UPS OnLine® Tools

Address Validation

XML Programming Information

Version 1.0

Volume 5, Number 3
Revision Date: October 18, 2007

Notice

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Welcome

Welcome

Welcome to the *UPS OnLine® Tools Developer's Guide*. This guide explains how to integrate your e-commerce applications with the installation of UPS OnLine Tools, XML Version. You may visit http://www.ec.ups.com for more information about Address Validation.

Contents at a Glance

- "Product Overview" provides an introduction to the UPS OnLine Tools.
- "General Programming Information" provides essential information on integrating your e-commerce applications with UPS OnLine Tools.
- "Address Validation" insures that customer-entered shipping addresses are correct at the time of order.
- "Customer Integration" describes the process for integration testing of your application.
- "Appendices" contains the glossary, tables, and frequently asked questions (FAQs).
- "Bibliography" contains reference materials for this guide.

Product Overview

Product Overview

UPS Address Validation

Introduction

With UPS Address Validation, available in the latest XML technology, you don't have to worry about your customers entering incorrect address information. If customers make a mistake, UPS Address Validation alerts them with an error message, ensuring that errors are corrected at the point of entry long before orders leave the shipping dock. This reduces costly returns for you and headaches for your customers.

UPS Address Validation uses U.S. Postal Service guidelines to thoroughly check the city, state and postal code of every shipment. UPS provides up to ten alternate addresses, including an accuracy rate that lets your customers know how closely the address they entered matches the suggested address.

With UPS Address Validation, You Can:

- Reduce operating costs by minimizing returns and correction charges.
- Improve customer service by assisting shoppers when they place orders.

Your Customers Can:

- Receive shipments quickly and accurately, without delivery delays due to incorrect addresses.
- Be assured their packages will be addressed correctly

For more information on UPS OnLine Tools, including UPS Address Validation, please visit http://www.ec.ups.com.

Tool Overview

This tool assesses the accuracy of an input city, state, postal code combination, and returns a list of up to 10 valid city/state/postal code combinations that closely match the input. The tool returns each valid city/state/ postal code combination with an assigned rank and quality value to indicate how closely it matches the input.

The UPS Address Validation Tool is only supported for addresses within the United States. All combinations of city, state and postal code must be for addresses within the United States.

Maintaining Your Profile

As your e-commerce needs continue to evolve, UPS OnLine Tools will evolve, too, offering more features and service benefits. Once you have registered to use UPS OnLine Tools, UPS will notify you by e-mail of updates and changes to the tools. It is essential that an accurate e-mail address for your company be maintained. In addition, it is recommended that you complete the secondary contact information as a back-up measure for receiving any updates and changes. This can be another individual or even group contact information (e.g. ACME Company – IT Group, ITGroup@ACME.com).

You should update your profile when changes occur or responsibilities for the Tools shift within your company. You can also return to the UPS e-commerce site to receive the latest updated information about UPS OnLine Tools.

License Agreements

The license agreements define the necessary business obligations of both UPS and the Licensee. Some of the reasons your entire team should be knowledgeable of the licensing requirements include:

- The license agreements have requirements that impact how programmers use and display information (e.g., regarding appropriate use of data and logos).
- The license agreements are different depending on how you use the UPS OnLine Tools (e.g., as an end-user or third party developer).

Usage Requirements

As part of the UPS OnLine Tools legal agreements, users of the Tools have certain obligations that are spelled out within the Tools agreement and its exhibits. Regardless of the manner in which the UPS OnLine Tools are integrated into your specific e-commerce web site or enterprise application, you must adhere to the Usage Requirements of the Tools legal agreement accepted by your company. Reference your OnLine Tools legal agreement for complete details of both parties' obligations. The following highlights a few of these usage requirements.

Branding Requirements

UPS should receive attribution and branding in all applications (including websites and software applications) that use the OnLine Tools. No End User, Third Party Developer or Access User should be permitted to use the OnLine Tools without providing branded recognition to UPS. Your use of the UPS logo can in no way imply endorsement, sponsorship or certification of your e-commerce web site or enterprise application by UPS. You are not allowed to use or alter the information returned by the UPS OnLine Tool in a way that misrepresents the information or the functionality of the tool.

UPS Access and Review of End User Applications

If you distribute your application as software, please provide UPS access to or a copy of your application (and/or any updates). If you host your application for the benefit of others, please provide the URL for each location of your application. If you build your own application, UPS might request the URL in order to review your application. UPS will review each appliance for compliance with the license agreement and the UPS Developer's Kit. You may not use the interfaces until UPS has provided you a written statement that the interfaces and their use in connection with your application are compatible with the UPS Systems and in compliance with the terms of the License Agreement. UPS maintains the right to test your interfaces, individually and as incorporated into your applications to verify that they have been designed in compliance

with the License Agreement. You may be instructed to make changes to the application or the embedded interfaces for the application to pass UPS's review.

Data Integrity

Within your applications, you must present all information returned by UPS within each data field without amendment, deletion or modification of any type.

Security Elements

To access the UPS OnLine Tools web site and use the product, several security elements are required including a UserId and Password, Developer Key and Access Key. Some premium tools require additional information and special processes in order to be implemented. Various Tool users may be licensed and provided access to the products in different ways.

If you have licensed the tools through the "OnLine Tools" section on http://www.ec.ups.com, all security elements will be obtained via the web site. If you have received the tools documents through other authorized means, your UPS OnLine Tools contact will provide you with the security elements you need to proceed. This document describes the process completed via the UPS OnLine Tools web site.

These security elements are confidential and can not be shared with other companies or third parties. Sharing these elements with third parties is strictly prohibited as expressed in the UPS OnLine Tools license agreements.

Implementation of Security Elements

In order to be authorized by UPS to obtain any Tool's documentation, you or someone in your company has already completed the appropriate UPS OnLine Tool's licensing process. These steps initially control your access to the technical documentation located within the http://www.ec.ups.com web site. Once you implement your Tool's enabled EC solution, various security elements must be provided to UPS systems at run-time. The following steps are needed for your software to effectively support the UPS licensing process:

1. Create a Tools UserId and Password.
2. License the Tools and receive your Developer Key.
3. Get an XML Access Key.
4. Build your EC solution.
5. Test your EC solution.
6. Go into production with your Tool's enabled EC solution.

1. Create a Tools UserId and Password.

Customers integrating the UPS OnLine Tools must complete the registration process on the "Online Tools" section at http://www.ec.ups.com to obtain a UserId and Password. This UserId controls access to the documentation and allows developers to stay informed about the latest OnLine Tools updates and enhancements. A UserId and Password will also be required with each input request a user makes to an UPS Server while using an XML Tool. It is important to note that every time a developer changes their password on the web site they will have to update any program that has the Tools embedded. It is recommended that users do not use an existing MyUPS.Com ID. UPS recommends you keep your MyUPS.Com UserId separate from your Tools UserId.

For the UPS Shipping and UPS Signature Tracking, additional data has to be associated with your UserId being passed with each transaction. For Shipping, you must have a valid Shipper Number(s) associated with the Registration ID. For Signature Tracking you must have a PIN(s) associated with your Registration ID. The special requirements are detailed in the Shipping and Signature Tracking Documentation. To be approved for the either tool a registered user submits a request form on the "Online Tools" portion of http://www.ec.ups.com. If approved users will be granted access to the documentation for these tools through the web site.

For participants in the UPS OnLine Tools Third Party Developer Program or other advanced users that have a large number of Registration ID's to set up, UPS can provide an XML interface to the Registration system.

2. License the Tools and receive your Developer Key.

As an end-user, you must login to http://www.ec.ups.com with your UserId and Password. A license agreement must be accepted on the "Online Tools" portion of http://www.ec.ups.com before gaining access to the Tools documentation. After accepting the appropriate Tools licensing agreement, a Developer Key will be e-mailed to the registered user. You need to permanently save a copy of your Developer Key for future reference. A valid Developer Key is needed to obtain an Access Key and will be needed for technical support. The Developer Key identifies the company and contact that is building the EC solution.

3. Get an XML Access Key.

You must pass an XML Access Key with each input request to the UPS OnLine Tools server. You can obtain your XML Access Key on the "Access Key" section of http://www.ec.ups.com. A Developer Key is required to get an Access Key. Each Access Key identifies each site where the Tool has been deployed.

Once you review the technical documentation, you must plan your strategy for those Access Keys you need. There are separate Access Keys for the HTML and XML Tools. Additionally, UPS recommends each site implementation of your EC solution have separate Access Keys. An example would be a company that is implementing the Tools into three parts of their organization in three different cities. In this case, it is recommended that you obtain three separate Access Keys to uniquely identify each site.

If you have requested use of the Premium Tools, do not request an Access Key until after you received confirmation from UPS that your Premium Tool request has been approved.

For participants in the UPS OnLine Tools Third Party Developer Program or other advanced End-users that have a large number of Access Keys to set up, UPS can provide an XML interface to the Get Access Key process.

4. Build your EC solution.

Imbed your UserId, Password and Access Key into your Tools enabled EC solution. An XML Access Request Message containing your UserId, Password and Access Key (Access License Number) must be submitted with every XML Service Request message.

5. Test your EC Tool implementation.

UPS provides customers with a Customer Integration Environment that allows customers to complete their integration testing with UPS' servers. This environment is not intended for stress testing. Customers should complete all testing with their application connected to the Customer Integration Environment URL for the tool they are integrating. Once testing and certification (if necessary) is completed, customers should point their applications to the production URL.

To ensure that your Tool's enabled EC solution works properly we provide sample code, DTD's and example XML documents. These can be found in the "How To" files for each Tool.

For the Premium XML Tools (e.g., Shipping and Signature Tracking), additional interactions and approvals with UPS are required before you go into production. Details of what to do and who to contact are contained in the documentation of each premium Tool.

6. Go into production with your Tools enabled for implementation.

Architecture Configuration

Your applications communicate via the Internet with the UPS OnLine Tools server that implements all functionality.

Communication

An e-commerce application invokes UPS OnLine Tools by initiating Hypertext Transfer Protocol (HTTP) communication with the server hosting UPS OnLine Tools. HTTP is an application-level protocol for distributed, collaborative, and hypermedia information systems. HTTP is also a generic protocol used to communicate from user agents and proxies/gateways to other Internet systems, including those supported by SMTP, NNTP, FTP, Gopher, and WAIS. HTTP allows a user to readily exchange XML-formatted messages.

UPS OnLine Tools use secure HTTP (HTTPS) for your protection and for the protection of UPS. The secure transmission ensures that the sender and receiver are the only parties able to decode a transmission. Encrypting the HTTP protocol through a Secure Socket Layer (SSL) socket performs HTTPS. Third-party sockets are available from a number of vendors.

All interactions with the UPS OnLine Tools server are through the HTTP POST method. The HTTP message content is formatted as an XML document.

UPS OnLine Tools supports the HTTP 1.1 protocol (refer to HTTP specifications at http://www.w3.org/Protocols/rfc1945/rfc1945).

XML

Extensible Markup Language (XML) is an open standard for defining markup languages to represent structured information over the web. XML documents are used for business-to-business communication and data interchange between dissimilar systems. Network transfer occurs with standard HTTP over TCP/IP.

UPS OnLine Tools uses XML documents to communicate with your applications. XML, like its cousin HTML, is a subset of Standard Generalized Markup Language (SGML). Whereas HTML is used to tag words, pictures, and other media so that they can be rendered the same way by different browsers, XML is used to tag documents and data so that different software consumers can interpret them without ambiguity.

For example, consider the following text:

```
1Z12345E1512345676
```

This string can be interpreted in many ways—an invoice number, a purchase order number, or random sequence of characters (noise). Using XML to tag the string removes the ambiguity:

```
<TrackingNumber>1Z12345E1512345676</TrackingNumber>
```

The tagging mechanism of XML guarantees that if documents are structured properly, the data can always be parsed.

UPS OnLine Tools supports XML 1.0 specification (http://www.w3.org/TR/1998/REC-xml-19980210.html)

XML Package Carrier Interface

XML Package Carrier Interface (XPCI) defines a vocabulary and structure for describing packages, shipments, and the activity details for package carriers and their customers. XPCI is a set of DTDs that defines the terminology, transaction enveloping, and XML message definitions. For a client to be XPCI-compliant, the client must generate a well-formed XML message that validates against the XPCI DTDs.

Several DTDs, organized into three categories, define XPCI:

- Vocabulary—This DTD defines the basic business vocabulary of XPCI. All tags used in a message are defined in this DTD.
- Interchange—This DTD defines the transaction-enveloping scheme. Every message includes transaction information.
- Message—Each message has an associated DTD that defines the vocabulary of the message.

