if isSpecialHandlingInLine is false (not specified).

### *InvoiceDetailLineShipping*

The shipping information for the line item. Ignored if isShippingInLine is false (not specified).

### *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).

### *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.

### *Extrinsic*

Additional information related to the line item. Should not duplicate anything in InvoiceDetailItem or InvoiceDetailOrder.

## InvoiceDetailItemReference

Defines all references related to an invoice line item.

InvoiceDetailItemReference has the following attributes:

| | |
|---|---|
| **lineNumber** | The purchase order line number of current line item, copied from the OrderRequest. |
| **serialNumber** | The product serial number for the current line item. |

### *ItemID*

The supplier part number of current line item, from the OrderRequest.

### *Description*

The line item description, from the OrderRequest.

### *ManufacturerPartID*

The manufacturer part number.

### *ManufacturerName*

The name of the manufacturer.

### *Country*

The country of origin of the product listed in the line item.

## InvoiceDetailDiscount

Defines discount or penalty applied.

InvoiceDetailDiscount has the following attribute:

| | |
|---|---|
| **percentageRate** | Discount or penalty rate 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%. |

## InvoiceDetailShipping

The shipping details of the invoice.

InvoiceDetailShipping has the following attribute:

| | |
|---|---|
| **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. Allowed Contact roles are shipFrom, shipTo, and carrierCorporate.

### *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.

### *ShipmentIdentifier*

The tracking number of this shipment.

### *DocumentReference*

The reference to an earlier ShipNoticeRequest document.

## InvoiceDetailSummary

Defines the summary information of an invoice.

### *SubtotalAmount*

Sum of line item quantities multiplied by unit price.

### *Tax*

Total tax information.

### *SpecialHandlingAmount*

Total special handling charge.

### *ShippingAmount*

Total shipping charge.

### *InvoiceDetailDiscount*

The total discount applied in the invoice. Its percentageRate attribute will be ignored if isDiscountInLine="yes".

### *GrossAmount*

Sum of subtotal, taxes, special handling charges, and shipping charges, before discounts.

### *NetAmount*

Total GrossAmount minus discounts.

### *DepositAmount*

Total deposit or prepayment amount.

### *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.

# Example Invoices

The following examples illustrate several types of invoices.



## 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/1.2.008/InvoiceDetail.dtd">
<cXML timestamp="2001-10-10T16:23:01-07:00" payloadID="Oct102001_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="2001-10-09T00:00:00-07:00"
               invoiceID="Oct102001_0447pm" purpose="standard" operation="new">
            <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>
          </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>
```

## 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/1.2.008/
InvoiceDetail.dtd">
<cXML version="1.0" 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>
    <InvoiceDetailPaymentTerm payInNumberOfDays="10" percentageRate="10"/>
    <InvoiceDetailPaymentTerm payInNumberOfDays="20" percentageRate="5"/>
    <InvoiceDetailPaymentTerm payInNumberOfDays="30" percentageRate="0"/>
    <InvoiceDetailPaymentTerm payInNumberOfDays="40" percentageRate="-5"/>
    <InvoiceDetailPaymentTerm payInNumberOfDays="50" percentageRate="-9"/>
  </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>
      </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">
          <TaxLocation xml:lang="en">CA</TaxLocation>
          <TaxableAmount>
            <Money currency="USD">15.40</Money>
          </TaxableAmount>
          <TaxAmount>
            <Money currency="USD">1.23</Money>
          </TaxAmount>
        </TaxDetail>
```

```
            <TaxDetail purpose="tax" category="sales" percentageRate="2">
               <TaxLocation xml:lang="en">US</TaxLocation>
               <TaxableAmount>
                  <Money currency="USD">15.40</Money>
               </TaxableAmount>
               <TaxAmount>
                  <Money currency="USD">0.31</Money>
               </TaxAmount>
            </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">
            <TaxLocation xml:lang="en">CA</TaxLocation>
            <TaxableAmount>
              <Money currency="USD">0.40</Money>
            </TaxableAmount>
            <TaxAmount>
              <Money currency="USD">4.95</Money>
            </TaxAmount>
          </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">
                    <TaxLocation xml:lang="en">CA</TaxLocation>
                    <TaxableAmount>
                        <Money currency="USD">20.35</Money>
                    </TaxableAmount>
                    <TaxAmount>
                        <Money currency="USD">1.63</Money>
                    </TaxAmount>
                </TaxDetail>
                <TaxDetail purpose="tax" category="sales" percentageRate="2">
                    <TaxLocation xml:lang="en">US</TaxLocation>
                    <TaxableAmount>
                        <Money currency="USD">20.35</Money>
                    </TaxableAmount>
                    <TaxAmount>
                        <Money currency="USD">0.41</Money>
                    </TaxAmount>
                </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>
```

