PDF Converter Services - User & Developer Guide

Muhimbi Ltd

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Purpose and audience of document

This document explains how to access the *Muhimbi PDF Converter Services* (MDCS) using its Web Services interface.

The intended audience is any developer that wishes to convert documents or web pages to PDF format from their own code.

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1 Introduction

This document explains how to access the *Muhimbi PDF Converter Services* (MDCS) using its Web Services interface. The intended audience is any developers that wish to convert documents or web pages to PDF format from their own code.

It is assumed that the audience has some familiarity with programming against Web Services based interfaces.

For more details about this product please see:

1. Product Information:
   http://www.muhimbi.com/Products/PDF-Converter-Services.aspx
2. Knowledge Base / Frequently Asked Questions:
   http://support.muhimbi.com/
3. Release Notes:
   http://www.muhimbi.com/support/documentation/PDF-Converter-Services/Release-Notes.aspx
4. Installation & Administration Guide:
   http://www.muhimbi.com/support/documentation/PDF-Converter-Services/Administration-Guide.aspx
5. PDF Converter related content on the Muhimbi Blog:
   http://blog.muhimbi.com/search/label/PDF%20Converter%20Services

To keep on top of the latest news and releases, please subscribe to our blog or twitter feed at http://www.muhimbi.com/contact.aspx.

1.1 Relevant articles on the Muhimbi Blog

The Muhimbi Blog is updated frequently with new articles related to this product. At the time of writing the following posts are available.

- Converting files to PDF Format using a Web Services based interface (.NET)
- Converting files to PDF Format using a Web Services based interface (Java)
- Invoking the PDF Converter Web Service from Visual Studio 2005 using vb.net
- Converting PDF files to PDF/A1b using a Web Services based interface
- Using Windows Azure to convert documents to PDF format
- Muhimbi PDF Converter Deployment scenarios
- Troubleshooting steps for the PDF Converter.
- Troubleshooting InfoPath to PDF Conversion / Document Converter Architecture
- Adding custom Converters to Muhimbi's range of PDF Conversion products
- Using the Watermarking features of the Muhimbi PDF Converter Services
- Using the PDF Watermarking features from Java based environments
- Converting InfoPath forms including all attachments to a single PDF file
- Convert InfoPath to MS-Word, Excel, XPS and PDF

- Controlling which views to export to PDF format in InfoPath
- Dealing with hyperlinks when converting InfoPath files to PDF format
- Cross-Convert document types (xls to xslx, doc to docx)
- Programmatically Convert HTML pages to PDF format
- Converting and merging multiple files using a Web Services based interface (.NET)
- Converting and merging multiple files using a Web Services based interface (Java)
- Splitting PDF Files using the PDF Converter Web Service (.NET)
- Converting AutoCAD (DXF, DWG) files to PDF
- Converting TIFF files to PDF
- Converting Outlook MSG files to PDF including attachments
- PDF/A Support in the Muhimbi PDF Converter Services & SharePoint
- Reduce PDF Converter Web Service message size using MTOM

A number of articles written specifically for SharePoint based environments are available as well.

- Using the PDF Converter from a SharePoint Designer workflow
- Convert and merge multiple PDF files using a SharePoint Designer workflow
- Converting multiple SharePoint files to PDF Format using Nintex workflow
- Watermark PDFs using Nintex Workflow
- Secure PDFs using Nintex Workflow
- Convert and Merge PDFs using Nintex Workflow
- Convert HTML to PDF using Nintex Workflow
- Copy Meta-Data and set content types using a SharePoint Designer Workflow
- Convert SharePoint documents to PDF using K2 workflows
- Splitting PDF Files using a SharePoint workflow
- Inserting SharePoint List data into a PDF document using a workflow
- Configure PDF Security from a SharePoint Workflow
- Watermarking features of the Muhimbi PDF Converter for SharePoint
- Applying user specific watermarks when a PDF document is opened
- Convert and merge files to PDF using the SharePoint User Interface
- Using the PDF Converter for SharePoint from your own code
- Automatically convert files to PDF using an e-mail enabled Document Library
- Batch print InfoPath Forms using the PDF Converter for SharePoint
- Using SharePoint Forms Services to convert InfoPath forms to PDF format
- Convert HTML pages to PDF format using the SharePoint User Interface
- Converting SharePoint Lists to PDF format using a SharePoint Designer Workflow
- Embedding SharePoint Document IDs in PDF files and generating Short URLs
- Mirror / sync a SharePoint folder structure using the Workflow Power Pack
- Create Shortened ('TinyURL') links from your SharePoint Workflow
- Send rich emails with attachments from a SharePoint Designer Workflow
- Adding the PDF Converter to non standard Document and Form Libraries
- Tuning SharePoint's workflow engine
- SharePoint Designer workflows trigger before properties are set

2 Features and functionality

The MDCS is a highly scalable and robust server side framework for converting typical office documents to PDF format using a Web Services based interface.

The key features are:

- Convert popular document types including MS-Office, AutoCAD, HTML, MSG (email) and images to PDF or XPS format with perfect fidelity.
- Cross-convert between formats including XLS to XLSX, DOCX to DOC, XLS to DOC, InfoPath to DOC and XLS and many more.
- Scalable architecture that allows multiple conversions to run in parallel. The service can be *scaled up* by adding additional CPUs and *scaled out* by using standard HTTP Load Balancers.
- Runs as a Windows Service. No need to install or configure IIS or other web service frameworks.
- Convert password protected documents.
- Apply security settings to generated PDF files including encryption, password protection and multiple levels of PDF Security options to prevent users from printing documents or copy a document's content.
- Flexible watermarking system allowing different watermarks for individual pages (odd, even, portrait, landscape, specific page numbers etc)
- Merge multiple documents into a single PDF file or split up a PDF file into multiple documents.
- Generate regular PDF files or files in PDF/A format.
- Generate high resolution PDF Files optimised for printing or normal resolution files optimised for use on screen.
- Dynamically refresh a document's content before generating the PDF. Ideal for merging content from external sources into your PDF file.
- Control how to convert hidden / selected content such as PowerPoint Slides, InfoPath views and Excel worksheets.
- Add custom converters using a simple plug-in architecture.

In addition to the features described above, the MDCS software stack also contains a layer of functionality to control concurrency, request queuing and watchdog services to deal with unresponsive and runaway processes.

The MDCS is built on top of the WCF Framework. Full details about WCF and how it can be configured / tuned can be found on the following page: http://msdn.microsoft.com/en-us/library/ms731925.aspx

2.1 Supported document formats

The MDCS supports the most common file formats including MS-Word, Excel, PowerPoint, InfoPath, MSG (email), Visio and Microsoft Publisher. Legacy file formats starting with Office 95 are supported as well as the latest formats used by Office 2010. Non MS-Office related file types such as HTML, AutoCAD and common image formats are supported as well.

	Supported	Not Supported
MS-Word	doc, docx, docm, rtf, txt, xml, odt, ott, wps, wpd	dotm, dotx, dot
Excel	xls, xlsx, xlsm, xlsb, xml, csv, dif, ods, ots	xltx, xltm, xlt, txt (tab delimited), prn, slk, xlam, xla
PowerPoint	ppt, pptx, pptm, xml, odp, otp, pps, ppsx, ppsm	potx, potm, pot, thmx, ppam, ppa
InfoPath	xml, infopathxml	
Publisher	pub	
Email	eml, msg	
Visio & Vector formats	vsd,vdx,vdw,svg,svgz	
HTML & Web pages	html, htm, mht and any url that returns HTML such as .aspx or .jsp.	
Image formats	gif, png, jpg, bmp, tif, tiff	
AutoCAD formats[1]	dwg, dxf	

As of version 6.0 the PDF Converter also supports output in non-PDF file formats. For details see section 4.3 *Cross-Converting between document types*.

[1] The AutoCAD converter has several automatic recolouring options. For details see *AutoCAD specific switches* in the *Administration Guide*, subsection *Tuning the Document Conversion Service*.

3 Web Services interface / Object Model

Although the Object Model exposed by the web service is easy to understand, the system provides very powerful functionality, including watermarking, security, PDF Merging and fine grained control over how PDF files are generated.

3.1 Overview

The web service contains the following methods:

- **Convert:** Convert the file in the *sourceFile* byte array using the specified *openOptions* and *conversionSettings*. The generated PDF or XPS file is returned as a byte array as well.
- **GetConfiguration:** Retrieve information about which converters are supported and the associated file extensions. Consider calling this service once to retrieve a list of valid file extensions, and check if a file is supported before it is submit to the web service. This will prevent a lot of redundant traffic resulting in increased scalability.
- **GetDiagnostics:** Run a diagnostics test that carries out an internal end-to-end test for each specified converter type. Call this method to check if the service and all prerequisites have been deployed correctly.
- **ProcessBatch:** Process multiple files in one call. Currently limited to merge and split operations.

The *ApplySecurity*, *ApplyWatermark* and *ProcessChanges* methods are identical at this moment in time and are provided for convenience only. They all take exactly the same parameters as the *Convert* method, but they can act on PDF files only and basically apply whatever combination of Watermarks, Security Settings and other information is provided.

The full object model is discussed below, larger versions of the diagrams can be found at the end of this document.

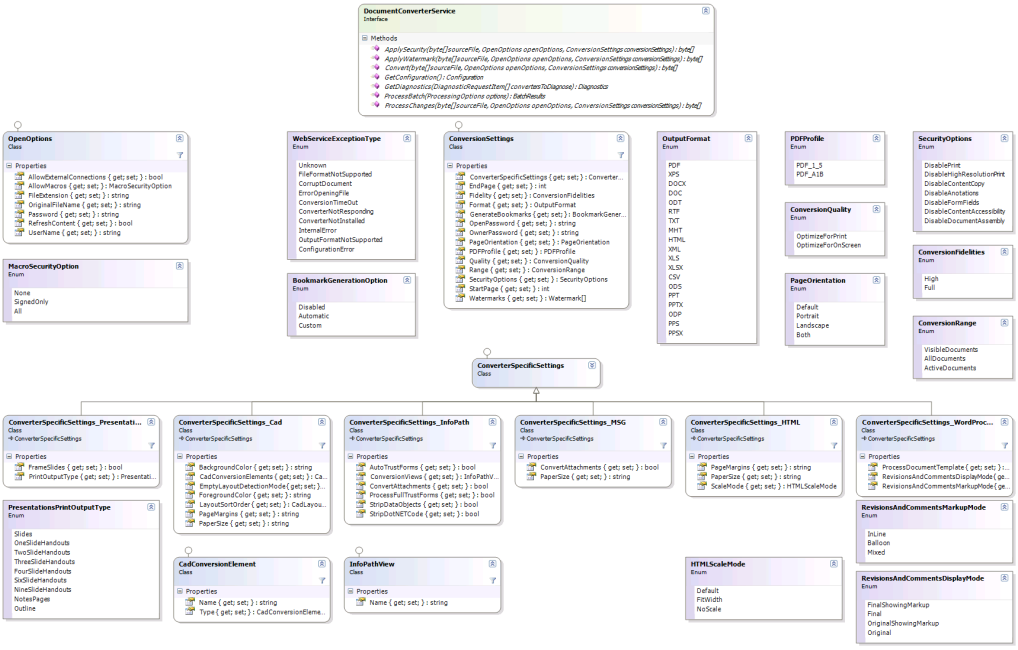
The WSDL can be found at the following location. Change *localhost* to the actual host name if the MDCS is located on a different machine.

http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl

3.2 Conversion

Perhaps not surprisingly, the core of the object model consists of classes and enumerations related to the actual conversion of documents.

This section describes these conversion related classes and methods in detail, the various enumerations are self describing. For code examples see chapters 4 - *Programmatically processing documents* and 5 - *Working with watermarks*.



