DataDirect® XML Converters™

User's Guide and Reference for .NET

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Preface

This book is your guide and reference to DataDirect XML Converters™ from DataDirect Technologies and describes how to use DataDirect XML Converters to build .NET applications that provide bi-directional access to non-XML data. This book provides information about the following topics:

- The converter: URI scheme
- Using DataDirect XML Converters to convert non-XML sources (like EDI and legacy file formats) to XML
- Using DataDirect XML Converters to convert XML to non-XML format (like CSV and tab-delimited files)
- Examples and tutorials that show how you can use DataDirect XML Converters in your environment
- XML Converters properties reference

What are DataDirect XML Converters™?

DataDirect XML Converters™ are high-performance Java™ and .NET components that provide bi-directional, programmatic access to virtually any non-XML file including EDI, flat files, and other legacy formats. DataDirect XML Converters allow developers to seamlessly stream any non-XML data as XML to industry-leading XML processing components or to any application. They support StAX, SAX, XmlReader, XmlWriter, DOM and I/O streaming interfaces, and can be embedded directly for translation purposes, or as part of a chain of programs including XSLT and XQuery, or even inside XML pipelines. DataDirect XML Converters maximize developer

productivity and provide a fast, scalable solution for converting between EDI and other legacy formats and XML.

Using This Book

This manual describes DataDirect XML Converters and how to use them to develop .NET applications. It is assumed that you are familiar with XML, .NET, and related technologies.

This manual has the following chapters:

- Chapter 1, "DataDirect XML Converters™ Overview" provides an overview of the DataDirect XML Converters API and URI schemes used for data integration.
- Chapter 2, "XML Converters™ URI Schemes" describes the converter: URI scheme and how to use Stylus Studio XML Enterprise Suite to build converter: URIs.
- Chapter 3, "Analyzing EDI to XML Conversions" describes how to use the DataDirect XML Converters API to analyze EDI streams for errors, generate an analysis report in XML format, and manage transmission response messages as part of the conversion process.
- Chapter 4, "Deploying XML Converters™ on Microsoft® BizTalk® Server" describes how to register DataDirect XML Converters components with Microsoft Visual Studio and use them to build BizTalk Server applications.
- Chapter 5, "XML Converters™ Examples" describes demo.cs, a simple C# program installed with the XML Converters, including how to run it, and detailed information about the actions performed by the example applications it contains. Other uses of the .NET API are also illustrated.
- Chapter 6, "XML Converters™ Properties" describes values for the properties for XML Converters.

Typographical Conventions

This book uses the following typographical conventions:

Convention	Explanation
italics	Introduces new terms that you may not be familiar with, and is used occasionally for emphasis.
bold	Emphasizes important information. Also indicates button, menu, and icon names on which you can act. For example, click **Next**.
UPPERCASE	Indicates keys or key combinations that you can use. For example, press the ENTER key.
`monospace`	Indicates syntax examples, values that you specify, or results that you receive.
`monospaced italics`	Indicates names that are placeholders for values you specify; for example, *`filename`*.
forward slash /	Separates menus and their associated commands. For example, Select File / Copy means to select Copy from the File menu.
vertical rule |	Indicates an OR separator to delineate items.
brackets [ ]	Indicates optional items. For example, in the following statement: SELECT [DISTINCT], DISTINCT is an optional keyword.
braces { }	Indicates that you must select one item. For example, {yes | no} means you must specify either yes or no.
ellipsis . . .	Indicates that the immediately preceding item can be repeated any number of times in succession. An ellipsis following a closing bracket indicates that all information in that unit can be repeated.

Contacting Technical Support

DataDirect Technologies offers a variety of options to meet your technical support needs. Please visit our Web site for more details and for contact information:

http://support.datadirect.com

The DataDirect Technologies Web site provides the latest support information through our global service network. The SupportLink program provides access to support contact details, tools, patches, and valuable information, including a list of FAQs for each product. In addition, you can search our Knowledgebase for technical bulletins and other information.

To obtain technical support for an evaluation copy of the product, go to:

http://www.datadirect.com/support/eval_help/index.ssp

or contact your sales representative.

When you contact us for assistance, please provide the following information:

- The serial number that corresponds to the product for which you are seeking support, or a case number if you have been provided one for your issue. If you do not have a SupportLink contract, the SupportLink representative assisting you will connect you with our Sales team.
- Your name, phone number, email address, and organization. For a first-time call, you may be asked for full customer information, including location.
- The DataDirect product and the version that you are using.
- The type and version of the operating system where you have installed your DataDirect product.

- Any EDI, flat file, legacy file, custom XML conversion definition, or other environment information required to understand the problem.
- A brief description of the problem, including, but not limited to, any error messages you have received, what steps you followed prior to the initial occurrence of the problem, any trace logs capturing the issue, and so on. Depending on the complexity of the problem, you may be asked to submit an example or reproducible application so that the issue can be recreated.
- A description of what you have attempted to resolve the issue. If you have researched your issue on Web search engines, our Knowledgebase, or have tested additional configurations, applications, or other vendor products, you will want to carefully note everything you have already attempted.
- A simple assessment of how the severity of the issue is impacting your organization.

1 DataDirect XML Converters™ Overview

DataDirect XML Converters is an assembly of .NET classes that provides programmatic bi-directional access to numerous data sources such as EDI, CSV, and other legacy formats as XML through .NET applications.

This chapter provides an overview of the XML Converters, including the types of file formats they support, how they can be used to access data from other sources, and examples of converting EDI to XML and XML Schema generation from EDI.

Types of XML Converters

DataDirect XML Converters support numerous file formats, from many EDI dialects to common formats such as CSV and tab-delimited files. Most XML Converters are bidirectional, allowing you to convert from a native format to XML and vice versa.

The following table summarizes the types of available XML Converters.

Table 1-1. File Formats Supported by XML Converters

File Type	Description	Bidirectional
Base-64	Converts any file, text or binary (such as an image), into a XML document with a single element containing the Base-64 encoded content of the input file.	Yes
Binary	Similar to the Base-64 XML Converter, except with hexadecimal output. Other options allow output in other bases, such as decimal or octal or even binary.	Yes
CSV	Converter for comma-separated values (CSV) files. Supports multiple encodings and options to tune the quote and escape characters. Supports delimiters besides commas.	Yes
dBase	Support for dBase II, III, III+, IV, and V formats.	Yes
DIF	Data Interchange Format (DIF) is a spreadsheet-based file format. There are also XML Converters for Super Data Interchange (SDI) and Symbolic Link (SYLK).	Yes
DotD	Support for Progress Software's OpenEdge text dump file format.	Yes
EDI	Automatically detects and parses ATIS, EANCOM, EDIFACT, Edig@s, HIPAA, HL7, IATA Cargo-IMP, IATA PADIS, NCPDP, TRADACOMS, and X12 EDI message types, with options for custom message types and message extensions to cover proprietary EDI-based formats.	Yes
JavaProps	Support for Java .properties file format, which is used for program configuration, translation, and data storage.	Yes
JSON	Uses the algorithms on the JSON.org website to read from XML and write to JSON (JavaScript Object Notation), and vice-versa.	Yes

Table 1-1. File Formats Supported by XML Converters

File Type	Description	Bidirectional
Line	Reads in text one line at a time, wrapping an element around each line and escaping any embedded & or > or < symbols.	Yes
Pyx	Support for this line-oriented notation for expressing tree-oriented data.	Yes
RTF	Converts rich-text format (RTF) into XML, and vice versa.	Yes
SDI	Super Data Interchange (SDI) is another popular spreadsheet-based file format. There are also XML Converters for DIF and SYLK.	Yes
SYLK	SYLK (Symbolic Link) is another popular spreadsheet-based file format. There are also XML Converters for DIF and SDI.	Yes
TAB	Tab-separated values format commonly associated with MS Excel spreadsheets.	Yes
WinIni	Converter for Windows .ini configuration files.	Yes
WinWrite	Converter for Microsoft WinWrite files; renders XHTML.	No
Custom	Custom XML conversions (.conv files) created using Stylus Studio.	No

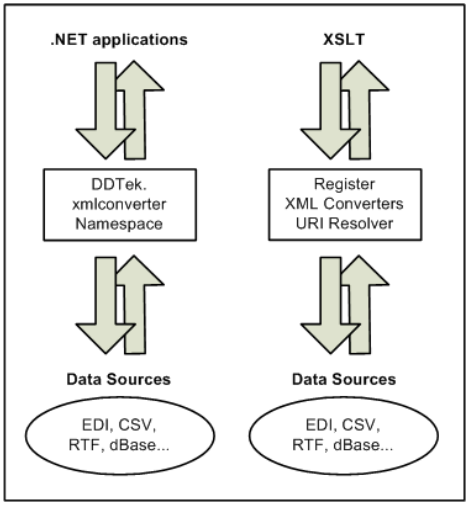
XML Converters Can Be Customized

Every XML Converter has properties that allow you to tailor the converter to suit your needs. Some XML Converters, for example, let you specify the line separator character, escape character, root element name, and other aspects of the output format. Default values are used for all properties that you do not explicitly specify. You specify properties in the converter: URI string that you use to invoke the XML Converter.

See "URI Schemes" on page 21 to learn more about the converter: URI. See Chapter 6 "XML Converters™ Properties" on page 113 for more information.

Data Access

XML Converters provide access to non-XML data stored in EDI and flat file formats like CSV, RTF, dBase, binary, and others. The following figure illustrates the different ways you can use XML Converters to access XML and non-XML data from .NET applications or from XSLT code.



Data access to non-XML data stored as EDI or other file formats (CSV, tab-delimited, and others, for example) is accomplished using the DataDirect XML Converters converter: URI scheme. See "URI Schemes" on page 21 to learn more about the URI schemes supported by XML Converters.

URI Schemes

In .NET, files and other data resources are referenced using file:, http:, ftp:, and a limited set of other URI schemes.

The XML Converters .NET API extends the functionality of the basic URI to recognize and understand the converter: URI scheme developed by DataDirect. You can use the converter: URI scheme in your C# and XSLT code.

For example, the URI scheme `converter:myConverter.conv` invokes the custom XML conversion myConverter.conv file. The URI scheme `converter:EDI?file:///m:/testing/editeur.edi` invokes the EDI XML Converter, using the file editeur.edi as the EDI source to be converted.

See Chapter 2, "XML Converters™ URI Schemes" for more information.

Command Line Usage

You can run DataDirect XML Converters™ from the command line.

To specify a native file to be converted to XML:

```
CmdLine /to [/analyze] [/report filename]
/converter name[:property_name=value ...] /in filename [/out filename]
```

To specify an XML file to be converted to a native format:

```
CmdLine /from /converter name[:property_name=value ...] /in filename [/out
filename]
```

Usage Notes

Following are some usage notes for running DataDirect XML Converters™ from the command line:

- The/to option specifies that you are converting a file from its native format to XML; the /from option specifies that you are converting an XML file to the file type specified in the /converter option.
- The XML Converter specified in the *name* argument for the converter option can take settings for properties specific to that converter. For example, /converter EDI:newline=cr indicates that the carriage return (cr) is to be used as the line separator (newline) character.
- *property_name=value* pairs cannot include blanks. For example, newline=platform is valid, newline = platform is not.
- Use /analyze to analyze and convert an EDI stream; use /report if you want to save the analysis report (by default, it is written to a temp file and deleted after the conversion). The /analyze and /report options can only be used when converting EDI to XML (that is, when you are using the /to option.

  See Chapter 3, "Analyzing EDI to XML Conversions" for more information.
- Use /in - to read from the standard input.
- To write to the standard output, omit the /out option.
- You can use dashes (-) instead of forward slashes (/) to separate options – for example, -to instead of /to.

- To generate XML Schema, replace the `/to` option with the `/schema` option. See "XML Schema Generation" on page 28 for more information.

Example

The following example uses the EDI XML Converter to convert the input file, 831.x12, to an XML file, my831.xml using default values for the EDI XML Converter:

```
CmdLine /to /converter EDI /in ..\examples\831.x12
/out my831.xml
```

The 831.x12 sample file and others are in the \examples directory where you installed XML Converters. To learn more about the examples, see "Example Applications" on page 36.

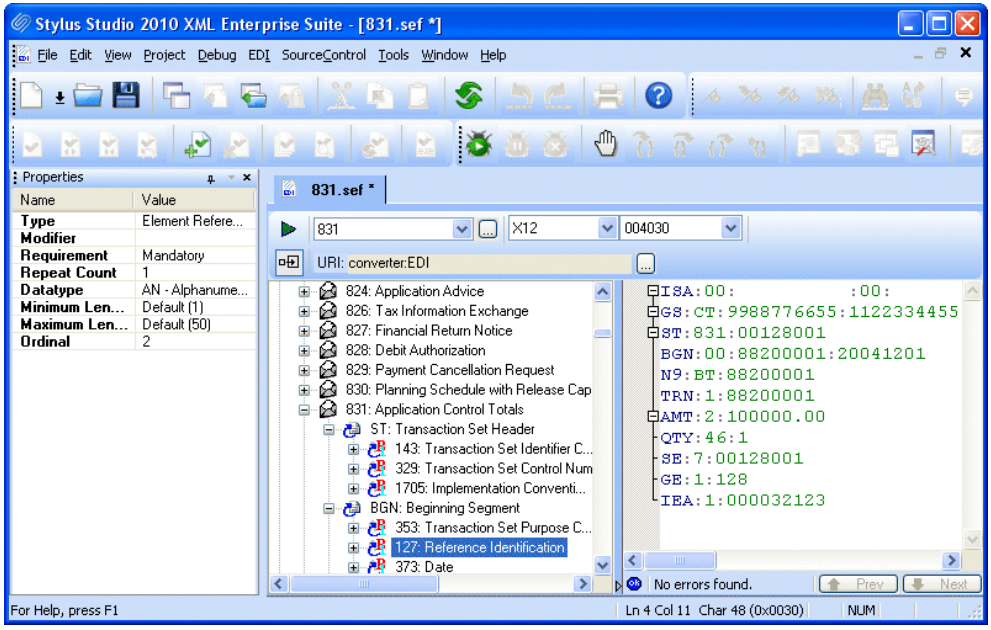
Handling Proprietary EDI Formats

DataDirect XML Converters™ supports the Standard Exchange Format (SEF). SEF allows you to specify an EDI structure, typically one that differs from one of the EDI standards like EDIFACT or X12, for example. You save this structure definition in a SEF file, which you can then instruct the EDI XML Converter to use when converting proprietary EDI to XML.

Creating a SEF File

You can create SEF files manually, based on the SEF specification. This process, however, can be difficult and error-prone. An easier way is to use the Stylus Studio EDI to XML Module, which provides a visual editor to help you build SEF files based on standard EDI dialects.

When using the EDI to XML Module, you can choose as your starting point an EDI document (from which an EDI dialect is inferred) or an EDI dialect. From there, you use the EDI to XML Module editor's tools to define the ways in which your proprietary EDI structure differs from the EDI standard.



The SEF Specification

You can find a copy of the SEF specification on the DataDirect XML Converters web site:

http://www.datadirect.com/docs/sef161.pdf

You need Adobe Acrobat Reader Version 4.0 or later to view this document. You can download the free Adobe Acrobat Reader here.

Example: Using a SEF File

See "Example 7" on page 97 for an example of using an SEF extension file to define an XML Schema. See also "Loading SEF Files Programmatically" on page 109.

Managing Errors

The DataDirect XML Converters™ API provides several ways to manage errors in your applications:

- EDI Analyzer
- ConverterListener Interface
- EDIConverterListener Interface
- EDIConverterException Interface

These features are currently implemented only for the EDI XML Converter.

EDI Analyzer

The EDI Analyzer API allows you to analyze an EDI stream for errors that might cause the XML Converter to throw an exception before converting the EDI stream to XML. A report generated by the EDI Analyzer in XML format identifies and describes any errors. The EDI Analyzer also automatically generates Accept/Reject messages that can be forwarded to the EDI sender.

The EDI Analyzer API is supported for EDI-to-XML conversions (and not vice versa).

See Chapter 3, "Analyzing EDI to XML Conversions" for more information on the EDI Analyzer API.

ConverterListener Interface

In an application, it is not always necessary for warnings and errors to throw exceptions and abort a conversion process; in such cases it can be desirable to simply make the application aware that a problem has occurred and allow it to recover (or not) from the warning or the error.

The `ConverterListener` interface allows you to intercept warnings, errors, and fatal errors and manage them separately. The default action is to ignore warnings, and to throw exceptions for errors and fatal errors.

Processing can resume after both warnings and errors; by simply not throwing the exception received, processing continues. In the case of an error, it is possible that other errors will cascade from the first. Fatal errors can be reported, but upon return a `ConverterException` is always thrown by the EDI XML Converters™ engine. The exception that is thrown will be an instance of `ConverterException` or one of its subclasses such as `ConverterArgumentException`.

Example

See "Example 8" on page 98 for an example of registering a `ConverterListener`.

EDIConverterListener Interface

The `EDIConverterListener` is a specialized version of `ConverterListener`; its methods provide more detailed information about error conditions. The `InvalidCharacter()`

method, for example, is called when a character does not match the specified encoding in the EDI stream; `UnknownCodeListValue()` is called when codelist validation fails.

EDIConverterException Interface

EDI-based conversions are typically more complex than other types of conversions (those for CSV and tab-delimited files for example). By providing more contextual information about where a problem has occurred, EDI XML Converters™ allow you to capture the error and possibly return standard EDI messages back to the sender of the message – CONTRL (for EDIFACT), 997 (for X12), or ACK (for HL7), for example.

The `EDIConverterException` is a specialized version of `ConverterException` that contains extra information about the context of errors in EDI files. When a `ConverterException` is thrown while processing an EDI file, or when a `ConverterListener` is registered and a `Warning()`, `Error()`, or `FatalError()` is called, in most cases the exception thrown will be `EDIConverterException`.

This exception contains many methods to probe the context of the specific error – `GetContentData()`, `GetControlData()`, `GetData()`, and `GetError()`. Processing can recover from both warnings and errors; fatal errors, however, always end the processing.

Error Diagnostics

Full context information is provided when an error is encountered within the EDI file, including the error number according to the local EDI dialect. For example, many EDIFACT errors are recorded in the 0085 element codelist, and if the error occurring matches one of those, it is reported as such.

XML Schema Generation

You can use the `SchemaGenerator` interface to create XML Schema files that describe the structure of XML files read or created by a `ConvertToXML` or `ConvertFromXML` object. You might want to use the SchemaGenerator interface in the following situations:

- You have a `FromXML` converter: URI, and you want to know the XML Schema that the input XML data must satisfy.
- You have a `ToXML` converter: URI, and you want to know the XML Schema of the XML output.
- You have a `ToXML` converter: URI and a non-XML data file, and you want to know the XML Schema of the XML output. (This functionality is available only with certain XML Converters. See "XML Schema Generation Summary" on page 35 for more information.)

The XML Schema of the generated file depends on the type of file for which the XML Schema is being created, and not on the actual data. For example, if you are creating an XML Schema for an EDI file, the XML Converter is concerned only with the file's dialect, version, and message type/transaction set. You can specify this information by providing a sample file input, or by specifying the appropriate properties in the converter: URI. See "Instance Documents" on page 31 and "URI Parameters That Affect XML Schema" on page 31 for more information.