## 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/1.2.008/
InvoiceDetail.dtd">
<cXML version="1.0" payloadID="123344-2001@foobar.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>
      .
      .
      .
```

## 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/1.2.008/
InvoiceDetail.dtd">
<cXML timestamp="2001-10-31T23:07:22-08:00" payloadID="1004598442900-
836727381519746707 0@10.10.13.100">
   <Response>
      <Status code="201" text="Accepted">Acknowledged</Status>
   </Response>
</cXML>
```

For a list of possible status codes, see “Status” on page 40.



## 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 reconciled, rejected, or paid, which refers to the action taken by the buying organization on the invoice:

| | |
|---|---|
| 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). |
| 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/1.2.008/cXML.dtd">
<cXML timestamp="2001-09-05T16:34:28-07:00" payloadID="999732868377--
681956365911302107@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>
```

For more information about the StatusUpdate transaction, see “StatusUpdateRequest” on page 139.

# Chapter 10
# Catalogs

Catalogs are files that convey product and service content to buying organizations. Suppliers use them to describe the products and services they offer and their prices, and they are the main communication channel from suppliers to their customers.

This chapter describes:



## Catalog Definitions

The cXML catalog definitions consist of two main elements: Supplier and Index. All three 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.

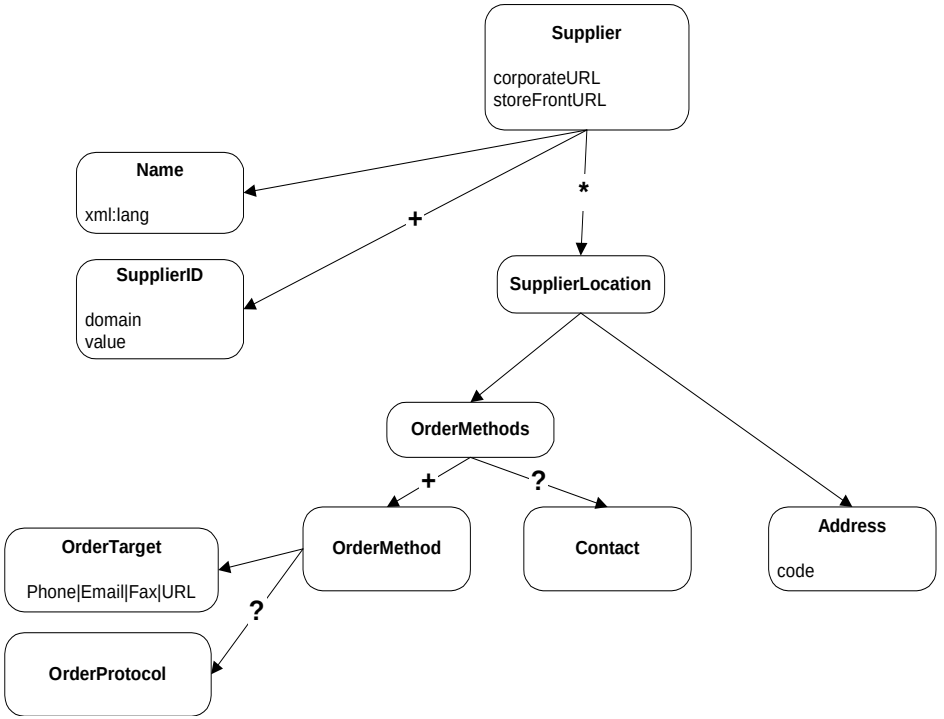
Contract was a catalog element that was deprecated in cXML 1.2.008.

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.

## 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 has the following attributes:

| | |
|---|---|
| **corporateURL** (optional) | URL for supplier's Website. |
| **storeFrontURL** (optional) | 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="InternalSupplierID">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>
```

### *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.

## 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:

| | |
|---|---|
| **loadmode** (optional) | The mode in which the target application should load the Index:<br>"Full" — Completely replaces a previously loaded index.<br>"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. |

### *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 ItemID element uniquely identifies a supplier's items. It contains a SupplierPartID element and an optional SupplierPartAuxiliaryID element.

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). For more information, see "Buyer and Supplier Cookies" on page 92.

### 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, and any number of Extrinsic elements. For more information, see "ItemDetail" on page 103.