3.2.1 The Convert Method

The *Convert* method, part of the *DocumentConverterService* interface, carries out the actual conversion. It accepts 3 parameters:

1. **sourceFile:** A *byte[]* containing the actual file to convert, e.g. an Excel file.
2. **openOptions**: The options to use when opening the source file, e.g. Macro Security settings and credentials. For details see section 3.2.2.
3. **conversionSettings**: The settings to apply when converting the file to PDF format, e.g. *watermarks*, *outputformat*, *security settings*, etc. For details see section 3.2.3.

The method returns a byte[] containing the generated file. Errors are raised as instances of the type *WebServiceFaultException*.

3.2.2 The OpenOptions class

An instance of this class is passed by the *Convert* method to provide details for opening the file, such as *Macro Security settings* and *security credentials*.

Property	Type	Description
AllowExternalConnections	Bool	Allow documents to connect to external data sources. Currently only supported by Excel.
AllowMacros	MacroSecurityOption	Specify what type of embedded macros to allow, if any.
FileExtension	String	Extension of the source file, indicating the document type.
OriginalFileName	String	File name of the original file for debugging and logging purposes.
Password	String	Optional password for protected documents.
RefreshContent	Bool	Refresh the content of the document after loading (apply MS-Word properties, recalculate content).
UserName	String	Optional user name for documents that require both user name and password (e.g. certain web pages)

3.2.3 The ConversionSettings class

An instance of this class is passed by the *Convert* method to provide settings to apply when converting the file, e.g. *watermarks*, *outputformat*, *security settings*, etc.

Property	Type	Description
ConverterSpecificSettings	Converter Specific Settings	An instance of an object that contains settings specific to the source document, e.g. how many PowerPoint slides to include in a page or how to include MS-Word revisions. See 3.2.4 - 3.2.8 for details.
EndPage	Int	The first page to render. Leave blank or specify -1 to ignore this value.
Fidelity	Conversion Fidelities	The type of converter to use. Usually *Full*, but in case of custom converters you may need to use *High*. For details see the Administration Guide.
Format	Output Format	Format to convert the file to. See 4.3 *Cross-Converting between document types*
GenerateBookmarks	Bookmark Generation Option	Generate TOC based on bookmarks. Note that this functionality is not available for all document types.
OpenPassword	String	Optionally specify the password to secure the generated document with to prevent users without a valid password to open the file.
OwnerPassword	String	Optionally specify the password to secure

Property	Type	Description
		the generated document with to prevent users without a valid password to access certain features
PageOrientation	PageOrientation	The orientation of the pages in the PDF file for converters that support this option, e.g. the HTML Converter.
PDFProfile	PDF Profile	The PDF Profile to use for rendering the document, e.g. PDF/A or PDF 1.5
Quality	Conversion Quality	Specify the required quality of the destination document.
Range	Conversion Range	For supported file types (Excel, PowerPoint etc) specify which parts of the file to render.
SecurityOptions	Security Options	Optionally specify one or more security options for the generated document.
StartPage	Int	The first page to render. Leave blank or specify -1 to ignore this value.
Watermarks	Watermark[]	Optional array of watermarks to apply to the generated PDF file. For details see 3.4.

3.2.4 The ConverterSpecificSettings_InfoPath class

An instance of this class is optionally passed in the *ConverterSpecificSettings* property of the *ConversionSettings* class for source documents that represent InfoPath forms. When this information is not provided then the default settings for the various properties will be taken from the service's config file.

Property	Type	Description
AutoTrustForms	Bool	Automatically trust InfoPath 2010 forms. For details see *Appendix - Using InfoPath with External Data Sources* in the Administration Guide.
ConversionViews	InfoPath View[]	List of view names to convert. See 4.9 for details.
ConvertAttachments	Bool	Enable the conversion of attachments.
StripDataObjects	Bool	To allow forms to be converted without extensive server configuration, remove all external data connections. It is recommended to always set this to 'true' unless you have a real good reason not to.
StripDotNETCode	Bool	To allow full trust forms to be converted without extensive server configuration, strip all custom .net code from the form. It is recommended to always set this to 'true' unless you have a real good reason not to.
ProcessFullTrustForms	Bool	Should InfoPath forms marked as requiring Full Trust be processed based on the other parameters (e.g. StripDotNETCode) or not?

3.2.5 The ConverterSpecificSettings_WordProcessing class

An instance of this class is optionally passed in the *ConverterSpecificSettings* property of the *ConversionSettings* class for source documents that represent Word Processing documents such as MS-Word files. When this information is not provided then the default settings for the various properties will be taken from the service's config file.

Property	Type	Description
ProcessDocumentTemplate	Bool	Specify if the MS-Word template will need to be stripped out for DOCX files. Specify *true* unless you are experiencing formatting problems.
RevisionsAndCommentsMarkupMode	RevisionsAndCommentsMarkupMode	Choose how to show revisions to the document. You can show revisions as balloons in the margins of the document or show them directly within the document itself.
RevisionsAndCommentsDisplayMode	RevisionsAndCommentsDisplayMode	Choose how to view the proposed changes to the document.

3.2.6 The ConverterSpecificSettings_HTML class

An instance of this class is optionally passed in the *ConverterSpecificSettings* property of the *ConversionSettings* class for HTML based source documents. When this information is not provided then the default settings for the various properties will be taken from the service's config file.

Property	Type	Description
PageMargins	String	The Margin / border around the generated PDF file. One or four {value}{dim} components separated by commas (,) where • {value} is a numerical value • {dim} is the dimension which can be 'mm', 'in.' or 'inches'. (Defaults to inches when nothing is specified) When multiple values are specified then then the sequence is: left, top, right and bottom. Example: "12mm, 24mm, 12mm, 24mm"
PaperSize	String	Specify the paper size to use for the PDF when converting HTML pages. Either: • A 'Named' paper size suchs as *'A4'* or *'Letter'* (See MSDN) • or a custom size in "{width}{dim}{sep}{height}{dim}" format where - {width} and {height} are numerical values (decimal separator must be colon '.')

Property	Type	Description
		- {dim} is the dimension which can be 'mm', 'in.' or 'inches'. (Defaults to inches when nothing is specified) - {sep} separates the width and the height, either 'by', comma (,) or the letter 'x' Example: "8.5 in. by 6 in."
ScaleMode	HTMLScaleMode	Determine how the HTML will be scaled to the PDF page size: • *FitWidth* - HTML is scaled to fit the width of the paper. • *NoScale* - HTML is not scaled, may result in truncating.

3.2.7 The ConverterSpecificSettings_Cad class

An instance of this class is optionally passed in the *ConverterSpecificSettings* property of the *ConversionSettings* class for CAD (dxf, wdg) based documents. When this information is not provided then the default settings for the various properties will be taken from the service's config file.

Property	Type	Description
BackgroundColor	String	Specify the background color. Accepted values: • *Default* - The default black color is used. • Named color, e.g. 'White' as defined on MSDN. • Web color using the "#aarrggbb" or "#rrggbb" format.
CadConversionElements	CadConversionElement[]	Array of named views, layouts, 3D views to convert to PDF.
EmptyLayoutDetectionMode	CadEmptyLayoutDetectionMode	Specifies how the conversion handles empty or nearly empty layouts. Accepted values are : • *SkipNone* - Every layout will be drawn regardless if it has anything in it or not • *SkipEmptyLayouts* - Layouts will be drawn only if they have entities or valid viewports attached to it • *SkipLayoutsWithoutViewports* - Only layouts with valid viewports are drawn
ForegroundColor	String	• *Default*: Objects are drawn in their original color. • *CorrectForBackground* - Objects are drawn in their own color, but colors matching the background color will be inverted to ensure visibility. • Named color, e.g. 'White' as defined on

Property	Type	Description
		MSDN. • Web color using the "#aarrggbb" or "#rrggbb" format. • *Greyscale* - All colors are converted to a shades of grey based on luminosity. • *GreyscaleDarken* - All colors are converted to a shade of grey then darkened • *GreyscaleLighten* - All colors are converted to a shade of grey then lightened • *Darken* - All colors are darkened • *Lighten* - All colors are lightened
PageMargins	String	The Margin / border around the generated PDF file. One or four {value}{dim} components separated by commas (,) where • {value} is a numerical value • {dim} is the dimension which can be 'mm', 'in.' or 'inches'. (Defaults to inches when nothing is specified) When multiple values are specified then then the sequence is: left, top, right and bottom. Example: "12mm, 24mm, 12mm, 24mm"
PaperSize	String	Specify the paper size to use for the PDF when converting HTML pages. Either: • A 'Named' paper size such as 'A4' or 'Letter' (See MSDN) • or a custom size in "{width}{dim}{sep}{height}{dim}" format where - {width} and {height} are numerical values (decimal separator must be colon '.') - {dim} is the dimension which can be 'mm', 'in.' or 'inches'. (Defaults to inches when nothing is specified) - {sep} separates the width and the height, either 'by', comma (,) or the letter 'x' Example: "8.5 in. by 6 in."
LayoutSortOrder	CadLayout SortOrder	Specify the sort order for layout names. Accepted values are: • *Default* - Use the order in which the layouts are stored in the source file. • *Ascending* - Sort the layout names from A-Z. • *Descending* - Sort the layout names from Z-A.

3.2.8 The ConverterSpecificSettings_Presentations class

An instance of this class is optionally passed in the *ConverterSpecificSettings* property of the *ConversionSettings* class for source documents that represent Presentations such as PowerPoint files. When this information is not provided then the default settings for the various properties will be taken from the service's config file.

Property	Type	Description
FrameSlides	Bool	Include a frame / border around the slides.
PrintOutputType	Presentations PrintOutput Type	Specify the part of the presentation to print. You can print the slides, handouts, speaker notes or the outline.

3.2.9 The ConverterSpecificSettings_MSG class

An instance of this class is optionally passed in the *ConverterSpecificSettings* property of the *ConversionSettings* class for source documents that represent MSG (email) files. When this information is not provided then the default settings for the various properties will be taken from the service's config file.

Property	Type	Description
ConvertAttachments	Bool	Enable the conversion of attachments.
PaperSize	String	Specify the paper size to use for the PDF when converting HTML based email. Either: • A 'Named' paper size such as 'A4' or 'Letter' (See MSDN) • or a custom size in "{width}{dim}{sep}{height}{dim}" format where - {width} and {height} are numerical values (decimal separator must be colon '.') - {dim} is the dimension which can be 'mm', 'in.' or 'inches'. (Defaults to inches when nothing is specified) - {sep} separates the width and the height, either 'by', comma (,) or the letter 'x' Example: "8.5 in. by 6 in."

3.2.10 The ConverterSpecificSettings_CommandLineConverter class

An instance of this class is optionally passed in the *ConverterSpecificSettings* property of the *ConversionSettings* class for file types that have been configured to use the Command Line Converter (See Admin Guide, *Appendix - Invoke 3rd party Converters*)

Property	Type	Description
Parameter1 – 10	String	Content for any command line arguments passed to the external executable using the {ParameterX} syntax.