Command Line Usage

To generate XML Schema from the command line:

```
CmdLine /schema /converter name
[:property_name=value [ :property_name=value ...] ] /in filename
```

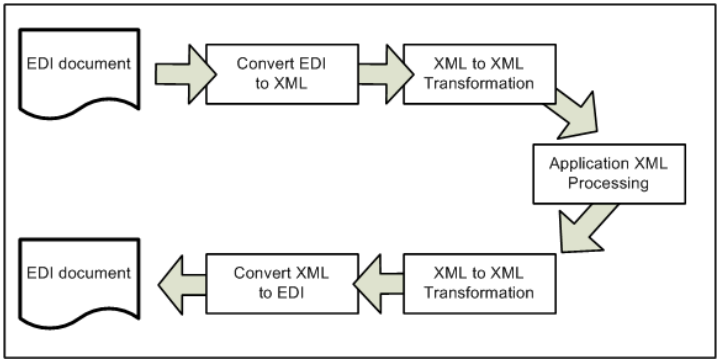
[/out *filename*]

Note that some XML Converters (like EDI, for example) require that you either provide an instance document or that you specify sufficient properties in the converter: URI. For ED,I for example, you need to provide dialect, version, and message type/transaction set.

Example Scenario

Consider the following example scenario: your enterprise routinely receives client data in EDI files. The data in these files needs to be converted to XML so that it can be transformed for processing by an application. After application processing, the resulting XML is again transformed to another format before being converted back to EDI.

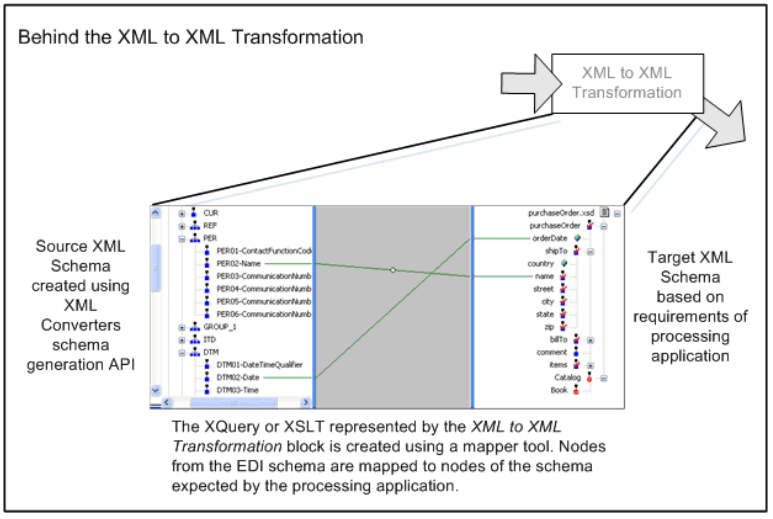
Such a workflow can be represented with the following diagram:



In this illustration, the conversion block *Convert EDI to XML* represents an instance of DataDirect XML Converters™, which is used to convert the incoming EDI document – imagine it is an X12 810 transaction set (Invoice). This XML conforms to the XML Schema consistent with the X12 EDI transaction set from which it was derived. However, before the XML can be used by the processing application, it needs to be transformed into the

format expected by the processing application – that is, it must conform to an XML Schema.

Imagine that XSLT is used to perform this transformation (the block *XML to XML Transformation* in the preceding illustration). One way to create such an XSLT is to use a mapping tool. In this case, we map nodes from the XML Schema representing the EDI X12 810 transaction set to the XML Schema representing the document format expected by the XML processing application. Here, we use DataDirect XML Converters™ to create the XML Schema for the EDI X12 810 transaction set, as shown in the following illustration.



A similar mapping process is performed to create the second XML to XML transformation (another XSLT), this time mapping XML Schema nodes from the application format to the EDI X12 810 transaction set format to create an XSLT. This XSLT transforms the XML data to a format that can be understood by the DataDirect XML Converters™.

See "Creating XML Schemas from EDI" on page 37 for an example of using DataDirect XML Converters™ to create XML Schema from an EDI document.

Instance Documents

Some XML Converters, like those for CSV and Tab, require an instance document in order to provide DataDirect XML Converters™ with the information it needs to generate an XML Schema. Other XML Converters (like EDI) can use instance documents, but they are not required; for this type of file, you can provide information using converter: URI properties to specify characteristics of the generated XML Schema. Still others (Base64 and SDI, for example) use neither instance documents nor converter: URI properties, relying instead on DataDirect XML Converters™ built-in settings for XML Schema generation for files of that type.

See "XML Schema Generation Summary" on page 35 for more information concerning instance document and converter: URI property usage for XML Converters.

URI Parameters That Affect XML Schema

This section describes how URI parameters affect XML Schema generation for the XML Converters that support their use. The XML Converters for which you can specify URI parameters are:

- CSV
- EDI
- Line
- Tab
- *custom* (built using Stylus Studio)

CSV XML Converter URI Parameters

The following parameters affect XML Schema generation for both CSV and tab-delimited files:

Table 1-2. Parameters for CSV and Tab XML Converters

Property	Description
first=	Specifies whether elements subordinate to the row element are named column (plus a number to make it unique) or are given their name based on the first row of data.
root=	Specifies the name of the root element in converted XML; also specifies the name of the root element in generated XML Schema.
row=	Specifies the name of the row element in converted XML; also specifies the name of the row element in generated XML Schema.

EDI XML Converter URI Parameters

The following parameters affect XML Schema generation for EDI files:

Table 1-3. Parameters for EDI XML Converters

Property	Description
dialect=	Must be one of the following: ATIS, CARGO, EANCOM, EDIFACT, EDIGAS, HIPAA, HL7, IATA, NCPDP, TRADACOMS, or X12. Use IATA to specify the PADIS dialect. The dialect must be specified if an instance document is not provided.

Table 1-3. Parameters for EDI XML Converters

Property	Description
doc=	Whether or not to include `xs:documentation` comments in the XML Schema. Default is "yes."
inter=	Certain EDI messages have alternate batch and interactive forms, depending upon whether they are used between systems that have real-time connections. The `inter=yes` setting causes the interactive form to be used, if available. For example, in EDIFACT, this would cause the normal envelope of UNB/UNH/UNT/UNZ to be replaced by UIB/UIH/UIT/UIZ.
long=	Whether you want to use long or short element names in your XML conversions – FTX03-TextReference (`long=yes`) or FTX03 (`long=no`), for example.
message=	Varies based on the dialect and version. Examples for EDIFACT include CONTRL and ORDERS; examples for HL7 include ACK and ADT_A01; examples for IATA PADIS include SPORES and TKTRES; and so on. Required if an instance document is not provided.
tbl=	Whether or not the codelist tables are created as enumerations in the generated XSD output. Default is "no."
user=	Optionally specifies a SEF extension file, whose structure is incorporated in the generated XML Schema.
version=	Varies based on the dialect. Examples for EDIFACT include 921 and D07A; examples for HL7 include 2.1 and 2.5; examples for IATA PADIS include 991 and 992; and so on. Required if an instance document is not provided.

Line XML Converter URI Parameters

The following parameters affect XML Schema generation for whole-line text files:

Table 1-4. Parameters for Line XML Converters

Property	Description
line=	Specifies the name of the element that wraps each line in converted XML; also specifies the name of that element in generated XML Schema.
root=	Specifies the name of the root element in converted XML; also specifies the name of the root element in generated XML Schema.

Tab XML Converter URI Parameters

See "CSV XML Converter URI Parameters" on page 32.

XML Schema Generation Summary

The following table summarizes information about the XML Schema generation capabilities of DataDirect XML Converters. Note that not all XML Converters can generate XML Schema.

Table 1-5. XML Converters That Can Generate XML Schema

Converter Name	*Can Generate XML Schema*	*Instance Document*	*URI Parameters Affect XML Schema*
Base64	Yes	Not needed	No
Binary	Yes	Not needed	No
CSV	Yes	Mandatory	Yes
custom	Yes	Not needed	via .conv file
dBase (all)	Yes	Mandatory	No
DIF	Yes	Not needed	No
DotD	Yes	Not needed	No
EDI (all)	Yes	Optional	Yes
JavaProps	Yes	Not needed	No
JSON	No	n/a	n/a
Line	Yes	Not needed	Yes
Pyx	No	n/a	n/a
RTF	No	n/a	n/a
SDI	Yes	Not needed	No
Sylk	Yes	Not needed	No
Tab	Yes	Mandatory	Yes
WinIni	Yes	Not needed	No
WinWrite	Yes	Not needed	No

Example Applications

This section presents two simple applications: one showing the conversion of an EDI file to XML, and another that shows how to use the API to create an XML Schema from an EDI file.

See Chapter 5 "XML Converters™ Examples" on page 85 for other application examples.

Converting EDI to XML

Following is a simple example application that reads EDI from one file (`myEdi.x12`) and writes XML to another (`myEdi.x12.xml`).

```
using System;
using System.Collections.Generic;
using System.Text;
using DDTek.XmlConverter;

namespace ConverterOne
{
   class Program
   {
      static void Main(string[] args)
      {
      Console.Out.WriteLine(args[0] + " --> " + args[1]);
      Converter toXML = new ConverterFactory().CreateConvertFromXml
      ("converter:EDI");
      toXML.Convert(new UriSource(args[0]), new UriResult(args[1]));
      }
   }
}
```

This program can be invoked from a command line as follows:

```
ConverterOne file:///c:/path/myEdi.x12   file:///c:/path/myEdi.x12.xml
```

Creating XML Schemas from EDI

Following is a simple example that shows a C# program that generates XML Schema for EDIFACT version D07A; the name of the message being converted (in this case, ORDERS), is taken from the command line, which might look like this:

```
com.ddtek.example.CreateEdifactSchema ORDERS
```

In this example, the XML Schema is written to the console.

```
using System;
using DDTek.XmlConverter;
namespace Example
{
   public class CreateEdifactSchema {
      static void Main(String[] args) {
         String uri = "EDI:dialect=EDIFACT:version=D07A:long=yes:message=" +
args[0];
         try {
            ConverterFactory factory = new ConverterFactory();
            SchemaGenerator schema = factory.CreateSchemaGenerator(uri);
            Result twr = new TextWriterResult(Console.Out);
            schema.GetSchema(twr);
         } catch (ConverterException ce) {
            Console.WriteLine(ce.Message);
         }
      }
   }
}
```

The previous example specified the dialect, version and message directly in the EDI: URI, using the dialect=, version= and message= properties:

```
...
String uri = "EDI:dialect=EDIFACT:version=D07A:long=yes:message=" + args[0];
...
```

For some file types, like EDI, you can instead supply a sample, or instance, document from which the XML Converters engine can read this information. When you use an EDI instance document, the schema generator generates an XML Schema for the dialect/version/message in that instance document.

In the following example, the name of the EDI instance document (data.edi) is taken from the command line, which might look like this:

```
com.ddtek.example.CreateAnySchema c:\myhome\data.edi
```

In this example, the XML Schema is again written to the console:

```
using System;
using DDTek.XmlConverter;
namespace Example
{
   public class CreateAnySchema {
     static void Main(String[] args) {
        String uri = "EDI:long=yes";
        try {
           ConverterFactory factory = new ConverterFactory();
           SchemaGenerator schema = factory.CreateSchemaGenerator(uri);
           Source us = new UriSource(args[0]);
           Result twr = new TextWriterResult(Console.Out);
           schema.GetSchema(us, twr);
        } catch (ConverterException ce) {
           Console.WriteLine(ce.Message);
        }
     }
   }
}
```

2 XML Converters™ URI Schemes

You can use the converter: URI scheme to reach a variety of data sources using DataDirect XML Converters. The converter: URI scheme can also be used with user-defined custom XML conversions created using Stylus Studio XML Enterprise Suite.

The converter: URI Scheme

The converter: URI scheme specifies an XML Converter name – either one of the standard XML Converters (for EDI or tab-delimited files, for example) and settings for the properties you wish to use, or a custom XML conversion created using Stylus Studio XML Enterprise Suite. SEF files, which describe proprietary extensions to EDI standard dialects and messages, can be passed as a parameter of the converter: URI.

Converter URI Syntax

While properties differ from one XML Converter to the next, the syntax used to invoke an XML Converter is the same:

`converter:`*`name`*`[:`*`property_name`*`=`*`value`*` ]... [?`*`URI`*`]`

To specify a converter: URI, you need to identify:

- The XML Converter you want to use (EDI, CSV, dBase, and so on)
- Options for that XML Converter (separator and escape characters, for example)

- The file to be converted

The format of the converter: URI string

Example

This converter: URI invokes the XML Converter for comma-separated values to convert the `three.txt` file in the \XMLConverters\examples\ directory to XML:

```
converter:CSV:newline=lf:first=yes?file:///c:/XMLConverters/examples/
three.txt
```

The instructions to the XML Converter engine from this instance of the converter URI are described the following table.

Instruction	Converter URI String
Use the Comma-Separated Values XML Converter converter	`converter:CSV`
The line separator in the source file is a line feed	`newline=lf`
The values in the first row of the source file should be used to supply field names	`first=yes`
The source file is three.txt	`?file:///c:/XMLConverters/examples/three.txt`

In this example:

- The name of the XML Converter is CSV. It could be any XML Converter – EDI, Base64, DIF, RTF, and so on.
- Only the newline= and first= properties have been specified; default values are used for all other converter properties.
- The source file being converted is `three.txt` on `c:/XMLConverters/examples`. If you are using the converter: URI programatically, you omit the ?*URI* parameter as the source file being converted is specified by the program.

Specifying XML Converter Properties

XML Converter properties that use default values do not have to be specified in the converter URI. A comma is the default separator character for the CSV XML Converter, for example. But if the particular file you were converting used another separator character, you would need to specify it using the sep= property.

While the basic format of the converter URI is the same from one XML Converter to another, XML Converters have different properties. For example, the XML Converter for dBase files has properties that the XML Converter for binary files does not.

For a complete description of properties for all XML Converters, see Chapter 6, "XML Converters™ Properties".

Building a converter: URI

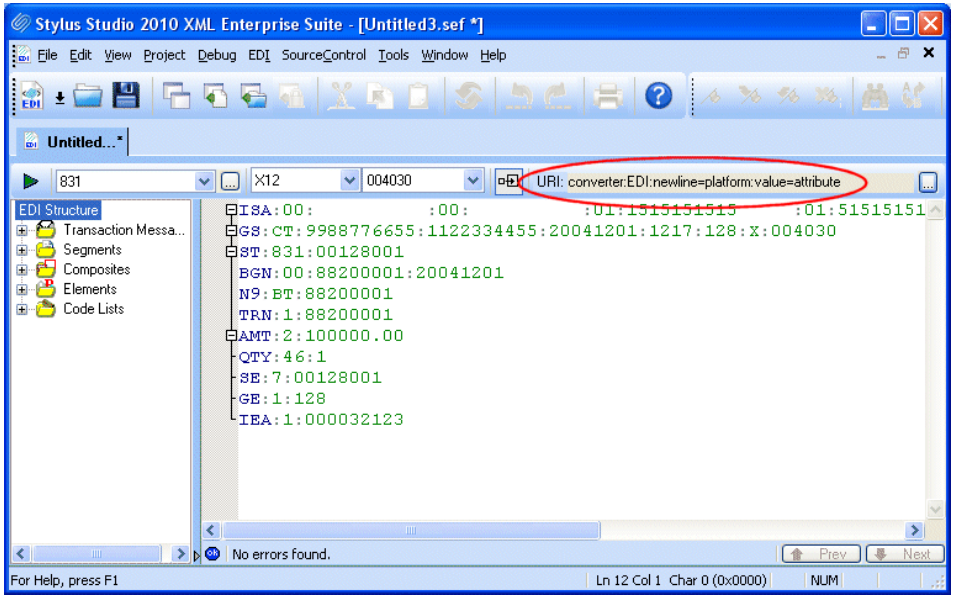
If you have Stylus Studio XML Enterprise Suite, you can use Stylus Studio to build the converter URIs you use in your .NET applications. Converter URIs can be long and complex – properties and their values vary from one converter to another, for example – so using Stylus Studio to construct them can reduce errors in your applications. Its graphic user interface can make it easier to specify the converter properties you need to include.

Otherwise, you must construct the converter URL manually, taking care to specify both setting names and their values correctly. For a complete description of properties for all XML Converters, see Chapter 6, "XML Converters™ Properties".

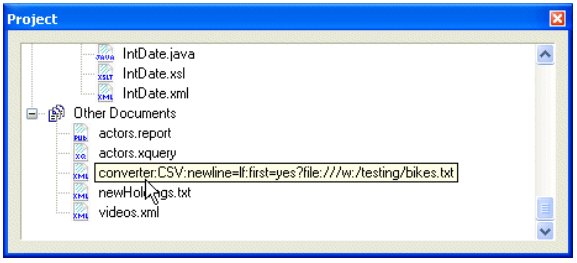
Where Converter URIs are Displayed in Stylus Studio

Converter URIs are displayed in the following places in Stylus Studio XML Enterprise Suite:

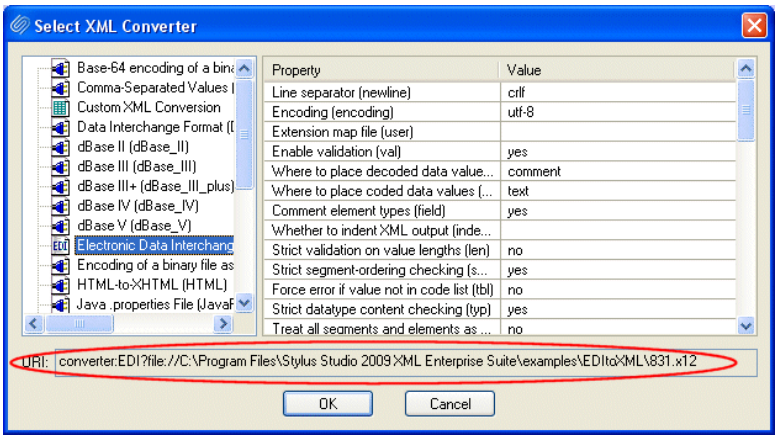
- In the **URI** field of the EDI to XML Module editor. You can also make changes to the converter URI here.



- In the **Project** window (select **Show Full URL Info** from the **Project** window shortcut menu)



- In the **URI** field of the **Select XML Converter** dialog box, as shown in the following illustration.



You can use any of these sources to capture the converter: URI string for use in your .NET applications. For more information, see the Stylus Studio product documentation.

Invoking a Custom XML Conversion

The converter: URI scheme can also be used to reference a custom XML conversion (a .conv file) built using Stylus Studio XML Enterprise Suite. In this case, the converter URI specifies only the location of the .conv file; the custom XML conversion contains all the information required to perform the XML conversion.

A converter URI that references a custom XML conversion called myConverter.conv might look like this:

```
converter:///myConverter.conv?file:inventory.txt
```

This converter: URI uses myConverter.conv to convert the file `inventory.txt` to some format (specified in the custom XML

conversion when you built it using Stylus Studio XML Enterprise Suite).

NOTE: Custom XML conversions can be defined using Stylus Studio XML Enterprise Suite *only*.

Invoking a Converter URI in XSLT

The .NET Framework uses a document URI resolver that enables the `document()` function to take a `converter:` URI as its argument.

Consider the following example of the document() function, which invokes the CSV XML Converter to convert the file one.csv to XML:

```
document('converter:///CSV:sep=,:first=yes?file:///c:/XMLConverter/one.csv')
```

In this example, only two of the CSV XML Converters properties is set (sep=, and first=yes); default settings are used for all other properties.