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 URL, ManufacturerName, ManufacturerPartID, ExpirationDate, EffectiveDate, SearchGroupData, TerritoryAvailable, and Extrinsic elements. It does not contain pricing, lead time, or unit of measure information.

# 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.

## TypeProvider

TypeProvider specifies the provider of the types being defined, identified by a name and one or more IDs (for example, NetworkId or DUNS).

TypeProvioder has the following attribute:

| | |
|---|---|
| **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). |

### *Name*

The Name element is for localized display purposes, allowing different names to be provided per locale.

### *OrganizationID*

Unique identifier for the type provider organization.

## 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:

| | |
|---|---|
| **name** (required) | Canonical name of the type. |
| **extends** (optional) | Name of the type that is being extended. |

### *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.

### *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.

## 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.

| | |
|---|---|
| **name** (required) | Specifies the canonical name of this attribute. |
| **type** (required) | Specifies the data type of this attribute. Can be one of:<br>"integer" A whole number, with no fraction.<br>"string" A group of characters with words that can be individually indexed for free text searching.<br>"literal" A group of characters with words that cannot be individually indexed for free text searching.<br>"double" A floating point number.<br>"date" A date of the form yyyy-mm-dd; for example, 2002-01-25<br>"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. |
| **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. |

### *Name*

Localized name of the TypeAttribute.

### *Description*

Localized description of the TypeAttribute.

### *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>
```

### *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.

## 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:

| | |
|---|---|
| **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". |

# 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
- Catalog Subscriptions

## 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.

### *SupplierListRequest*

SupplierListRequest requests a list of the suppliers with whom the buyer has established trading relationships.

```
<Request>
    <SupplierListRequest/>
</Request>
```

### *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>
```

### *SupplierDataRequest*

SupplierDataRequest requests data about a supplier.

```
<Request>
    <SupplierDataRequest>
        <SupplierID domain="DUNS">123456789</SupplierID>
    </SupplierDataRequest>
</Request>
```

### *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” on page 198.

### *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. For more information, see Chapter 11, “GetPending Transaction.”

```
<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>
```

## Catalog Subscriptions

Catalog-subscription management uses three 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.

### *Subscription*

The catalog subscription transactions all 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. |

### *SubscriptionListRequest*

This element requests the buyer's current list of catalog subscriptions.

```
<Request>
    <SubscriptionListRequest/>
</Request>
```

### *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>
```

### *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>
```

### *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>
```

### *SubscriptionChangeMessage*

This element signals the buying organization'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 Chapter 11, "GetPending Transaction."

```
<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.

# 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.

## CatalogUploadRequest

The following example shows a CatalogUploadRequest:

*MIME header*

```
--kdflkajfdksadjfklasdjfkljdfdsfdkf
Content-type: text/xml; charset=UTF-8
Content-ID: <part0.PCO28.975529413484@saturn.workchairs.com>
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.008/cXML.dtd">
<cXML timestamp="2000-12-28T16:56:03-08:00" payloadID="123456669138--
1234567899555556789@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>MyHomemadeCatalogManager</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>
              --kdflkajfdksadjfklasdjfkljdfdsfdkf
MIME attachment header ——  Content-type: text/plain; charset=US-ASCII
              Content-Disposition: attachment; filename=PremiereCatalog.cif
              Content-ID: <part2.PCO28.975529413154@saturn.workchairs.com>
              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 Element*

CatalogUploadRequest has the following attribute:

| | |
|---|---|
| **operation** | Specifies the type of upload to perform:<br>"new" Uploads a new catalog. A catalog with the same name must not exist.<br>"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:

| | |
|---|---|
| **xml:lang** | Specifies the language used for the catalog name.<br>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.<br>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 attribute:

| | |
|---|---|
| **xml:lang** | Specifies the language used for the catalog name.<br>For more information, see the description of xml:lang for CatalogName, above. |

### 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" on page 218.

### 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 (Universal Standard Products and Services Classification) 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:

| | | |
|---|---|---|
| **Enabled** | Specifies whether to automatically publish the catalog: | |
| | "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" on page 220.

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. For more information see Chapter 3, "Profile Transaction."

URLPost has the following attribute

| | |
|---|---|
| **Enabled** | Specifies whether the network sends catalog-status notifications through StatusUpdateRequest:<br>"true" Enables this feature.<br>"false" Disables this feature. |

### *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:".

For more information about attachments in cXML, see the discussion of the "Attachment" on page 127.

Catalog files can be zipped to compress them.

## 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/1.2.008/cXML.dtd">
<cXML payloadID="980306507433-671499827796134101 2@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 Code | 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” on page 40.

### *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). |

### *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/1.2.008/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--
1234567899555556789@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. |
| 470 Catalog Has Errors | The message is the status of the catalog. (HasErrors) |

# Chapter 11
# GetPending Transaction

Some buying organizations do not have HTTP entry points for receiving cXML messages from outside their corporate firewalls. The cXML specification allows for these environments.

This section introduces definitions that allow source systems to queue messages when target systems are unable to directly accept HTTP posts. Target systems instead pull messages at their convenience by using the GetPending transaction.

Two examples of documents that depend on the GetPending transaction are SupplierChangeMessage and SubscriptionChangeMessage, which are used to notify buying organizations about changes to supplier data and catalogs.

## 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 messages.

| | |
|---|---|
| **lastReceivedTimestamp** (optional) | The timestamp of the most recent message received. |
| **maxMessages** (optional) | Maximum number of messages in a single response that the requester can handle. |

Upon receiving the request, the receiver returns the oldest messages, of the specified types, with timestamps equal to or later than the specified timestamp. If there are multiple messages meeting this criterion, multiple messages can be returned, subject to the maxMessages attribute. The queuing system discards all pending messages of the specified message types with timestamps earlier than the specified timestamp.