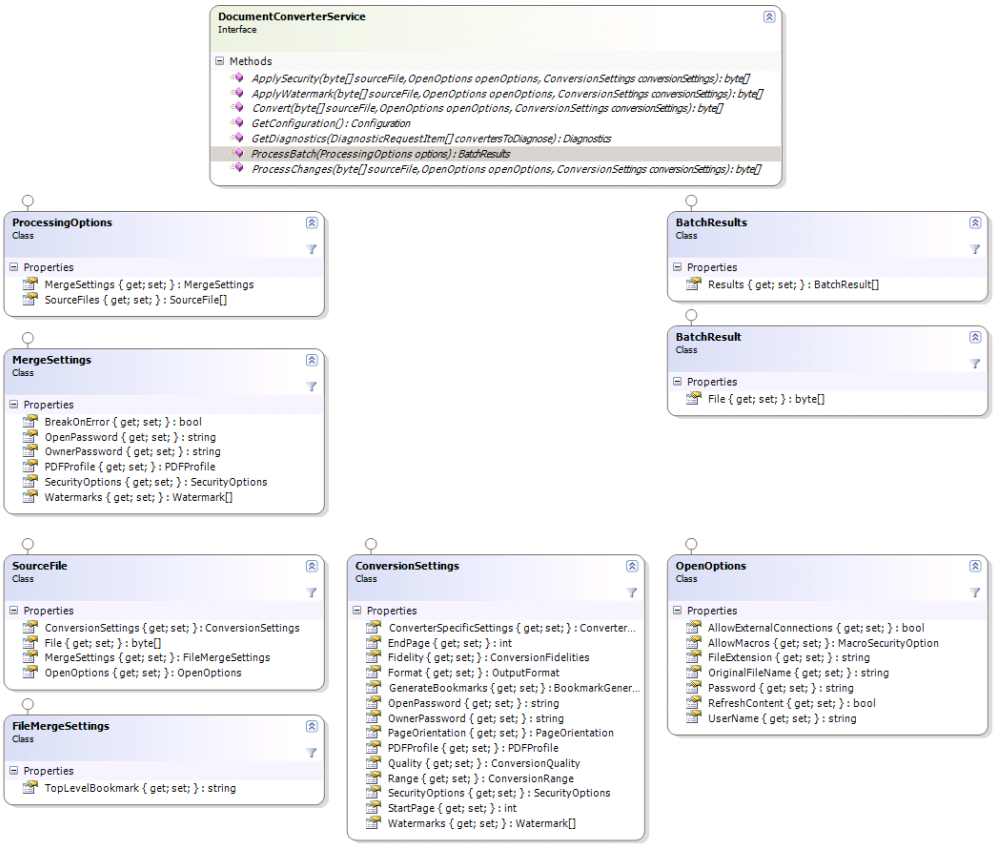
3.3 Working with ProcessBatch (Merging / Splitting files)

The *Muhimbi Document Conversion Service* allows multiple files to be merged into a single PDF file or a single file to be split into separate files. These actions are carried out using the *ProcessBatch* method described in this section.

3.3.1 Merging files

The key features of the merging facility are as follows:

1. Convert and merge any supported file format / URL (inc. HTML, AutoCAD, MS-Office, InfoPath, TIFF) or merge existing PDF files.
2. Apply different watermarks on each individual file as well as on the entire merged file (e.g. page numbering).
3. Apply PDF Security settings and restrictions on the merged file.
4. Optionally skip (and report) corrupt / unsupported files.
5. Add PDF Bookmarks for each converted file.
6. Apply any *ConversionSetting* supported by the regular conversion process.



The Web Service method that controls merging of files is called *ProcessBatch* (highlighted in the screenshot above). It accepts a *ProcessingOptions* object that holds all information about the source files to convert and the *MergeSettings* to apply, which may include security and watermarking related settings. A *BatchResults* object is returned that, when it comes to merging of files, always contains a single file that holds the byte array for the merged PDF file.

For a full code example see section **Error! Reference source not found.** REF _Ref303074272 \h * MERGEFORMAT **Error! Reference source not found.**.

3.3.2 Splitting files

The key features of the new splitting facility are as follows:

1. Split a single PDF file into one or more individual PDF files.
2. Split based on number of pages or bookmarks.
3. Automatically generate numbered file names using .NET's formatting syntax, e.g. 'split-{0:D3}.pdf' will use 3 digits for the sequential numbers starting at 'split-001.pdf'. When splitting by bookmark then an optional {1} parameter can be inserted in the file name to include the name of the bookmark as well.
4. Can be combined in combination with other actions, e.g. convert & merge.

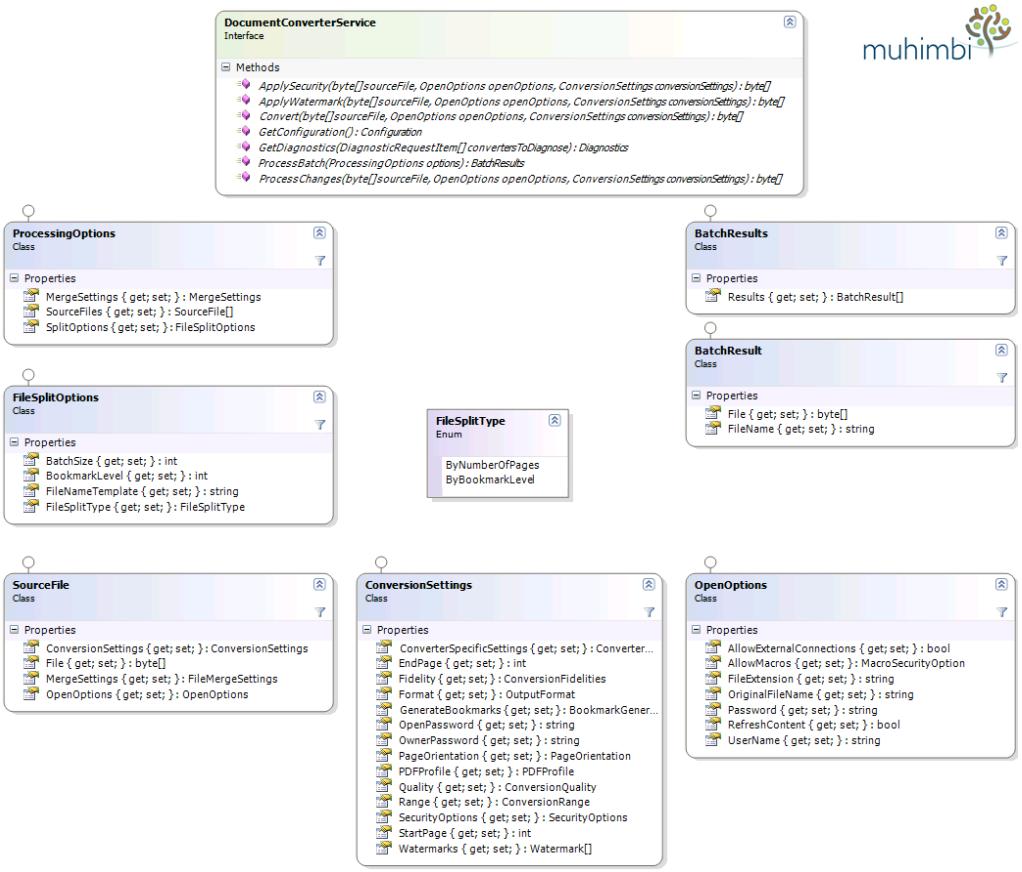
A note about splitting based on bookmark levels: PDFs store bookmarks at the page level, so it is not clear on what part of the page a heading starts or ends. As a result an extra page will always be exported for each file split based on bookmark levels.

For example let's assume the following document:

- **Page 1:** Contains chapter 1 and sections 1.1. and 1.2.
- **Page 2:** Contains the last paragraph of 1.2 and all of chapter 2.
- **Page 3:** Contains Chapter 3.

When splitting this document based on bookmarks using '1' as the batch size then the following files will be created:

- **File 1:** Contains page 1 and 2 as expected.
- **File 2:** Contains pages 2 and 3 even though Chapter 2 is only really part of page 2. This is because there is no way to know if Chapter 2 runs over into page 3 or not.
- **File 3:** Contains Chapter 3.



The object classes involved in splitting files is similar to the ones used by the merging facility described in 3.3.1.

The Web Service method that controls splitting (as well as merging) of files is called *ProcessBatch*. It accepts a *ProcessingOptions* object that holds all information about the files to process and the operations to apply. A *Results* object is returned that, when it comes to splitting of files, contains one or more results that hold the contents of the file as well as the suggested output file name, which you may us to save the file locally.

As the *ProcessingOptions* class accepts both *MergeSettings* and *SplitOptions* it is possible to *convert and merge* a set of input files (see **Error! Reference ource not found.**) and then split up the results, all in a single web service call. Just populate the various properties and the system will take care of the rest.

Details about the various classes involved can be found below. A code sample can be found in section 4.6.

3.3.3 The ProcessingOptions class

This object is the only parameter passed into the *ProcessBatch* method. It allows all parameters required for the batch operation to be passed in.

Property	Type	Description
MergeSettings	MergeSettings	Settings associated with PDF Merge operations, see 3.3.4.
SourceFiles	SourceFile[]	An array of files associated with the batch operation.
SplitOptions	FileSplitOptions	Settings associated with PDF Split operations, see 3.3.5.

3.3.4 The MergeSettings class

Any settings associated with a PDF Merge batch process are communicated using this class.

Property	Type	Description
BreakOnError	Bool	Specify if any error should abort the entire batch process or if the offending file should be skipped.
OpenPassword	String	The 'open password' to be applied to the PDF file containing all merged documents. See 3.2.3 for details.
OwnerPassword	String	The 'owner password' to be applied to the PDF file containing all merged documents. See 3.2.3 for details.
PDFProfile	PDFProfile	The PDF Profile to use for the PDF file containing all merged documents. See 3.2.3 for details.
SecurityOptions	SecurityOptions	Security restrictions to apply to the PDF file containing all merged documents. See 3.2.3 for details.
Watermarks	Watermark[]	Watermarks to apply to the PDF file containing all merged documents. Note that it is still possible to specify Watermarks for each individual file in the batch as well using the *SourceFile.ConversionSettings* property, see 3.3.6 for details.

3.3.5 The FileSplitOptions class

Any settings associated with PDF Split operations are communicated using this class.

Property	Type	Description
FileSplitType	FileSplitType	How to split the file: *ByNumberOfPages* or *ByBookmarkLevel*.
BatchSize	Int	When splitting by the number of pages set this value to the number of pages to use per file.
BookmarkLevel	Int	When splitting by bookmark set this value to the bookmark level to split on.
FileNameTemplate	String	Template to use for generating file names using .NET formatting standards, e.g. 'spf-{0:D3}.pdf' generates names starting with 'spf-001.pdf'. When splitting by bookmark then an optional {1} parameter can be inserted in the file name to include the name of the bookmark as well.

3.3.6 The SourceFile class

An array of *SourceFile* objects is passed to the server as part of the *ProcessingOptions* class.

Property	Type	Description
ConversionSettings	ConversionSettings	The settings to use for this particular file, including Quality, Watermarks and page ranges. See 3.2.3 for details.
File	Byte[]	The content of the file to process or the Byte array of the URL to convert *System.Text.Encoding.UTF8.GetBytes(url)*
MergeSettings	FileMergeSettings	Settings associated with merging this file. See 3.3.7 for details.
OpenOptions	OpenOptions	Any options for opening the file, see 3.2.2 for details.

3.3.7 The FileMergeSettings class

File specific settings associated with merging individual documents are passed using this class.

Property	Type	Description
TopLevelBookmark	String	The name to use as the 'top level bookmark' in the combined PDF file.

3.3.8 The BatchResults class

The results of a batch operation are passed back in the *BatchResult* class.

Property	Type	Description
Results	BatchResult[]	One or more results coming out of the batch operation. Note that in case of a *file merge operation* the merged file is always stored in element 0.