Here is the document() function in the context of a code sample that shows the use of XML Converter as XmlResolver. The transformation combines one.xml with one.csv into eleven.xml. The XSLT processor resolves one.csv through the XmlResolver implementation provided by the ConverterFactory class.

```
try{
            String xsltString =
            @"<xsl:stylesheet version='1.0'
              xmlns:xsl='http://www.w3.org/1999/XSL/Transform'>
             <xsl:output method='xml' indent='yes'/>
             <xsl:template match='/'>
             <root>
                  <xsl:copy-of select='.'/>
                  <xsl:copy-of select=""
                   document('converter:///CSV:sep=,:first=yes?" + exampleDir
                   + @"one.csv')""/>
```

```
    </root>
    </xsl:template>
    </xsl:stylesheet>";

    XslCompiledTransform xslt = new XslCompiledTransform();
    XsltSettings settings = new XsltSettings(true, false);
   xslt.Load(XmlReader.Create(new StringReader(xsltString)),
     settings, null);
    xslt.Transform(
        XmlReader.Create(exampleDir + "one.xml"),
        new XsltArgumentList(),
        XmlWriter.Create(exampleDir + "eleven.xml"),
        factory.CreateResolver());
    Console.WriteLine("test 11 finished: one.xml + one.csv ->
     eleven.xml");
}
catch (Exception e)
{
    Console.WriteLine("test 11 failed with exception: " + e);
}
```

3 Analyzing EDI to XML Conversions

This chapter describes the EDI Analyzer API and how to use it to convert EDI to XML. It covers the following topics:

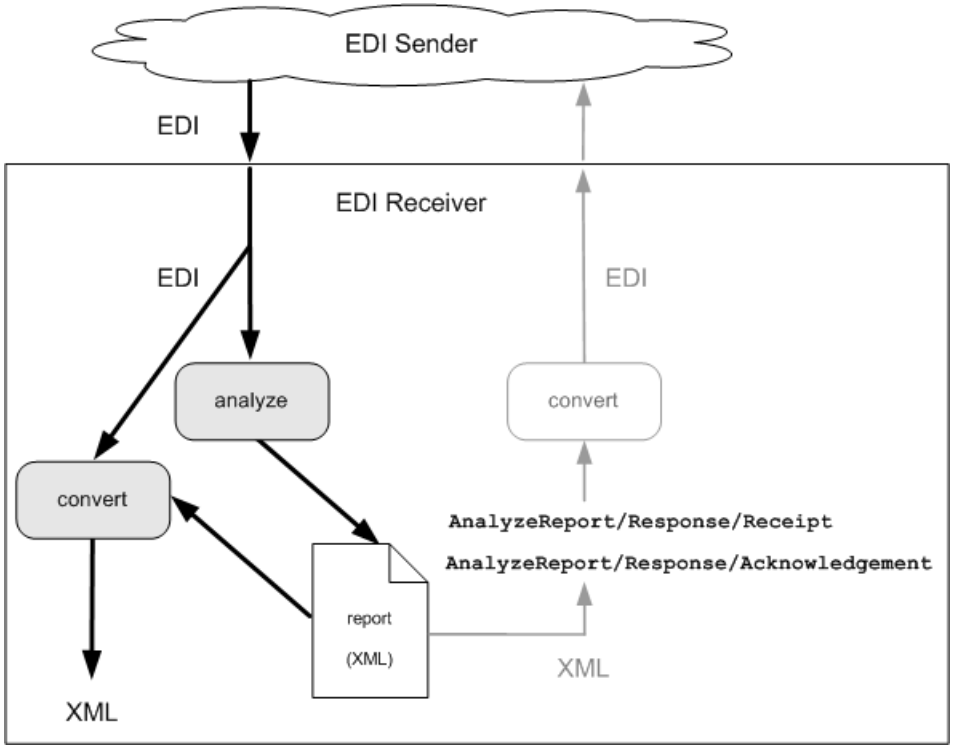
Overview

The Analyze method of the EDI Analyzer API analyzes an EDI stream for warnings, errors, and fatal errors before converting the EDI stream to XML. An XML report generated by the Analyze method identifies any errors in the EDI; this report is used by the Convert method to filter out interchanges, groups, and messages that contain errors during conversion, allowing partial processing of EDI streams that contain errors. The analysis report also includes dialect-specific transmission response messages that can be returned to the EDI sender.

This section covers the following topics:

Illustration

The following illustration shows how you can use EDI Analyzer API Analyze and Convert methods to convert EDI to XML. It shows EDI provided by an *EDI sender* – this could be an EDI document, EDI data stored on a file system, or EDI provided by a business partner's Web service, for example – being passed to an *EDI receiver* – a separate business entity, a business partner, or some other consuming application. Transmission response messages contained in the analysis report can optionally be returned to the EDI sender.



EDI Analysis

First the EDI data stream is analyzed by the Analyze method for any errors. Errors are classified as warnings, errors, and fatal errors. Errors, along with other information about the EDI stream and its transmission, are captured in an analysis report. The analysis report is always generated by the Analyze method, whether or not the EDI stream is free of errors. The Analyze method does not throw an exception unless the input stream or output stream could not be opened.

Some input data errors can make the input data file unrecognizable to the Convert method. If such is the case, then the analysis report will contain a <FatalError> element which describes the fatal error.

Analysis Report

The *analysis report* is an XML report generated by the Analyze method. It identifies any interchanges, groups, or messages that contain errors and describes those errors. For some EDI dialects, the analysis report also includes a Response element, with Receipt and Acknowledgement sub-elements that you can use to send transmission responses to the EDI sender.

You can write the analysis report to any output you choose – you might want to review the report before converting the EDI to XML, for example – but the analysis report needs to be available to the Convert method in order for the EDI to be converted to XML.

See "EDI Analysis Report" on page 54 for detailed information about the report's contents and structure.

EDI Conversion

The same EDI stream specified for the Analyze method must be specified for the Convert method. Once the analysis is complete, you pass the analysis report to the Convert method. The Convert method uses the errors identified in the analysis report to filter the EDI, preventing messages containing errors from being converted to XML while allowing the rest of the messages to be converted. When using Convert without the analysis report, if an error or fatal error occurs, the Convert method will throw an exception and no useful XML output will be generated. When Convert is used with the analysis report, then it will throw an exception only if:

- The input stream, output stream or analysis report could not be opened.
- The analysis report contains a <FatalError> element indicating that the input data file is unrecognizable.

Specifying the EDI Stream and EDI Conversion Settings

The EDI input stream specified for the Analyze method must be the same as that specified in the Convert method for a given XML conversion. When using a UriSource, it is convenient to use the same UriSource object for both Analyze and Convert. If, however, you use an InputStream source, you must rewind the input stream after calling Analyze, so that Convert can reread the same data.

Also, any conversion properties specified for the EDI stream in the Analyze method must also be specified for the EDI stream in the Convert method. These conversion properties were specified when the Converter object was created using the ConverterFactory.CreateConvertToXml(…) method. As long as you use the same Converter object for both the Analyze and

Convert, you are assured that the same conversion properties are used for both.

To learn more about conversion properties, see "EDI XML Converter Properties" on page 122.

Transmission Response Messages

Some EDI specifications provide message definitions for notifying an EDI sender about the success of a transmission, and about those messages that were successfully processed or rejected because of errors. The Analyze method automatically generates transmission response messages, creating a Response element with Receipt and Acknowledgement subelements in the EDI analysis report. Each subelement holds a complete EDI message in XML format that can be easily manipulated using .NET and then serialized to EDI to transmit the response to the EDI sender.

Communicating with the EDI sender is optional, and business entities will have different requirements for transmitting receipt messages, acknowledgement messages, or both. See "Managing Transmission Responses," for more information on this topic.

Dialect Support

The Analyze method is supported for all EDI dialects supported by DataDirect XML Converters. The Analyze method is supported for EDI to XML conversions only, and not vice versa.

Note, however, that automatic generation of transmission response messages is supported only for these EDI dialects:

- ATIS
- EDIFACT
- HIPAA
- X12

See "Managing Transmission Responses," for more information on this topic.

Method Definition

The Analyze method is defined as follows:

```
void ConvertToXml.Analyze(Source source, Result result)
```

The Source and Result implementations are the same as those supported by the Convert(Source, Result) method. In the case of the Analyze method, the Result object receives the EDI analysis report. Once the analysis report has been created, you use this method to convert the input data file:

```
void Convert(Source source, Result result, Source analyzeReportSource)
```

See "EDI Analysis Report" on page 54 for detailed information about the report's contents and structure. See "Example 14" on page 106 to see an implementation of the Analyze method in a simple .NET application.

Command Line Interface

The EDI Analyzer is supported through the command line interface using `/analyze` and `/report` options as part of the `CmdLine` command, as summarized in the following table.

Table 3-1. EDI Analyzer Command Line Options

Option	Description
`/analyze`	Analyzes the EDI data stream, identifying invalid items (a segment with an error, for example). Invalid items are skipped, and the rest of the data stream is converted to XML. Writes the analysis report to a temp file, which is used during the conversion, and then deleted.
`/report <Uri>`	Saves the analysis report to the specified <*Uri*>. Allows later use of the transmission response messages that are automatically generated for some EDI dialects. Note: The `/report` option cannot be used alone. It must always be used with the `/analyze` option.

See "Command Line Usage" on page 21 for general information about using the XML Converters command line interface.

Sending a Transmission Response

The `/analyze` option performs the EDI analysis *and* conversion as a single operation. If you want to be able to send a transmission response to the EDI sender, you must use the `/report` option and specify a file name in order to make the analysis report's Receipt and Acknowledgement elements accessible for conversion back to EDI.

See "Managing Transmission Responses" on page 61 for more information on this topic.

EDI Analysis Report

The EDI analysis report is an XML document that is generated automatically by the Analyze method. It contains complete information about the transmission, including information about

- The dialect of the EDI data source
- The interchanges, groups, and messages in the transmission
- Errors
- Dialect-specific accept/reject messages

The remainder of this section describes the structure of the analysis report and provides details about the format and content of each section in the report. It is organized as follows:

- "Document Root,"
- "Interchanges Element,"
- "Response Element,"

Document Root

The document root of the EDI analysis report is called AnalyzeReport. It has a single attribute that indicates the EDI dialect of the input document. For example:

```
<AnalyzeReport dialect="X12">
```

The AnalyzeRoot element contains two subelements – the Interchanges element and the Response element.

Interchanges Element

An *interchange* is an envelope for a set of EDI messages. The AnalyzeReport element contains a sequence of Interchange elements in which errors have been found. Interchange elements are grouped by a single Interchanges element. For example:

```
<Interchanges>
    <Interchange
          sequence="1"
          implicit="false"
          firstSegment="1"
          lastSegment="11"
          errors="false"
          warnings="true">
```

Each Interchange element defines the following attributes:

- sequence – the ordinal position in the input document
- implicit – indicates if the interchange was missing, and, therefore, inferred
- firstSegment, lastSegment – the segment range for this interchange
- errors – whether or not errors were found in the interchange
- warnings – whether or not warnings were found in the interchange

  Note that both errors and warnings are recorded using the Error element; a severity attribute indicates the type of error – W for warning, E for error. See "Errors" on page 56 for more information about the Error element.

Segments

Each Interchange element contains a Segments element, which includes header and trailer Segment elements, as well as a Segment element for any segment containing errors.

```
<Segments>
  <Segment segnum="1" header="true" segname="ISA">
```

Each Segment element defines the following attributes:

- segnum – the absolute ordinal number for the segment in the entire EDI transmission
- header – indicates whether the segment is a header or trailer (=true) or data segment (=false)
- segname – the segment name

SegmentData

Each Segment element contains a SegmentData subelement. The specific contents of the SegmentData subelement varies based on the dialect of the EDI source being converted to XML. For an X12 EDI document, for example, the SegmentData sublement would contain an ISA element, with ISA01, ISA02, subelements, as shown here:

```
<SegmentData>
   <IEA>
     <IEA01><!--I16: Number of Included Functional-->1</IEA01>
     <IEA02><!--I12: Interchange Control Number-->32123</IEA02>
   </IEA>
</SegmentData>
```

Errors

Each Segment element can also contain an Errors subelement. The Errors subelement contains one or more Error subelements. For example:

```
<Errors>
 <Error severity="E">
  <ErrorCode>DDEE0008</ErrorCode>
  <NativeErrorCode>7</NativeErrorCode>
  <NativeErrorTable>723</NativeErrorTable>
  <SegmentName>BGN</SegmentName>
```

```
  <SegmentNumber>4</SegmentNumber>
  <Value>99</Value>
  <InvalidCharacter/>
  <Element>1</Element>
  <Repeat>1</Repeat>
  <SubElement/>
  <TriElement/>
  <Offset>4</Offset>
  <ElementName>353 (s)</ElementName>
  <Dialect>X12</Dialect>
  <SyntaxVersion>00403</SyntaxVersion>
  <MessageVersion>00403</MessageVersion>
  <CodeListVersion>004030</CodeListVersion>
  <SystemVersion/>
  <HeaderVersion/>
  <ControllingAgency>004030</ControllingAgency>
  <ErrorText>[DDEE0008] ERROR Value 99 not in codelist 353.
  Dialect: X12
  Version: syntax=00403/004030;codelist=004030/;message=
00403/004030;agency=004030
  Message: 831
  Segment: BGN (segment 4)
  Position: BGN01
  Element: 353 (s) Transaction Set Purpose Code
  Value: "99"
  Native error: 7, in table: 723

The value for an element in the data stream cannot be found
in the codelist associated
with the element. Turning off codelist validation with
"tbl=no" will eliminate the error.</ErrorText>
 </Error>
</Errors>
```

The Error element defines a single attribute:

- severity – E for error, W for warning, F for fatal.

  Note that if the file contains an <Error severity="F"> element, it will also contain a <FatalError> element (the first

child of the <AnalyzeReport> element). In this case, the analysis report cannot be used by the Convert method.

Each Error element can contain the following subelements. Note that if the element is empty, it is omitted from the report.

- ErrorCode – the vendor code
- NativeErrorCode – internal use only
- NativeErrorTable – internal use only
- SegmentName – the name of the segment in which the error occurred
- SegmentNumber – the absolute ordinal position of the segment relative to the entire EDI transmission
- Value – the field value that triggered the error
- InvalidCharacter – the invalid character that triggered the error
- Element – the absolute ordinal position of the message element where the error occurred
- Repeat – the iteration number in a loop where the error occurred
- Subelement – the particle where the error occurred; appears for HL7 conversions only
- TriElement – the particle where the error occurred; appears for HL7 conversions only
- Offset – the offset in characters from the start of the segment
- ElementName – the name of the message element where the error occurred
- Dialect – the EDI dialect name
- SyntaxVersion – the EDI syntax version
- MessageVersion – the EDI message version

- CodeListVersion – the EDI codelist version
- SystemVersion – the EDI system version
- HeaderVersion – the EDI message header version
- ControllingAgency – the agency controlling the EDI specification
- ErrorText – the complete error message

Groups

Each Interchange element also contains a Groups subelement, itself containing one or more Group elements. Each Group element defines the following attributes:

- sequence – the ordinal position within the interchange
- implicit – indicates there was no group start segment, and, therefore, it was inferred
- firstSegment, lastSegment – the segment range for this group
- errors – whether or not errors were found in the group
- warnings – whether or not warnings were found in the group

Segments

Each Group element contains a Segments element. See "Segments" on page 55 for a description.

Messages

Each Group element contains a Messages element, itself containing one or more Message elements. Each Message element defines the following attributes:

- sequence – the ordinal position in the input document

- implicit – indicates if the message was missing, and, therefore, inferred
- firstSegment, lastSegment – the segment range for this message
- errors – whether or not errors were found in the message
- warnings – whether or not warnings were found in the message

Response Element

For EDI dialects for which transmission responses are supported (ATIS, EDIFACT, HIPAA, and X12), the Analyze method generates a Response element in the EDI analysis report. The Response element contains Receipt and Acknowledgement subelements :

```
<Response>
 <Receipt>...</Receipt>
 <Acknowledgement>...</Acknowledgement>
</Response>
```

The Receipt and Acknowledgement elements each contain a complete EDI message in XML format:

- Receipt element messages indicate only that the transmission from the EDI sender was received; they contain no information about the content of the transmission.
- Acknowledgement element messages contain information for each interchange, group, and message that was received, including whether it was accepted without errors, rejected, or partially accepted.

Receipt and Acknowledgement elements can be easily manipulated using .NET and then serialized to EDI for consumption by the EDI sender.

For EDI dialects for which transmission responses are not supported, the analysis report contains an empty Response element.

See "Managing Transmission Responses" on page 61 for more information on this topic.

Managing Transmission Responses

Some EDI specifications define the interchanges and messages to be used to notify the EDI sender about transmission status, from initial receipt of the transmission to the errors, if any, encountered in the EDI data stream received from the EDI sender. For example:

- HIPAA and X12 use the TA1 interchange to indicate whether a transmission was accepted, accepted with errors, or rejected. The 997 transaction set is used to report errors encountered during EDI processing.
- EDIFACT uses the CONTRL message to indicate acceptance or rejection of a transmission, and also to report errors encountered during EDI processing.

As described in "Response Element" on page 60, the Analyze method generates dialect-specific transmission responses as Receipt and Acknowledgement elements in the EDI analysis report.

This section covers the following topics:

Receipt Element Example

Here is an example of the Receipt element from the analysis report created using the Analyze method to convert the sample file threemsgs.x12 to XML:

```
<Receipt>
    <X12>
        <ISA>
            <ISA01>00</ISA01>
            <ISA03>00</ISA03>
            <ISA05>01</ISA05>
            <ISA06>5151515151</ISA06>
            <ISA07>01</ISA07>
            <ISA08>1515151515</ISA08>
            <ISA11>^</ISA11>
            <ISA12>00403</ISA12>
            <ISA13>0</ISA13>
            <ISA14>0</ISA14>
            <ISA15>P</ISA15>
            <ISA16>*</ISA16>
        </ISA>
        <TA1>
            <TA101>32123</TA101>
            <TA102>041201</TA102>
            <TA103>1217</TA103>
            <TA104>A</TA104>
            <TA105>000</TA105>
        </TA1>
        <IEA/>
    </X12>
</Receipt>
```

The specific structure of the Receipt element varies based on the dialect, and contents, of the EDI stream being converted. In this example:

- The X12 element specifies the EDI dialect of the EDI data stream that was converted to XML.

- The ISA element represents the Interchange Control Header segment; its subelements (ISA01, ISA02, and so on) show the values for the corresponding segment fields (Authorization Information Qualifier, Authorization Information, and so on).
- The TA1 element represents the Transaction Acknowledgement segment; its subelements (TA101, TA102, and so on) show the values for the corresponding segment fields (Interchange Control Number, Interchange Date, and so on).
- The IEA element represents the Interchange Control Trailer segment; it is empty because the values for this segment are computed automatically by DataDirect XML Converters when the Receipt element is converted to EDI for transmission back to the EDI sender.

  Other EDI segments that are computed when the XML is converted to EDI include the Transaction Set Trailer (SE) and Function Group Trailer (GE).