DTDs

A Document Type Definition (DTD) is a set of rules that specifies how to use XML markup. It contains specs for each element, including what the element's attributes are, what values the attributes can take on, and what elements can be contained in others. Trading partners uses DTDs as interface contracts (for example, input/output specifications that programmers use to craft software). DTDs are also used by software to validate the syntax of XML documents. DTDs are available on the http://www.ec.ups.com website.

General Programming Information

General Programming Information

Integration Requirements

To integrate UPS OnLine Tools into your e-commerce applications, you must develop custom code that adapts your application's business logic and data to UPS OnLine Tools. You can use any programming language that supports HTTP communication across Internet socket and secure connections, such as Java, Visual Basic, or C+ + .

1. You will need to know how to program URL or socket connections. There are several ways you can do this. Which method you choose will depend on your application platform and programming language. For example, if you program in Java on any platform, you could use the URLConnection Class, which is part of the Java Development Kit. Alternatively, Microsoft supplies several components for use with Visual Basic and ASP (VBScript).
2. You will need to obtain, or write, a secure socket implementation that supports the SSL standard for secure communications. UPS OnLine Tools requires secure HTTP (HTTPS). This data security is required for the protection of both the client application and UPS; sensitive (billing-related) data is being transferred back and forth across the public Internet.
3. You will need to know how to encode and decode XML documents. To program XML documents, you'll probably want to use an XML parser, which provides an Application Programming Interface (API) for manipulating XML documents. There are several XML parsers available as freeware, as well as commercial software products. (See Bibliography for more information.)
4. You will need to design a strategy into your software for handling errors. Consider that there are three types of errors: hard errors, transient errors, and warnings. For a smoothly running application you must decide how you handle each type of error. In some cases it may be appropriate to display the error to the user. On the other hand, if there is no GUI in your application, your software must decide what to do. For instance, if you are designing a GUI interface, you must decide whether to show transient errors or simply retry the request behind the scenes. In all cases, we will supply an error number and a natural language error message.
5. You will need to establish a connection to the Internet from the computer that runs your e-commerce application. You also need to establish Internet access with your own Internet Service Provider.

Planning the OnLine Tools Integration

A successful implementation of the UPS OnLine Tools depends on many factors. It is important that you have the appropriate tools to work with the platform you are integrating with, the appropriate skill set (XML knowledge and/or experience) as well as a project plan and design. The following checklist should aid in the process:

1. Obtain UserId, Password and Developer's Key from http:/ec.ups.com/ecommerce. (See " Security Elements" in the Product Overview section.)
2. Obtain documentation and the corresponding " How To" file for the tool you wish to implement.
3. Carefully review the documentation.
4. Obtain parser and utility software for SSL. For tools returning graphic images (Signature Tracking and Shipping), obtain software for Base64 Encoding.

5. Determine how your application will connect to the Internet. This may involve discussions with your network administrator and/or network security staff.
6. Develop a plan for error handling.
7. Develop your application.
8. Obtain Access Key. (See " Security Elements" in the Product Overview section.)
9. Perform integration testing with the UPS Customer Integration Environment.
10. For Signature Tracking and Shipping, follow the product certification process identified in the Customer Integration Environment section.
11. Launch your application.

Communication

An application invokes UPS OnLine Tools by initiating HTTP communication with the server hosting UPS OnLine Tools. All interactions with the host server are through the HTTP POST method. The HTTP message content sent is formatted as an XML document.

Applications connected to the Internet can connect directly to UPS OnLine Tools at the HTTPS port 443, by opening either a secure TCP/IP socket or secure URL connection. Applications send request data to UPS OnLine Tools by writing data to the TCP/IP socket or URL connection. The request data must be formatted as a valid XML request message and adhere to the HTTP protocol. Applications receive the response data from UPS OnLine Tools by reading data from the same TCP/IP socket or URL connection.

HTTPS is accomplished by using the HTTP protocol using a secure (SSL) socket. You must obtain an SSL package that supports the RSA encryption algorithm in order to communicate with the UPS OnLine Tools server.

Invoking UPS OnLine Tools via XML

An application creates an XML document containing the content required by the interface to be invoked. The application also provides the access tokens needed for the interface to be invoked. The application must know which URL to use to access the desired interface.

Upon establishing connection with the URL, the application sends the HTTP message to the URL using the POST method. The request HTTP message consists of a header section and a content section. The header section specifies the HTTP method (POST), the content type (application/x-www-form-urlencoded), the content length, and so on, as per HTTP 1.0 or 1.1 specification. The content of the HTTP message is the XML document containing the data needed for the interface to be invoked. The application waits for a response.

The interface receives the HTTP content, and attempts to parse the received XML document and perform the requested action.

The interface generates new XML content to be returned to the application. The content type is set to application/x-www-form-urlencoded. The response is returned to the HTTP server, which sends it to the application.

The application, upon receiving the response, extracts the content according to the content type, and evaluates the response to determine if the desired service was rendered.

Base64 Encoding

Note: Base64 Encoding is only required for Signature Tracking and Shipping.

Base64 encoding is used to preserve binary data. The UPS OnLine Tools server uses **B**ase64 encoding to preserve images. Listed below are links to help you better understand Base64 encoding.

- This details Sun's interface in one of its packages that codes and decodes Base64

  http://java.sun.com/products/commerce/release_10ea1/api/Package-javax.commerce.util.html
- This link contains a detailed discussion of the RFC and its implications

  http://www.freesoft.org/CIE/RFC/1521/7.htm
- These sites offer classes, which code and decode Base64. We have not tested, much less investigated these, and suggest you do your own search and due diligence investigations.

  http://www.fourmilab.ch/webtools/base64/

  http://www.davecentral.com/7202.html

Secure Socket Layer (SSL)

SSL technology is used to protect sensitive data while traveling over public domains. UPS requires you to use SSL for all transactions. The following sites contain more information on SSL. They are listed for your convenience. UPS does not endorse these sites or products in any way.

- These Sun sites contain a good guide to SSL issues, one for JDK 1.1, the other for JDK 1.2:

  http://java.sun.com/products/jdk/1.2/docs/guide/rmi/SSLInfo.html

  http://java.sun.com/security/ssl/API_users_guide.html

  http://www.phaos.com/solutions.html
- This site is the home for a free SSL implementation written in Java. These are listed for your convenience.

  http://speedy.rtfm.com/puretls/
- These sites offer licensed SSL implementations for Java.

  http://www.certicom.com/products/sslplus_java.html

  http://www.alphaworks.ibm.com

UPS OnLine Tools support the following browsers:

- Netscape Navigator 3.0 and later
- Microsoft Internet Explorer 3.02 and later
- America Online 3.0 and later

Certificates

The OnLine Tools currently use certificates from GTE CyberTrust and VeriSign. There are multiple ways one can add a certificate to be used by their application dependent upon the environment, programming language, and

type of application. To obtain the proper certificate, place the XML Tool's URL in a browser (https://wwwcie.ups.com/ups.app/xml/[ToolName] for CIE and https://onlinetools.ups.com/ups.app/xml/[ToolName] for production), connect to the URL, and double-click on the "lock" on the bottom right of the window (using Internet Explorer). After that the steps can be followed to obtain and install the certificate.

XPCI

XML Package Carrier Interface (XPCI) defines a vocabulary and structure for describing packages, shipments, and the activity details for package carriers and their customers. XPCI is a set of DTDs that defines the terminology, transaction enveloping, and XML message definitions. For a client to be XPCI-compliant, the client must generate a well-formed XML message that validates against the XPCI DTDs.

UPS OnLine Tools demand as a pre-condition that all messages be XPCI-compliant. This means that each message must validate against its corresponding DTD, however, the XML message itself should not contain a DOCTYPE. UPS OnLine Tools do not use the XML DOCTYPE reference.

Access Request

An XML Access Request message containing your UserId, Password and Access Key must be concatenated in front of every XML Service Request message. Refer to the XML Request code samples in the Programming Information chapter for examples of submitting the Access Request message.

Connecting and Messaging

To invoke UPS OnLine Tools:

1. Open a secure TCP/IP socket or secure URL connection using the connection address for the interface to be invoked.
2. Create an XML Service Request message. All messages must be XPCI-compliant.
3. Send an XML Access Request message concatenated in front of the Service Request message to the tool. To send a request message to a tool, an application writes a stream of data to the tool via a secure TCP/IP socket or secure URL connection. The data stream must be in the form of an HTTP POST request message.
4. Receive the XML response message from the tool. To read a response from a tool, an application reads the response in XML format via a secure TCP/IP socket or secure URL connection.
5. Parse the XML response message to retrieve data.
6. Identify and handle error conditions.

Transaction Framework

The XPCI defines a common element found on all transactions. This container node, labeled TransactionReference, contains the transaction specific information CustomerContext and XPCI Version.

XpciVersion controls a transaction language's version separately from the vocabulary of business terms. XpciVersion identifies the version of the transaction language. The implied version is the most recent version. The tag XpciVersion identifies the version of the business vocabulary.

The client uses CustomerContext to synchronize request/response pairs. The client establishes CustomerContext, which can contain any information you want, as long as it is valid XML; it is echoed back to the server.

The success or failure of a transaction is detailed in ResponseStatusCode and ResponseStatusDescription. The UPS XPCI server only supports synchronous interchanges at this time. XPCI compliant transactions always contain a request and a response.

Interchange Interface Specification

Each UPS OnLine Tools interchange contains common elements. These elements are used to frame each request, response, and error.

The UPS OnLine Tools interchange operates within an HTTP 1.0 framework. An XML request is sent to an interface via the HTTP POST method. An XML response is returned. The interchange is synchronous (that is, the UPS OnLine Tools client thread waits for the UPS OnLine Tools server to respond).

The following XPCI tables represent the interchange interface elements involved in the UPS OnLine Tools transactions.

Table 1: XPCI Interchange INPUT Element Definitions

Element (Xpath)	Required / Cardinality	Type	Length	Description / Values
Request/ TransactionReference	Yes One	Container	N/A	Transaction Reference container tag.
Request/ TransactionReference/ CustomerContext	No Zero or One	ANY	0..512	Customer context can be any free form, valid XML characters. The client uses CustomerContext to synchronize request/response pairs. The client establishes CustomerContext, which may contain customer-defined valid XML tags that are echoed in the response.
Request/ TransactionReference/ XpciVersion	No One	Alpha-numeric	6	Identifies the version of the message. The current XpciVersion is 1.0001.
Request/ RequestAction	Yes One	Alphanumeric	1..15	Identifies the function to be invoked. Each Tool has a unique ID name.

Table 1: XPCI Interchange INPUT Element Definitions

Element (Xpath)	Required / Cardinality	Type	Length	Description / Values
Request/ RequestOption	No One	Alphanumeric	1..15	Identifies the optional processing to be performed. Each service defines the possible options.

On a successful exchange with the Tools, only the first four elements below will be returned as output. If an error occurs, additional fields will be populated.

Table 2: XPCI Interchange OUTPUT Element Definitions

Element (Xpath)	Required / Cardinality	Type	Length	Description / Values
Response/ TransactionReference	Yes Zero or One	Container	N/A	Container for customer provided data and the XPCI Version.
Response/ TransactionReference/ CustomerContext	No Zero or One	Any	0..512	Customer context can be any free form, valid XML characters. The client uses CustomerContext to synchronize request/response pairs. The client establishes CustomerContext, which may contain customer-defined valid XML tags that are echoed in the response.
Response/ TransactionReference/ XpciVersion	No Zero or One	Alpha-numeric	6	Identifies the version of the message. The current XpciVersion is 1.0001.
Response/ ResponseStatusCode	Yes One	Numeric	1	Identifies the success or failure of the transaction. **1** = Successful **0** = Failed
Response/ ResponseStatusDescription	No Zero or One	Alpha-numeric	7	Describes Response Status Code. Returns text of “Success” or “Failure”.
Response/Error	No Zero to Many	Container	N/A	If an error is encountered during the interchange, the Response contains an error. If the error is present, then the ErrorSeverity and ErrorCode are required.

Table 2: XPCI Interchange OUTPUT Element Definitions

Element (Xpath)	Required / Cardinality	Type	Length	Description / Values
Response/Error/ ErrorSeverity	Yes One	Alpha-numeric	1..15	Describes the severity of the error. TransientError - Customer's data has not been processed due to system unavailability. The customer has to wait and try again. HardError - The error was encountered processing the customer's data and that the data needs correction. Warning - The customer's data was successfully processed; however, there were warnings encountered during processing.
Response/Error/ ErrorCode	Yes One	Numeric	1..15	A numeric value that describes the error. Each tool defines a range of error codes. Refer to Error Conditions table in the 'Programming Information' chapter for detailed descriptions of all errors.
Response/Error/ ErrorDescription	No Zero or One	Alpha-numeric	1..50	Describes the error code.
Response/Error/ MinimumRetrySeconds	No Zero or One	Numeric	1..5	Number of seconds to wait until retry. This field is populated on special conditions of the Transient Error only, as defined by the service. A number between **1** and **86400** (24 hours)
Response/Error/ ErrorLocation	No Zero to Many	Container	N/A	Identifies the element in error.
Response/Error/ ErrorLocation/ ErrorLocationElementName	No Zero Or One	Alpha-numeric	1..512	The XPATH name of the element in error. This is a valid XPATH pointing to an element in the request document.