3.3.9 The BatchResult class

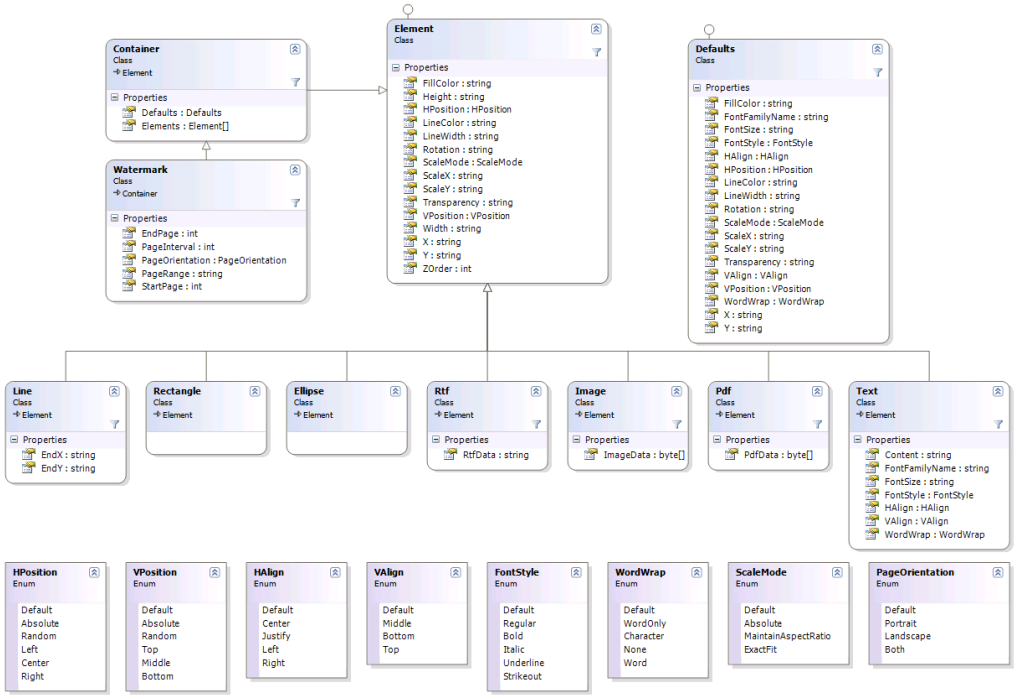
Individual results, part of the *BatchResults* class, are passed using the *BatchResult* class.

Property	Type	Description
File	Byte[]	The file associated with the result, e.g. the split or merged file.
Filename	String	The suggested file name to use for saving the file. Please note that this is just a suggestion and can be ignored. This is mainly used when splitting PDF files, see 3.3.5.

3.4 Watermarking

The *Muhimbi Document Conversion Service* contains a very flexible system for applying watermarks to documents. Multiple watermarks can be applied to the same page and watermarks can be applied to page ranges or certain page types such as *odd, even, portrait* or *landscape*.

Watermarks are passed as part of the *ConversionSettings* object, a parameter of the *Convert* method. For details see sections 3.2.1 and 3.2.3, for a code example see chapter 4.8.



3.4.1 The Watermark class

An instance of this class is passed by the *Convert* method, as part of the *ConversionSettings* object, in order to apply watermarks to the converted document.

Note that some of this class' properties are inherited from the *Container* type, which in turn inherits from the *Element* type. The properties are largely self describing, the ones that require explanation are as follows:

Property	Type	Description
Defaults	Defaults	The default values for each of the watermark's elements, e.g. *LineColor*, *alignment, transparency*, etc. For details see 3.4.4.
Elements	Element[]	A list of elements, e.g. *Text, Line* or *Image* that make up the watermark. For details see 3.4.2.
EndPage	Int	The last page the watermark applies to.

		Defaults to the last page.
PageInterval	Int	The page interval that determines if a watermark should be applied to the current page number, e.g. '*2*' to apply the watermark to every other page.
PageOrientation	Page Orientation	Specifies what page orientation the watermark applies to: *Portrait*, *Landscape* or *Both*.
PageRange	String	An optional string representation of the range of pages the watermark applies to. For example "1,3,7,10-15". If specified, this is in addition to the values stored in the *StartPage* and *EndPage* properties.
StartPage	Int	The first page of the document the watermark applies to. Defaults to the first page.
ZOrder	Int	For the watermark, not for individual elements, a negative z-order means that the watermark will be displayed behind the content of the document. A positive value will display the watermark on top of the content.

3.4.2 The Element class

The *Element* class is the base class for the individual watermark elements such as *Line, Rectangle, Image, Text, PDF* etc. Do not instantiate this class directly, instead use one of the derived types defined in 3.4.3.

The properties shared by all individual element types are as described below. Note that some properties, which you would have expected to be of type *int* or *float*, are of type *string*. The reason for this is to make it possible to determine if a value has been specified at all and to allow different units of measure. If a value has not been specified then for most properties its value will be read from the corresponding *Defaults* instance.

Property	Type	Description
FillColor	String	The color of the element's fill in *#rrggbb* or *#aarrggbb* format where *aa* represents the alpha / transparency.
Height	String	The height of the element. Note that this field is of type *string* to allow the unit of measure to be specified (future version).
HPosition	HPosition	The horizontal position of the element.
LineColor	String	The color of the element's line in *#rrggbb* or *#aarrggbb* format where *aa* represents the alpha / transparency.
LineWidth	String	The width of the element's line. Note that this field is of type *string* to allow the unit of

Property	Type	Description
		measure to be specified (future version).
Rotation	String	The rotation to apply to the element in degrees. Note that this field is of type *string* to allow the system to determine if it has been specified or not.
ScaleMode	ScaleMode	The behaviour to use when scaling the element, e.g. maintain Aspect Ratio or ExactFit.
ScaleX	String	The horizontal scaling to apply to the element, where 1 is the original size. Any number between 0 and 1 reduces the size whereas any number above 1 increases the size. Note that this field is of type *string* to allow different scaling units to be specified in a future version.
ScaleY	String	The vertical scaling to apply to the element, where 1 is the original size. Any number between 0 and 1 reduces the size whereas any number above 1 increases the size. Note that this field is of type *string* to allow different scaling units to be specified in a future version.
Transparency	String	The element's transparency where 1 is opaque and 0 is completely transparent.
VPosition	VPosition	The vertical position of the element.
Width	String	The width of the element. Note that this field is of type *string* to allow the unit of measure to be specified (future version).
X	String	The x-coordinate of the element. Note that this field is of type *string* to allow the unit of measure to be specified (future version).
Y	String	The y-coordinate of the element. Note that this field is of type *string* to allow the unit of measure to be specified (future version).
ZOrder	Int	The z-order (layer index) of the element. A lower value indicates that the element will be drawn further in the background.

3.4.3 Individual Element Types

As all individual elements inherit from the *Element* class, they largely share the same properties.

The currently recognised Element Types (Shapes) are as follows.

- **Line:** Represents a single line. Please note that the *Width* and *Height* properties are ignored, instead it uses the *EndX* and *EndY* properties.

- **Rectangle:** Represents a rectangle. This shape does not implement any additional properties.
- **Ellipse:** Represents an ellipse. This shape does not implement any additional properties.
- **Rtf:** Represents a piece of text encoded in RTF format. The text is specified in the *RtfData* property.
- **Image:** Represents an image. The image's binary data is stored in the *ImageData* (byte[]) property. The following image types are supported:
  - Bmp
  - JPG
  - GIF
  - PNG
  - TIFF
  - WMF
  - EMF / EMF+
- **Pdf:** Represents an existing PDF file that is used as the watermark. If the PDF document contains multiple pages then the first page is used as the watermark. The PDF's data is stored in the *PdfData* (byte[]) property.
- **Text:** Represents a text box that allows plain text to be specified with full control over horizontal and vertical alignment, font face and size as well as word wrapping. The actual text is stored in the *Content* property. The text field also allows field codes such as *page number* to be embedded. For details see *3.4.5*.

3.4.4 The Defaults class

The *Defaults* class allows default values to be specified for all elements in the watermark. For example, if all lines and text boxes are red then there is no need to specify the colour on each individual element.

The following properties are available:

Property	Type	Description
FillColor	String	The color of the element's fill in *#rrggbb* or *#aarrggbb* format where *aa* represents the alpha / transparency.
FontFamilyName	String	The name of the font to use. When the font is not found the system will throw an exception.
FontSize	String	The size of the font.
FontStyle	FontStyle	The style of the text. Multiple values can be combined, e.g. *FontStyle.Bold* | *FontStyle .Italic*.
HAlign	HAlign	Horizontal alignment of text stored in a *Text*

Property	Type	Description
		element.
HPosition	HPosition	The horizontal position of the element.
LineColor	String	The color of the element's line in *#rrggbb* or *#aarrggbb* format where *aa* represents the alpha / transparency.
LineWidth	String	The width of the element's line. Note that this field is of type *string* to allow the unit of measure to be specified (future version).
Rotation	String	The rotation to apply to the element in degrees. Note that this field is of type *string* to make allow the system to determine if it has been specified or not.
ScaleMode	ScaleMode	The behaviour to use when scaling the element, e.g. maintain Aspect Ratio or ExactFit.
ScaleX	String	The horizontal scaling to apply to the element, where 1 is the original size. Any number between 0 and 1 reduces the size whereas any number above 1 increases the size. Note that this field is of type *string* to allow different scaling units to be specified in a future version.
ScaleY	String	The vertical scaling to apply to the element, where 1 is the original size. Any number between 0 and 1 reduces the size whereas any number above 1 increases the size. Note that this field is of type *string* to allow different scaling units to be specified in a future version.
Transparency	String	The element's transparency where 1 is opaque and 0 is completely transparent.
VAlign	VAlign	Vertical alignment of text stored in a *Text* element.
VPosition	VPosition	The vertical position of the element.
WordWrap	WordWrap	The word wrapping behaviour of text stored in a *Text* element.
X	String	The x-coordinate of the element. Note that this field is of type *string* to allow the unit of measure to be specified (future version).
Y	String	The y-coordinate of the element. Note that this field is of type *string* to allow the unit of measure to be specified (future version).

3.4.5 Embedding field codes in the Text element

The *Text* and RTF elements allows field codes to be embedded, for example the *number of pages* or the *current date*. This makes it very simple to use watermarks to automatically generate headers and footers on each page, while taking orientation and page interval (Odd / Even pages) into account.