Acknowledgement Element Example

Following is an example of the Acknowledgement element from the same analysis report created using the Analyze method to convert the sample file threemsgs.x12 to XML. Note that is has been abbreviated for formatting considerations.

```
<Acknowledgement>
    <X12>
        <ISA> … </ISA>
        <GS> … </GS>
        <TS_997>
            <ST>
                <ST01>997</ST01>
                <ST02>0</ST02>
            </ST>
            <AK1>
                <AK101>CT</AK101>
```

```
                <AK102>128</AK102>
            </AK1>
            <AK2>
                <AK201>831</AK201>
                <AK202>00128001</AK202>
            </AK2>
            <AK5> … </AK5>
            <AK2>
                <AK201>831</AK201>
                <AK202>00128002</AK202>
            </AK2>
            <AK3> … </AK3>
            <AK4>
                <AK401> … </AK401>
                <AK402>782</AK402>
                <AK403>6</AK403>
                <AK404>ZZZZ</AK404>
            </AK4>
            <AK5> … </AK5>
            <AK2> … </AK2>
                <AK201>831</AK201>
                <AK202>00128003</AK202>
            <AK5> … </AK5>
            <AK9>
                <AK901>P</AK901>
                <AK902>3</AK902>
                <AK903>3</AK903>
                <AK904>2</AK904>
            </AK9>
            <SE/>
        </TS_997>
        <GE/>
        <IEA/>
    </X12>
</Acknowledgement>
```

- The X12 and ISA elements serve the same function as those in the Receipt element.
- The GS element represents the Functional Group Header segment; its subelements (GS01, GS02, and so on) show the

values for the corresponding segment fields (Functional Identifier Code, Application Sender's Code, and so on).

- The TS_997 element serves as a message wrapper for all functional acknowledgement transaction messages. The TS stands for *transaction set*, and 997 indicates the type of message. In this case, 997 represents the X12 997 functional acknowledgement. Functional acknowledgement transaction message wrapper elements have different names in different EDI dialects.
- The ST element represents the Transaction Set Header.
- The AK elements represent the
  - Functional Group Response Header (AK1) and Functional Group Response Trailer (AK9) segments. There is one pair of AK1/AK9 segments for every group of transactions.
  - Transaction Set Response Header (AK2) and Transaction Set Response Trailer (AK5). These pairs of segments can repeat, once for each transaction in the transaction set. In this example, there are three AK2 segments because there are three messages in the threemsgs.x12 EDI source document.

  If a message contains an error, the analysis report will also contain elements representing these segments:
  - AK3 (Data Segment Note). This segment identifies the invalid segment's position within the transaction, as well as an error code that specifies the type of error.
  - AK4 (Data Element Note). If the segment is determined to be invalid because of bad data (a value with an improper data type, for example), the AK4 subelements specify the Data Element Syntax Error Code (AK403) and Copy of Bad Data Element (AK404).
- The SE, GE, and IEA segments are the same as those described in "Receipt Element Example" on page 62.

Converting Response Messages to EDI

Since transmission responses are structured as XML, they need to be converted to EDI before they can be returned to the EDI sender. This example shows how to

- Use the Analyze method to generate the analysis report and convert the EDI data stream (in this case, a sample X12 EDI document, threemsgs.x12) to XML
- Locate the Receipt element in the analysis report
- Convert the XML for the TA1 Transaction Acknowledgement segment to EDI

To see a complete example application that converts both Receipt and Acknowledgement responses to EDI, see "Example 14" on page 106.

Invoking the Analyze Method

To get started, the EDI XML Converter is used to initiate the conversion of the source EDI document, threemsgs.x12 to EDI:

```
try {
   Source ediSource = new UriSource(uriString + "threemsgs.x12");
   ConvertToXml toXml = factory.CreateConvertToXml("converter:EDI");
```

Next the Analyze method is used to generate the analysis report and saves the output to report.xml:

```
   Result reportResult = new UriResult("report.xml");
   toXml.Analyze(ediSource, reportResult);
```

See "Receipt Element Example" on page 62 for a sample of the analysis report, report.xml.

Converting the Source EDI

In this section of code, the analysis report is used as input to convert the EDI stream to XML. Any errors in the EDI stream are recorded in the analysis report, which is used by ConvertToXml as a filter so that only valid EDI messages are converted to XML. Here, the valid EDI is written to an XML document, twomsgs.xml.

```
Source reportSource = new UriSource(new FileInfo("report.xml").FullName);
Result xmlResult = new UriResult("twomsgs.xml");
toXml.Convert(ediSource, xmlResult, reportSource);
```

Locating Response Messages

The EDI analysis report is used again, this time as the source for the EDI transmission response messages that have been generated in the Receipt and Acknowledgement elements in the XML report. It is these elements whose contents will be converted to EDI for transmission back to the EDI sender. Here the report is opened with an instance of XmlReader.

```
XmlReader rdr = XmlReader.Create("report.xml");
```

Once the XmlReader object is created, we can read through the analysis report, skipping first to the Receipt element, then to the X12 element:

```
while(rdr.Read()) {
   if (   rdr.NodeType == XmlNodeType.Element
       && rdr.LocalName == "Receipt")
      break;
}
while(rdr.Read()) {
   if (   rdr.NodeType == XmlNodeType.Element
       && rdr.LocalName == "X12")
      break;
}
```

(For a refresher of the Receipt element structure, see “Receipt Element Example” on page 62.)

Converting the Receipt Element to EDI

Once the Receipt element is located in the analysis report, it can be converted to EDI for transmission back to the EDI sender. Note that the converter: property is specified as ED.

```
ConvertFromXml converter = factory.CreateConvertFromXml("converter:EDI");
Source responseSource = new XmlReaderSource(rdr);
Result receiptResult = new UriResult("receipt.x12");
converter.Convert(responseSource, receiptResult);
```

The resulting EDI is written to the file, receipt.x12, which contains the following:

```
ISA+00+          +00+          +01+5151515151
+01+1515151515     +090818+1110+^+00403+000000000+0+P+*'
TA1+000032123+041201+1217+A+000'
IEA+0+000000000'
```

Notice that the IEA segment (Interchange Control Trailer), which was represented in the original XML conversion of the source EDI document as an empty element (<IEA/) has been automatically computed by the EDI XML Converter and now includes values for the Number of Included Functional Groups (IEA01) and Interchange Control Number (IEA02) segments.

Sending Responses to the EDI Sender

When you send a response to an EDI sender, you typically must provide each interchange with a unique identifier – for X12, for example, this is the Interchange Control Number (ISA12) segment; for EDIFACT, this is the Interchange Control Reference (UNB05) segment.

You can perform this task as part of the application code that extracts the Receipt or Acknowledgement element from the analysis report; it is expected that the generation of a unique identifier is handled elsewhere.

Example

This simple XSLT locates the Interchange Control Header (ISA) segment, replaces the value of the Interchange Control Number (ISA12) segment with 1000, and converts the node to EDI for transmission to the EDI sender.

```
<?xml version='1.0'?>
<xsl:stylesheet version="1.0" xmlns:xsl=
"http://www.w3.org/1999/XSL/Transform">
    <xsl:output method="xml" indent="yes"/>
    <xsl:param name="InterchangeControlID"/>

    <xsl:template match="/">
        <xsl:apply-templates select="/AnalyzeReport/Response/Receipt/X12"/>
    </xsl:template>

    <xsl:template match="*">
        <xsl:copy>
            <xsl:apply-templates/>
        </xsl:copy>
    </xsl:template>

    <xsl:template match="ISA12">
        <ISA12><xsl:value-of select="$InterchangeControlID"/></ISA12>
    </xsl:template>

</xsl:stylesheet>
```

4 Deploying XML Converters™ on Microsoft® BizTalk® Server

Data inside a Microsoft® BizTalk® Server (BizTalk) application always moves as XML. Because of this, .NET users often need to integrate conversion operations in the context of BizTalk to manage EDI or legacy formats.

This chapter describes how to deploy DataDirect XML Converters for .NET on Microsoft BizTalk to help control the input and output ports of BizTalk applications that need to convert data in native formats to XML.

About Microsoft BizTalk Server

Microsoft BizTalk Server is a Business Process Manager (BPM) enterprise solution that allows users to connect diverse software and then both create and modify the process logic that uses that software.

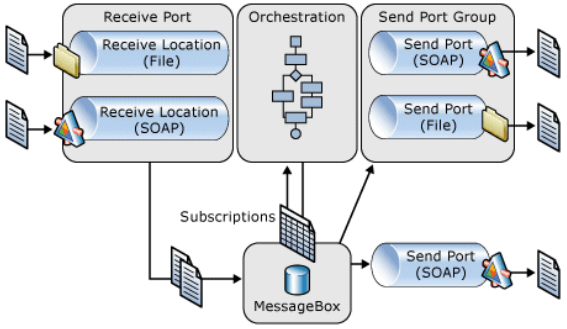
The BizTalk Architecture

One of the key elements of the BizTalk architecture is processing business messages in XML. BizTalk assumes, therefore, that incoming messages are already in XML, or that they get translated to XML upon reception.

Not all business data is XML – Electronic Data Interchange (EDI) and comma-separated values (CSV) are two file formats commonly found in both business-to-business (B2B) and numerous small- and medium-size business applications. BizTalk provides a mechanism to plug-in third-party components (like DataDirect XML Converters) to convert input and output data from and to XML.

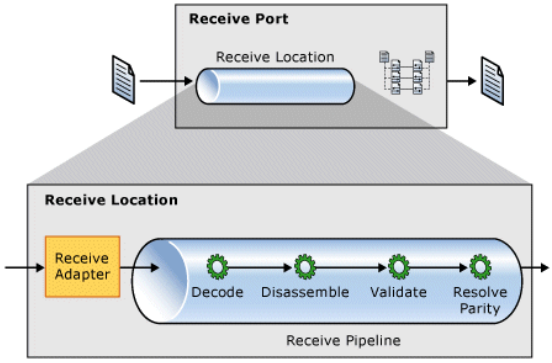
Receiving and Sending Messages

In order to have a flexible architecture, BizTalk allows you to configure a pipeline on input (receive) and output (send) ports that provides a way to manipulate and transform the data before it is stored in the MessageBox. BizTalk stores all messages in SQL Server, as shown in the following Microsoft BizTalk Server illustration.



XmlConverters Disassembler

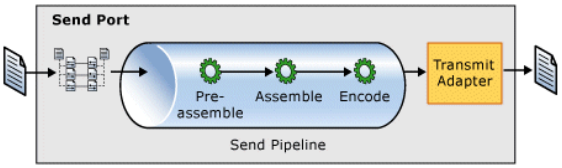
Pipeline processing deals with both message content and message context. Message content is generally handled in the decoding, disassembling, and validating stages, as shown in the following Microsoft BizTalk Server illustration:



The job of the disassembler is to process an incoming message from an adapter, disassembling it into many messages, and parsing the message data. By definition, it expects that data is being converted from a native format to XML. XML Converters provides a disassembler implementation that can be used to convert a variety of flat file formats into XML.

XmlConverters Assembler

When a message is ready to be sent from BizTalk, it undergoes a complementary process in the send port. Maps are applied to messages before the send pipeline is executed, allowing a message to be transformed to a customer- or application-specific format before being processed by the pipeline and sent through the adapter. In the send pipeline, properties are demoted from the context into the message, instead of being promoted into the message context, as shown in the following Microsoft BizTalk Server illustration.



The job of the assembler is to process an outgoing message to an adapter, and to serialize the message data. The DataDirect XML Converters assembler implementation can be used to convert XML into a variety of flat file formats.

Building a BizTalk Receive Pipeline

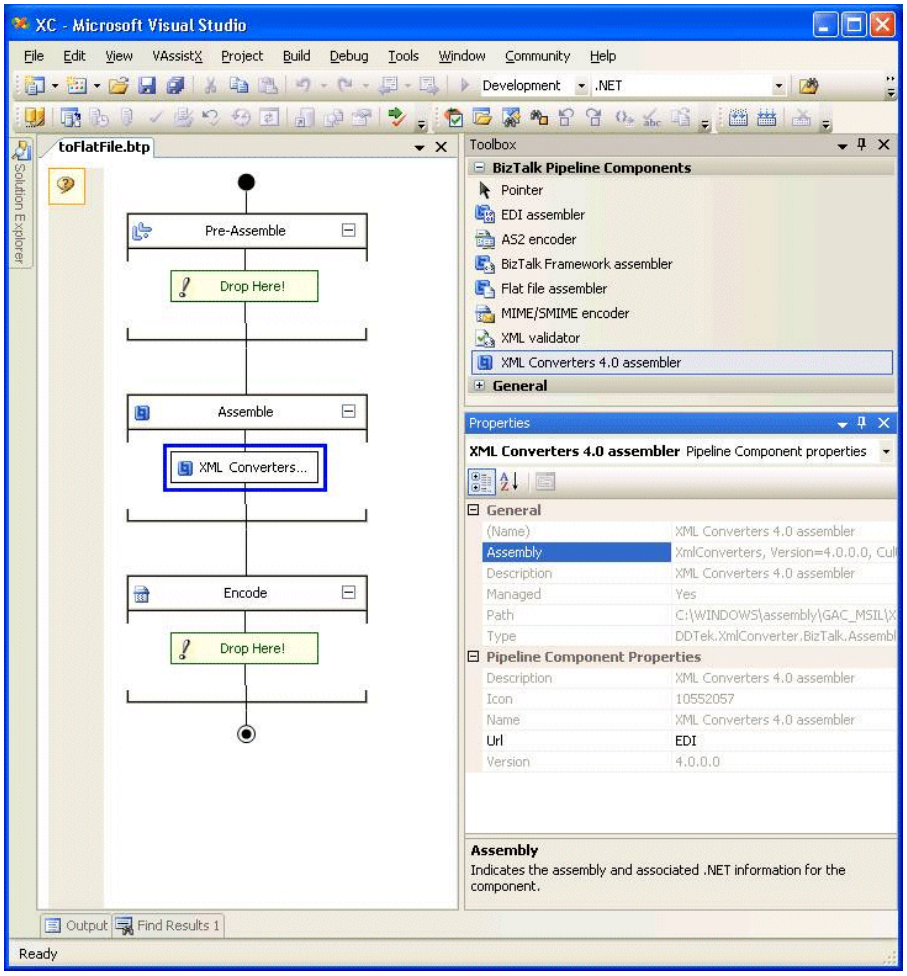
This section describes how to build a BizTalk receive pipeline. The first step is registering DataDirect XML Converters components.

Registering DataDirect XML Converters Components

In order to use DataDirect XML Converters in the BizTalk pipeline visual editor, you need to register the component in Microsoft Visual Studio.

To register DataDirect XML Converters components with BizTalk:

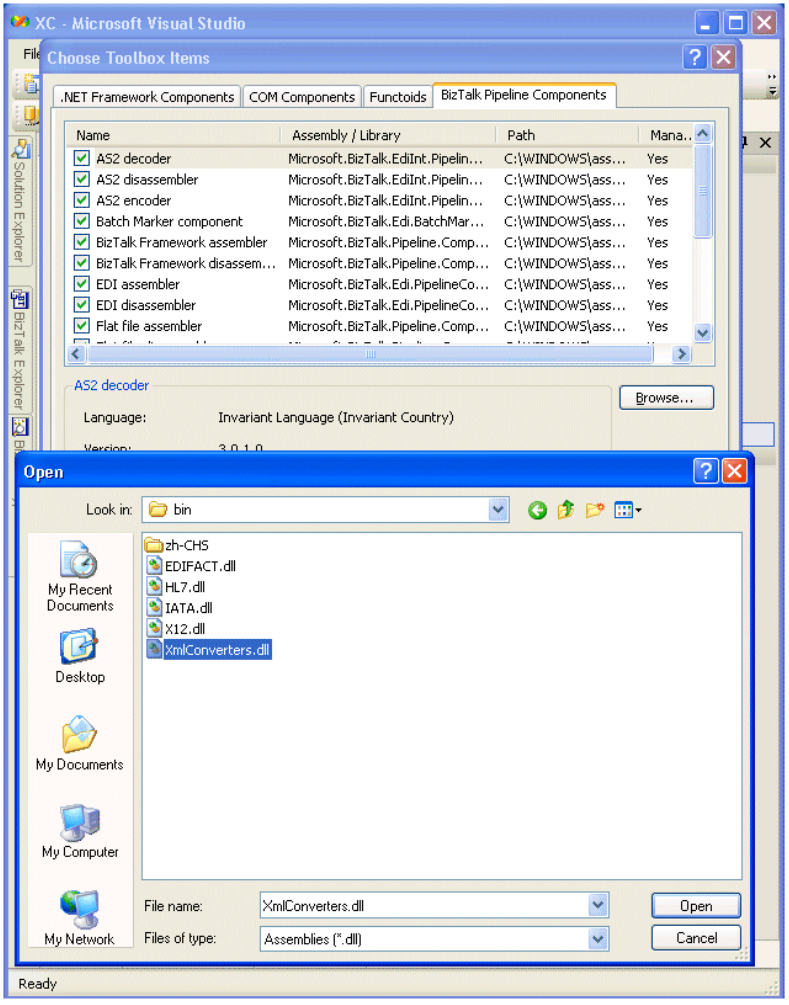
1 In Microsoft Visual Studio, right-click **BizTalk Pipeline Components** toolbox and select **Choose Items**.



The Choose Toolbox Item dialog box appears.

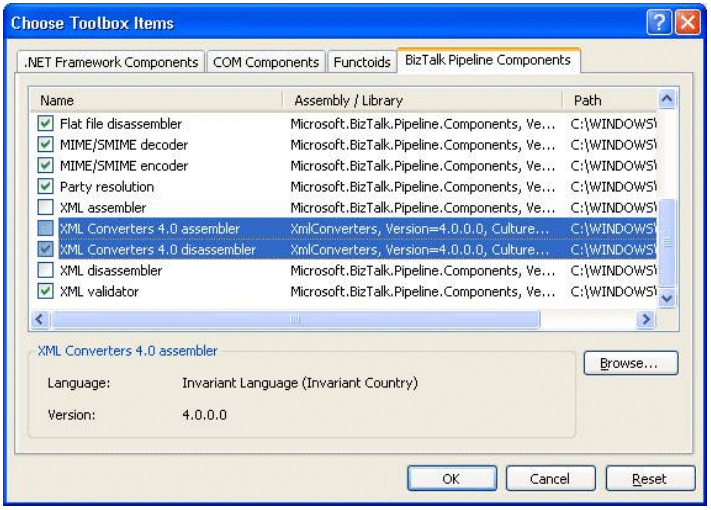
2 In the Choose Toolbox Item dialog box, select the **BizTalk Pipeline Components** tab and click the **Browse** button.

The Open dialog box appears.



3 Navigate to the folder where you installed DataDirect XML Converters, and select XmlConverters.dll and click the **Open** button.

XML Converters assembler and XML Converters disassembler appear in the list box.