Table 2: XPCI Interchange OUTPUT Element Definitions

Element (Xpath)	Required / Cardinality	Type	Length	Description / Values
Response/Error/ ErrorLocation/ ErrorLocationAttributeName	No Zero or One	Alpha-numeric	1..50	The name of the attribute in error. This is the name of the attribute contained by the Error Location Element.
Response/Error/ ErrorLocation/ ErrorDigest	No Zero to Many	Alpha-numeric	Bound by the size of the Request data.	The contents of the element in error.

Data Type Codes

UPS OnLine Tools supports the XML 1.0 specification, as recommended by the World Wide Web consortium (http://www.w3.org/TR/REC-xml). All message data must conform to this specification.

All message data is text (a sequence of characters), which may represent markup or character data. A character is an atomic unit of text, as specified by ISO/IEC 10646*. Legal characters are tab, carriage return, line feed, and the legal graphic characters of Unicode and ISO/IEC 10646. The use of compatibility characters, as defined in The Unicode Standard, Version 2.02†, is discouraged.

Supported Character Set

UPS OnLine Tools supports the UTF-8 and ISO–8859-1 character sets.

Dates, Times, and Numbers

Reducing all data to character data simplifies many aspects of message parsing and transport. However, this also creates problems when more complex data is needed, since all data is text, dates, times, and numbers require agreement, with regard to their representation. UPS OnLine Tools use the following representation of dates, times and numbers.

Table 3: Representation of Dates, Times, and Numbers

Data Type	Description
Date	Two date formats are supported: YYYY-MM-DD and YYYYMMDD
Time	Two time formats are supported: HHMMSS and HH:MM:SS, where HH is the hour field and uses a 24-hour clock (military time). All time is based on LOCAL time zone.
Number	Decimal numbers are represented with 2 decimal positions. Integers are represented without any decimal points.
Telephone Number	Only digits 0-9 are allowed. Length must be between 10 and 14 digits.

* ISO (International Organization for Standardization). ISO/IEC 10646-1993 (E). Information technology -- Universal Multiple-Octet Coded Character Set (UCS) -- Part 1: Architecture and Basic Multilingual Plane. [Geneva]: International Organization for Standardization, 1993 (plus amendments AM 1 through AM 7).

† The Unicode Consortium. The Unicode Standard, Version 2.0. Reading, Mass.: Addison-Wesley Developers Press, 1996.

HTTP Request and Response

The following text and examples illustrate HTTP requests and responses. The examples illustrate the HTTP POST command and all necessary headers. The response shows the response headers and response data. The bold LF in the XML is added for formatting and does not exist in the actual data.

XML Request Messages over HTTP

Every HTTP request consists of four parts:

- request line
- header fields
- empty line
- message body

Sending Requests

To send a request to a tool, an application writes a stream of data to the tool via a TCP/IP socket or URL connection. The data stream must be in the form of an HTTP request message. An application can create a formatted request message in a buffer, and then write the contents of the buffer to the tool. The exact syntax used to write the buffer to the tool varies, depending on the programming language and the communication API being used.

Request Line

The request line comprises the following three elements:

- Method
- Request-URL
- HTTP-version, and ending with carriage-return-line-feed (CRLF) string

Table 4: Request Line Elements

Element	Description
Method	Indicates the method for sending data to the resource identified by the Request-URL. Method is case-sensitive. Though other values are possible, the UPS OnLine Tools require this be set to POST.
Request-URL	The location of the tool to which the message data should be sent.
HTTP-version	The HTTP version of the message.

Header Fields

Header fields provide general information about a request. To understand what kind of data is being received, every request containing a message body should include a Content-type header. The Content-type header field indicates the media type (text, HTML, image, etc.) of the message body sent to the recipient. For the POST method, HTTP requires that the Content-Length header be supplied. The Content-Length provided in the header is the length, in bytes, of the message body.

Empty Line

After the necessary headers are added to the request, an empty line must be added to indicate the end of the header fields and the start of the message body, if there is one.

Message Body

The message body contains the information to be processed by a tool. The message must be XPCI-compliant.

HTTP Request Example

```
Request:  POST /address validation/1.1

Content-Type: application/x-www-form-urlencoded

Content-Length: 273

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

Within the request line, each element is separated by a blank space (SP). No CRs or LFs are allowed, except in the final CRLF sequence. The structure of the request line is shown below, followed by an example.

```
Request Line = Method SP Request-URL SP HTTP-version CRLF

Example: POST /address validation HTTP/1.1
```

XML Response Messages over HTTP

Every response consists of four parts: status line, header fields, empty line, and message body.

Reading Responses

To read a response from a tool, an application reads the response in XML format via a TCP/IP socket or URL connection. The application parses the data out of the response data stream. The exact syntax of the response complies with the XPCI specification.

Status Line

The status line comprises three elements:

- HTTP-version
- Status-Code
- Reason-Phrase, and ending with carriage return-line feed (CRLF) string

Table 5: Status Line Elements

Element	Description
HTTP-version	The HTTP version of the message.
Status-Code	A 3-digit integer result code of the attempt to understand and satisfy the request.
Reason-Phrase	A short textual description of Status-Code.

HTTP Response Example

```
HTTP/1.1 200 OK
Server: Netscape-Enterprise/3.6
Date: Fri, 06 Aug 2004 LF
21:04:44 GMT
Content-type: application/x-www-form-urlencoded
<?xml version="1.0" encoding="UTF-8"?>LF
```

Within the status line, each element is separated by blank spaces (SP). No CRs or LFs are allowed, except in the final CRLF sequence. The structure of the status line is shown below, followed by an example.

```
Status Line = HTTP-version SP Status-Code SP Reason-Phrase CRLF
```

Example: `HTTP/1.0 200 OK`

Address Validation Programming Information

Address Validation

UPS Address Validation

Introduction

With UPS Address Validation, available in the latest XML technology, you don't have to worry about your customers entering incorrect address information. If customers make a mistake, UPS Address Validation alerts them with an error message, ensuring that errors are corrected at the point of entry long before orders leave the shipping dock. This reduces costly returns for you and headaches for your customers.

UPS Address Validation uses U.S. Postal Service guidelines to thoroughly check the city, state and postal code of every shipment. UPS provides up to ten alternate addresses, including an accuracy rate that lets your customers know how closely the address they entered matches the suggested address.

With UPS Address Validation, You Can:

- Reduce operating costs by minimizing returns and correction charges.
- Improve customer service by assisting shoppers when they place orders.

Your Customers Can:

- Receive shipments quickly and accurately, without delivery delays due to incorrect addresses.
- Be assured their packages will be addressed correctly

For more information on UPS OnLine Tools, including UPS Address Validation, please visit http://www.ec.ups.com.

Tool Overview

This tool assesses the accuracy of an input city, state, postal code combination, and returns a list of up to 10 valid city/state/postal code combinations that closely match the input. The tool returns each valid city/state/ postal code combination with an assigned rank and quality value to indicate how closely it matches the input.

The UPS Address Validation Tool is only supported for addresses within the United States. All combinations of city, state and postal code must be for addresses within the United States.

Connection Address

Address Validation request documents must be sent to the UPS OnLine Tools server for processing. Each request requires specific processing based on the request type; therefore, each tool has a unique URL for connection purposes. For Address Validation, the link is: https://onlinetools.ups.com/ups.app/xml/AV

Note: Due to the technology employed by UPS to most efficiently route customers' requests to the Tools servers in a timely fashion and to prevent issues which could arise from future upgrades by UPS it is necessary to allow the URL for the OnLine Tools to resolve to the appropriate IP addresses for the Tools. Due to these reasons please do not hard code any IP addresses for the Tools.

Please review the Customer Integration Environment section for testing, certification, and moving to production.

Address Validation Process

To receive Address Validation information, an application sends a request to the Address Validation interface. The Address Validation request must contain one of the following input combinations:

- City, State, and Postal Code
- City
- Postal Code
- City and State
- City and Postal Code
- State and Postal Code

Once the request has been successfully submitted, the Address Validation tool returns the following output data for each match (the closest match is returned first):

- Rank
- Quality
- City
- State
- Low-end postal code match
- High-end postal code match

When the Address Validation tool finds close matches for a given input combination, a postal code range may be associated with each match. For example, suppose the input combination is **Atlanta, GA, 30300**. The Address Validation tool would recognize that **30300** is an invalid postal code and would return up to 10 valid candidates that closely match the input combination. Some matches include a postal code range (for example, **30301-30371**); however, some matches only have one associated postal code, as illustrated in the table below. In this example, **30301** would be the low-end postal code match and **30371** would be the high-end postal code match. Therefore, there are 71 postal codes associated with this particular match.

Table 1: Returned Address Matches

Rank	Quality	City	State	Postal Code Range
1	0.926	Atlanta	GA	30301 - 30371
2	0.926	Atlanta	GA	30374 - 30381
3	0.926	Atlanta	GA	30383 - 30390
4	0.924	Atlanta	GA	30392 - 30392
5	0.924	Atlanta	GA	30394 - 30394
6	0.924	Atlanta	GA	30396 - 30396
7	0.924	Atlanta	GA	30398 - 30399
8	0.919	Atlanta	GA	31106 - 31107

Table 1: Returned Address Matches

9	0.919	Atlanta	GA	31150 - 31150
10	0.919	Atlanta	GA	39901 - 39901

Displaying the UPS Address Validation Notice

You must display the following notice, or such other language provided by UPS from time to time, in reasonable proximity to the Address Validation input and output information screens:

" NOTICE: UPS assumes no liability for the information provided by the address validation functionality. The address validation functionality does not support the identification or verification of occupants at an address."

Table Notes

The following input and output tables are for reference only and may include data elements that are contained in the DTD, but are not relevant for the use of this tool. Elements that are " Not Relevant For This Tool" or are " Not Populated for This Release" are shaded in gray. Elements that are required or are optional for this tool are not shaded. Please note that the XPCI DTD documents for this tool contain some data elements that are not referenced in these tables and are not relevant for this tool at this time.

Description/Values Definitions

- Can Be Used—the data element is optional and can be used in accordance with the terms specified in the Validation Rules.
- Defaults To—identifies the default values for data elements that are not populated.
- Format—identifies specific formats that will be recognized for a specific data element.
- Not Populated for This Release—the referenced data element is not used for this release of this Tool, but may be used in a future release. The data element will not be processed and no error will be returned.
- Not Relevant for This Tool—the referenced data element is not pertinent to this tool. However, if passed, the data element will not be processed and an error message will not be returned.
- Required For—the referenced data element will be processed if the conditions identified are met. If the conditions are not met, the element may be ignored or an error returned (if stated rules are violated).
- Valid Values—identifies the specific values or parameters that will be recognized for the referenced data element.

USPS Postal Addressing Standards

When a user inputs abbreviations or certain punctuation marks in an address line that do not meet United States Postal Service (USPS) standards, the Address Validation tool may interpret and convert these abbreviations and punctuations to conform to USPS standards. Be sure to reference USPS Publication 28 for more detailed information on standard abbreviations and punctuation of address information.

Address Validation Request Input

Refer to the General Programming Information chapter for a description of the Transaction Reference elements.

Table 2: Address Validation Request Input

Element (Xpath)	Required / Cardinality	Type	Length	Description / Values
AddressValidationRequest/ Request/RequestAction	Yes One	Char	2	The action to be taken by the Address Validation tool. Must contain **AV** to execute address validation.
AddressValidationRequest/ Address	Yes One	Container	N/A	Address container tag.
AddressValidationRequest/ Address/City	Cond. Zero to Many	Char	max 40	U.S. city to be validated. (A valid city/state/postal code combination must be included as input)
AddressValidationRequest/ Address/StateProvinceCode	Cond. Zero to Many	Char	2	State to be validated. (A valid city/ state/postal code combination must be included as input)
AddressValidationRequest/ Address/PostalCode	Cond. Zero to Many	Char	max 9	Postal code to be validated. (A valid city/state/postal code combination must be included as input)

Address Validation Response Output

Once the Address Validation request has been processed, an XML response document will be returned. The response document will meet the XPCI requirements and contain the requested Address Validation information or error information.

The Address Validation tool returns up to 10 City/State/Postal Code combinations (ascending and ordered by rank) that closely match the input combination. Each valid City/State/Postal Code combination is returned with an assigned rank and quality value to indicate how closely the combination matches the input combination.

In cases where no city/state/postal code combinations are found, the response document has a status of success and contains zero address validation result elements.

The following table describes and defines all possible data elements included in the Address Validation response. The required data elements are identified by the word "Yes" in the Required column.

Refer to the General Programming Information chapter for a description of the Transaction Reference elements.

Table 3: Address Validation Response Output

Element (Xpath)	Required / Cardinality	Type	Length	Description
AddressValidationResponse/ AddressValidationResult	Yes Zero to Many	Container	N/A	Address Validation Result container tag.
AddressValidationResponse/ AddressValidationResult/Rank	Yes One	Integer	1..2	The rank of each range result.
AddressValidationResponse/ AddressValidationResult/ Quality	Yes One	Float	1..4	The quality factor, which describes the accuracy of the result compared to the request. **1.0** = Exact match **.95-.99** = Very close match **.90-.94** = Close match **.70-.89** = Possible match **.00-.69** = Poor match
AddressValidationResponse/ AddressValidationResult/ Address/City	Yes One	Char	max 40	The city for this address match.
AddressValidationResponse/ AddressValidationResult/ Address/StateProvinceCode	Yes One	Char	2	The state for this address match.
AddressValidationResponse/ AddressValidationResult/ PostalCodeLowEnd	Yes One	Char	5	When the Address Validation tool finds matches for a given input combination, a postal code range may be associated with each match. This is the low end of the range.
AddressValidationResponse/ AddressValidationResult/ PostalCodeHighEnd	Yes One	Char	5	When the Address Validation tool finds matches for a given input combination, a postal code range may be associated with each match. This is the high end of the range.

Sample XML Address Validation Request

The XML Address Validation request must include the Licensing and Access XML document followed by the Address Validation request. The access information is found in the Access License section of this manual.

Each transaction is made up of two separate XML request documents. These requests are concatenated and posted to the UPS web servers using a single HTTP Post.

When validating the request XML documents, do not treat the two concatenated documents as a single XML document. XML parsers can not parse two concatenated documents. Validate each XML Request separately.

UPS will separate the two documents and parse them individually. To ensure this occurs, verify that `<?xml version="1.0"?>` is at the top of each XML request document.

An XML example of an Address Validation request follows:

```
<?xml version="1.0"?>
<AccessRequest>
  <AccessLicenseNumber>TEST262223144CAT</AccessLicenseNumber>
  <UserId>REG111111</UserId>
  <Password>REG111111</Password>
</AccessRequest>
<?xml version="1.0"?>
<AddressValidationRequest xml:lang="en-US">
  <Request>
    <TransactionReference>
      <CustomerContext>Maryam Dennis-Customer Data</CustomerContext>
      <XpciVersion>1.0001</XpciVersion>
    </TransactionReference>
    <RequestAction>AV</RequestAction>
  </Request>
  <Address>
    <City>MIAMI</City>
    <StateProvinceCode>FL</StateProvinceCode>
  </Address>
</AddressValidationRequest>
```

Sample XML Address Validation Responses

XML examples of successful Address Validation responses follows:

Example 1. Address Validation Response with a single match:

```
<?xml version="1.0"?>
<AddressValidationResponse>
  <Response>
        <TransactionReference>
              <XpciVersion>1.0001</XpciVersion>
        </TransactionReference>
        <ResponseStatusCode>1</ResponseStatusCode>
        <ResponseStatusDescription>Success</ResponseStatusDescription>
```

```
    </Response>
    <AddressValidationResult>
           <Rank>1</Rank>
           <Quality>1.0</Quality>
           <Address>
                  <City>TIMONIUM</City>
                  <StateProvinceCode>MD</StateProvinceCode>
           </Address>
           <PostalCodeLowEnd>21093</PostalCodeLowEnd>
           <PostalCodeHighEnd>21094</PostalCodeHighEnd>
    </AddressValidationResult>
  </AddressValidationResponse>
```

Example 2. Address Validation Response with multiple candidate matches:

```
<?xml version="1.0"?>
<AddressValidationResponse>
     <Response>
           <TransactionReference>
              <XpciVersion>1.0001</XpciVersion>
           </TransactionReference>
           <ResponseStatusCode>1</ResponseStatusCode>
           <ResponseStatusDescription>Success</ResponseStatusDescription>
    </Response>
    <AddressValidationResult>
           <Rank>1</Rank>
           <Quality>0.9975000023841858</Quality>
           <Address>
                  <City>TIMONIUM</City>
                  <StateProvinceCode>MD</StateProvinceCode>
           </Address>
           <PostalCodeLowEnd>21093</PostalCodeLowEnd>
           <PostalCodeHighEnd>21094</PostalCodeHighEnd>
    </AddressValidationResult>
    <AddressValidationResult>
           <Rank>2</Rank>
           <Quality>0.8299999833106995</Quality>
           <Address>
                  <City>LUTHERVILLE TIMONIUM</City>
                  <StateProvinceCode>MD</StateProvinceCode>
           </Address>
           <PostalCodeLowEnd>21093</PostalCodeLowEnd>
           <PostalCodeHighEnd>21094</PostalCodeHighEnd>
    </AddressValidationResult>
    <AddressValidationResult>
           <Rank>3</Rank>
           <Quality>0.8299999833106995</Quality>
           <Address>
                  <City>LUTHERVILLE</City>
                  <StateProvinceCode>MD</StateProvinceCode>
           </Address>
```

```
            <PostalCodeLowEnd>21093</PostalCodeLowEnd>
            <PostalCodeHighEnd>21094</PostalCodeHighEnd>
      </AddressValidationResult>
   </AddressValidationResponse>
```

Address Validation Error Conditions

Several errors can be encountered during the processing of Address Validation requests. Some errors are high in severity while others serve as warnings. The errors numbers are classified according to the table below.

Table 4: Error Code Range

Error Code	Description
01xxxx	XML error.
02xxxx	Architecture error.
15xxxx	Tracking -specific error.

There are three levels of errors:

- Hard Error—Hard Errors represent the highest level of severity and signify that the entire XML request is invalid. Data modifications must be made to the document prior to re-sending. Possible causes of Hard Errors are XML format discrepancies, missing XML elements, invalid data, etc.
- Transient Error—Transient Errors may be recoverable when the XML request is re-sent. Data modifications are not necessary, but the XML request must be re-sent for attempted processing. Causes of Transient Errors include server connectivity or availability outages, database failure, system timeout, etc. Transient Errors are accompanied by a Minimum Retry Seconds element that specifies the duration of time required before the request can be re-sent.
- Warning—Warnings represent the lowest severity and are stated even though processing will continue.

When an error is encountered, it may affect multiple data elements. The user should inspect the Error/ErrorLocation/ErrorLocationElementName element included in the error to determine the name of the invalid element.

The error code can be found in the `<Response>` container which is part of every document returned by UPS OnLine XML Tools. The `<ResponseStatusCode>` will contain the error code and the `<ResponseStatusDescription>` will contain the natural language description.

```
<Response>
   <TransactionReference>
   <CustomerContext>AddressValidation</CustomerContext>
      <XpciVersion>1.0001</XpciVersion>
</TransactionReference>
   <ResponseStatusCode>1</ResponseStatusCode>
   <ResponseStatusDescription>Success</ResponseStatusDescription>
 </Response>
```

Table 5: Address Validation Request/Response Error Conditions

Error Code	Error Severity	Description
10001	Hard	The XML document is not well formed
10002	Hard	The XML document is well formed but the document is not valid
20001	Hard	General process failure
101111	Transient	AV General Error.
101112	Hard	No Address Candidate Found.
250000	Hard	No XML declaration in the XML document
250001	Hard	Invalid Access License for the tool. Please re-license.
250002	Hard	Invalid UserId/password.
250003	Hard	Invalid Access License number.
250004	Hard	Incorrect UserId or Password.
250005	Hard	No Access Identification provided.
250009	Hard	License Number not found in the UPS database.
250019	Hard	Invalid field value.
250047	Hard	License number revoked.
250050	Hard	License system not available.
250052	Hard	Authorization system is currently unavailable.

UPS ONLINE TOOLS

Customer Integration Environment

Customer Integration Environment

The Customer Integration Environment allows customers to test their application prior to launch. This environment is intended for integration testing of customer applications with the UPS servers. No stress testing should ever be performed by customers against any UPS systems.

Once your application has been thoroughly tested, you should redirect the application to the UPS Production Environment.

Please note that while the Customer Integration Environment maintains system availability 24 hours, 7 days each week, there are occasional system down times to allow for server maintenance.

Address Validation

Test your Address Validation application with valid and invalid address elements. It is recommended that you use addresses that are familiar to you, for example, your home or business address. This will ensure that your application has the ability to process success and error responses correctly.

For integration testing, you should direct your Address Validation software to https://wwwcie.ups.com/ups.app/xml/AV.

Once you have completed your testing, you should direct your software to https://onlinetools.ups.com/ups.app/xml/AV.

System Availability

The Customer Integration Environment is available 24 hours a day, 7 days a week.

Server Availability Check

All of the UPS services work using HTTPS POST. Using the same URL as you point your application to, perform an HTTP GET. If the server is available, it will reply with the service name, remote user, server port, server name and servlet path. To see this in action, type the following URL in your web browser:

https://onlinetools.ups.com/ups.app/xml/AV

You should see the following in the browser window:

```
Service Name: AV
Remote User:  null
Server Port:  80
Server Name:  /onlinetools.ups.com
Servlet Path: /ups.app
```

Technical Support

Technical Support

For customers in the United States:

A technical support form is available from the E-Business web site. To access this form login to MyUPS with your UserID and Password. Click to access the Contact UPS page. Then, click on Internet Technical Support. Then, click on OnLine Tools Support. Then, click on Receive Technical Support for UPS e-Commerce Solutions. Finally, click on I'd like technical support for UPS OnLine Tools. This will present you with a form to complete with information regarding the issue for which you are looking for support. A response to your inquiry will be sent within one business day.

If you have not received the UPS OnLine Tools from the E-Business web site, please contact your UPS OnLine Tools representative for technical support.

For International customers outside the United States:

A technical support form is available. Please access your country's UPS web page and Login to MyUPS.com with your UserId and Password. Click to access the Business Solutions Page. Then, click on UPS OnLine Tools. From the left navigation menu, click on Support. Select Technical Support from the web page. Complete the required information and click Submit.

Appendices

Appendix A

Glossary of Terms

- **Accessorials**—Optional service options selected by a customer.
- **API**—Application Programming Interface.
- **Application**—Customer's application integrated with the UPS OnLine Tools.
- **Billable Weight**—The weight used for rate calculation. Depending on the shipment characteristics, this varies from actual weight to dimensional weight to oversize rating.
- **Client Machine**—The computer from which a user communications with UPS.
- **Daily Pickup Account Holder**—Shipper with an established account at UPS whose packages are picked up on a daily basis.
- **Consignee**—Receiver of a shipment.
- **Dimensional Weight**—Dimensional weight considers density, which is the amount of space a package occupies in relation to its actual weight. Calculations are based on the International Air Transport Association (IATA) volumetric standards. For additional information, see the UPS Service Guide.
- **Domestic Shipment**—Any shipper where the Shipper Country is the same as the Consignee Country.
- **Destination**—Address the shipment was sent to.
- **DTD**—Document Type Definition. Set of rules which specify how to use XML.
- **HTTP**—Hypertext Transfer Protocol. An application level protocol for distributed, collaborative and hypermedia information systems. HTTP is a generic protocol used to communicate between user agents and proxies/gateways to other Internet systems.

- **HTTPS**—Secure Hypertext Transfer Protocol. Requires the use of the SSL protocol.

- **Hundredweight**—Service rates that apply only to Ground shipments with a total actual weight of 200 pounds or Air shipments with a total actual weight of 100 pounds or more. For additional information, see the UPS Service Guide.

- **Multi-piece shipment**—A group of packages being shipped together from one shipper location to one consignee. The packages must have the same service (Next Day Air, 2nd Day Air, Ground, etc.) and the same collection of accessorials (Saturday Delivery, Additional Handling, etc.).

- **Origin**—Pickup location for a shipment.

- **Oversize**—Adjusted rate calculation performed when the packages weight and dimensions exceed published thresholds. For additional information, see the UPS Service Guide.

- **Premium Tools** - Customers must be pre-approved for both the UPS Shipping and Signature Tracking Tools prior to downloading the technical documentation. Once implemented, customers must successfully complete a verification process before moving into the UPS production environment.

- **Published Rate**—The standard rates for UPS services.

- **Reference Number**—Customer-defined number, that may or may not be unique, used to identify a shipment.

- **Service Guide**—Describes the services supported by UPS (http://www.ups.com/using/svc-index.html).

- **Shipment**—A group of packages being shipped together from one shipper location to one consignee. The packages must have the same service (Next Day Air, 2nd Day Air, Ground, etc.) and the same collection of accessorials (Saturday Delivery, Additional Handling, etc.).

- **Shipment Identification Number**—UPS-assigned number that uniquely identifies a shipment.

- **Shipper**—UPS account holder. The shipper is billed for all shipments.

- **Secure Socket Layer (SSL)**—Socket protocol that supports authentication, data privacy and secures data from tampering.

- **TCP/IP**—Transport Control Protocol/Internet Protocol. A common suite of communication protocols used to exchange information between computers or processes within a computer. Additional protocols use TCP/IP to accomplish an application specific task such as HTTPS.

- **Tracking Number**—UPS-defined number that uniquely identifies a package.

- **URL**—Uniform Resource Locator. The network address of a service or content.

- **XML**—eXtensible Markup Language. An open standard for defining markup languages to represent structured information over the web. XML documents are used for business-to-business communication and data interchange between dissimilar systems. Network transfers occur with standard HTTPS over TCP/IP.

- **XPCI**—XML Package Carrier Interface. Defines a vocabulary and structure for describing packages, shipments and the activity details for package carriers and their customers. XPCI is a set of DTDs that define the terminology, transaction enveloping and XML message definitions.

Appendix B

Status Codes

Each HTTP response contains a status code. The following table lists the possible values:

Table 1: HTTP Status Codes

Code	Description
200	Request processed successfully.
240	Request Processed, some warnings exist. Check XML Doc for details.
250	Request could not be processed. Check XML Doc for error information.
500	UPS OnLine Tool unavailable; try again later.

Appendix C

Reference Tables

Table 2: Universal Rules

Subject	Rule
Dimensional Values	Dimensional values such as length, width, or height, must be whole numbers. For example, the dimensional length must be a whole number such as 15 15.0 and 15 are not valid.
Phone Number	The value of the PhoneNumber elements are mixed. A PhoneNumber element can contain #PCDATA or StructuredPhoneNumber, but not both. StructuredPhoneNumber contains four elements: PhoneCountryCode, PhoneDialPlanNumber, PhoneLineNumber and PhoneExtension. PhoneCountryCode is the country code portion of the phone number. PhoneDialPlanNumber contains characters used to connect to the country's area switch. PhoneLineNumber contains characters used to connect to a specific end terminal. PhoneExtension contains characters for a phone extension. For US phone numbers, PhoneCountryCode should not be used. For non US phone numbers, the combined length of the values for PhoneCountryCode, PhoneDialPlanNumber, PhoneLineNumber and PhoneExtension must be 15 or less. For US, Canadian, and Caribbean phone numbers; PhoneCountryCode is not used with US numbers, PhoneDialPlanNumber would be the area code, PhoneLineNumber would be the telephone number, and PhoneExtension would be the extension number. An example of a US phonenumber follows; PhoneCountryCode element would not have a value, PhoneDialPlanNumber element's value is "972", the PhoneLineNumber element's value is "5551212" and the PhoneExtension element's value is "5678". This information together logically represents the phone number (972)555-1212 with the phone extension 5678. For all other phone numbers; PhoneCountryCode would be the country code, PhoneDialPlanNumber would be the city code, PhoneLineNumber would be the telephone number, and PhoneExtension would be the extension number. An example of a Italian phone number follows; PhoneCountryCode element's value is "39", PhoneDialPlanNumber element's value is "02", the PhoneLineNumber element's value is "25088700" and the PhoneExtension element's value is "987". This information together logically represents the phone number 39-2-25088700 with the phone extension 987.

Table 3: Pickup Types

Code	Description
01	Daily Pickup
03	Customer Counter
06	One Time Pickup
07	On Call Air Pickup®
11	Suggested Retail Rates
19	Letter Center
20	Air Service Center

Table 4: Package Type Codes

Code	Description
00	Unknown
01	UPS Letter
02	Package
03	UPS Tube
04	UPS Pak
21	UPS Express Box
24	UPS 25KG Box
25	UPS 10KG Box

Table 5: Reference Number Codes

Reference Number Code	Reference Number Description
"00" or an unknown code or no code	"Reference No.1" for the first reference number for the shipment or "Reference No.2" for the second reference number for the shipment.
"28"	"Purchase Order No."
"33"	"Model Number"
"34"	"Part Number"
"35"	"Serial Number"
"50"	"Department Number"
"51"	"Store Number"
"54"	"FDA Product Code"

Table 5: Reference Number Codes

“55”	“Acct. Rec. Customer Acct.”
“56”	“Appropriation Number”
“57”	“Bill of Lading Number”
“58”	“Employer's ID Number”
“59”	“Invoice Number”
“60”	“Manifest Key Number”
“61”	“Dealer Order Number”
“62”	“Production Code”
“63”	“Purchase Req. Number”
“64”	“Salesperson Number”
“65”	“Social Security Number”
“66”	“Fed Taxpayer ID No.”
“67”	“Transaction Ref. No.”
“RZ”	“RMA”
“9V”	“COD Number”

Table 6: U.S. State Codes

State Code	State Name
AL	Alabama
AK	Alaska
AZ	Arizona
AR	Arkansas
CA	California
CO	Colorado
CT	Connecticut
DE	Delaware
DC	District of Columbia
FL	Florida
GA	Georgia
HI	Hawaii
ID	Idaho
IL	Illinois
IN	Indiana
IA	Iowa
KS	Kansas
KY	Kentucky
LA	Louisiana
ME	Maine
MD	Maryland
MA	Massachusetts
MI	Michigan
MN	Minnesota
MS	Mississippi
MO	Missouri
MT	Montana
NE	Nebraska
NV	Nevada
NH	New Hampshire
NJ	New Jersey
NM	New Mexico
NY	New York

Table 6: U.S. State Codes

State Code	State Name
NC	North Carolina
ND	North Dakota
OH	Ohio
OK	Oklahoma
OR	Oregon
PA	Pennsylvania
RI	Rhode Island
SC	South Carolina
SD	South Dakota
TN	Tennessee
TX	Texas
UT	Utah
VT	Vermont
VA	Virginia
WA	Washington
WV	West Virginia
WI	Wisconsin
WY	Wyoming

Table 7: Canadian Province Codes

Province Code	Province Name
AB	Alberta
BC	British Columbia
MB	Manitoba
NB	New Brunswick
NL	Newfoundland
NT	Northwest Territories
NS	Nova Scotia
NU	Nunavut
ON	Ontario
PE	Prince Edward Island
QC	Quebec
SK	Saskatchewan
YT	Yukon

Appendix D

Common Business Vocabulary XML Definitions

The Common Business Vocabulary contains functional elements that are shared across all UPS OnLine Tools XML request and response documents. Vocabulary element names were defined based upon established shipping industry terminology. These element structures can represent a common or custom business entity. All UPS OnLine Tools XML request and response documents reference the common vocabulary.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
AccessLicenseNumber	The identifying number of the Access License. Note: Also referred to Access Key
AccessLicenseProfile	A container that includes country code and language code.
AccessLicenseText	The text of the agreement
AccountNumber	Carrier's customer account number.
Activity	The location, status, and time of occurrence of a package or shipment activity. This represents information that details package or shipment movement through the package delivery cycle.
ActivityLocation	Geographic location where an activity occurred during the movement of a package or shipment.
Additional Handling Charge	The charge applied when a package is identified as or qualified for requiring Additional Handling.
AdditionalHandling	An indicator that determines whether a package requires an additional handling charge. True or on when present.
AdditionalHandling Indicator	An indicator that determines whether a package requires an additional handling charge. True or on when present.
Address	Information that specifies a physical location.
AddressArtifactFormat	The address artifact format contains all of the data to uniquely identify an address to the Address Validation and Verification products.
AddressExtended Information	Describes an apartment, room, suite, space, floor, building or other secondary addressing numeric or alphanumeric that follows a street address.
AddressKeyFormat	Contains all of the basic information about a location without a postal code.
AddressLabelFormat	Format designed to display user input
AddressLine1	The first line of the address (street address).
AddressLine2	The second line of the address (room/floor/suite).

Table 8: Common Business Vocabulary XML Definitions

Element	Description
AddressLine3	The third line of the address (department).
AddressRegionalFormat	Provides information relevant to the location without specifics of individual building, street, and name. Only allows for Town, City, State/Providence, Country and Postal Code.
AddressTokenFormat	PCDATA allows for additional information that has not yet been defined.
AlternateDeliveryDate	PCDATA allows for an alternate date when the shipment should be delivered.
AlternateDeliveryTime	An alternate time when the shipment should be delivered.
AlternateProfileAccess Number	An alternate profile access number.
AttentionName	Contact person for a transaction.
AutoDutyIndicator	Automatically calculates the duty based upon input provided by the DocumentsOnlyIndicator.
BarCodeDelivery Number	UPS Assigned Bar Code Delivery Number used to track a BCDN Delivery Attempt
BCDNPackage	Defines a package assigned to a Bar Code Delivery Number during a Delivery Attempt
BeginDate	Qualifies a reference number-tracking query. Specifies the beginning of the pickup date range for which to search for a tracking number or shipment identification number. Format: YYYYMMDD
BillDutyTaxShipCharges toShipper	A billing type that instructs UPS to bill the shipper or third party for destination country duty and tax, as well as all shipping changes.
BillImporter	Importer of record for a shipment. This element specifies the payment method for the importer charges and either the UPS account number or credit card information.
BillingWeight	The weight used for rate calculation. This varies from the actual weight when the package dimensions causes dimensional weight or oversized weight rating calculation to occur.
BillReceiver	The receiver's UPS account number or credit card information. This information is used when UPS is instructed to bill the receiver for all or part of the total shipping charges.
BillShipper	The shipper's UPS account number or credit card information. Also specifies payment method for the shipment.
BillThirdParty	The information required to bill a third party for charges related to a shipment.
BillThirdPartyConsignee	The information required to bill a third party consignee for charges related to a shipment.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
BillThirdPartyShipper	The information required to bill a third party shipper for charges related to a shipment.
BookNumber	Pickup book number. UnitOfMeasurement indicates the units in which the weight is expressed. If UnitOfMeasurement is not present, the default of U.S. pounds is used.
BothIndicator	Indicates whether the number provided in the AddressExtendedInformation. Should the field contain both a letter and a number or just a letter it is referred to as both.
BrokerCode	Identifies the Broker for the shipment. Valid only for Canada shippers to the US when Standard Service is selected.
BuildingName	Allows for information concerning the name of the building.
BusinessTransitDays	Number of business days the shipment will take to get from one location to another.
CallTagARS	Information for a Call Tag/Authorized Return Service package.
CallTagARSCharge	The charge applied for Call Tag/Authorized Return Service on a package.
Candidate	A potential match provided by the Address Validation tool.
CertificateOfOrigin	Information relating to the Certificate of Origin.
City	City portion of the address.
ClientSoftwareProfile	Information relating to the software installer, the software name, provider and version number.
COCode	Related to certificate of origin.
COD	Indicates that money is to be collected by the UPS service provider prior to delivering a package.
CODAmount	The currency code and the amount of money that the UPS service provider must collect prior to delivering a package.
CODCharge	Charge amount for COD service.
CODCode	The code associated with the type of COD. **1** = Regular COD **2** = Express COD **3** = Tagless COD
Code	A generic building block element used throughout the vocabulary. Code has meaning within the context that it is used.
CODFundsCode	The code that indicates the type of funds used for the COD payment. **0** = All supported funds accepted **8** = Cashier's check or money order – no cash allowed
CODStatus	Information regarding the status of the COD.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
Comments	Comments or remarks directed from the shipper to the consignee at the shipment level.
CommodityCode	The international commodity or harmonized code that represents the commodity contained in the invoice line, as indicated on the commercial invoice.
CompanyName	Name of a company. CompanyName has meaning within the context in which it is used.
CompanyURL	URL of the company.
ConsigneeBilled	The information required to bill a consignee for the charges related to a shipment.
ConsolidatedClearance Quantity	The number or consignees in the consolidated clearance.
Contact	Information including the name, title e-mail address, phone number and fax number of the contact person.
ContactInfo	Information about the contact where only Name and phone number may be provided.
ContactPhoneNumber	The telephone number of a contact person.
ControlNumber	COD control number for a COD package.
CostAndFreight	Billing method where the shipper pays shipping charges to the port of import, and the consignee pays the balance.
Country	Country Name
CountryCode	The country code referenced in the context of the containing element. CountryCode is the UPS billing code or IATA country code.
CreditCard	Information specifying a credit card.
CurrencyCode	Represents supported currency types. UPS OnLine Tools only supports U.S. dollars.
CustomerCenterCutoff	Customer Service call time.
Date	A date container. Date has context within the element in which it is contained. Format: YYYYMMDD
DayOfWeek	Provides the Day (Monday, Tuesday, etc.)
DCISNumber	Delivery Confirmation Control number associated with the delivery confirmation for the package.
DCISType	Indicates that the Delivery Confirmation option is in use for this package. **1** = Name/Date **2** = Signature/Date

Table 8: Common Business Vocabulary XML Definitions

Element	Description
DeclarationStatement	Statements from the shipper declaring certain facts or criteria to be true. The statements are usually directed at customs or a government agency, or placed on the invoice as a result of a customs regulation.
DeclaredValue	The amount for which the package/shipment is Declared.
DelayCount	Number of days the shipment will be delayed, typically reserved for international shipments that may be delayed in customs.
DelDutyPaidVATUnPaid	Deliver duty paid, VAT unpaid specifies the billing method for the shipment. The billing method specifies that the shipper pays the shipping charges and duty, and the consignee pays the value-added tax.
DeliveryAttemptDate	Date the delivery was attempted
DeliveryAttemptTime	Time the delivery was attempted
DeliveryConfirmation	The information required for requesting a type of delivery confirmation for a package.