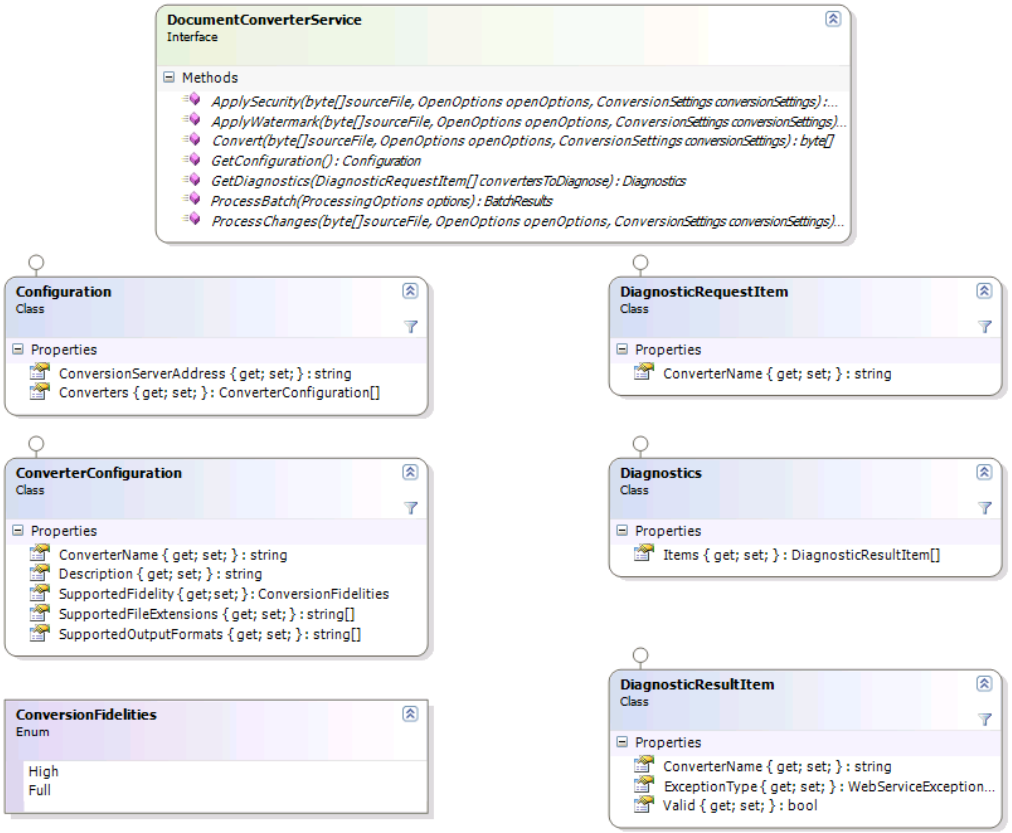
The following field codes are available for use:

- **{LONG_DATE}:** The long representation of the current date, equivalent in C# to *DateTime.Now.ToLongDateString()*
- **{LONG_TIME}:** The long representation of the current time, equivalent in C# to *DateTime.Now.ToLongTimeString()*
- **{DATE}:** The short representation of the current date, equivalent in C# to *DateTime.Now.ToShortDateString()*
- **{TIME}:** The short representation of the current time, equivalent in C# to *DateTime.Now.ToLongTimeString()*
- **{PAGE}:** The number of the current page in the PDF file.
- **{NUMPAGES}:** The total number of pages in the PDF file.

Date and time fields are formatted using the regional settings of the account the Document Conversion Service is running under.

3.5 Configuration and Diagnostics

The Document Conversion Service comes with a *Configuration and Diagnostics* interface that allows the individual converters to be tested and information about the available converters to be retrieved.



3.5.1 Retrieving Configuration settings

The *GetConfguration* method, part of the *DocumentConverterService* interface retrieves the server's configuration. The method call does not require any parameters and returns the results in an instance of the *Configuration* class.

The Configuration class has the following properties:

Property	Type	Description
ConversionServerAddress	String	The exact address the web service is listening on.
Converters	Converter Configuration[]	An array containing the list of converters available in the system. This list contains both converters that are shipped in the box as well as any custom converters.

Each item in the *Converters* array is represented by an instance of the *ConverterConfiguration* class, which has the following properties:

Property	Type	Description
ConverterName	String	The short name of the converter used for uniquely identifying it.
Description	String	A human readable description. Typically used for display in a user interface.
SupportedFidelity	Conversion Fidelities	The fidelity supported by the converter.
SupportedFileExtensions	String[]	An array of file extensions supported by the converter.
SupportedOutputFormats	String[]	An array of file extensions / formats the converter can output.

The array of converters largely matches the information stored in the Document Conversion Server's config file. For details see section 2.4.6 of the Administration Guide.

3.5.2 Running Diagnostic tests

The *GetDiagnostics* method, part of the *DocumentConverterService* interface, runs an end-to-end diagnostic test on each of the specified converters to see if everything has been configured properly and is working as expected. The method accepts an array of *DiagnosticRequestItem* instances and returns an object of type *DiagnosticResultItem*.

The *DiagnosticRequestItem* class has the following properties:

Property	Type	Description
ConverterName	String	The short name of the converter to run the diagnostics for.

The *Diagnostics* class has the following properties:

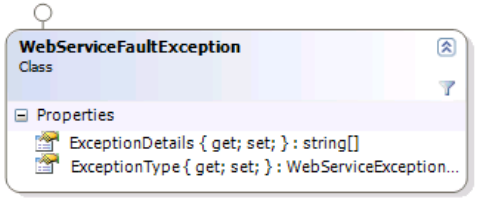
Property	Type	Description
Items	Diagnostic ResultItem[]	An array of items that holds the results.

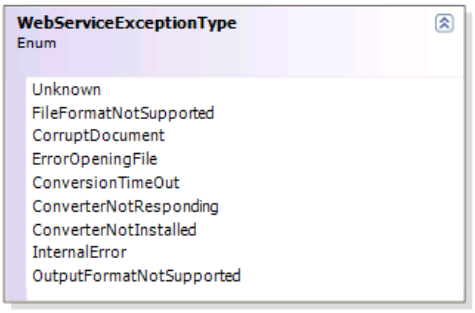
The *DiagnosticResultItem* class has the following properties:

Property	Type	Description
ConverterName	String	The short name of the converter that this item holds the results for.
ExceptionType	WebService Exception Type	The type of exception that occurred during the validation (e.g. *ConverterNotInstalled*)
Valid	Bool	A flag indicating if the converter is valid (No errors encountered during diagnosis).

3.6 Exception handling

Any Exception that occurs anywhere inside the web service is automatically wrapped in a *WebServiceFaultException*. If the cause of the internal exception is known then the *ExceptionType* property is set to a value of the *WebServiceExceptionType* enumeration.





For examples of how to deal with these kind of exceptions see the sample code in sections 4.1 (.net) and 4.2 (Java).

4 Programmatically processing documents

4.1 PDF Conversion in .NET

Listed below is a basic example of how to convert a document to PDF format using a simple *WinForms* application. For a more comprehensive example see the .NET Sample code installed alongside each copy of the MDCS. Use the Start Menu to open the appropriate folder.

The latest version of this example can be found at the following page:

http://blog.muhimbi.com/2009/12/converting-office-files-to-pdf-format.html

This example does not explicitly set *ConversionSettings.Format*. As a result the file is converted to the default PDF format. It is possible to convert files to other file formats as well by setting this property to a value of the *OutputFormat* enumeration. For details see 4.3 *Cross-Converting between document types*.

1. Start a new Visual Studio project and select the project type of your choice. In this example we are using a standard .net 3.0 project of type *Windows Forms Application*. Name it '*Simple PDF Converter Sample*'.
2. Add a *TextBox* and *Button* control to the form. Accept the default names of *textBox1* and *button1*.
3. In the *Solution Explorer* window, right-click *References* and select *Add Service Reference*.
4. In the *Address* box enter the WSDL address listed at the end of section 3. If the MDCS is located on a different machine then substitute *localhost* with the server's name.
5. Accept the default Namespace of *ServiceReference1* and click the OK button to generate the proxy classes.
6. Double click Button1 and replace the content of the entire code file with the following:

```
using System;
using System.IO;
using System.ServiceModel;
using System.Windows.Forms;
using Simple_PDF_Converter_Sample.ServiceReference1;

namespace Simple_PDF_Converter_Sample
{
    public partial class Form1 : Form
    {
        // ** The URL where the Web Service is located. Amend host name if needed.
        string SERVICE_URL = "http://localhost:41734/Muhimbi.DocumentConverter.WebService/";

        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
```

```
            DocumentConverterServiceClient client = null;

            try
            {
                // ** Determine the source file and read it into a byte array.
                string sourceFileName = textBox1.Text;
                byte[] sourceFile = File.ReadAllBytes(sourceFileName);

                // ** Open the service and configure the bindings
                client = OpenService(SERVICE_URL);

                //** Set the absolute minimum open options
                OpenOptions openOptions = new OpenOptions();
                openOptions.OriginalFileName = Path.GetFileName(sourceFileName);
                openOptions.FileExtension = Path.GetExtension(sourceFileName);

                // ** Set the absolute minimum conversion settings.
                ConversionSettings conversionSettings = new ConversionSettings();
                conversionSettings.Fidelity = ConversionFidelities.Full;
                conversionSettings.Quality = ConversionQuality.OptimizeForPrint;

                // ** Carry out the conversion.
                byte[] convFile = client.Convert(sourceFile, openOptions, conversionSettings);

                // ** Write the converted file back to the file system with a PDF extension.
                string destinationFileName = Path.GetDirectoryName(sourceFileName) + @"\" +
                                             Path.GetFileNameWithoutExtension(sourceFileName) +
                                             "." + conversionSettings.Format;
                using (FileStream fs = File.Create(destinationFileName))
                {
                    fs.Write(convFile, 0, convFile.Length);
                    fs.Close();
                }

                MessageBox.Show("File converted to " + destinationFileName);
            }
            catch (FaultException<WebServiceFaultException> ex)
            {
                MessageBox.Show("FaultException occurred: ExceptionType: " +
                                ex.Detail.ExceptionType.ToString());
            }
            catch (Exception ex)
            {
                MessageBox.Show(ex.ToString());
            }
            finally
            {
                CloseService(client);
            }
        }


        /// <summary>
        /// Configure the Bindings, endpoints and open the service using the specified address.
        /// </summary>
        /// <returns>An instance of the Web Service.</returns>
        public static DocumentConverterServiceClient OpenService(string address)
        {
            DocumentConverterServiceClient client = null;

            try
            {
                BasicHttpBinding binding = new BasicHttpBinding();
                // ** Use standard Windows Security.
                binding.Security.Mode = BasicHttpSecurityMode.TransportCredentialOnly;
                binding.Security.Transport.ClientCredentialType =
                                                        HttpClientCredentialType.Windows;
                // ** Increase the client Timeout to deal with (very) long running requests.
                binding.SendTimeout = TimeSpan.FromMinutes(30);
                binding.ReceiveTimeout = TimeSpan.FromMinutes(30);
                // ** Set the maximum document size to 50MB
```

```
                binding.MaxReceivedMessageSize = 50*1024*1024;
                binding.ReaderQuotas.MaxArrayLength = 50 * 1024 * 1024;
                binding.ReaderQuotas.MaxStringContentLength = 50 * 1024 * 1024;

                // ** Specify an identity (any identity) in order to get it past .net3.5 sp1
                EndpointIdentity epi = EndpointIdentity.CreateUpnIdentity("unknown");
                EndpointAddress epa = new EndpointAddress(new Uri(address), epi);

                client = new DocumentConverterServiceClient(binding, epa);

                client.Open();

                return client;
            }
            catch (Exception)
            {
                CloseService(client);
                throw;
            }
        }

        /// <summary>
        /// Check if the client is open and then close it.
        /// </summary>
        /// <param name="client">The client to close</param>
        public static void CloseService(DocumentConverterServiceClient client)
        {
            if (client != null && client.State == CommunicationState.Opened)
                client.Close();
        }

    }
}
```

Providing the project and all controls are named as per the steps above, the project should compile without errors. Run it, enter the full path to the source file, e.g. an MS-Word document, and click the button to start the conversion process. The conversion may take a few seconds depending on the complexity of the document.

Note that in this example we are programmatically configuring the WCF Bindings and End Points. If you wish you can use a declarative approach using the config file. For more information about working with WCF see http://msdn.microsoft.com/en-us/library/ms735119(v=VS.90).aspx

4.2 PDF Conversion in Java

Even though the MDCS itself must run on a Windows based server, it has been designed to interoperate with non Windows platforms such as Java. This section describes how to convert documents to PDF format using a Java based environment.

The full version of the sample code discussed in this chapter, including pre generated proxies, is installed alongside each copy of the MDCS. Use the Start Menu to open the appropriate folder.

The example described below assumes the following:

1. The JDK has been installed and configured.
2. The MDCS and all prerequisites have been installed in line with the Administration Guide.
3. The MDCS is running in the default *anonymous mode*. This is not an absolute requirement, but it makes initial experimentation much easier.

The first step is to generate proxy classes for the web service by executing the following command:

```
wsimport http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl
-d src -Xnocompile -p com.muhimbi.ws
```

Feel free to change the package name and destination directory to something more suitable for your organisation.