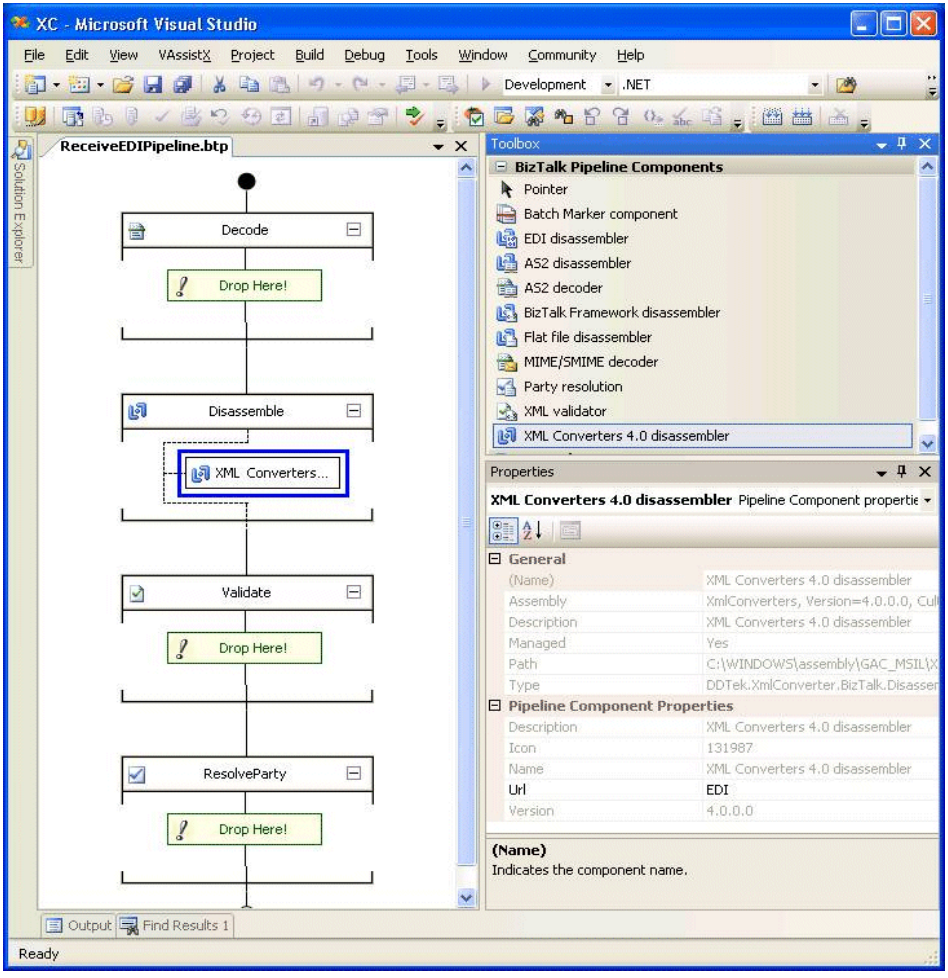


4 Ensure that the check boxes are selected so that these components are enabled.

Adding the Disassembler to the Receive Pipeline

Once the registration of the DataDirect XML Converters components is complete, you can manipulate the assembler and disassembler components as you would any other BizTalk components.

In our case, we want to drag and drop the DataDirect XML Converters disassembler component into the disassemble block in the diagram that represents our receive pipeline, as shown in the following illustration.

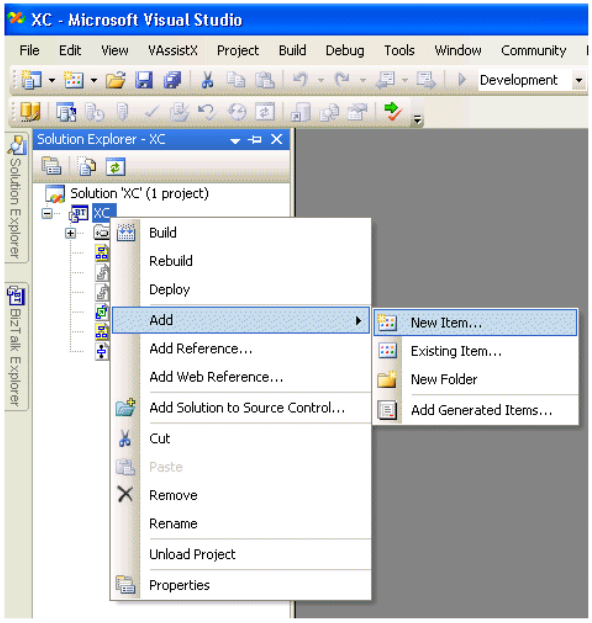


Building a BizTalk Send Pipeline

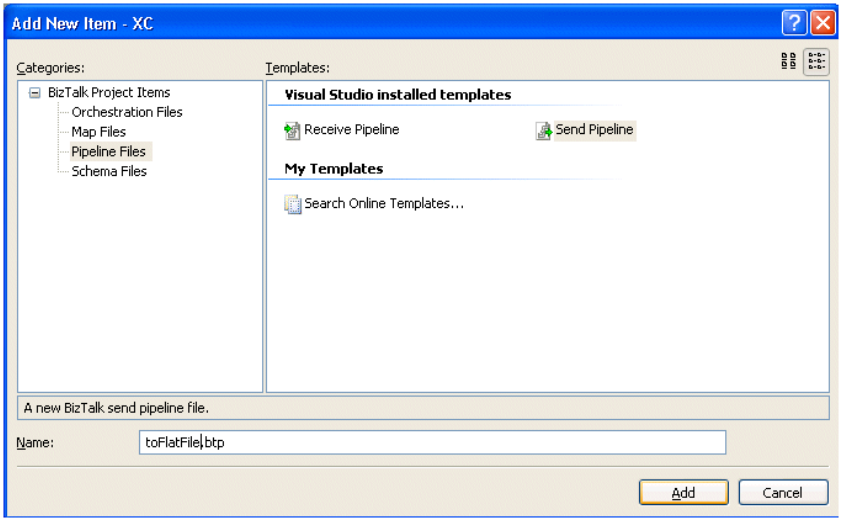
The procedure in this section assumes that the XML Converters components have already been registered in Microsoft Visual Studio. See "Registering DataDirect XML Converters Components" on page 74 for more information.

To create a send pipeline that uses the XML Converters assembler:

1 In Microsoft Visual Studio, right-click on the BizTalk project in the Solution Explorer and choose **Add** > **New Item**.



The Add New Item dialog box appears.



2 Select **Send Pipeline** and then click the **Add** button.

The XML Converters assembler is now listed in the BizTalk Pipeline Components Toolbox and can be added to the send pipeline.

Example: Converting EDI X12 Into a Flat File

In this example, we design a BizTalk process that receives purchase orders in EDI X12 850 format and forwards these purchase orders to an order system that accepts only CSV flat file format.

Create XML Schema

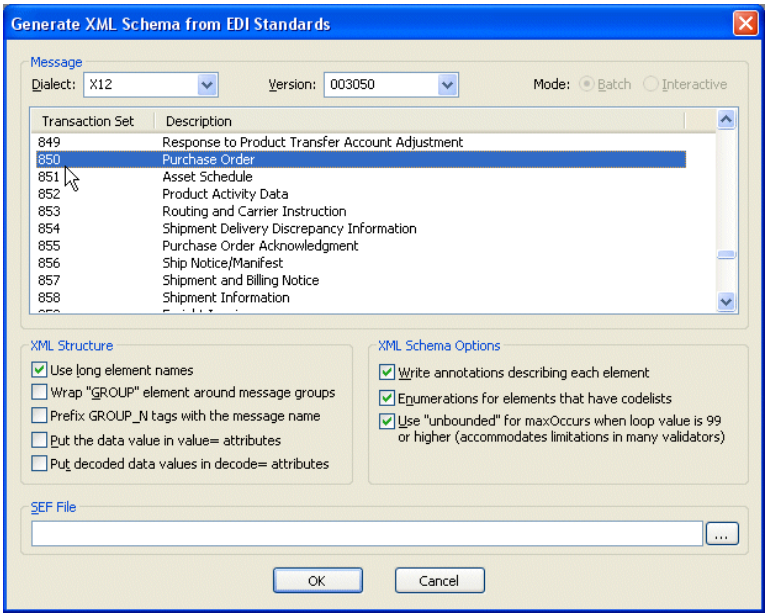
To create our BizTalk process, we will build a BizTalk map that translates the purchase order into the order system flat file structure. In order to accomplish this, we need one XML Schema

that describes the incoming purchase order and another that describes the outgoing order system flat file.

We can use Stylus Studio XML Enterprise Suite to create both XML Schema.

Creating XML Schema from EDI

The Stylus Studio EDI to XSD document wizard lets you create XML Schema from numerous EDI dialects and message types:



To run this wizard, select **File** > **Document Wizards** from the Stylus Studio menu, and then select **XML Editor** > **EDI to XSD**.

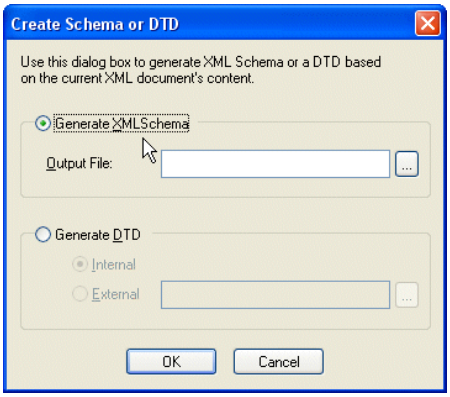
Creating XML Schema for a Flat File

To create XML Schema for a flat file has a few more steps:

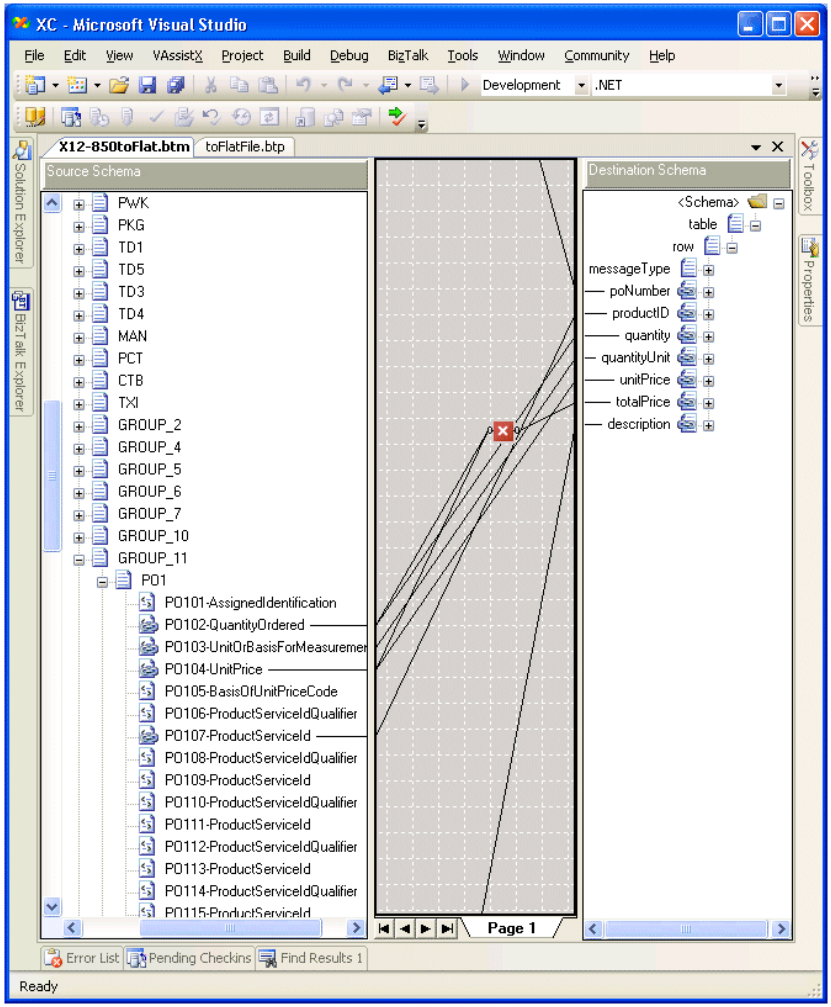
1 Load an example of the order system flat file in Stylus Studio.

2 Open it using Stylus Studio's built-in CSV converter, which converts the sample CSV file to XML.

3 Create an XML Schema based on the converted XML – select **XML** > **Create Schema from XML Content** from the Stylus Studio menu.



Once we have XML Schema describing the format of both the purchase order and the order system document formats, we can create a BizTalk map to represent the conversion process, as shown in the following illustration:



5 XML Converters™ Examples

The DataDirect XML Converters API allows you to access non-XML files and convert them to XML, and vice versa. The converter: URIs used to access data sources can be invoked programmatically, in an XSLT application, for example. This facility allows you to treat non-XML data as XML, manipulate it as needed, and, optionally, write it back to its source in its original format.

This chapter describes demo.cs, a simple .NET program installed in the DataDirect XML Converters \examples folder that demonstrates some of the features of DataDirect XML Converters and the Converters API.

This chapter also provides examples of using DataDirect XML Converters that are not part of the \examples folder.

Overview of the demo.cs Example

The example file, demo.cs, runs several sample demonstrations that show how the XML Converters API can be used to convert data to and from XML stored in a number of different formats using both DataDirect XML Converters and user-defined custom XML conversions created using Stylus Studio. This section describes the files associated with the demonstrations and how to run it.

Examples Summary

The examples included in demo.cs are summarized in the following table.

Example	Description
Example 1	Shows a simple conversion of a comma-separated values (CSV) file to XML.
Example 2	Shows how to convert an XML file to CSV.
Example 3	Shows how to use a custom XML converter to convert a fixed-width file to XML.
Example 4	Shows how to perform a conversion to XML and then transform the result using XSLT.
Example 5	Shows how to use the result of an XSLT transformation as input to an XML conversion.
Example 6	Simple example showing how to use the EDI XML Converter.
Example 7	Shows how to use a Standard Exchange Format (SEF) extension file to convert EDI messages using a proprietary format.
Example 8	Shows how to use the `ConverterListener` to manage warnings and errors during the conversion process.
Example 9	Shows how to generate an XML Schema from a CSV file.
Example 10	Shows how to generate an XML Schema from an EDI file.
Example 11	Shows how to use the XPath document() function in an XSLTstylesheet object to take a converter: URI as its argument.
Example 12	Shows how to convert an EDI file into XPathDocument contained entirely in memory.

Example	Description
Example 13	Shows how to convert an EDI file into an XmlReader, which can then be used to read the XML data entirely from memory in a streaming fashion.
Example 14	Shows how to use the Analyze() method to analyze an EDI stream for errors as part of the conversion process.

Demonstration Files

The files required to run the demonstrations are summarized in the following table. All of these files are installed in the `\examples` directory where you installed the XML Converters.

File	Description
`831.x12`	EDI file used in Example 6.
`copier.xslt`	XSLT used in Example 4 and Example 5.
`demo.cs`	The source for the demonstration; this file contains the usage comments.
`DemoApplication.csproj`	The Visual Studio project file for demo.cs.
`DemoApplication.sln`	The Visual Studio solution file for demo.cs.
`one.csv`	The input file for the first example.
`proprietary.sef`	SEF file that defines non-standard X12 message types; used in Example 7.
`proprietary.x12`	Sample X12 with a non-standard message type; used in Example 7.
`three.conv`	The definition for the custom XML conversion used in the third example.
`three.txt`	The input file for the third example.
`threemsgs.x12`	The EDI input file used for Example 14.
`two.xml`	The input file for the second example.

Running demo.cs

This section describes the requirements and procedure for running the demonstration application, demo.cs.

How to Run the Demonstration

To start the demo.cs demonstration:

1 Start Microsoft Visual Studio 2005.

2 Open DemoApplication.sln.

3 Press Ctrl+F5 to run the project.

Example 1

Example 1 converts a comma-separated values (CSV) file, one.csv, to an XML file, one.xml, using the CSV XML Converter. The conversion parameter for the new Converter object is specified as a converter: URL that indicates which XML Converter to use to convert the input file to the output file. Only two XML Converter property settings are expressed; default values are used for all properties unless you specify them in the converter: URL.

```
try {
    Source converterSource = new UriSource(exampleDir + "one.csv");
    Result converterResult = new UriResult(exampleDir + "one.xml");

    Converter toXml = factory.CreateConvertToXml("converter:CSV:sep=,
        :first=yes");
    toXml.Convert(converterSource, converterResult);

    Console.WriteLine("test 1 finished: one.csv -> one.xml");
    }
catch(Exception e) {
    Console.WriteLine("test 1 failed with exception: " + e);
    }
```

Both input and output streams are opened and closed by the Converter object.

Example 2

Example 2 is similar to Example 1, but instead of converting a non-XML file to XML, it does the opposite. It also shows how to use the URI resolver to create both the input stream and output stream:

```
try {
    ConverterResolver resolver = factory.CreateResolver();
    Uri inputUri = resolver.ResolveUri(uriBase, "two.xml");
    using (Stream inStream = (Stream) resolver.GetEntity(inputUri, null,
         typeof(Stream))) {

        Source converterSource = new InputStreamSource(inStream);

        using (Stream outStream = File.OpenWrite(exampleDir + "two.csv")) {

            Result converterResult = new OutputStreamResult(outStream);

            Converter fromXml = factory.CreateConvertFromXml
                ("converter:CSV:sep=,:first=yes");
            fromXml.Convert(converterSource, converterResult);
        }
    }

    Console.WriteLine("test 2 finished: two.xml -> two.csv");
   }
catch(Exception e) {
    Console.WriteLine("test 2 failed with exception: " + e);
   }
```

In this example, we need to close the input and output streams since we, and not the Converter object, opened them.

Example 3

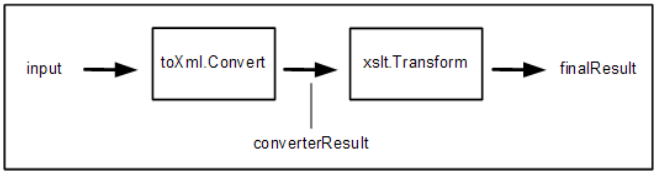
Example 3 uses a custom XML conversion, `three.conv`, built using Stylus Studio XML Enterprise Suite, to convert a fixed-width file, three.txt, to XML. Here, we create our own Streams – because we are converting a local text file, there is no need to use the URI Resolver.

```
try {
    using (Stream inStream = File.OpenRead(exampleDir + "three.txt") ) {
        using (Stream outStream = File.OpenWrite(exampleDir + "three.xml") ){
            Source converterSource = new InputStreamSource(inStream);
            Result converterResult = new OutputStreamResult(outStream);

            String converter = "converter:" + exampleDir + "three.conv";

            Converter toXml = factory.CreateConvertToXml(converter);
            toXml.Convert(converterSource, converterResult);

            }

        }

    Console.WriteLine("test 3 finished: three.txt -> three.xml");
    }
catch(Exception e) {
    Console.WriteLine("test 3 failed with exception: " + e);
    }
```

Example 4

Examples 1, 2, and 3 performed simple conversion of one file type to another – some type of converter (either a DataDirect XML Converter or a user-defined custom XML conversion) was given an input and converted it to another format.

In Example 4, the Converter converterResult will make the Converter output available as an XmlReader. The XSLT Transformer will read the data from the XmlReader. The Converter will not actually process the input data until the XSLT Transformer starts to read from the XmlReader. The Converter will then begin converting the input data, as needed. If the transformer terminates early, without reading all the data, the Converter will also terminate without converting all the input data.