DeliveryConfirmation Charge	The charge applied when Delivery Confirmation is requested for a package.
DeliveryStop	Defines all the packages assigned to a specific Bar code delivery Number during a delivery attempt
DeliveryZone	Delivery zone required for international shipments.
Description	A building block element that has meaning within the context in which it is used.
DescriptionOfGoods	General description of the goods contained in the shipment, as indicated on the waybill.
DestinationControl	The Destination Control statement is required to be on the invoice, and transmitted for all U.S. to P.R export shipments containing invoice level detail.
DestinationCountryCode	For use with tracking. Limits the returned track items by the country code of the destination address.
DestinationPostalCode	For use with tracking. Limits the returned track items by the postal code of the destination address.
DeveloperLicense Number	The identifying number of a developer license.
DimensionalWeight	The weight of a package, with size factored in.
Dimensions	The physical dimensions of an object.
DiscountRebate	The discount or rebate amount as indicated on the commercial invoice.
DocumentCode	Identifies the contents type of the entire shipment. **1** = Letter (Document only) **2** = Document (Non-letter only)

Table 8: Common Business Vocabulary XML Definitions

Element	Description
DocumentsOnly	An indicator for international shipments only which states that package contains only documents. True or on when present.
DocumentsOnlyIndicator	An indicator for international shipments only which states that package contains only documents. True or on when present.
EarliestDeliveryTime	The earliest delivery time that a Next Day Air Early A.M. package can be delivered to the consignee. Format: HHMMSS
EarliestTimeReady	The earliest time ready
EMailAddress	E-Mail address of the entity containing the element.
EMailMessage	Allows for a memo and an image
EmployerIdentification Number	Employer identification number
EndDate	Qualifies a reference number-tracking query. Specifies the ending of the pickup date range for which to search for a tracking number or shipment identification number. Format: YYYYMMDD
EstimatedArrival	A container that provides (DayOfWeek, Time, Date, BusinessTransitDays, TotalTransitDays, CustomerCenterCutoff, RestDays, HolidayCount, NextDayPickupIndicator, DelayCount, PickupDate)
EvenIndicator	Indicates whether the number provided in the AddressExtendedInformation is in fact an even number
ExpirationDate	Credit card expiration date.
ExportCommodity ControlNumber	The ECCN for the commodity contained in the shipment, as indicated on the waybill.
ExportLicense Information	See LicenseExpirationDate and LicenseInformation tags in this table.
ExtendedDestination	The presence of this tag indicates service to extended area domestic and international destinations.
ExtendedDestination Indicator	The presence of this tag indicates service to extended area domestic and international destinations.
EvenIndicator	Part of the OddEvenChoices Parameter, this element indicates whether the is in fact even.
FaxDestination	Fax information for the entity containing the element.
FaxDestinationIndicator	The presence of this tag indicates an international fax destination.
FaxNumber	The phone number of the fax machine at the party's site.
FlatRate	A flat charge to be applied to a package or shipment.
FloorID	Identifies what floor to delivery to.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
FreeOnBoard	UPS billing method where the shipper or third party pays the shipping charges to the port of export, and the receiver or importer pays the remaining charges.
FreightCharges	Information concerning the monetary value of the freight charges in the proper currency.
FreightCollect	UPS billing method where the receiver or importer pays all shipping charges.
GraphicImage	A label image. The image is encoded using a Base64 encoding algorithm. LabelImageFormat defines the format of the image.
Guaranteed	Indicates whether the service will be guaranteed or not. The element is not named GuaranteedIndicator because future iterations may contain descriptions of disclaimers.
GuaranteedDaysTo Delivery	The number of business days that UPS has determined it will take for a shipment to reach its destination.
HandlingCharge	A shipper added charge (flat rate or percentage) to be added for handling of the shipment.
HandlingChargeAmount	Information about the monetary value of the shipment as well as the proper currency code.
HazardousMaterials Charge	The charge applied when a package is identified as containing hazardous materials.
HazardousMaterialsCode	Indicates that the package contains hazardous materials. **0** = Default **1** = Hazardous Materials **2** = Electronically billed Hazardous Materials
Height	See UnitOfMeasurement.
High	Extended address number high
HoldForPickup	The presence of this tag indicates that hold for pickup service was provided.
HoldForPickupIndicator	The presence of this tag indicates that hold for pickup service was provided.
HolidayCount	Number of days the shipment is disrupted because of holidays.
HTMLImage	HTML formatting information for a label image. A browser uses HTMLImage and GraphicImage to render the shipping or pickup summary barcode labels.
HTTPUserAgent	Describes browser properties required to scale and rotate a label image, so that the image is rendered properly on the printed label stock. HTTPUserAgent contents are the standard http header produced by a web browser.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
HundredWeight	The presence of this tag indicates that hundredweight service was provided.
HundredWeight Indicator	The presence of this tag indicates that hundredweight service was provided.
Image	Provides information about the image format and the graphic image
ImageFormat	Defines the format of the image contained in the Graphic Image (i.e. gif, jpg etc…)
ImporterOfRecord	The information required to identify the person or organization importing the shipment.
InformationLevel	Indicates shipment of package level advisory level information. **S** = Shipment **P** = Package
InsuranceCharges	Insurance amount as indicated on the commercial invoice.
InsuredValueCharge	The amount charged for insurance/Declared Value.
InvoiceLineTotal	A container containing monetary value and currency code to show the value of the package/shipment.
InvoiceNumber	The Invoice Number for International Shipments.
ItemizedPackageCharges	The listing of charges other than transportation being applied to the package.
ItemizedShipment Charges	The listing of charges other than transportation being applied to the shipment.
LabelControlNumber	The information used to identify the product and printer information on labels.
LabelImage	The elements needed to render a label on a printer or in a browser. Specifies the format in which GraphicImage is represented. If LabelImageFormat is GIF, LabelImage contains GraphicImage and HTMLImage. Otherwise, it contains only GraphicImage.
LabelImageFormat	The format of a label image byte stream. Permissible values are GIF image and EPL2 Eltron printer image.
LabelPrintMethod	The device used to print a label image.
LabelSpecification	Specifies how to generate a label image. See also LabelPrintMethod, HTTPUserAgent, LabelStockSize, LabelImageFormat.
LabelStockSize	The size of the label stock used to render a label image. See also UnitOfMeasurement, Height, Width.
LanguageCode	Destination language code. If this tag is not present, then the default language is English.
LatestTimeReady	The latest time the pickup is ready
Length	See UnitOfMeasurement.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
LicenseExpirationDate	Expiration date for the export license for the commodity.
LicenseInformation	Validated export license number for the commodity contained in the shipment, as indicated on the waybill and/or S.E.D. May also contain license exceptions. Values for license exceptions **APR** = Items for export or re-export not controlled for nuclear nonproliferation, missile technology or crime control **AVS** = U.S. aircraft on foreign sojourn into foreign country **BAG** = Individual or exporting carriers crew members baggage **CIV** = National security items for civil end users **CTP** = Computers and computer parts **ENC** = Encrypted software and hardware – financial institutions **GBS** = Export or re-export to Country Group B; controlled for national security reasons **GFT** = Gift shipments; packages to individuals , religious, charitable or educational, donations of basic needs **GOV** = Government shipments, covers shipments for U.S. government agencies, personnel or of cooperating foreign governments **KMI** = Encrypted software and hardware **LVS** = Value of Shipments limited **NLR** = No license **RPL** = Servicing and replacement of parts and equipment, one for one replacement parts service or replacement of equipment **TMP** = Temporary exports, export and re-export of beta test software **TSPA** = Software or technology outside the scope of export regulations **TSR** = Technology and software, national security reasons, Country Group B **TSU** = Technology and software shipments, of basic requirements, data supporting prospective or actual bids, offers to sell, lease or supply an item, software update for fixing programs, mass marketed software
LineMonetaryTotals	Line monetary total associated with the commodity or invoice line, as indicated on the commercial invoice.
LineNumber	Line number associated with the commodity or invoice line, as indicated on the commercial invoice.
LineUnitAmountPrice	The per-unit value of the commodity contained in the invoice line, as indicated on the commercial invoice.
Location	Related to the pickup details of the package/shipment. Can contain additional direction information.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
Low	Extended address number low
MarksAndNumbers	Refers to any distinguishing marks and numbers that appear on the package.
Memo	Free-form message.
MerchandiseDescription	Refers to a description of the overall package contents.
Modify	The presence of this tag indicates that the modification service was provided.
ModifyIndicator	The presence of this tag indicates that the modification service was provided.
MonetaryValue	An amount of money. Its value is determined by the currency code to which it is related.
Name	Name of the generic element that contains it.
NextDayPickupIndicator	If present, indicates package can be picked on the next Day.
NotificationCode	The type of shipment notification requested.
Number	A generic field for holding a number.
NumberBCDNPackages	The number of packages assigned to a Bar Code Delivery Number.
NumberOfPackagesPer Commodity	Number of packages in the shipment that contain one or more units of the good.
OddIndicator	Indicates whether the number provided in the AddressExtendedInformation is in fact an odd number
OnCallAir	Specifies an on call air shipment.
OnLineTool	Container for the ToolID and the ToolVersion
OriginCountryCode	The country code that pertains to the origin of the shipment.
OtherCharges	Any other amount being charged as indicated on the commercial invoice.
OtherDocuments	The presence of this tag indicates that documentation is attached to an international shipment.
OtherDocuments Indicator	The presence of this tag indicates that documentation is attached to an international shipment.
OversizePackage	Indicates that a package's dimensions exceed the carrier's package dimension limit.
Package	Package defines the package that is either to be shipped or tracked.
PackageResults	Carrier-generated information for each package in a shipment, after UPS has fully processed the shipment.
PackageServiceOptions	Defines service options available for packages. See also DeliveryConfirmation, COD, InsuranceValue, EarliestDeliveryTime, HazardousMaterialsCode, SignatureRequired, HoldForPickup, VerbalConfirmation, ShipmentNotification.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
PackageWeight	Weight of a package. See also Weight, UnitOfMeasurement. If UnitOfMeasurement is not present, pounds assumed.
PackagingType	Type of packaging in which the goods being shipped are packed.
PageNumber	Page number of the shipper's shipping book. PageNumber and BookNumber uniquely identify a manifest.
PartiesToTransaction	Identifies the shipper and consignee/importer as related or non-related, as indicated on the waybill and/or S.E.D. **R** = Related **N** = Non-Related
PartNumber	The shipper's part number or reference number for the commodity contained in the invoice line, as indicated on the commercial invoice.
Password	Client's password. Password and UserId are used to authenticate the client system during login.
PaymentInformation	Method shipper is using to pay for a shipment. See also Prepaid, FreightCollect, BillThirdParty, FreeOnBoard, CostAndFreight, DelDutyPaidVATUnPaid, BillDutyTaxShipChargestoShipper.
PaymentTerms	Description of the payment terms.
Percentage	A generic field for holding a percentage (0-100).
PhoneCountryCode	The prefix to the dial plan number indicating which country the phone is located.
PhoneDialPlanNumber	Depends upon the location of the phone, in North America the Dial plan uses area code, other parts of the world use a phone number prefix according to the city.
PhoneExtension	Telephone number extension.
PhoneLineNumber	For the US it is the seven digits, in all other locations the numbers would include the remaining numbers excluding the dial plan number.
PhoneNumber	Telephone number of the entity containing the element.
PickupCountryCode	The country where the shipment will be picked up.
PickupDate	Date that the carrier is to pickup a shipment.
PickupDateRange	Qualifies a reference number-tracking query. If this element is included in the query, only candidates picked within the date range will be returned.
PickupDetails	Allows for additional information such as the suite, room number, floor number, location etc.
PickupPostalCode	Postal code of the shipper's pickup location.
PickupType	Determines UPS published rate chart to be used. Default is 03. See Appendix C for Pickup Types.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
PLDData	An identifier used the change the default application code entered into the PLD file.
PODDate	Proof of Delivery Date
PODDays	Number of days until customer can be provided with proof of delivery
PoliticalDivision4	Currently is an open field reserved for later use
PoliticalDivision3	Used for Urbanization or Town
PoliticalDivision2	Used for City
PoliticalDivision1	Used for State/Providence
PONumber	Purchase Order Number for the International shipment.
PostalCode	Postal code of the address that contains it. In the U.S., this is the zip code of the address.
PostcodeExtendedLow	Low-end extended postal code in a range. Example in quotes: Postal Code 30076-'1234' (Cannot be used to submit a range)
PostcodeExtendedHigh	High-end extended postal code in a range. Example in quotes: Postal Code 30076-'1234' (Cannot be used to submit a range)
PostalCodeHighEnd	High side of a postal code range. Used by address validation to show ranges of valid postal codes.
PostalCodeLowEnd	Low side of a postal code range. Used by address validation to show ranges of valid postal codes.
PostcodePrimaryLow	Low-end Postal Code. (Cannot be used to submit a range). Used to input US only zip codes.
PostcodePrimaryHigh	High-end Postal Code. (Cannot be used to submit a range)
Prepaid	UPS billing method where the shipper or third party pays all shipping charges, and the receiver or importer pays the value-added taxes.
PrepPickupTransaction ID	Transaction identifier returned by prepared shipment. Used by the client to query the status of the prepared shipment package level detail upload occurring in the background.
PrimaryContact	Primary contact name for the shipment delivery.
PrinterDriverVersion	The driver version of the printer used to print the labels.
PrinterMakeAndModel	The make and model of the printer used to print the labels.
ProductName	The name of the application used to interface with Local UPS OnLine Tools.
ProductVersion	The version of the application used to interface with Local UPS OnLine Tools.
ProofOfDeliveryReply Type	Alternate party information.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
Quality	Quality of an address validation candidate match.
Quantity	Quantity. Can be used in reference to number of objects.
QuantityScheduleBUnits	The quantity of the commodity contained on the S.E.D. line as indicated in the S.E.D document.
Rank	Numerical ranking the address validation candidates. Rank of 1 indicates best, rank of 10 indicates worst.
ReasonForExport	The type of shipment or the reason the shipment is to be exported, as indicated on the commercial invoice.
Receiver	Information about the receiver of a package. See also Address, SignedForByName.
ReferenceNumber	Shipment-level or package-level reference numbers. Reference numbers are defined by the shipper and can contain any character string.
Region	The region
RegistrationInformation	Data used to register a client with UPS. See also UserName, Title, CompanyName, Address, PhoneNumber, PhoneExtension, FaxNumber, EMailAddress, ShipperNumber, PickupPostalCode.
Remarks	Free-form remarks.
RescheduledDelivery Date	Date the receiver wishes to reschedule delivery
RescheduledDelivery Time	Time the receiver wishes to reschedule the delivery
ResendPLDTransaction ID	An identifying code returned by the resend PLD service.
ResidentialAddress	Indicates whether an address is residential or commercial. The presence of this element within an address indicates that the address is residential.
ResidentialAddress Indicator	Indicates whether an address is residential or commercial. The presence of this element within an address indicates that the address is residential.
RestDays	Number of days the shipment is in rest.
RuntimeLicenseNumber	The identifying number of the Runtime License.
RuntimeLicenseProfile	A container that includes country code and language code.
RuntimeLicenseText	The text of the agreement
SaturdayDelivery	Indicates that a package is to be delivered on Saturday. This is a package service option. The presence of this element indicates that the option is selected.
SaturdayDeliveryCharge	The charge applied when Saturday Delivery is requested for a shipment.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
SaturdayDelivery Indicator	Indicates that a package is to be delivered on Saturday. This is a package service option. The presence of this element indicates that the option is selected.
SaturdayPickup	Indicates that a package is to be picked up on Saturday. This is a shipment service option. The presence of this element indicates that the option is selected.
SaturdayPickupCharge	The charge applied when Saturday Pickup is requested for a shipment.
SaturdayPickupIndicator	Indicates that a package is to be picked up on Saturday. This is a shipment service option. The presence of this element indicates that the option is selected.
ScheduledDeliveryDate	Date a shipment is scheduled to be delivered. This element is set by a tracking response.
ScheduledDeliveryTime	Time a shipment is scheduled to be delivered. This element is set by a tracking response.
ScheduledPickupDate	Scheduled pickup date refers to the Call Tag/Authorized return service scheduled pickup date.
SequenceNumber	A sequence number.
Service	The UPS service selected for a shipment.