Wsimport automatically generates the Java class names. Unfortunately some of the generated names are rather long and ugly so you may want to consider renaming some, particularly the Exception classes, to something friendlier. This, however, means that if you ever run wsimport again you will need to re-apply those changes.

Once the proxy classes have been created add the following sample code to your project. Run the code and make sure the path to the document to convert is specified on the command line.

This example sets *ConversionSettings.Format* to *OutputFormat.PDF*. As a result the file is converted to the default PDF format. It is possible to convert files to other file formats as well by setting this property to a different value. For details see 4.3 *Cross-Converting between document types*.

```
package com.muhimbi.app;

import com.muhimbi.ws.*;
import java.io.*;
import java.net.URL;
import java.util.List;
import javax.xml.bind.JAXBElement;
import javax.xml.namespace.QName;

public class WsClient {

  private final static String DOCUMENTCONVERTERSERVICE_WSDL_LOCATION =
        "http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl";
```

```
public static void main(String[] args) {
  try {
    if (args.length != 1) {
      System.out.println("Please specify a single file name on the command line.");
    } else {
      // ** Process command line parameters
      String sourceDocumentPath = args[0];
      File file = new File(sourceDocumentPath);
      String fileName = getFileName(file);
      String fileExt = getFileExtension(file);
      System.out.println("Converting file " + sourceDocumentPath);

      // ** Initialise Web Service
      DocumentConverterService_Service dcss = new DocumentConverterService_Service(
          new URL(DOCUMENTCONVERTERSERVICE_WSDL_LOCATION),
          new QName("http://tempuri.org/", "DocumentConverterService"));
      DocumentConverterService dcs = dcss.getBasicHttpBindingDocumentConverterService();

      // ** Only call conversion if the file's extension is supported
      if (isFileExtensionSupported(fileExt, dcs)) {
        // ** Read source file from disk
        byte[] fileContent = readFile(sourceDocumentPath);

        // ** Converting the file
        OpenOptions openOptions = getOpenOptions(fileName, fileExt);
        ConversionSettings conversionSettings = getConversionSettings();
        byte[] convertedFile = dcs.convert(fileContent, openOptions, conversionSettings);

        // ** Writing converted file to file system
        String destinationDocumentPath = getPDFDocumentPath(file);
        writeFile(convertedFile, destinationDocumentPath);
        System.out.println("File converted sucessfully to " + destinationDocumentPath);

      } else {
        System.out.println("The file extension is not supported.");
      }
    }

 } catch (IOException e) {
    System.out.println(e.getMessage());
 } catch (DocumentConverterServiceGetConfigurationWebServiceFaultExceptionFaultFaultMessage e){
    printException(e.getFaultInfo());
 } catch (DocumentConverterServiceConvertWebServiceFaultExceptionFaultFaultMessage e) {
    printException(e.getFaultInfo());
 }
}

public static OpenOptions getOpenOptions(String fileName, String fileExtension) {
  ObjectFactory objectFactory = new ObjectFactory();
  OpenOptions openOptions = new OpenOptions();
  openOptions.setOriginalFileName(objectFactory.createOpenOptionsOriginalFileName(fileName));
  openOptions.setFileExtension(objectFactory.createOpenOptionsFileExtension(fileExtension));
  return openOptions;
}

public static ConversionSettings getConversionSettings() {
  ConversionSettings conversionSettings = new ConversionSettings();
  conversionSettings.setQuality(ConversionQuality.OPTIMIZE_FOR_PRINT);
  conversionSettings.setRange(ConversionRange.ALL_DOCUMENTS);
  conversionSettings.getFidelity().add("Full");
  conversionSettings.setFormat(OutputFormat.PDF);
  return conversionSettings;
}

public static String getFileName(File file) {
  String fileName = file.getName();
  return fileName.substring(0, fileName.lastIndexOf('.'));
}
```

```
  public static String getFileExtension(File file) {
    String fileName = file.getName();
    return fileName.substring(fileName.lastIndexOf('.') + 1, fileName.length());
  }

  public static String getPDFDocumentPath(File file) {
    String fileName = getFileName(file);
    String folder = file.getParent();
    if (folder == null) {
      folder = new File(file.getAbsolutePath()).getParent();
    }
    return folder + File.separatorChar + fileName + '.' + OutputFormat.PDF.value();
  }

  public static byte[] readFile(String filepath) throws IOException {
    File file = new File(filepath);
    InputStream is = new FileInputStream(file);
    long length = file.length();
    byte[] bytes = new byte[(int) length];

    int offset = 0;
    int numRead;
    while (offset < bytes.length
        && (numRead = is.read(bytes, offset, bytes.length - offset)) >= 0) {
      offset += numRead;
    }

    if (offset < bytes.length) {
      throw new IOException("Could not completely read file " + file.getName());
    }
    is.close();
    return bytes;
  }

  public static void writeFile(byte[] fileContent, String filepath) throws IOException {
    OutputStream os = new FileOutputStream(filepath);
    os.write(fileContent);
    os.close();
  }

  public static boolean isFileExtensionSupported(String extension, DocumentConverterService dcs)
    throws DocumentConverterServiceGetConfigurationWebServiceFaultExceptionFaultFaultMessage
    {
      Configuration configuration = dcs.getConfiguration();
      final JAXBElement<ArrayOfConverterConfiguration> converters = configuration
          .getConverters();
      final ArrayOfConverterConfiguration ofConverterConfiguration = converters.getValue();
      final List<ConverterConfiguration> cList = ofConverterConfiguration
          .getConverterConfiguration();

      for (ConverterConfiguration cc : cList) {
        final List<String> supportedExtension = cc.getSupportedFileExtensions()
                .getValue().getString();
        if (supportedExtension.contains(extension)) {
          return true;
        }
    }
    return false;
  }

  public static void printException(WebServiceFaultException serviceFaultException) {
    System.out.println(serviceFaultException.getExceptionType());
    JAXBElement<ArrayOfstring> element = serviceFaultException.getExceptionDetails();
    ArrayOfstring value = element.getValue();
    for (String msg : value.getString()) {
      System.out.println(msg);
    }
  }
}
```

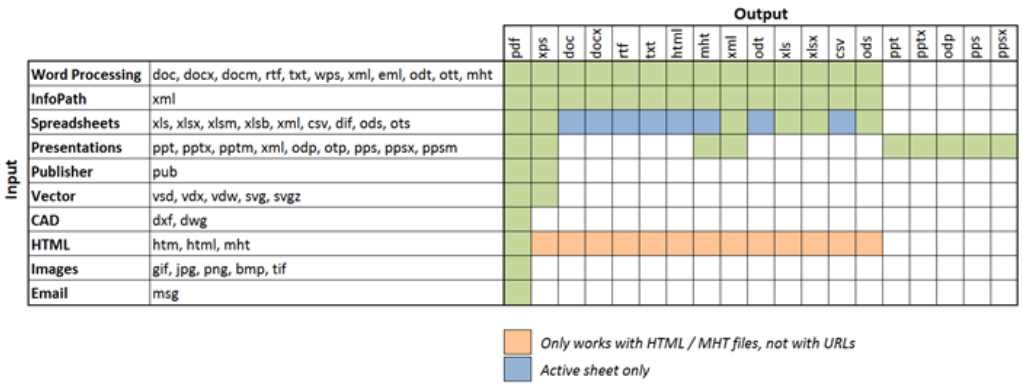
4.3 Cross-Converting between document types

Although the product names refers to PDF Conversion, as of version 6.0 it is also possible to cross convert between document types, e.g. doc to docx, xlsx to xls and even xls to doc.

So, how is this useful? Well, let's say that you have a large amount of legacy Office 97-2003 files, but your company now requires all files to be saved in the more modern, and open, Office 2007-2010 formats. By using the Muhimbi PDF Converter you can convert between these formats automatically using simple web service call using Java or .NET.

Conversion in the other direction is possible as well. For example many users in an organisation may still be on Office 2000 or 2003, but those fancy guys in IT are saving documents in Office 2010 format, which no-one else can open. A simple application will automatically take care of this and convert all files to the desired format.

Naturally some thought needs to be given to what file formats to convert between. Converting between AutoCAD and Excel makes little sense, but from Excel to Word and Word to Excel could be useful. The table listed below shows which file formats can be converted between.



Some points of interest:

1. It is now possible to convert InfoPath files to MS-Word, Excel and HTML For details see section 4.3.2.
2. Although not displayed in this chart, it is also possible to convert PDF (and any other file type) to PDF/A. For details see *Appendix - Post processing PDF output to PDF/A* in the Administration Guide.
3. It is even possible to 'convert' to the same format as the source, e.g. *docx* to *docx*, but specify additional settings such as a password on the document.

4.3.1 Cross-Converting file types using a Web Service call

Converting files to non-PDF formats using web service calls works identical to converting files to PDF. The only difference is that the *Format* property on the *ConversionSettings* object must be set to the file type you are converting to. For details see the existing Convert to PDF sample code in chapters 4.1 and 4.2.

4.3.2 Convert InfoPath to MS-Word, Excel, XPS and PDF

The PDF Converter's cross-conversion facility opens up a whole new world of possibilities such as converting between DOC and DOCX, XLS and XLSX, but more importantly it also supports conversion between completely different document types such as Excel to MS-Word and HTML to Excel.

This section describes another new conversion type that should be of particular interest to InfoPath users as it is now possible to convert InfoPath forms to MS-Word, Excel and HTML.

Conversion to these new formats generally works very well, but there are some limitations due to the nature of these non-PDF based destination formats. Specifically:

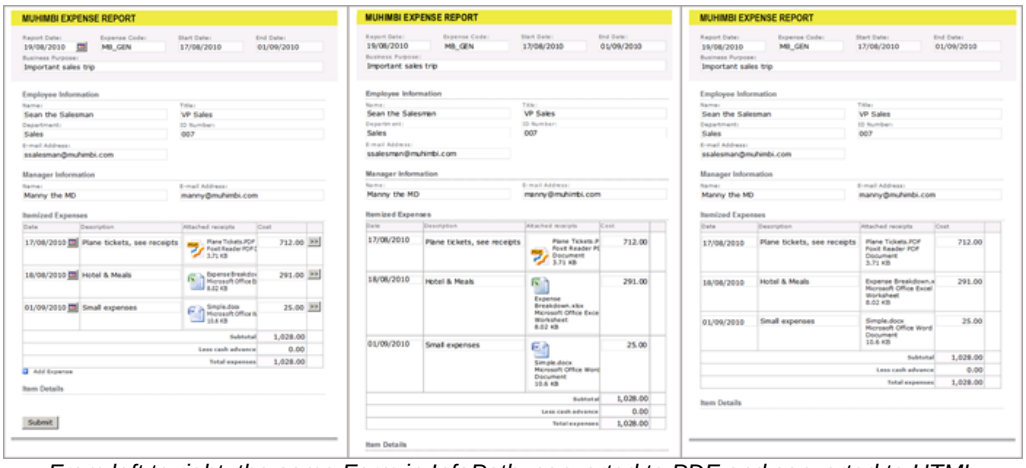
1. **Attachments**: When converting an InfoPath form to PDF the software also converts all attachments and merges them into the main PDF. This is possible because you can represent almost any file format in PDF and merge them together. Unfortunately this is not possible when converting to HTML, MS-Word or Excel.
2. **View Selection:** The software provides a number of ways to specify which view or views to convert (See chapter 4.9 *Controlling which InfoPath views to Export to PDF*). When converting to PDF it is possible to specify multiple views, which the converter then merges together into a single document. When converting to HTML, MS-Word or Excel it is only possible to convert a single view as these file formats don't support merging. As a workaround it is possible to create a 'conversion specific view' and combine the content of multiple views in it.