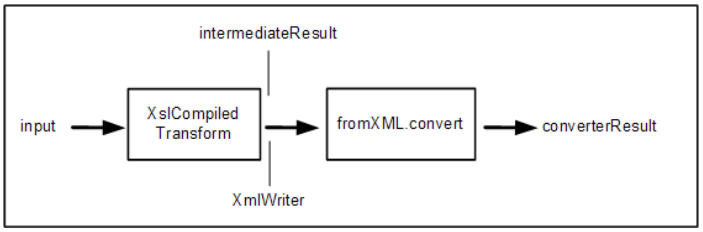
Here is the code for Example 4:

```
try {
    using(Stream inputStream = File.OpenRead(exampleDir + "one.csv"){
      InputStreamSource converterSource = new InputStreamSource(inputStream);

      XmlReaderResult converterResult = new XmlReaderResult();

      Converter toXml = factory.CreateConvertToXml("converter:///CSV:sep=,
            :first=yes");
      toXml.Convert(converterSource, converterResult);

      XslCompiledTransform xslt = new XslCompiledTransform();
      xslt.Load(exampleDir + "Copier.xslt");
      XmlWriterSettings settings = new XmlWriterSettings();
      settings.Indent = true;
      settings.IndentChars = "\t";
      XmlWriter writer = XmlWriter.Create(exampleDir + "four.xml", settings);
      xslt.Transform(converterResult.XmlReader, writer);
      converterResult.XmlReader.Close();
      }

      Console.WriteLine("test 4 finished: one.csv -> four.xml");
      }
catch(Exception e) {
      Console.WriteLine("test 4 failed with exception: " + e);
      }
```

XmlWriter writer is an XML document, four.xml. In this example, we used a copy/identity transformation, but you could specify any XSLT transformation here to perform any processing on the intermediate result you required.

Example 5

In Example 5, output from an XSLT transformation is sent to a converter, which takes the XML that is written to it (as a an XmlWriter) and converts it to CSV. This process is summarized in the following illustration.



Here is the code for Example 5:

```
try {

    UriResult converterResult = new UriResult(exampleDir + "five.csv");

    XmlWriterSource converterSource = new XmlWriterSource();

    ConvertFromXml fromXml =factory.CreateConvertFromXml("converter:CSV:
        sep=,:first=yes");
    XmlWriter xmlWriter = fromXml.GetXmlWriter(converterResult);

    XslCompiledTransform xslt = new XslCompiledTransform();
    xslt.Load(exampleDir + "Copier.xslt");
    xslt.Transform(exampleDir + "two.xml", xmlWriter);

    Console.WriteLine("test 5 finished: two.xml -> five.csv");
    }
catch(Exception e) {
    Console.WriteLine("test 5 failed with exception: " + e);
    }
```

To convert the transformation's output to CSV, we have used an instance of the ConvertFromXML object. This object uses the XML Converters CSV converter.

Example 6

Example 6 shows the use of an EDI XML Converter (converter: EDI) to convert a file in the X12 dialect (831.x12) to XML (831.x12.xml), and then back to EDI (831.x12.xml.fromxml).

```
try{
   Source converterSource = new UriSource(exampleDir + "831.x12");
   Result converterResult = new UriResult(exampleDir + "831.x12.xml");
   Converter toXml = factory.CreateConvertToXml("converter:EDI");
   toXml.Convert(converterSource, converterResult);
   Console.WriteLine("test6 toXML finished: 831.x12 -> 831.x12.xml");
   }
catch (Exception e)
   {
   Console.WriteLine("test 6 toXML failed with exception: " + e);
   }

try{
   Source converterSource = new UriSource(exampleDir + "831.x12.xml");
   Result converterResult = new UriResult(exampleDir +
       "831.x12.fromxml");
   Converter fromXml = factory.CreateConvertFromXml("converter:EDI");
   fromXml.Convert(converterSource, converterResult);
   Console.WriteLine("test6 fromXML finished: 831.x12.xml ->
       831.x12.fromxml");
   }
catch (Exception e)
   {
   Console.WriteLine("test 6 fromXML failed with exception: " + e);
   }
```

Example 7

This example shows how to use a Standard Exchange Format (SEF) extension file to convert EDI messages using a proprietary format. The SEF file used in this example adds 99 as a permitted code value in the 353 element of segment BGN in transaction set 831.

The URL of the SEF file is specified in the `user=` parameter of the `converter:` URL. It is also possible to specify the SEF file name as a relative pathname. If XML Converters has been installed in a directory PRODUCT_PATH, and the EDI `converter:` URL contains `user=relative.sef`, then the SEF file will be found at `PRODUCT_PATH/lib/CustomEDI/relative.sef`.

```
try{
   XmlUrlResolver resolver = new XmlUrlResolver();
   Uri sefUri = resolver.ResolveUri(uriBase, "proprietary.sef");

   String ediUri = "converter:EDI:user=" + sefUri;
   Source converterSource = new UriSource(exampleDir + "proprietary.x12");
   Result converterResult = new UriResult("proprietary.xml");
   Converter toXml = factory.CreateConvertToXml(ediUri);
   toXml.Convert(converterSource, converterResult);
   Console.WriteLine("test 7 toXML finished: proprietary.x12 ->
       proprietary.xml");
    }
catch (Exception e)
    {
    Console.WriteLine("test 7 toXML failed with exception: " + e);
    }
```

Example 8

This example shows how to register a `ConverterListener`, which is notified of warnings, errors, and fatal errors that occur during conversion. Also included in this example is a simple implementation of the three `ConverterListener` methods (`warning`, `error`, and `fatalError`). This implementation appears at the end of demo.cs.

This example uses the proprietary data file (proprietary.xml) as "Example 7" on page 97, but it omits the proprietary.sef extension file. This will result in a error that is reported to the `ConverterListener` implementation.

Sample Application

```
try{
    Source converterSource = new UriSource(exampleDir + "proprietary.x12");
    Result converterResult = new UriResult("proprietary.xml");
    Converter toXml = factory.CreateConvertToXml("converter:EDI");

    ConverterListener listener = new DemoListener();
    toXml.Configuration.ConverterListener = listener;
    toXml.Convert(converterSource, converterResult);
    Console.WriteLine("test 8 toXML finished: proprietary.x12 ->
         proprietary.xml");
}
catch (Exception e)
{
    Console.WriteLine("test 8 toXML failed with exception: " + e);
}
```

ConverterListener Implementation in demo.cs

```
public class DemoListener : ConverterListener {

      public void Warning(ConverterException e) {
            Console.WriteLine("Converter warning notification: " + e);

            return;
      }

      public void Error(ConverterException e) {
            Console.WriteLine("Converter error notification: " + e);

            return;
      }

      public void FatalError(ConverterException e) {
            Console.WriteLine("Converter fatal error notification: " + e);

            return;
      }
}
```

Error Listener Output

After running demo.cs, the program generates the following output; note the error encountered after completing Example 7.

```
test 1 finished: one.csv -> one.xml
test 2 finished: two.xml -> two.csv
test 3 finished: three.txt -> three.xml
test 4 finished: one.csv -> four.xml
test 5 finished: two.xml -> five.csv
test 6 toXML finished: 831.x12 -> 831.x12.xml
test 6 fromXML finished: 831.x12.xml -> 831.x12.fromxml
test 7 toXML finished: proprietary.x12 -> proprietary.xml

Starting test 8.  The ConverterListener will print a warning and an error.
Converter warning notification:
com.ddtek.xmlconverter.adapter.edi.EDIConverterException: [DDEW0063] WARNING
```

```
Starting with 00402, the format of ISA11 changed. Adjusting 'U' to '^'.

In X12 prior to 004020, ISA11 was element I10 and had to have the value "U".
But from 004020 onwards, it is element I65 and is the repetition character.
This fix has been automatically made to the data stream.
Converter error notification:
com.ddtek.xmlconverter.adapter.edi.EDIConverterException: [DDEE0008] ERROR
Value 99 not in codelist 353.
  Dialect: X12
  Version: syntax=00403/004030;message=00403/004030;agency=004030;table=
004030
  Message: 831
  Segment: BGN (line 4)
  Position: BGN01
  Element: 353 (s) Transaction Set Purpose Code
  Value: "99"
  Native error: 7, in table: 723

The value for an element in the data stream cannot be found in the codelist
associated with the element. Turning off codelist validation with "tbl=no"
will eliminate the error.
test 8 toXML finished: proprietary.x12 -> error.xml
test 9 schema generator finished: one.csv -> one.xsd
test 10 schema generator finished: --> edi.xsd
test 11 finished: one.xml + one.csv -> eleven.xml
```

Example 9

This example shows how to use the DataDirect XML Converters™ API to create an XML Schema based on a comma-separated values (CSV) file. Note that an instance document is required in order to generate XML Schema for CSV and other file types. See "Instance Documents" on page 31 for more information.

The XML Schema generator is used very much like an XML Converter – the program provides the sample input file as a `Source` object and the generated XML Schema is written to the `Result` object.

See "XML Schema Generation" on page 28 for more information on this topic.

```
try{
   Source sampleSource = new UriSource(exampleDir + "one.csv");
   Result xsdResult    = new UriResult("one.xsd");
   SchemaGenerator generator =
       factory.CreateSchemaGenerator("converter:///CSV:sep=,:first=yes");
   generator.GetSchema(sampleSource, xsdResult);
   Console.WriteLine("test 9 schema generator finished: one.csv -> one.xsd");
    }
catch (Exception e)
    {
    Console.WriteLine("test 9 schema generator failed with exception: " + e);
    }
```

Example 10

This example shows how to use the DataDirect XML Converters™ API to create an XML Schema based on an EDI file. The generated XML Schema depends on the EDI dialect, version, and message being converted, but not on the actual data in the EDI message. This information can be provided

- Using a sample EDI input (as shown in "Example 9" on page 101). See "Instance Documents" on page 31 for more information.
- As part of the `converter:` URL, as demonstrated in this example. Also, see "URI Parameters That Affect XML Schema" on page 31 for more information.

See "XML Schema Generation" on page 28 for more information on this topic.

```
try{
   Result xsdResult    = new UriResult("edi.xsd");
   String uri = "EDI:dialect=EDIFACT:version=D06B:message=INVOIC:tbl=no";
   SchemaGenerator generator = factory.CreateSchemaGenerator(uri);
   generator.GetSchema(xsdResult);
   Console.WriteLine("test 10 schema generator finished: --> edi.xsd");
   }
catch (Exception e)
   {
   Console.WriteLine("test 10 schema generator failed with exception: " + e);
   }
```

Example 11

This example shows how to use a document URI resolver (a .NET XmlResolver) to enable the XPath document() function in an XSLTstylesheet object to take a converter: URI as its argument.

The first statement uses CreateResolver() to get the XML Converters URI resolver, which is able to resolve converter: URIs for the document() function.

```
try {

   XmlResolver resolver = factory.CreateResolver();
```

Next, the example creates a converter: URI like this:

converter:///CSV:sep=,:first=yes?file:///c:/examples/one.csv

```
   String converterUrl = "converter:///CSV:sep=,:first=yes?" + exampleDir +
    "one.csv";
```

The XML Converter will read its input from "one.csv", convert it to XML, return its document node to the document() function.

Previous examples used a converter: URI like this:

converter:///CSV:sep=,:first=yes

and the name of the input file was provided elsewhere. When using the document() function, you must provide the converter: URI and the input file URI all at once,separating them with a '?' character as shown in this example.

Here is the complete code for Example 11:

```
try {

   XmlResolver resolver = factory.CreateResolver();
   String converterUrl = "converter:///CSV:sep=,:first=yes?" + exampleDir +
"one.csv";

   String xsltString =
```

```
         @"<xsl:stylesheet version='1.0' xmlns:xsl=
'http://www.w3.org/1999/XSL/Transform'>
            <xsl:output method='xml' indent='yes'/>
            <xsl:template match='/'>
               <root>
                  <xsl:copy-of select='.'/>
                  <xsl:copy-of select='document(""PUT THE URL HERE"")'/>
               </root>
            </xsl:template>
         </xsl:stylesheet>";

   xsltString = xsltString.Replace("PUT THE URL HERE", converterUrl);

   XslCompiledTransform xslt = new XslCompiledTransform();
   XsltSettings settings = new XsltSettings(true, false);
   xslt.Load(XmlReader.Create(new StringReader(xsltString)), settings, null);
   xslt.Transform(
               XmlReader.Create(exampleDir + "one.xml"),
               new XsltArgumentList(),
               XmlWriter.Create(exampleDir + "eleven.xml"),
               resolver);
   Console.WriteLine("test 11 finished: one.xml + one.csv -> eleven.xml");
}
catch (Exception e) {
   Console.WriteLine("test 11 failed with exception: " + e);
}
}
```

Example 12

This example shows how to use XML Converters™ to convert an EDI file into an XPathDocument contained entirely in memory. In the example, the toXml.Convert call starts the conversion. The application can read results of the conversion with the converterResult.XmlReader. The application can do anything it chooses with the output data. In this example, it uses a new XPathDocument(...) to read the results directly into an XPathDocument object.

```
try{
       Source converterSource = new UriSource(uriString + "831.x12");
      XmlReaderResult converterResult = new XmlReaderResult();
      Converter toXml = factory.CreateConvertToXml("converter:EDI");
            toXml.Convert(converterSource, converterResult);
      XPathDocument xpathdoc = new XPathDocument(converterResult.XmlReader);

  Console.WriteLine("test 12 finished: 831.x12 --> XPathDocument in memory");
      }
      catch (Exception e) {
      Console.WriteLine("test 12 failed with exception: " + e);
   }
```

Example 13

This example shows how to use an XML Converter to convert an EDI file into an XmlReader, which can then be used to read the XML data. XmlReader processes data entirely in memory in a streaming fashion, allowing efficient processing of input files of literally unlimited size.

Note that there is no call to Convert(...) in this example. The GetXmlReader call is a convenience method which does the convert and returns the XmlReader in one call. The example then reads and counts all the parsing events from the XmlReader.

In a real application, the program would process those events as they are read.

```
try{
     Source converterSource = new UriSource(uriString + "831.x12");
    ConvertToXml toXml = factory.CreateConvertToXml("converter:EDI");
    int eventCount = 0;
      using (XmlReader rdr = toXml.GetXmlReader(converterSource)) {
       while(rdr.Read()) {
      eventCount++;
       }
    }
```

```
            Console.WriteLine("test 13 finished: 831.x12 --> XmlReader
containing " + eventCount + " events.");
        }
        catch (Exception e) {
            Console.WriteLine("test 13 failed with exception: " + e);
        }
    }
```

Example 14

This example shows how to use the EDI Analyzer API to convert an input EDI document, threemsgs.x12, to XML. The source EDI contains three messages, one of which contains an error. This example shows how to use the EDI analysis report generated by the Analyze() method to filter the invalid message from the EDI while converting the rest of the EDI stream to XML. Finally, it shows how to convert the EDI analysis report's Receipt and Acknowledgement elements to EDI for transmission back to the EDI sender.

For more information about using the EDI Analyzer API, see Chapter 3, "Analyzing EDI to XML Conversions."

```
        try {
            Source ediSource = new UriSource(uriString + "threemsgs.x12");
            ConvertToXml toXml = factory.CreateConvertToXml("converter:EDI");

            Result reportResult = new UriResult("report.xml");
            toXml.Analyze(ediSource, reportResult);

            Source reportSource = new UriSource(new FileInfo("report.xml")
                                                .FullName);
            Result xmlResult = new UriResult("twomsgs.xml");
            toXml.Convert(ediSource, xmlResult, reportSource);

            XmlReader rdr = XmlReader.Create("report.xml");

            while(rdr.Read()) {
                if ( rdr.NodeType == XmlNodeType.Element
```

```
                && rdr.LocalName == "Receipt")
                break;
        }

        while(rdr.Read()) {
            if ( rdr.NodeType == XmlNodeType.Element
                && rdr.LocalName == "X12")
                break;
        }

        ConvertFromXml converter = factory.CreateConvertFromXml
                                    ("converter:EDI");
        Source responseSource = new XmlReaderSource(rdr);
        Result receiptResult = new UriResult("receipt.x12");
        converter.Convert(responseSource, receiptResult);

        while(rdr.Read()) {
            if ( rdr.NodeType == XmlNodeType.Element
                && rdr.LocalName == "Acknowledgement")
                break;
        }

        while(rdr.Read()) {
            if ( rdr.NodeType == XmlNodeType.Element
                && rdr.LocalName == "X12")
                break;
        }

        Result ackResult = new UriResult("acknowledgement.x12");
        converter.Convert(responseSource, ackResult);

        rdr.Close();

        Console.WriteLine("test 14 finished: threemsgs.x12 -->
                twomsgs.xml, receipt.x12, acknowledgement.x12");

    }
    catch (Exception e) {
        Console.WriteLine("test 14 failed with exception: " + e);
    }
}
```

Processing Conversion Results

You can use the `OutputStreamResult` class to write a `Converter`'s output to a stream. Using this implementation, conversion results are written as a whole (as an XML document, for example) once the conversion is complete. This technique is known as *pushing* results.

Sometimes it can be more efficient or desirable to treat conversion results one-at-a-time – as XML fragments instead of an entire XML document. This technique is known as *pulling* results, and it can be accomplished using the standard `XmlStreamReader` interface, as shown in the following example:

```
InputStreamSource source = new InputStreamSource(inputData);
Converter toXml = factory.CreateConvertToXml("converter:EDI:field=no");
using (XmlReader rdr = toXml.GetXmlReader(converterSource)) {
      while(rdr.Read()) {
            // process the XML event
      }
};
```

Loading SEF Files Programmatically

The `SetEDIExtension()` method allows you to reference a SEF file programmatically. This method is a member of the `Configuration` class. Following is its definition:

```
void   SetEDIExtension(DDTek.XmlConverter.Source source)
```

DataDirect XML Converters reads the source object and parses the data as a SEF file, creating an `Extender` object. All XML Converters created using that `Configuration` object use that `Extender` object as if it had been supplied with the user= option in the URI.

The source object may be one of the following:

```
UriSource
InputStreamSource
TextReaderSource
```

Using SEF Files Created with Stylus Studio

In addition to custom segment and message definitions, SEF files created using the Stylus Studio EDI to XML Module can contain a converter: URI in a .PRIVATE section. This converter: URI can contain XML Converters properties (val=no and len=yes, for example).

If you specify such a SEF file in your application, XML Converters uses the converter properties from that URI when performing the XML conversion. That is, XML Converter properties specified in the SEF become the new default values for the XML Converter properties. This behavior is also true when the SEF file is loaded with the user= URI property.

Using a SEF File for Multiple Conversions

The `Configuration` object owns the `Extender`. If you want to use a SEF file for multiple conversions, you can do so as follows:

```
ConverterFactory factory = new ConverterFactory();
factory.Configuration.SetEDIExtension (sefSource);
```

All `Converter` and `SchemaGenerator` objects created from that factory have access to the loaded SEF file, but they do not parse the SEF file each time they are created.

If `SetEDIExtension` is called two times, then the first SEF file is replaced by the second one. Any `Converter` or `SchemaGenerator` objects already created will still use the first SEF file.

If you want to use a SEF file for one `Converter` or `SchemaGenerator` object only, you can do so as follows:

```
ConverterFactory factory = new ConverterFactory();
Converter converter = factory.NewConvertToXML(…);
Converter.Configuration.SetEDIExtension (sefSource);
```

6 XML Converters™ Properties

XML Converters share certain properties (the line separator property, for example), and each has properties that are unique – the CSV XML Converter allows you to specify an escape character, but the binary XML Converter does not, for example.

This chapter provides reference information for the line separator property, which is common to most XML Converters, and reference information for individual XML Converters.

Line Separator Values

Most XML Converters allow you to specify some type of line separator (referred to in the converter URI as *newline*). The following table summarizes commonly occurring values. All values are case-insensitive.