```
<Request>
    <GetPendingRequest lastReceivedTimestamp="2002-03-12T18:39:09-08:00"
            maxMessages="5">
        <MessageType>SubscriptionChangedMessage</MessageType>
```

```
    </GetPendingRequest>
</Request>
```

## GetPendingResponse

This element contains one or more messages waiting for the requester.

```
<Response>
    <Status code="200" text="OK"/>
    <GetPendingResponse>
        <cXML xml:lang="en-US"
            payloadID="456778@ariba.com"
            timestamp="2002-03-12T18:39:09-08:00">
            <Header>
                <From>
                    <Credential domain="AribaNetworkUserId">
                        <Identity>admin@ariba.com</Identity>
                    </Credential>
                </From>
                <To>
                    <Credential domain="AribaNetworkUserId">
                        <Identity>admin@acme.com</Identity>
                    </Credential>
                </To>
                <Sender>
                    <Credential domain="AribaNetworkUserId">
                        <Identity>admin@ariba.com</Identity>
                    </Credential>
                <UserAgent>Ariba.com</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>
```

For information about the SupplierChangeMessage element, see “SupplierChangeMessage” on page 209.

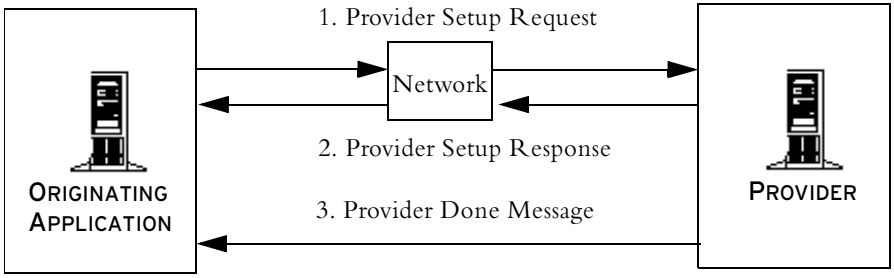
For information about the SubscriptionChangeMessage element, see “SubscriptionChangeMessage” on page 213.

# Chapter 12
# 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. cXML messages provide a means for the originator and the provider to communicate during this transaction. 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.

## Message Flow

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




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.

# 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.

## Header

The *Header* portion of the document contains addressing and authentication information. The following sample is the header portion taken from a Provider Setup Request cXML 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 "Ariba Buyer 7.0 EA." 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>
    <!-- AM-NE -->
        <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” on page 37 for specifics on how to construct this portion of the message.

## 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>AMNE.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 |

| Element | Instances | Parent Elements | Child Elements | Attributes |
|---|---|---|---|---|
| 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:

### *Request*

Contains a request to initiate a Provider PunchOut transaction, and in this case contains a ProviderSetupRequest element.

### *ProviderSetupRequest*

A request from an originating application to a provider to initiate a transaction.

### *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.

### *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.

### *SelectedService*

Identifies the service requested by the originating application and offered by the provider.

### *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.

## Sample

To demonstrate a typical ProviderSetupRequest document, the following is a request from a marketplace host, called Triton bank, to AM-NE.