   Print Views are also ignored when converting to HTML, Word or Excel. Instead you will need to use Muhimbi's View Selection facilities if you wish to convert any view other than the default View.
3. **Formatting:** PDF is a very flexible format that allows any content to be placed anywhere on the page. MS-Word, Excel and HTML are not necessarily this flexible. For example, Excel uses a 'cell based approach' to display content. If an InfoPath form is not specifically designed for export to Excel, e.g. it uses nested tables or different column widths across a page, then you may need to optimise your InfoPath form for conversion, or create a 'conversion specific view'.

Some hints and tips related to converting to the various non-PDF formats can be found below.

InfoPath to HTML (MHT)

When converting InfoPath to HTML the resulting file is a self contained MHT file that most modern browsers can display. All information including images, HTML and style sheets are included in this single file.

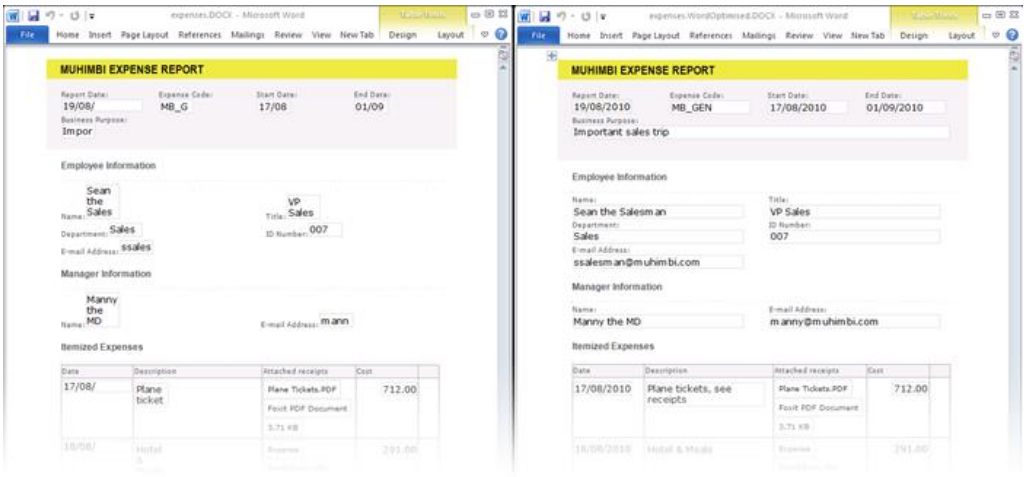


From left to right, the same Form in InfoPath, converted to PDF and converted to HTML

As this image shows, InfoPath data can be represented in HTML really well so it is usually not needed to make any changes to the XSN file.

InfoPath to MS-Word

Depending on how an InfoPath form has been designed, some work may be required to make things look better when converting to MS-Word. This is mainly due to the fact that MS-Word does not like dimensions that are expressed in percentages, while it is common in InfoPath to create a table grid and populate that grid with controls that take up 100% of the available cell space.



Results when converted to MS-Word before optimisation (left) and afterwards (right).

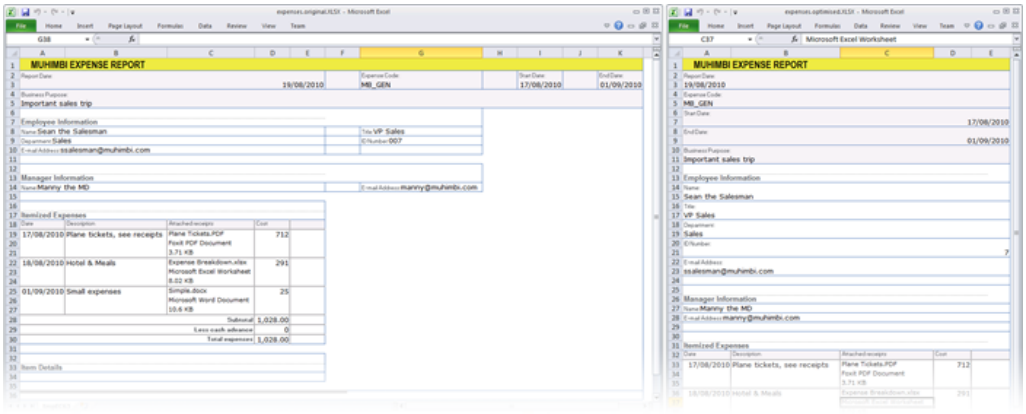
Looking at the 'before optimisation' conversion results in the image displayed above, there are 2 things that stand out:

1. **Dimension of text fields:** The dimensions of most text fields are not quite right. This can easily be changed by opening the form in InfoPath Designer and changing the width of the various fields from '100%' to the actual dimensions in cm or inches.
2. **Missing 'year' in date picker fields**: Due the way the Date Picker is structured internally, modifying its width does not translate properly when displayed in MS-Word. To solve this, change the date picker field to a regular text field either by creating a conversion specific view, or using a display rule.

The InfoPath to MS-Word facility can generate output in *doc, docx, rtf, txt, html* and *odt* formats.

InfoPath to Excel

InfoPath to Excel conversion for existing forms that are not optimised for conversion to Excel are probably the trickiest ones to get right. If the 'look and feel' of the Excel sheet is not important then no change is required. However, if the Excel forms need to 'look good' then you may need to rethink the way the form is designed.



Results when converted to Excel before optimisation (left) and afterwards (right).

Looking at the 'before optimisation' in the image above things don't look too bad, but clearly it is not the same as the original. The main issues are as follows:

1. **Column Widths**: As Excel uses a cell / grid based approach it is not possible to mix different column widths. The information in the form's header requires different column width and spans than the columns used in the repeating table further down the page. By changing the horizontally oriented fields in the header to individual rows we no longer have this problem.

2. **Number formats:** Depending on a cell's content, Excel sometimes tries to be 'clever'. Most of the time this works great, but in this case a field with value '007' is changed into a '7'. This could be fixed by changing the content of the InfoPath field into a formula and concatenating an apostrophe in front of it.

The InfoPath to Excel facility can generate output in *xls, xlsx, csv* and *ods* format.

4.4 Merging multiple files into a single PDF using .NET

The following example describes the steps needed to convert all files in a directory, merge the results into a single file and apply page numbering to the merged file using the built in watermarking engine. We are using Visual Studio and C#, but any environment that can invoke web services should be able to access this functionality. Note that the WSDL can be found at *http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl*.

1. Start a new Visual Studio project and create the project type of your choice. In this example we are using a standard *.net 3.0* project of type *Windows Forms Application*. Name it 'Simple PDF Converter Sample'.
2. Add a *TextBox* and *Button* control to the form. Accept the default names of *textBox1* and *button1*.
3. In the *Solution Explorer* window, right-click *References* and select *Add Service Reference*. (Do not use web references!)
4. In the *Address* box enter the WSDL address listed in the introduction of this section. If the Conversion Service is located on a different machine then substitute *localhost* with the server's name.
5. Accept the default Namespace of *ServiceReference1* and click the *OK* button to generate the proxy classes.
6. Double click *Button1* and replace the content of the entire code file with the following:

```
using System;
using System.Collections.Generic;
using System.IO;
using System.ServiceModel;
using System.Windows.Forms;
using Simple_PDF_Converter_Sample.ServiceReference1;

namespace Simple_PDF_Converter_Sample
{
    public partial class Form1 : Form
    {
        // ** The URL where the Web Service is located. Amend host name if needed.
        string SERVICE_URL = "http://localhost:41734/Muhimbi.DocumentConverter.WebService/";

        public Form1()
        {
            InitializeComponent();
        }

        private void button1_Click(object sender, EventArgs e)
        {
            DocumentConverterServiceClient client = null;

            try
            {
                // ** Options and all settings for batch conversion
                ProcessingOptions processingOptions = new ProcessingOptions();

                // ** Specify the minimum level of merge settings
                MergeSettings mergeSettings = new MergeSettings();
                mergeSettings.BreakOnError = false;
                mergeSettings.Watermarks = CreateWatermarks();
```

```
            processingOptions.MergeSettings = mergeSettings;

            // ** Get all files in the folder
            string sourceFolder = textBox1.Text;
            string[] sourceFileNames = Directory.GetFiles(sourceFolder);

            // ** Iterate over all files and create a list of SourceFile Objects
            List<SourceFile> sourceFiles = new List<SourceFile>();
            foreach (string sourceFileName in sourceFileNames)
            {
                // ** Read the contents of the file
                byte[] sourceFileContent = File.ReadAllBytes(sourceFileName);

                // ** Set the absolute minimum open options
                OpenOptions openOptions = new OpenOptions();
                openOptions.OriginalFileName = Path.GetFileName(sourceFileName);
                openOptions.FileExtension = Path.GetExtension(sourceFileName);

                // ** Set the absolute minimum conversion settings.
                ConversionSettings conversionSettings = new ConversionSettings();
                conversionSettings.Fidelity = ConversionFidelities.Full;
                conversionSettings.Quality = ConversionQuality.OptimizeForPrint;

                // ** Create merge settings for each file and set name for the PDF bookmark
                FileMergeSettings fileMergeSettings = new FileMergeSettings();
                fileMergeSettings.TopLevelBookmark = openOptions.OriginalFileName;

                // ** Create a source file object and add it to the list
                SourceFile sourceFile = new SourceFile();
                sourceFile.OpenOptions = openOptions;
                sourceFile.ConversionSettings = conversionSettings;
                sourceFile.MergeSettings = fileMergeSettings;
                sourceFile.File = sourceFileContent;
                sourceFiles.Add(sourceFile);
            }

            // ** Assign source files
            processingOptions.SourceFiles = sourceFiles.ToArray();

            // ** Open the service and configure the bindings
            client = OpenService(SERVICE_URL);
            // ** Carry out the merge process
            BatchResults results = client.ProcessBatch(processingOptions);
            // ** Read the results of the merged file.
            byte[] mergedFile = results.Results[0].File;

            // ** Write the converted file back using the name of the folder
            string folderName = new DirectoryInfo(sourceFolder).Name;
            DirectoryInfo parentFolder = Directory.GetParent(sourceFolder);
            string destinationFileName = Path.Combine(parentFolder.FullName,
                                                      folderName + ".pdf");
            using (FileStream fs = File.Create(destinationFileName))
            {
                fs.Write(mergedFile, 0, mergedFile.Length);
                fs.Close();
            }

            MessageBox.Show("Contents of directory merged to " + destinationFileName);
        }
        catch (FaultException<WebServiceFaultException> ex)
        {
            MessageBox.Show("FaultException occurred: ExceptionType: " +
                            ex.Detail.ExceptionType.ToString());
        }
        catch (Exception ex)
        {
            MessageBox.Show(ex.ToString());
        }
        finally
        {
            CloseService(client);
```

```
        }
    }


    /// <summary>
    /// Configure the Bindings, endpoints and open the service using the specified address.
    /// </summary>
    /// <returns>An instance of the Web Service.</returns>
    public static DocumentConverterServiceClient OpenService(string address)
    {
        DocumentConverterServiceClient client = null;

        try
        {
            BasicHttpBinding binding = new BasicHttpBinding();
            // ** Use standard Windows Security.
            binding.Security.Mode = BasicHttpSecurityMode.TransportCredentialOnly;
            binding.Security.Transport.ClientCredentialType =
                                                    HttpClientCredentialType.Windows;
            // ** Increase the Timeout to deal with (very) long running requests.
            binding.SendTimeout = TimeSpan.FromMinutes(30);
            binding.ReceiveTimeout = TimeSpan.FromMinutes(30);
            // ** Set the maximum document size to 40MB
            binding.MaxReceivedMessageSize = 50 * 1024 * 1024;
            binding.ReaderQuotas.MaxArrayLength = 50 * 1024 * 1024;
            binding.ReaderQuotas.MaxStringContentLength = 50 * 1024 * 1024;

            // ** Specify an identity (any identity) in order to get it past .net3.5 sp1
            EndpointIdentity epi = EndpointIdentity.CreateUpnIdentity("unknown");
            EndpointAddress epa = new EndpointAddress(new Uri(address), epi);

            client = new DocumentConverterServiceClient(binding, epa);
            client.Open();
            return client;
        }
        catch (Exception)
        {
            CloseService(client);
            throw;
        }
    }

    /// <summary>
    /// Check if the client is open and then close it.
    /// </summary>
    /// <param name="client">The client to close</param>
    public static void CloseService(DocumentConverterServiceClient client)
    {
        if (client != null && client.State == CommunicationState.Opened)
            client.Close();
    }


    /// <summary>
    /// This method creates watermarks for applying page numbers
    /// </summary>
    /// <returns>Array of watermarks</returns>
    private Watermark[] CreateWatermarks()
    {
        // ** Create watermark container
        Watermark pageWatermark = new Watermark();
        // ** Set positioning to the lower right of the page
        pageWatermark.HPosition = HPosition.Right;
        pageWatermark.VPosition = VPosition.Bottom;
        // ** Set size
        pageWatermark.Width = "200";
        pageWatermark.Height = "20";

        // ** Create text object for the page numbering
        Text oddPageText = new Text();
        // ** No need to position the element in the watermark container
```

```
            oddPageText.Width = "200";
            oddPageText.Height = "20";
            // ** set content including field codes
            oddPageText.Content = "Page {PAGE} of {NUMPAGES}";
            // ** set font properties
            oddPageText.FillColor = "#ffff0000";
            oddPageText.FontFamilyName = "Verdana";
            oddPageText.FontSize = "10";
            oddPageText.FontStyle = FontStyle.Regular;
            //* set text alignment
            oddPageText.HAlign = HAlign.Right;
            oddPageText.VAlign = VAlign.Top;

            //** create array of watermark elements
            Element[] pageWatermarkElements = new Element[] { oddPageText };

            //** set elements of watermark
            pageWatermark.Elements = pageWatermarkElements;

            //* return array of watermarks
            return new Watermark[] { pageWatermark };
        }
    }
}
```