Table 6-1. Line Separator Values

Value	Description
cr or mac	The Macintosh standard.
crlf or dos	The DOS and Windows standard.
lf or unix	The Unix standard.
lfcr	Not standard usage.
nel	0x85 (commonly found in mainframes).
null	A null byte.
platform	If another value has not been specified, the line separator uses the platform value as returned by the System.getProperty("line.separator") method. platform is the default.

Base-64 XML Converter Properties

The following table shows XML Converters properties for Base-64 encoded binary files as documented in RFC 1341.

XML Converter Name in URL

Base-64

Table 6-2. Properties for Base-64 XML Converters

Name in URL	Property Name	Description
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.
newline	Line separator	Used only when converting a Base-64 binary file to XML, and not vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

Binary XML Converter Properties

You can convert binary files that have been encoded as a sequence of digits in a base from 2 to 36, and vice versa. Use the Base-64 XML Converter for base-64 encoded binary files. See "Base-64 XML Converter Properties" on page 115 for more information.

XML Converter Name in URL

Binary

Table 6-3. Properties for Binary Base-2 to Base-36 XML Converters

Name in URL	Property Name	Description
base	Base	The numeric base of the encoded file. The default is 16 (hexadecimal). Base-2 is binary; base-8 is octal; and base-10 is decimal.
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.
newline	Line separator	Used when converting a binary encoded file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.
space	Byte separator	Whether or not byte values should be contiguous (no value) or separated with the value specified for this property. For example, if you set space=, the value 000FFF would be output as `00,0F,FF`.
wrap	Wrap lines	Whether you want to wrap lines (wrap=yes) or output all values on a single line (wrap=no).

Comma-Separated Values (CSV) XML Converter Properties

You can use the CSV XML Converter to convert comma-separated values files to XML and vice versa.

XML Converter Name in URL

CSV (comma-separated values)

Table 6-4. Properties for CSV XML Converters

Name in URL	Property Name	Description
collapse	Collapse consecutive separators	Whether or not you want to collapse consecutive separators – that is, separators that do not contain any data. Default is no.
double	Doubling embedded quote escapes it	Whether or not doubling an embedded quotation mark has the effect of escaping the quoted string. Default is no.
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML.
escape	Escape character	This character escapes quotes and separators so that they can be embedded in values. The back slash (\) is the default.
first	First row contains field names	Generated field names depend on the values in the first and number fields. If first=yes and number=no, field names are read from the first row. Any field names after that are named `column.`*nnn*, where *nnn* is the column number, starting from one and including explicitly named columns in the count. If number=yes, extra columns (those after the first) are named just column.

Table 6-4. Properties for CSV XML Converters

Name in URL	Property Name	Description
newline	Line separator	See "Line Separator Values" on page 114 for a list of values.
number	Number rows and columns	If number=yes (no is the default), each row will also have an attribute, named row, which will contain the row number from the source document, starting from one. Also, each column, even those explicitly named, will have a column attribute numbering the column from one. Any empty columns are omitted from the output, but the numbering of subsequent columns will reflect that a column(s) was skipped.
quotes	Quote character	A list of characters the converter should interpret as quotation characters. Double and single quote marks (" ') are the default values.
root	Root element name	The value you want to use for the root element name. Default is table.
row	Row element name	The value you want to use for the row element name. Default is row.
sep	Separator	The separator value between each value. This can be TAB, any single character (a comma (,) is the default), or the %*XX*-escaped value of the separator character (%2c, for example).

dBase XML Converter Properties

Properties are the same for all dBase XML Converters – dBase II, dBase III, dBase III+, dBase IV, and dBase V.

XML Converter Names in URL

- dBase_II
- dBase_III
- dBase_III_plus
- dBase_IV
- dBase_V

Table 6-5. Properties for dBase XML Converters

Name in URL	Property Name	Description
deleted	Include deleted records	Whether or not records marked with a "deleted" attribute are included in the output to XML and preserved in the conversion from XML. Stylus Studio generates the "deleted" attribute on output, and looks for it on input when this property is set to yes.
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.
newline	Line separator	Used only to convert a dBase file to XML, not vice versa. See “Line Separator Values” on page 114 for a list of values.

Datatypes Supported by Version

The following table identifies datatypes supported by dBase XML Converters.

Table 6-6. Datatype Support for dBase XML Converters

Datatype	Symbol	dBase II	dBase III	dBase III+	dBase IV	dBase V
binary	B					✔
character	C	✔	✔	✔	✔	✔
date	D		✔	✔	✔	✔
float	F				✔	✔
general	G					✔
logical	L	✔	✔	✔	✔	✔
memo	M		✔	✔	✔	✔
numeric	N	✔	✔	✔	✔	✔

DIF XML Converter Properties

You can use the Data Interchange Format (DIF) XML Converter to convert DIF files to XML and vice versa.

XML Converter Name in URL

DIF (Data Interchange Format)

Table 6-7. Properties for the DIF XML Converter

Name in URL	*Property Name*	*Description*
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is cp850.
newline	Line separator	Used when converting a DIF file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

EDI XML Converter Properties

You can use the Electronic Data Exchange (EDI) XML Converter to convert EDI files to XML and vice versa.

Properties are the same for most supported EDI dialects – ATIS, EANCOM, EDIFACT, Edig@s, HIPAA, HL7, IATA Cargo-IMP, IATA PADIS, NCPDP, TRADACOMS, and X12. Some properties are dialect-specific.

TIP: DataDirect XML Converters support the Standard Exchange Format (SEF) standard, which allows you to define extensions to an EDI standard. See "Handling Proprietary EDI Formats" on page 23 for more information.

XML Converter Name in URL

EDI

Properties for EDI XML Converters

The following table describes properties for all EDI XML Converters. Note that some properties (cexpand and hexpand, for example) are dialect-specific.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
atis	Attempt to handle X12 as ATIS	Whether or not XML Converters should scan the first 100 segments of an X12 file to determine if it is an ATIS file. If the file is an ATIS file, ATIS rules are used; otherwise, X12 rules are used. Default is no.
auto	Auto-fixup values where possible	Automatically calculates values where possible. For X12, XML Converters counts segments and fills in hash values for CTT, SE and IEA segments. For EDIFACT, XML Converters calculates segment totals for UNE, UNT, and UNZ segments. If the UNZ segment is missing, it is created as needed. The SE or UNT segments only need to be mapped; all of their elements can be automatically populated. In any header or trailer fields containing dates or times, segments are placed into the correct format based on whether they are defined as YYMMDD or CCYYMMDD for dates, or whatever length for times. Default values are filled in if they are missing. See also "count" on page 126.
cent	Window for century cut-off	If the date is given in the file with a two-digit year and the output requires a four-digit year, this value is the cutoff so that the proper century can be selected.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
cexpand	Fully expand HL7 CE/CF/CNE/CWE element	HL7 includes specialized composite elements that contain coded values, the text version of the code, and the lookup table for CE, CF, CNE, and CWE elements. If you set cexpand=yes, XML Converters attempts to expand all of the fields in the composite element. The CNE and CWE elements also allow pulling information from tables across versions of the standard – an HL7 2.4 element could look up information from an HL7 2.5 table, for example. Each of these also has an 'alternate' set of fields, so that codes can be included both in the native (HL7, for example) and foreign code list.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
chr	Character repertoire override	Allows XML Converters to override and alter character encodings for EDIFACT-based documents (like EANCOM and IATA PADIS). You can use one or more of the following options, connected with a "+" symbol (chr=REPLACE+FINNISH, for example): ■ DEFAULT – The encoding specified in the file is used. This option cannot be used with any others. ■ EANCOM – Support for these extra EANCOM characters to UNOA and UNOB are added: #, @, [,], {, }, \, |, ‘, and ^. ■ SYMBOL – Forces all characters, including special characters such as element and segment separators that might otherwise be permitted, to be validated against the encoding. ■ REPLACE – Replaces any invalid characters with the character specified by the invalid property. An underscore ("_") is used if the invalid property is not specified. If REPLACE is not specified, XML Converters throws an error. ■ FINNISH – Changes the meaning of certain characters in the Finnish character set for UNOA and UNOB (and adds UNOY and UNOZ as synonyms for UNOA and UNOB respectively). See “FINNISH Character Set Overrides” on page 142 for more information. See “Explicit Character Overrides” on page 143 for more information on this topic.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
clean	Remove linefeeds and nulls	Whether or not you want to remove linefeeds and nulls from EDI converted to XML and vice versa. Valid values are both (directions), fromXML, toXML, and never. See also "rtrim" on page 139.
component	Component value separator	When an element is a composite element, the character that is used to separate the component elements from each other within the composite element. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.
continued	Line continuation character	Character appended to the segment terminator when each segment in an EDI message is split onto a new line. This character indicates to the host system that the end of the interchange has not been reached. Appended to all segments in an interchange but the last one. The continued property takes the same values as "element" on page 128 and "segment" on page 140. Note: This property is supported for all dialects except Cargo-IMP.
count	Enforce segment maximum counts	Whether or not you want XML Converters to enforce segment counts as they are defined in the EDI repository. Valid values are: ■ yes – Repository counts are enforced. ■ no – Repository counts are not enforced. ■ multi – If the repository allows only one instance, enforce it; otherwise, treat the count as unlimited. See also "auto" on page 123.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
decimal	Decimal character	Symbol used for the decimal character in the converted file. Usually a period or comma. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.

decode	Where to place decoded data values	Allows you to specify where to place code list value descriptions when converting EDI to XML. Valid values are:
		■ no – code list table values are not output as XML:
		`<ISA15><!--I14: Interchange Usage Indicator-->P</ISA15>`
		■ comment – adds the description as a comment. For example, `<!--Production Data-->` in the following code:
		`<ISA15><!--I14: Interchange Usage Indicator-->P<!--Production Data--></ISA15>`
		■ attribute – adds the description as an attribute:
		`<ISA15 decode="Production Data"><!--I14: Interchange Usage Indicator-->P</ISA15>`
		■ text – adds the code as an attribute, and the description as element value:
		`<ISA15 value="P">Production Data</ISA15>`
		Note that the value property must also be set to attribute to generate this output.
		Turn off this and *Comment element types* (field) to disable all comment generation. See also value .

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
dialect	EDI dialect	The EDI dialect of the file you are converting. Valid values are: ATIS, CARGO, EANCOM, EDIFACT, EDIG@S, HIPAA, HL7, IATA, and X12. Use IATA to specify the PADIS dialect. This property is used only for schema generation. See "XML Schema Generation" on page 28 for more information.
doc	Include xs:documentation	Whether or not include xs:documentation comments in the XML Schema. Valid values are yes (the default) and no. This property is used only for schema generation. See "XML Schema Generation" on page 28 for more information.
eol	Add linefeeds between segments on write	Allows you to put each segment on its own line when converting XML to EDI. (Extra linefeeds are ignored when converting EDI to XML.) Valid values are: ■ yes (the default) – the value specified in the Line separator (newline) property is used to separate each segment. The normal segment output character is also generated. ■ no –linefeeds between segments are not added ■ an integer between 1 and 1024 – specifies the number of columns on which to wrap a line. So, for example, eol=80 wraps the line at 80 columns. If you specify an integer, the last row is not padded out to the value you specify.
element	Element separator	The character used to separate elements in a segment. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
empty	How to handle empty HL7 content	Controls how XML Converters manages empty fields. Empty tokens at the first level are never written to the XML file, regardless of how this property is set. In HL7 versions prior to 2.3, empty fields were treated as present, but without a value; in HL7 version 2.3 and later, empty fields are indicated with a set of quotation marks. A missing field – that is, a field for which there is no value in the data stream – does not display quotation marks. Valid values for this property are: ■ auto – The HL7 version determines how XML Converters treats empty fields: ■ HL7 2.2 and earlier – XML Converters behaves as if empty=empty. ■ HL7 2.3 and later – XML Converters behaves as if empty=quotes. ■ empty – All empty fields, with or without quotation marks, are treated as present but empty (use for HL7 2.2 and earlier). ■ quotes – If the field has quotes, it is treated as empty, that is, the data stream has a null value (‘""’ is recognized as a marker for an empty field, for example); otherwise, it is treated as missing, that is, there is no value in the data stream (use for HL7 2.3 and later).

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
empty (cont'd)		Consider the following examples for different conversion scenarios: ■ HL7 to XML, empty=empty - Empty top-level elements are not output - Empty lower-level elements are output as as empty XML elements - Elements containing paired double-quotes are passed through unchanged ■ HL7 to XML, empty=quotes - Empty top-level elements are not output - Empty lower-level elements are not output - Elements containing paired double-quotes are output as empty XML elements ■ XML to HL7, empty = empty - Empty elements are passed through as empty - Elements containing paired double-quotes are passed through unchanged ■ XML to HL7, empty = quotes - Empty elements are passed through as paired double-quotes - Elements containing paired double-quotes are passed through unchanged
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
field	Comment element types	Creates a comment at the start of each element that includes the element's name and number. For example, `<!--I14: Interchange Usage Indicator-->` in the following code: `<ISA15><!--I14: Interchange Usage Indicator-->P<!--Production Data--></ISA15>` Turn off this and *Comment code list* (`decode`) to disable all comment generation.
following	Segment name/segment content separator	In TRADACOMS data streams, the default character used to separate the segment name and segment contents is the equal sign (=). You can use the following= property to override the default character.. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
group	Use message groups if provided	Allows you to add grouping elements to XML when converting EDI to XML. Grouping elements can make EDI messages in the converted XML easier to access with XPath for some types of documents. Consider using this property if your EDI documents use multiple message groups. Valid values for this property are: ■ yes – Wraps each message group with an extra <GROUP></GROUP> element. ■ always – Wraps all the output associated with an interchange (for example, everthing from an ISA segment to its IEA segment, inclusive) in an <INTERCHANGE></INTERCHANGE> element. <GROUP></GROUP> elements are also used when group=always. ■ no – Grouping elements are not added to the converted XML. This is the default. This property can also be used when generating XML Schema.
hexpand	Expand HL7 hex escapes	In HL7 data streams, \X is an escape sequence used to include hex data in the stream. You can use this property (hexpand=yes) to expand the hex data. If the data is binary, an exception is thrown. Valid values are yes and no.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
hipaa	Enable HIPAA Auto-detection	Whether or not XML Converters should determine if an X12 file is a HIPAA file. If the file is a HIPAA file, HIPAA rules are used; otherwise, X12 rules are used. Valid values for hipaa= are: ■ yes – XML Converters determines whether the X12 file is a HIPAA file. ■ no – XML Converters processes the file as an X12 document, even if it is recognized as a HIPAA document. This is the default. ■ loop – same as yes, but this value also creates a nested loop structure for the converted XML and generated XML Schema which can simplify this output's use in XML mapping tools. The hipaa property can be used with atis .
ignore	Ignore specific errors	Allows you to specify which, if any, errors you want to ignore during XML conversion. The syntax for this field is ignore=*n1*,*n2*,*n3*.... For example, ignore=3,4,47 ignores errors 3, 4, and 47. Can be used with the opt property to allow continued processing even when the data stream is missing mandatory segments and data elements.
indent	Whether to indent XML output	Controls whether or not the XML output will be indented. Valid values are yes, no, and blank (unspecified). Note: If this value is unspecified, XML output is indented unless decode and field are both set to no.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
inter	Interactive messages	Certain EDI messages have alternate batch and interactive forms, depending upon whether they are used between systems that have real-time connections. The inter=yes setting causes the interactive form to be used, if available. For example, in EDIFACT, this would cause the normal envelope of UNB/UNH/UNT/UNZ to be replaced by UIB/UIH/UIT/UIZ. This property is used only for schema generation. See "XML Schema Generation" on page 28 for more information.
invalid	Invalid character replacement	Used with REPLACE value for the chr property to specify the character that should be used to replace invalid characters. The default (if invalid is not specified) is an underscore ("_")). Valid values are: ■ \u#### – To specify a Unicode value, substituting the #### for the appropriate value. ■ \d#### – To specify a decimal value, substituting the #### for the appropriate value. See "Using Special Characters for Separators" on page 145 for more information about how to specify values for this property.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
ldate	How to handle 'L' HL7 date	Controls how XML Converters manages the *L* value (which traditionally means "local system" in HL7) if it is passed as either a date, time, datetime, or timestamp. Valid values are: ■ header – The *L* value is replaced with the value of the MSH-7 element from the header. ■ current – The *L* value is replaced with the date and/or time that the message processing started. ■ error – The *L* value is treated as a syntax error. ■ pass – The *L* value is passed through unchanged.
leading	Ignore leading zeros on numbers	Whether or not you want the XML Converter engine to ignore leading zeros on numbers. Setting ignore=yes means that leading zeros on the value in the EDI and the value in the codelist are compared without any leading zeros. So with ignore=no, "012" does not match "12"; but with ignore=yes these values do match. This applies only to codelist validation, not for handling of numbers.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
len	Strict validation on value lengths	For most EDI dialects, controls whether an element's content is checked against the upper and lower length limits as defined by the relevant EDI specification. For Cargo-IMP, however, len= enables or disables checking the entire message length against the standard limit of 1600 characters. Because Cargo-IMP requires fixed positions of certain elements, element length checking is always performed. Valid values for len= are: ■ yes – length checking is enabled. ■ no – length checking is disabled. This is the default.
long	Use long element names	Whether you want to use long or short element and/or segment names in your XML conversions – FTX03-TextReference or FTX03, for example. Valid values for long= are: ■ elements – long names are used for elements. (This was formerly achieved by setting long=yes; yes has been deprecated as of XML Converters release 5.0 for naming consistency.) ■ segments – long names are used for elements. ■ all – long names are used for both elements and segments.
loop-prefix	Prefix GROUP_... tags with the enclosing message name	Allows you to prefix the name of a GROUP_*no* tag with the message name it appeared in. For example, <INVOIC>…<GROUP_1> becomes < INVOIC >…< INVOIC _GROUP_1>. This property is set to no (loop-prefix=no) by default.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
message	Message type	The type of EDI message being converted. Valid values vary based on dialect and version. This property is used only for schema generation. See "XML Schema Generation" on page 28 for more information.
newline	Line separator	Used when converting EDI to XML, and XML to EDI when the *Add linefeeds between segments on write* property (eol) is set to yes. The default is crlf. See "Line Separator Values" on page 114 for a list of values.
opt	Treat all segments and elements as optional	If set to yes, all mandatory segments and mandatory data elements are treated as optional. If set to no (the default), a missing mandatory segment or mandatory data element triggers an error. You can use opt=no with the ignore property to ignore errors for missing mandatory segments (errors 39 and 9), missing mandatory data elements (error 4), or both. For example, opt=no and ignore=39,9 allows processing to continue even if the data stream is missing mandatory segments Enabling this property can be useful if your provider declines to provide segments and elements that are considered mandatory according to the EDI specification, but you are aware of what the missing values are.
prefix	Namespace prefix	Namespace prefix to be added, with the Namespace URI, to the root element. The prefix alone is added to all elements.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
release	Release (escape) symbol	The release, or escape, character. It turns off special processing of the next character. Suppose your message uses within a text description the same character that was used to separate elements. This is the character that would be used to tell the EDI processor to treat that character as a normal character and not as the end of the text. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.
repeat	Repeat symbol	The repeat symbol for EDI dialects that use it. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
rtrim	Trim trailing delimiters	Typically, most trailing delimiters are removed automatically. But in the conversion process, new trailing delimiters are sometimes created. The rtrim property controls how XML Converters manages these trailing delimiters. Valid values are: ■ no – Trailing delimiters are not trimmed. ■ yes – Trailing delimiters are trimmed as long as performance is not affected. ■ always – Trailing delimiters are trimmed regardless of the impact on performance. You can also use this property to *add* additional spaces, or padding: ■ pad1 – Add spaces at the top-most level only. ■ pad2 – Add spaces to the first two levels only – elements and composite elements taht don't contain other composites. ■ pad3 – Add spaces for every level of element. This value can create many empty elements (when converting to XML) and many empty delimiters (when converting to EDI). See also "clean" on page 126.
seg	Strict segment-ordering checking	Whether or not you want to check segment ordering as defined by the message. If this property is set to no, message and group definitions are ignored, resulting in the possibility that data is grouped incorrectly (<GROUP_*n*> tags are never emitted, for example). Valid values are yes and no; the default is yes.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
segment	Segment separator	The character you want to use for segment separators. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.
setup	Write setup segment if appropriate	Used to indicate whether or not to write the file's setup segment when writing EDI. Used only if the EDI dialect supports an optional setup segment (the EDIFACT or IATA UNA segment, for example); otherwise, it is ignored. Valid values are yes and no; the default is yes.
strict	Strict validation mode	If strict=yes, checks that all mandatory elements are present, and ensures that no composite elements are in places where only simple elements are allowed. Also checks for extra elements at the end of segments that are not part of the specification. The default is strict=no.
strip	Strip C-style comments	Determines whether content in the incoming EDI stream wrapped in C-style `/*` and `*/` comment delimiters is ignored. Default setting is off (strip=no) since it can potentially conflict with real EDI content. HL7 files used with or generated by certain systems might include this markup, for example.
tbl	Force error if value not in code list	Generates an error if the value for an element is not in the codelist associated with that element. If this property is off (no), values are not checked for the presence of a codelist.
tertiary	Subcomponent (tertiary) separator	The character you want to use for subcomponent separators. See "Using Special Characters for Separators" on page 145 for information about how to specify values for this property.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description
typ	Strict datatype content checking	Ensures that only characters that are appropriate for a given field are included in the value for that field. For example, this property ensures that dates are valid and numbers are well-formed.
uri	Namespace URI	Namespace URI to be added, with the Namespace prefix, to the root element. If the prefix is set, but the URI is not, the prefix is ignored.
user	Extension map file	The URL of the SEF file containing custom message type definitions. This property can also be used when generating XML Schema.
val	Enable validation	When set to yes (the default), the version, release, messages and segments of the EDI file (input or output) is compared to the relevant EDI repository. If the EDI file contains a value that is not in the EDI repository, an error is thrown. If validation is disabled (val=no), processing continues even if the EDI file contains a version, release, message, or segment that is not in the repository. When processing an unknown version, release, message, or segment, some checks cannot be performed because the structure of the required data is unknown. For example, if a file is of a known version but contains an unknown segment, data type checking for that segment is not performed, but checks on the remainder of the file are performed as usual. Similarly, if a message does not exist in the EDI repository, the file is still processed, but segment order checking is not performed.