```
<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>AMNE.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>
```

# 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@amne.ariba.com"
    xml:lang="en-US" timestamp="2000-03-12T18:40:15-08:00">
    <Response>
        <Status code="200" text="OK"/>
        <ProviderSetupResponse>
            <StartPage>
                <URL>http://amne@ariba.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 |
| StartPage | 1 | ProviderSetupRepons e | URL | None |
| URL | 1 | StartPage | None | None |

### *Response*

Contains the Status and ProviderSetupResponse elements.

### *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:

| | |
|---|---|
| **code** | The status code of the request. This follows the HTTP status code model. For example, 200 represents a successful request. |
| **text** | The text of the status message. This text aids user readability in logs, and it consists of canonical strings in English. |

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” on page 40 for a list of all possible status code values.

### *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.

### *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.

## Sample

The following ProviderSetupResponse document is in reply to Triton Bank from a provider from the previous ProviderSetupRequest section.

```
<cXML payloadID="456789@amne.ariba.com"
    xml:lang="en-US" timestamp="2000-03-12T18:40:15-08:00">
    <Response>
        <Status code="200" text="OK"/>
        <ProviderSetupResponse>
            <StartPage>
                <URL>http://amne@ariba.com/enter?23423SDFSDF23</URL>
```

```
            </StartPage>
        </ProviderSetupResponse>
    </Response>
</cXML>
```

# ProviderDoneMessage Document

The *ProviderDoneMessage* document contains any information the originating application must know about the completed operation at the provider site.

## 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>
    <!-- AM-NE -->
        <Credential domain="NetworkId">
            <Identity>AN01000000003</Identity>
        </Credential>
    </From>

    <To>
        <!-- Triton bank -->
        <Credential domain="NetworkId">
            <Identity>AN01000001709</Identity>
        </Credential>
    </To>

    <Sender>
    <!-- AM-NE -->
    <Credential domain="NetworkId">
        <Identity>AN01000000003</Identity>
    </Credential>
    <UserAgent>Purchase</UserAgent>
    </Sender>
</Header>
```

Because the Header element is similar for each message type, see “Header” on page 37 for the specifics on how to construct this portion of the message.

## 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:

## 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.

## 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.

## ReturnValue

A value that is used by the originating application. This value depends on what service the provider supplies.

### *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.

## 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>
    <!-- AM-NE market cluster -->
        <Credential domain="NetworkId">
            <Identity>AN01000000003</Identity>
        </Credential>
    </From>

    <To>
        <!-- Triton bank -->
        <Credential domain="NetworkId">
            <Identity>AN01000001709</Identity>
        </Credential>
    </To>

    <Sender>
        <!-- AM-NE market cluster -->
        <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>
```

# Appendix A
# New Features in cXML 1.2.008

cXML 1.2.008 contains the following new features:



## Type Definitions

Type definitions are a new document type used to describe supplemental catalog attributes and parametric data for catalogs. The new Type element replaces the deprecated SearchGroup element.

For more information:

"Type Definitions" on page 203

Type definitions provide a richer and more general framework for defining parametric types, and they allow the definition and standardization of parametric types from *type provider* organizations independent of catalog index data in which SearchGroup elements resided.

The SearchGroupData and SearchDataElement elements continue 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.

The TypeDefinition document is defined in a new cXML DTD named Catalog.dtd.

## Catalog loadmode Attribute

For more information:

“Index” on page 200

The Index element has a new attribute named loadmode, which can be set to either "Full" or "Incremental" to indicate whether the catalog should be loaded into the target application as a complete catalog or an incremental change.

Previously, all cXML catalogs were incremental.

## Ad-Hoc Item Flag

The ItemOut element in purchase orders has a new attribute named isAdHoc, which indicates that the item is a non-catalog (ad-hoc) item.

For more information:

“ItemOut” on page 128

Non-catalog items are items entered manually by requisitioners, not items selected from electronic catalogs. Often, these items do not have 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.

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.

## Backordered Flag

For more information:

“ConfirmationRequest” on page 144

Suppliers can now issue ConfirmationRequest documents to indicate that items are back ordered.

The new type="backordered" attribute value can be used in either ConfirmationHeader for the entire order or in ConfirmationStatus for individual line items.

## Contract Element Deprecated

The Contract element for defining contract pricing is deprecated. It is no longer needed, because MasterAgreementRequest documents can handle most of the requirements of contract pricing.

## SearchGroup Element Deprecated

The SearchGroup element for defining parametric data fields is deprecated. It is no longer needed, because of the new TypeDefinition element.

Note that catalogs continue to use the SearchGroupData element to populate parametric data.

# Index

## E



## F



## G



## H



## I



## L



## M

## S



## T



## U



## V



## X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