ServiceOptionCharges	The cost related to the service options for packages and shipments. See also CurrencyCode, MonetaryValue.
ShipFrom	Address and contact information describing the location where a shipment is to be picked up. See also CompanyName, AttentionName, PhoneNumber, FaxNumber, Address.
Shipment	Defines a shipment. See also Description, Shipper, ShipTo, ShipFrom, ShipmentWeight, PaymentInformation, ShipmentIdentificationNumber, ReferenceNumber, Service, PickupDate, ScheduledDeliveryDate, ScheduledDeliveryTime, Package, ShipmentServiceOptions.
ShipmentCharges	Changes breakdown for a shipment. See also TransportationCharges, ServiceOptionCharges, TotalCharges.
ShipmentDigest	UPS-generated data linking ConfirmShipment and AcceptShipment requests.
ShipmentIdentification Number	UPS-assigned tracking number used to track a shipment.
ShipmentInsuredValue	The monetary value that the shipper has determined for the goods for purposes of obtaining Declared Value protection, as indicated on the waybill.
ShipmentNotification	The information required to request shipment notification for a shipment or package.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
ShipmentNotification Charge	The charge applied when Shipment Notification is requested for a shipment and/or package.
ShipmentResults	Processed shipment information returned from ConfirmShipment and AcceptShipment requests. See also ShipmentCharges, BillingWeight, ShipmentIdentificationNumber, PackageResults.
ShipmentSEDCAS Number	The company's authorized symbol (CAS) or shipper authorized symbol (SAS), as indicated on the waybill.
ShipmentServiceOptions	Optional UPS services related to a shipment. See also SaturdayPickup, SaturdayDelivery, DeclaredInsuranceValue, OnCallAir.
ShipmentWeight	The sum of all of the package weights.
Shipper	Shipper of record for a shipment. See also Name, AttentionName, TaxIdentificationNumber, PhoneNumber, FaxNumber, ShipperNumber, Address.
ShipperAssigned IdentificationNumber	An identification number assigned by the shipper.
ShipperExport Declaration	The presence of this tag indicates that the commodity requires an SED (Shipper's Export Declaration).
ShipperExport DeclarationCode	Indicates that an S.E.D has been completed and the form it takes, as indicated on the waybill. **D** = S.E.D. included with export documents **E** = Electronically filed by the shipper **U** = UPS prepared on the shipper's behalf **Y** = S.E.D. exists, but type unknown
ShipperExport DeclarationIndicator	The presence of this tag indicates that the commodity requires an SED (Shipper's Export Declaration).
ShipperExport DeclarationLineAmount	The value of the S.E.D commodity contained in the S.E.D.
ShipperInformation	The information about the shipper.
ShipperNumber	Shipper's account number. This is a 6-digit UPS account number or a 10-digit UPS BIN.
ShipperProperty	A single item of information about a shipper.
ShipperQuery	The information required to query the shipper information.
ShipTo	Address and contact information describing the location where a shipment is to be delivered. See also ShipperAssignedIdentificationNumber, CompanyName, AttentionName, PhoneNumber, TaxIdentificationNumber, FaxNumber, Address.
SignatureImage	Defines signature image and format obtained at delivery.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
SignatureRequired	Package service option requiring UPS to obtain a signature prior to delivering a package. This option is selected by including the tag in PackageServiceOptions.
SignatureRequired Indicator	Package service option requiring UPS to obtain a signature prior to delivering a package. This option is selected by including the tag in PackageServiceOptions.
SignedForByName	Name of the person who signed for a package at the delivery point.
SoftwareInstaller	The vendor who installed the product that allows access to a UPS on-line tool.
SoftwareProductName	Vendor's product that allows to access to a UPS on-line tool.
SoftwareProvider	The vendor who provides the product that allows to access to a UPS on-line tool.
SoftwareVersionNumber	The identifying number of the software version. The product version that allows access to a UPS on-line tool.
StateProvinceCode	Abbreviation for the state or province of the address that contains it.
Status	Status of a shipment being tracked.
StatusCode	Shipper's comments or service instructions.
StatusType	State of a package within the UPS system. Values are I= In transit, D= Delivered, X= Exception, P= Pickup, M= Manifest pickup.
StreetName	Street Name
StreetNumberLow	Street Number Low. Part of address.
StreetNumberHigh	Street number high. Part of address.
StreetNumberOddEven	Allows for indicators to determine whether the Street Number is Odd Even or Both. Refer to OddIndicator, EvenIndicator, BothIndicator
StreetNumberPrefix	Not used in United States. International locations may use a prefix before the street address.
StreetSuffix	Street directional suffix, such as North, South, East, West.
StreetType	What type of street the address is located on, is it a Road, Circle, Lane etc.
StructuredPhoneNumber	Is a container for segregated elements for the overall telephone number, country code, dial plan, line number, and extensions.
SubTotal	Invoice subtotal.
SuiteRoomID	Location of the suite and or the room number.
TaxIdentificationNumber	Tax number of the entity containing this element.

Table 8: Common Business Vocabulary XML Definitions

Element	Description
TermsOfShipment	Terms of delivery, as indicated on the commercial invoice. Defines the terms of delivery as indicated on the commercial invoice. **CFR** = Cost and Freight **CIF** = Cost, Insurance and Freight **CIP** = Carriage and Insurance Paid **CPT** = Carriage Paid To **DAF** = Delivered at Frontier **DDP** = Delivered Duty Paid **DDU** = Delivered Duty Unpaid **DEQ** = Delivered Ex Quay **DES** = Delivered Ex Ship **EXW** = Ex Works **FAS** = Free Along Side **FCA** = Free Carrier **FOB** = Free On Board
ThirdParty	The information required to identify a third party person or organization.
Time	Time of day. The element has meaning within its expressed content. Format: HHMMSS.
Title	Job title of the client contact person defined in the registration request.
ToolID	The universal identifier for an EC tool.
ToolVersion	The version of the EC tool.
TotalCharges	Total charges for a shipment. It includes transportation cost as well as service option costs.
TotalPackagesDelivered	Total number of packages delivered with a shipment.
TotalPackagesIn Shipment	Number of packages contained in a shipment.
TotalTransitDays	The total days, including non-business days, the shipment would take from one location to the final destination.
TrackingNumber	UPS-assigned number used to track a package.
TradeAgreementType	The types of trade agreements applicable for the commodities contained in the invoice line, as indicated on the commercial invoice. **EEC** = European Economic Community **EFTA** = European Free Trade Agreement **NAFTA** = North American Free Trade Agreement
TransitFrom	Address container for the origin of the shipment
TransitFromList	Contains a candidate list for Time in Transit from the Address Validation Tool

Table 8: Common Business Vocabulary XML Definitions

Element	Description
TransitTo	Address container for the destination of the shipment.
TransitToList	Contains a candidate list for Time in Transit from the Address Validation Tool
TransportationCharges	Base charges incurred by a shipment to move it from the origin address to the destination address. See also CurrencyCode, MonetaryValue.
Type	Allows for secondary address information such as suite, apt.
UltimateDestination Country	Country code of the delivery code for a shipment.
UnitOfMeasurement	Unit of measurement for the element that contains it. It applies to Height, Length, and Weight measures.
Urbanization	Used in regional format
UserId	UPS-required identifier that specifies a client is to be granted access to UPS services.
UserInput	Currently used in the AddressLabelFormat as a free-form for users to provide input.
UserName	Name of the client registering with UPS.
Value	Shipper-assigned reference number value for a shipment or package.
VerbalConfirmation	Tag contains information about the service adjustment.
VerbalConfirmation Charge	The charge applied when Verbal Confirmation is requested for a package.
Version	The version of the specified item.
Void	The presence of this tag indicates that the Package was voided.
VoidIndicator	The presence of this tag indicates that the Package was voided.
WaybillNumber	The Waybill/brokerage identification number.
WaybillPrint	The presence of this tag indicates that a waybill was used, regardless of who printed the waybill.
WayBillPrintIndicator	The presence of this tag indicates that a waybill was used, regardless of who printed the waybill.
Weight	Weight indicates the weight of the containing element.
Width	See UnitOfMeasurement.
XpciVersion	Current version of the DTD utilized by the tool.

Appendix E

Frequently Asked Questions

General Questions

Q. What are UPS OnLine Tools?

A. UPS OnLine Tools is a set of UPS server applications that present an Application Programming Interface based on the secured Hypertext Transport Protocol (HTTP) and eXtensible Markup Language (XML). UPS OnLine Tools provide an easy method for integrating UPS shipping services into your e-commerce applications. The tools return data in a convenient eXtensible Markup Language (XML) format that can be easily processed by client-side applications.

UPS OnLine Tools acts as the server side of an Internet client/server application. An e-commerce application using UPS OnLine Tools acts as the client, even though the application may be simultaneously acting as a server to its end-users' web browsers.

Q. Do I need to install UPS OnLine Tools on my system?

A. No. All functionality is implemented on the remote UPS OnLine Tools server maintained by UPS.

Q. Is there a graphical user interface?

A. No, you use UPS OnLine Tools by exchanging XML documents between your e-commerce applications and UPS Internet server.

Q. How do my applications communicate with UPS OnLine Tools?

A. Applications connected to the Internet can connect directly to remote UPS OnLine Tools by opening either a secure TCP/IP socket or secure URL connection. Applications send request data to remote UPS OnLine Tools by writing data to the TCP/IP socket or URL connection. The request data must be formatted as a valid XML request message and adhere to the HTTP protocol. Response data is received from UPS OnLine Tools by reading data from the same TCP Applications receive TCP/IP socket or URL connection.

Q. How do I get the XPCI DTD's?

A. The XPCI DTD's are available for download as part of the " How To" files available on http://www.ec.ups.com.

Q. What user development effort is required?

A. To integrate remote UPS OnLine Tools into your e-commerce applications, you must develop custom code that adapts your application's business logic and data to UPS OnLine Tools. You can

use any programming language that supports HTTP communication across Internet socket and secure connections, such as Java, Visual Basic, or C+ + .

You must know how to program URL or socket connections. There are several ways you can do this. Which method you choose will depend on your application platform and programming language. For example, if you program in Java on any platform, you could use the URLConnection Class, which is part of the Java Software Development Kit.

You must obtain, or write, a secure socket implementation that supports the SSL standard for secure communications.

You must know how to encode and decode XML documents. To program XML documents, you'll probably want to use an XML parser, which provides an Application Programming Interface (API) for manipulating XML documents. There are several XML parsers available as freeware, as well as commercial software products.

You must know how to decode Base64-encoded data. UPS OnLine Tools embeds binary data within XML documents, thus requiring the data to be decoded.

You must establish a connection to the Internet from the computer that runs your e-commerce applications. You must establish Internet access with your own Internet Service Provider.

Q. How does UPS OnLine Tools return data?

A. UPS OnLine Tools returns data in an eXtensible Markup Language (XML) format that can be easily parsed by client-side applications. Document Type Definitions (DTDs) may be used to validate the syntax of XML documents.

Q. When attempting to connect to the UPS OnLine Tools server, I receive an error stating " wrong Content-Type" . What content-type does the server respond to?

A. The UPS OnLine Tools Server does not require a content-type to be used. However, through our testing and platform integration we have discovered that applications running under WindowsNT they must set the content-type to application/x-www-form-urlencoded.

Q. How does UPS OnLine Tools handle data security?

A. During shipping transactions, sensitive billing-related data is transferred back and forth across the public Internet. To ensure that you and UPS are the only parties able to decode a transmission, UPS OnLine Tools uses secure HTTP. HTTPS is accomplished by using the HTTP protocol using a Secure Socket Layer (SSL) socket. You must obtain an SSL package that supports the RSA encryption algorithm in order to communicate with the UPS OnLine Tools server.

Q. How do I get sample code and documentation?

A. Currently, UPS offers sample code in Java. It is available for download as part of the " How To" files on http://www.ec.ups.com.

Q. I operate a mail order business that receives orders over the Internet and the telephone. How can UPS OnLine Tools help me?

A. You can integrate UPS OnLine Tools into your existing order-entry system. Let's suppose you have software installed that accepts order, shipping, and payment information. You can use UPS OnLine Tools to validate address information, validate shipping service information and options, and to ship packages. You can also use UPS OnLine Tools to cancel orders, and to track shipments and verify delivery. Another use of UPS OnLine Tools would be in a warehouse fulfillment business. Suppose retail outlets use your warehouse to provide product and shipping to end customers. You can integrate UPS OnLine Tools into your order-entry system to upload package detail to UPS and to track shipments.

Q. How will I know when updates to the Tools are available?

A. As your e-commerce site continues to evolve, UPS OnLine Tools will evolve, too, offering more features and service benefits for your online customers. Once you have registered to use UPS OnLine Tools, UPS will notify you by e-mail of all updates and changes to the tools. It is essential that an accurate E-mail address for your company be maintained. You should update your profile when changes occur or responsibilities for the Tools shift within your company. You may also return to the UPS e-commerce site to receive the latest updated information about UPS OnLine Tools.

Q. What are some of the reasons the license agreements are important to both the programmer and the business manager?

A. The license agreements define the necessary business obligations of both UPS and the Licensee. Just some of the reasons your entire team should be knowledgeable of the licensing requirements include:

- The license agreements have requirements that impact how programmers use and display information (e.g., regarding appropriate use of data and logos).
- The license agreements are different depending on how you use the UPS OnLine Tools (e.g., as an end-user or third-party developer).

Usage Requirements

As part of the UPS OnLine Tools legal agreements, users of the Tools have certain obligations that are spelled out within the Tools agreement and its exhibits. Regardless of the manner in which the UPS OnLine Tools are integrated into your specific e-commerce web site or enterprise application, you must adhere to the usage requirements of the Tools legal agreement accepted by your company. Reference your OnLine Tools legal agreement for complete details of both parties' obligations. The following highlights a few of these usage requirements.

Branding Requirements

UPS should receive attribution and branding in all applications (including websites and software applications) that use the OnLine Tools. No End User, Third Party Developer or Access User should be permitted to use the OnLine Tools without providing branded recognition to UPS. Your use of the UPS logo can in no way imply endorsement, sponsorship or certification of your e-commerce web site or enterprise application by UPS. You are not allowed to use or alter the information returned by the UPS OnLine Tool in a way that misrepresents the information or the functionality of the tool.

Tracking Authorization

End User must conspicuously display the following language, or such other language provided by UPS from time to time, in reasonable proximity to the tracking input and output information screens: "NOTICE: UPS authorizes you to use the UPS tracking systems solely to track shipments tendered by or for you to UPS for delivery and for no other purpose. Any other use of UPS tracking systems and information is strictly prohibited." This text may be updated from time to time by UPS.

Rate Information

If End User or any other party charges, displays or advertises rates which are different from the UPS published rates returned by the Rates & Service Selection Tool or as otherwise published by UPS for use or display by the Application, then the following language, or other such language provided by UPS from time to time, must be conspicuously displayed in reasonable proximity to such rates: "These fees do not necessarily represent UPS published rates and may include handling charges levied by [End User]."

XML Questions

Q. I read in the Developer's Guide that XML does not allow certain characters. Where can I get a list of those characters?

A. For a comprehensive treatment of XML 1.0, refer to the following web site: http://www.w3.org/TR/1998/REC-xml-19980210.

Service Response Questions

Q.The UPS OnLine Tools Server is not responding. Why is this happening?

A.There may be several reasons why the UPS OnLine Tools Server is not responding:

1. The URL (Universal Resource Locator) may not be correct.
2. Your firewall or proxy server is not allowing access to the service.
3. Your DNS (Domain Name Server) server may have the wrong IP address/Server name.
4. The server may be temporarily unavailable.

Q. How do I determine if the UPS OnLine Tools Server is unavailable?

A. To determine if the XML OnLine Tools Server is available, follow these steps:

1. Use a browser to perform on the server < hostname> , for example:

   https://onlinetools.ups.com/ups.app/xml<toolname>

2. If the server is available, the response will state the following:

   Service Name: <toolname>

   Remote User: null

   Server Port: 80

   Server Name: /onlinetools.ups.com

   Server Path: /ups.app

Q. I am sending XML request documents to the UPS OnLine Tools Server but there is no response. Why is there no response?

A. If your XML request document is being sent to the correct service URL (Universal Resource Locator), you should receive a response in the form of an XML document. If you have ensured that your software is making connection and passing authentication, but still no response, contact technical support.

Q. I am getting the following HTML response when I submit an XML Request document:

```
<HTML><HEAD><TITLE>Content wrong type.</TITLE></HEAD>
<BODY><H1>Content wrong type.</H!>
```

Your browser sent a query this server could not understand.

```
</BODY></HTML>
```

How can I resolve this problem?

A. Though XML standards do not recommend that data be transmitted using a content type of " application/x-www-form-urlencoded" , experience has shown that this is the only content type that will allow Microsoft's wininet.dll to communicate properly. If not using this .dll, the content type should always be set to " application/xml" .

Appendix F

Change Summary

If you downloaded this document, access the http://www.ec.ups.com website for further details on updates in this document, otherwise, contact your UPS Electronic Commerce Coordinator for further details on updates in this document.

Volume 1 Number 2

The changes applied to this release of this document are for clarifications and corrections in the Address Validation Programming Information chapter. There has not been any change of functionality or upgrade to the initial release of this XML Address Validation tool.

Volume 2 Number 1

This version includes license agreement information that is relevant to this UPS OnLine Tool.

Volume 3 Number 1

This version includes updates to several tables in Appendix C.

Volume 4 Number 1

This version includes updates to the XPath and Error codes that were deployed with the January 2004 Enterprise Release.

Volume 4 Number 2

This version includes updates to the Error codes for the September 2004 Maintenance Release.

Volume 4 Number 3

This version includes the following updates:

1) Updated the InsuredValueCharge element description to include, ".../Declared Value".

2) Updated the ShipmentInsuredValue element description to include, "...of obtaining Declared Value protection".

3) Added USPS Postal Addressing Standards section to document.

Volume 4 Number 4

This version includes the following updates for the August 2005 Maintenance Release:

1) Added text for GTE Cybertrust certificate and advice against the use of hard coded IP addresses.

Volume 5 Number 1

1) UPS Address Validation Tool is only supported for addresses within the United States hence country table is removed from the appendices.

Volume 5 Number 2

This version includes the following updates for the July 2006 Enterprise Release:

1) Change the ProvinceStateCode for Newfoundland to NL.

2) Removed all HTTP 1.0 references.

Bibliography

Bibliography

Books

A few books that we have found especially useful include:

Enner, L., Chuvan, C., Fremante, P., Routray, R., & Ruuskanen, J. (2000). *The XML Files: Using XML and XSL with IBM Websphere 3.0*.

DuCharme, B. (1999). *XML: The Annotated Specification*. Prentice Hall PTR. Upper Saddle River, NJ.

Laughlin, B. (2000). *Java and XML*. O'Reilly. Sebastopol, CA.

St. Laurant, S. (2000). *Building XML Applications*. McGraw Hill. New York.

St. Laurant, S. (2000). *XML Elements of Style*. McGraw-Hill. New York.

On the Web

Here are some quick reference web sites to aid in your gaining the knowledge of standards and protocol required for utilizing and effectively accessing the UPS OnLine Tools.

- Java Documentation: Sun's Javasoft at http://www.javasoft.com is the reference for the Java Development Kit.
- XML Specifications: The World Wide Web Consortium at http://www.w3.org has the information for XML and HTTP standard specifications.
- IBM's XML for Java: IBM's alphaWorks at http://alphaworks.ibm.com is the source for XML4J, the XML parser used in this guide's example code, as well as numerous other XML and Java links, articles, and tools.
- HTTP version 1.0 specification: http://www.w3.org/Protocols/rfc1945.txt
- Web naming and addressing: http://www.w3.org/Addressing.
- UPS Service Guide: http://www.ups.com/using/svc-index.html. The UPS Service Guide will help you understand UPS business practices and terms.

Here are some other web sites that you may find useful for detailed information on XML.

- Simon St. Laurent, author of articles on current XML issues and two of the above books, has an informative site with white papers. http://www.simonstl. com/
- XML.ORG has ambitions of being a clearinghouse for schemas. Theses schemas are interesting from a design standpoint and the links are good for learning more about XML. http://www.xml.org/xml-dev/index.shtml

- These sites are good sources for developers on the latest happenings in the XML world as well as the latest tools and techniques. They also publish a weekly e-mail newsletter. This site is for the truly sophisticated XML developer. http://www.xmlhack.com/
- XML Info aims to be an exhaustive set of links and information on XML. This is a good place to start a search for an exotic subject. http://www.xmlinfo.com/