Table 6-8. Properties for All EDI XML Converters

Name in URL	Property Name	Description

value	Where to place coded data values	Allows you to specify where you want to place coded data values in XML output. Valid values are:
		■ text – outputs the coded data value (here, 00) in the text node:
		`<BGN01><!--353: Transaction Set Purpose Code-->00</BGN01>`
		■ attribute – outputs the coded data value as an attribute:
		`<BGN01 value="00"><!--353: Transaction Set Purpose Code--></BGN01>`
		See also decode .

version	Dialect version	The version of the dialect specified by the dialect property. Valid values vary based on dialect. This property is used only for schema generation. See "XML Schema Generation" on page 28 for more information.

FINNISH Character Set Overrides

As described elsewhere, you can use the using the Character repertoire override property (chr) to change the meaning of certain characters for the Finnish character set for UNOA (UNOY) and

UNOB (UNOZ). The following table shows which characters are changed based on the character set in use.

Table 6-9. Character Encoding Overrides

Character From	*Character To*	*Applicable Character Sets*	*Unicode Name*
[	Ä	UNOA/UNOY, UNOB/UNOZ	Latin capital letter A with diaeresis
\	Ö	UNOA/UNOY, UNOB/UNOZ	Latin capital letter O with diaeresis
]	Å	UNOA/UNOY, UNOB/UNOZ	Latin capital letter A with ring above
^	Ü	UNOA/UNOY, UNOB/UNOZ	Latin capital letter U with diaeresis
{	ä	UNOB/UNOZ	Latin small letter a with diaeresis
|	ö	UNOB/UNOZ	Latin small letter o with diaeresis
}	Å	UNOB/UNOZ	Latin small letter a with ring above
~	ü	UNOB/UNOZ	Latin small letter u with diaeresis

Explicit Character Overrides

In addition to the modifiers you can specify using the Character repertoire override property (chr), you can instruct the XML Converters to take character encodings from the URI, instead of from the EDIFACT-style UNB or UIB `001` element. If you choose to

do this, you may use the encodings described in the following table:

Table 6-10. Character Encoding Overrides

Property Name	*Description*
UNOA or IATA	UN/ECE level A (upper case only)
UNOB or IATA	UN/ECE level B (same as UNOA but including lower case)
UNOC or IATC	UN/ECE level C (ISO-8859-1 or Latin-1/Western European)
UNOD or IATD	UN/ECE level D (ISO-8859-2 or Latin-2/Central European)
UNOE or IATE	UN/ECE level E (ISO-8859-5 or Latin/Cyrillic)
UNOF or IATF	UN/ECE level F (ISO-8859-7 or Latin/Greek)
UNOG or IATG	UN/ECE level G (ISO-8859-3 or Latin-3/South European)
UNOH or IATH	UN/ECE level H (ISO-8859-4 or Latin-4/North European)
UNOI or IATI	UN/ECE level I (ISO-8859-6 or Latin/Arabic)
UNOJ or IATJ	UN/ECE level J (ISO-8859-8 or Latin/Hebrew)
UNOK or IATK	UN/ECE level K (ISO-8859-9 or Latin-5/Turkish)
UNOQ or IATQ	UN/ECE level Q (ISO-8859-15 or Latin-9/)
UNOW or IATW	UN/ECE level W (ISO 10646-1 octet with code extension technique to support UTF-8)
UNOX or IATX	UN/ECE level X (Code extension technique as defined by ISO 2022 utilizing the escape techniques in accordance with ISO 2375)
UNOY or IATY	UN/ECE level Y (ISO 10646-1 octet without code extension technique.); also Finnish UNOA
UNOZ or IATZ	Finnish UNOB

These can also be combined with other `chr=` options. For example, an EDI file might specify UNOA encoding, but with lower-case text, because the sending system sent inconsistent data. Using `chr=UNOB+REPLACE`, the data could be consumed, and any non-UNOB characters would turn into '_' characters, allowing processing to continue.

XML Converters does no character checking for UNOX; rather it depends on the native platform converter or the application to ensure that the characters are valid. This is because there are too many implementation-specific details, subsets, and proprietary and local extensions, and it is not possible to account for them all.

Using Special Characters for Separators

Most special characters or symbols cannot be entered directly into a URL – you cannot specify that the colon (:) is the element separator character by entering `converter:EDI:element=::auto=yes`, for example. Instead, you must escape special characters using the appropriate decimal or hex value. To specify a colon as a element separator character, you would use `converter:EDI:element=\u3A:auto=yes`, for example. Note that not all EDI dialects use all special characters.

See Table 6-11, "Common Separator Characters," on page 146 for a complete list of separator characters and their decimal and hex values.

Which Properties Specify Separators?

The following properties can be used to specify separators for EDI XML Converters:

- "segment" on page 140
- "element" on page 128
- "component" on page 126
- "release" on page 138
- "decimal" on page 127
- "tertiary" on page 140
- "repeat" on page 138.

Restrictions for Separator Characters

The values you set for separator properties apply only when converting XML to EDI.

You cannot use letters, numbers, or spaces for separator characters.

You must use unique values for each separator property you choose to set.

Commonly Used Separator Characters

Commonly used separator characters and their escape values (in decimal and hex) are shown in the following table.

Table 6-11. Common Separator Characters

Character	Decimal	Hex
~	\d126	\u007E
!	\d33	\u0021
@	\d64	\u0040
#	\d35	\u0023
$	\d36	\u0024
%	\d37	\u0025
^	\d94	\u005E
&	\d38	\u0026
*	\d42	\u002A
(	\d40	\u0028
)	\d41	\u0029
_	\d95	\u005F
+	\d43	\u002B
`	\d96	\u0060
-	\d45	\u002D

Table 6-11. Common Separator Characters

Character	Decimal	Hex
=	\d61	\u003D
[	\d91	\u005B
]	\d93	\u005D
}	\d123	\u007B
{	\d125	\u007D
\	\d92	\u005C
|	\d124	\u007C
’	\d39	\u0027
;	\d59	\u003B
"	\d34	\u0022
:	\d58	\u003A
/	\d47	\u002F
.	\d46	\u002E
,	\d44	\u002C
?	\d63	\u003F
>	\d62	\u003E
<	\d60	\u003C

Control Characters

You can also use non-printable control characters as separators, as shown in the following table.

Table 6-12. Control Characters

Character	Decimal	Hex	Other
NUL	\d0	\u0000	
SOH	\d1	\u0001	
STX	\d2	\u0002	

Table 6-12. Control Characters

Character	Decimal	Hex	Other
ETX	\d3	\u0003	
EOT	\d4	\u0004	
ENQ	\d5	\u0005	
ACK	\d6	\u0006	
BEL	\d7	\u0007	
BELL	\d7	\u7000	
BS	\d8	\u0008	
HT	\d9	\u0009	\t
TAB	\d9	\u0009	\t
LF	\d10	\u000A	\n
VT	\d11	\u000B	
FF	\d12	\u000C	\f
CR	\d13	\u000D	\r
SO	\d14	\u000E	
SI	\d15	\u000F	
DLE	\d16	\u0010	
DC1 (XON)	\d17	\u0011	
DC2	\d18	\u0012	
DC3 (XOFF)	\d19	\u0013	
DC4	\d\0	\u0014	
NAK	\d21	\u0015	
SYN	\d22	\u0016	
ETB	\d23	\u0017	
CAN	\d24	\u0017	
EM	\d25	\u0019	
SUB	\d26	\u001a	
ESC	\d27	\u001b	
FS	\d28	\u001c	
GS	\d29	\u001d	

Table 6-12. Control Characters

Character	Decimal	Hex	Other
RS	\d30	\u001e	
US	\d31	\u001f	
DEL	\d127	\u007F	
BPH	\d130	\u0082	
NBH	\d131	\u0083	
IND	\d132	\u0084	
NEL	\d133	\u0085	
SSA	\d134	\u0086	
ESA	\d135	\u0087	
HTS	\d136	\u0088	
HTJ	\d137	\u0089	
VTS	\d138	\u008A	
PLD	\d139	\u008B	
PLU	\d140	\u008C	
RI	\d141	\u008D	
SS2	\d142	\u008E	
SS3	\d143	\u008F	
DCS	\d144	\u0090	
PU1	\d145	\u0091	
PU2	\d146	\u0092	
STS	\d147	\u0093	
CCH	\d148	\u0094	
MW	\d149	\u0095	
SPA	\d150	\u0096	
EPA	\d151	\u0097	
SOS	\d152	\u0098	
SCI	\d154	\u009A	
CSI	\d155	\u009B	
ST	\d156	\u009C	

Table 6-12. Control Characters

Character	Decimal	Hex	Other
OSC	\d157	\u009D	
PM	\d158	\u009E	
APC	\d159	\u009F	
NBS (NBSP)	\d160	\u00A0	
SHY	\d173	\u00AD	

EDI Processing Instructions

You can specify EDI processing instruction (PI) values in the EDI XML Converter URI as described in the following table.

Table 6-13. Properties for EDI Processing Instructions

Processing Instruction	Name in URI	Description	Default
edi_component	component	Component value separator.	:
edi_decimal	decimal	Decimal character.	,
edi_element	element	Element separator.	+
edi_following	following	Segment name/segment content	=
edi_invalid	invalid	Invalid character replacement	_
edi_release	release	Release (escape) separator.	?
edi_repeat	repeat	Repeat symbol separator.	~
edi_segment	segment	Segment separator.	’
edi_tertiary	tertiary	Subcomponent (tertiary) separator.	&

Leave these values blank to assume the default values. XML Converters will generate an error if a PI and URI switch have

conflicting values, or if either value conflicts with one of the values encoded in a segment for these values.

The syntax of an EDI processing instruction is "<?" followed by processing instruction name (edi_segment, for example), followed by a space, and then the new special character.

Example

Suppose an X12 document had to be written so that the segment terminator was a carriage return, the element separator was an asterisk, and the component separator was the greater-than symbol. The actual start of the file might end up looking much like this:

```
<?xml version="1.0" encoding="utf-8"?>
<?edi_segment \r?>
<?edi_element *?>
<X12>
   <ISA>
      <ISA01><!--I01: Authorization Information Qualifier-->00</ISA01>
      <ISA02><!--I02: Authorization Information--></ISA02>
      <ISA03><!--I03: Security Information Qualifier-->00</ISA03>
      <ISA04><!--I04: Security Information--></ISA04>
      <ISA05><!--I05: Interchange ID Qualifier-->01</ISA05>
      <ISA06><!--I06: Interchange Sender ID-->1515151515</ISA06>
      <ISA07><!--I05: Interchange ID Qualifier-->01</ISA07>
      <ISA08><!--I07: Interchange Receiver ID-->5151515151</ISA08>
      <ISA09><!--I08: Interchange Date-->041201<!--2004-12-01--></ISA09>
      <ISA10><!--I09: Interchange Time-->1217</ISA10>
      <ISA11><!--I65: Repetition Separator-->U</ISA11>
      <ISA12><!--I11: Interchange Control Version-->00403</ISA12>
      <ISA13><!--I12: Interchange Control Number-->000032123</ISA13>
      <ISA14><!--I13: Acknowledgment Requested-->0</ISA14>
      <ISA15><!--I14: Usage Indicator-->P</ISA15>
      <ISA16><!--I15: Component Element Separator-->></ISA16>
   </ISA>
...
```

Java .properties File XML Converter Properties

You can use the JavaProps XML Converter to convert Java .properties files to XML and vice versa.

XML Converter Name in URL

JavaProps

Table 6-14. Properties for JavaProps XML Converters

Name in URL	*Property Name*	*Description*
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is ISO-8859-1.
newline	Line separator	Used when converting a file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

JSON XML Converter Properties

The following table shows properties for JSON (JavaScript Object Notation) XML Converters.

XML Converter Name in URL

JSON

Table 6-15. Properties for JSON XML Converters

Name in URL	*Property Name*	*Description*
indent	Indent	The level of indent you want to use for the converted XML. The default is 4.
newline	Line separator	The character that indicates the start of a new line in the document to be converted. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

OpenEdge .d Data Dump XML Converter Properties

You can use the DotD XML Converter to convert Progress OpenEdge .d data dump files to XML and vice versa.

XML Converter Name in URL

DotD

Table 6-16. Properties for DotD XML Converters

Name in URL	Property Name	Description
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.
newline	Line separator	Used when converting a file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

Pyx Format XML Converter Properties

You can use the Pyx XML Converter to convert Pyx format files to XML and vice versa.

XML Converter Name in URL

Pyx

Table 6-17. Properties for Pyx XML Converters

Name in URL	Property Name	Description
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.
newline	Line separator	Used when converting a file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

Rich Text Format XML Converter Properties

XML Converter Name in URL

RTF

Table 6-18. Properties for RTF XML Converters

Name in URL	Property Name	Description
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is cp850.
newline	Line separator	Used when converting a file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

SDI XML Converter Properties

You can use the SDI XML Converter to convert Super Data Interchange Format (SDI) files to XML and vice versa.

XML Converter Name in URL

SDI (Super Data Interchange Format)

Table 6-19. Properties for SDI XML Converters

Name in URL	*Property Name*	*Description*
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is cp850.
newline	Line separator	Used when converting SDI files to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

SYLK XML Converter Properties

You can use the SYLK XML Converter to convert Symbolic Link Format (SYLK) files to XML and vice versa.

XML Converter Name in URL

SYLK (Symbolic Link Format)

Table 6-20. Properties for SYLK XML Converters

Name in URL	*Property Name*	*Description*
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is cp850.
newline	Line separator	Used when converting SYLK files to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

Tab-Separated Values XML Converter Properties

You can use the TAB XML Converter to convert tab-separated values files to XML and vice versa.

XML Converter Name in URL

TAB (tab-separated values)

Table 6-21. Properties for Tab-Separated Values XML Converters

Name in URL	*Property Name*	*Description*
collapse	Collapse consecutive separators	Whether or not you want to collapse consecutive separators – that is, separators that do not contain any data. Default is no.
double	Doubling embedded quote escapes it	Whether or not doubling an embedded quotation mark has the effect of escaping the quoted string. Default is no.
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML.
escape	Escape character	This character escapes quotes and separators so that they can be embedded in values. The backslash (\) is the default.
first	First row contains field names	Generated field names depend on the values in the first and number fields. If first=yes and number=no, field names are read from the first row. Any field names after that are named column.nnn, where nnn is the column number, starting from one and including explicitly named columns in the count. If number=yes, extra columns (those after the first) are named just column.

Table 6-21. Properties for Tab-Separated Values XML Converters

Name in URL	*Property Name*	*Description*
newline	Line separator	See "Line Separator Values" on page 114 for a list of values.
number	Number rows and columns	If number=yes (no is the default), each row will also have an attribute, named row, which will contain the row number from the source document, starting from one. Also, each column, even those explicitly named, will have a `column` attribute numbering the column from one. Any empty columns are omitted from the output, but the numbering of subsequent columns will reflect that a column(s) was skipped.
quotes	Quote characters	A list of characters the converter should interpret as quotation characters. Double and single quote marks (" ') are the default values.
root	Root element name	The value you want to use for the root element name. Default is table.
row	Row element name	The value you want to use for the row element name. Default is row.
sep	Separator	The separator value between each value. This can be TAB, any single character (a comma (,) is the default), or the %*XX*-escaped value (`%2c`, for example).

Whole-line Text XML Converter Properties

You can use the Line XML Converter to convert whole-line text formatted files to XML and vice versa.

XML Converter Name in URL

Line

Table 6-22. Properties for the Whole-line Text XML Converter

Name in URL	*Property Name*	*Description*
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.
line	Line element name	Value used for the line element name. Default is line.
newline	Line separator	Used when converting a whole-line text file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.
root	Root element name	Value used for the root element name. Default is root.

Windows .ini File XML Converter Properties

You can use the WinIni XML Converter to convert Windows .ini files to XML and vice versa.

XML Converter Name in URL

WinIni

Table 6-23. Properties for WinIni XML Converters

Name in URL	Property Name	Description
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is cp1252.
newline	Line separator	Used when converting a file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

Windows Write XML Converter Properties

You can use the WinWrite XML Converter to convert Windows Write files to XML and vice versa.

XML Converter Name in URL

WinWrite

Table 6-24. Properties for WinWrite XML Converters

Name in URL	*Property Name*	*Description*
encoding	Encoding	The encoding for the input file when it is not XML; or the encoding for the output file when it is not XML. The default is utf-8.
newline	Line separator	Used when converting a file to XML, and vice versa. The default is crlf. See "Line Separator Values" on page 114 for a list of values.

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