Providing the project and all controls are named as per the steps above, it should compile without errors. Run it, enter the full path to a folder that holds a couple of text files (PDF, Word, Excel, etc) and click the button to start the convert and merge process. The operation may take a while depending on the number and complexity of files in the folder.

Note that in this example we are programmatically configuring the WCF Bindings and End Points. If you wish you can use a declarative approach using the config file. For more information about working with WCF see http://msdn.microsoft.com/en-us/library/ms735119(v=VS.90).aspx

A more complex and full featured sample application is installed, with full source code, alongside the Conversion Service.

4.5 Merging multiple files into a single PDF using Java

The following sample merges all files specified on the command line into a single PDF. If the source files are not already in PDF format then it automatically converts them in the process. A PDF bookmark is automatically generated for each merged file as well.

The full version of the sample code discussed in this chapter, including pre generated proxies, is installed alongside each copy of the product. Use the Start Menu to open the appropriate folder. The latest version of this tutorial can be found on-line at http://blog.muhimbi.com/2011/12/converting-and-merging-multiple-files.html.

For details about setting up all Java prerequisites as well as using *wsimport* to generate Java proxies for the web service see section 4.2 *PDF Conversion in Java*.

Once the proxy classes have been created add the following code to your project. Run the code and make sure the paths to multiple documents to convert and merge are specified on the command line.

```
package com.muhimbi.app;

import com.muhimbi.ws.*;
import java.io.*;
import java.net.URL;
import javax.xml.bind.JAXBElement;
import javax.xml.namespace.QName;

public class WsClient {

  private final static String DOCUMENTCONVERTERSERVICE_WSDL_LOCATION =
        "http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl";

  private static ObjectFactory _objectFactory = new ObjectFactory();

  public static void main(String[] args) {
    try {
      if (args.length == 0) {
        System.out
            .println("Please specify one or more file names to convert and merge.");
      } else {
        System.out.println("Merging files");

        // ** Initialise Web Service
        DocumentConverterService_Service dcss = new DocumentConverterService_Service(
            new URL(DOCUMENTCONVERTERSERVICE_WSDL_LOCATION),
            new QName("http://tempuri.org/", "DocumentConverterService"));
        DocumentConverterService dcs = dcss.getBasicHttpBindingDocumentConverterService();

        // ** Get the options for all files that need to be merged
        ProcessingOptions processingOptions = getProcessingOptions(args);

        // ** Carry out the merging (and converting if needed)
        BatchResults results = dcs.processBatch(processingOptions);

        // ** Get the content of the first file, which holds the merged file in the byte array
        byte[] convertedFile =

        results.getResults().getValue().getBatchResult().get(0).getFile().getValue();

        // ** Write converted file to file system
        writeFile(convertedFile, "merged.pdf");
```

```
        System.out.println("Files merged into 'merged.pdf'");
      }

    } catch (IOException e) {
      System.out.println(e.getMessage());
    } catch (DocumentConverterServiceProcessBatchWebServiceFaultExceptionFaultFaultMessage e) {
      printException(e.getFaultInfo());
    }
  }


  public static ProcessingOptions getProcessingOptions(String[] sourceFileNames) throws
IOException
  {
    // ** Options and all settings for batch conversion
    ProcessingOptions processingOptions = new ProcessingOptions();

    // ** Specify the minimum level of merge settings, optionally add watermarks and security
    MergeSettings mergeSettings = new MergeSettings();
    mergeSettings.setBreakOnError(false);
    processingOptions.setMergeSettings(
                        _objectFactory.createProcessingOptionsMergeSettings( mergeSettings ));

    // ** Create an array of files to merge
    ArrayOfSourceFile sourceFiles = new ArrayOfSourceFile();
    for(int i =0; i<sourceFileNames.length; i++)
    {
      SourceFile sourceFile = getSourceFile(sourceFileNames[i]);
      sourceFiles.getSourceFile().add(sourceFile);
    }

    processingOptions.setSourceFiles(
                        _objectFactory.createProcessingOptionsSourceFiles(sourceFiles));
    return processingOptions;
  }


  public static SourceFile getSourceFile(String fileName) throws IOException
  {
    File file = new File(fileName);

    // ** Read the contents of the file
    System.out.println("- Reading: " + fileName);
    byte[] sourceFileContent = readFile(fileName);

    // ** Set the absolute minimum open options
    OpenOptions openOptions = getOpenOptions(getFileName(file), getFileExtension(file) );

    // ** Set the absolute minimum conversion settings.
    ConversionSettings conversionSettings = getConversionSettings();

    // ** Create merge settings for each file and set the name for the PDF bookmark
    FileMergeSettings fileMergeSettings = new FileMergeSettings();
    fileMergeSettings.setTopLevelBookmark(
                _objectFactory.createFileMergeSettingsTopLevelBookmark( file.getName() ));

    // ** Create a source file object and return it
    SourceFile sourceFile = new SourceFile();
    sourceFile.setOpenOptions(_objectFactory.createSourceFileOpenOptions(openOptions));
    sourceFile.setConversionSettings(
                _objectFactory.createSourceFileConversionSettings(conversionSettings));
    sourceFile.setMergeSettings(_objectFactory.createSourceFileMergeSettings(fileMergeSettings));
    sourceFile.setFile(_objectFactory.createSourceFileFile(sourceFileContent));
    return sourceFile;
  }

  public static OpenOptions getOpenOptions(String fileName, String fileExtension) {
    OpenOptions openOptions = new OpenOptions();
    // ** Set the minimum required open options. Additional options are available
    openOptions.setOriginalFileName(_objectFactory.createOpenOptionsOriginalFileName(fileName));
    openOptions.setFileExtension(_objectFactory.createOpenOptionsFileExtension(fileExtension));
```

```
    return openOptions;
  }

  public static ConversionSettings getConversionSettings() {
    ConversionSettings conversionSettings = new ConversionSettings();
    // ** Set the minimum required conversion settings. Additional settings are available
    conversionSettings.setQuality(ConversionQuality.OPTIMIZE_FOR_PRINT);
    conversionSettings.setRange(ConversionRange.ALL_DOCUMENTS);
    conversionSettings.getFidelity().add("Full");
    conversionSettings.setFormat(OutputFormat.PDF);
    return conversionSettings;
  }

  public static String getFileName(File file) {
    String fileName = file.getName();
    return fileName;
  }

  public static String getFileExtension(File file) {
    String fileName = file.getName();
    return fileName.substring(fileName.lastIndexOf('.') + 1, fileName.length());
  }

  public static byte[] readFile(String filepath) throws IOException {
    File file = new File(filepath);
    InputStream is = new FileInputStream(file);
    long length = file.length();
    byte[] bytes = new byte[(int) length];

    int offset = 0;
    int numRead;
    while (offset < bytes.length
        && (numRead = is.read(bytes, offset, bytes.length - offset)) >= 0) {
      offset += numRead;
    }

    if (offset < bytes.length) {
      throw new IOException("Could not completely read file " + file.getName());
    }
    is.close();
    return bytes;
  }

  public static void writeFile(byte[] fileContent, String filepath)
      throws IOException {
    OutputStream os = new FileOutputStream(filepath);
    os.write(fileContent);
    os.close();
  }

  public static void printException(WebServiceFaultException serviceFaultException) {
    System.out.println(serviceFaultException.getExceptionType());
    JAXBElement<ArrayOfstring> element = serviceFaultException.getExceptionDetails();
    ArrayOfstring value = element.getValue();
    for (String msg : value.getString()) {
      System.out.println(msg);
    }
  }

}
```

4.6 Splitting PDFs into multiple documents

The following sample describes the steps needed to split up a single PDF file based on the number of pages. We are using Visual Studio and C#, but any environment that can invoke web services should be able to access this functionality. Note that the WSDL can be found at *http://localhost:41734 /Muhimbi.DocumentConverter.WebService/?wsdl*.

The source code for this example can be found in the folder the Muhimbi Conversion service has been installed to. For more details see http://blog.muhimbi.com/2011/10/splitting-pdf-files-using-pdf-converter.html.

1. Start a new Visual Studio project and create the project type of your choice. In this example we are using a standard *.net 3.0* project of type *Console Application*. Name it 'Split PDF'.
2. In the *Solution Explorer* window, right-click *References* and select *Add Service Reference*. (Do not use web references!)
3. In the *Address* box enter the WSDL address listed in the introduction of this section. If the Conversion Service is located on a different machine then substitute *localhost* with the server's name.
4. Accept the default Namespace of *ServiceReference1* and click the *OK* button to generate the proxy classes.
5. Optionally add a PDF file to the solution, set the *Build Action* to *None* and *Copy to Output Directory* to *Copy if newer*. By doing this there will always be a valid test file in the same directory as the compiled executable.
6. Copy and paste the following code and replace the contents of *Program.cs*.

```
using System;
using System.IO;
using System.ServiceModel;
using Split_PDF.ServiceReference1;

namespace Split_PDF
{
    class Program
    {
      // ** The URL where the Web Service is located. Amend host name if needed.
      static string SERVICE_URL = "http://localhost:41734/Muhimbi.DocumentConverter.WebService/";

        static void Main(string[] args)
        {
            DocumentConverterServiceClient client = null;
            try
            {
                // ** Determine the source file and read it into a byte array.
                string sourceFileName = null;
                if (args.Length == 0)
                {
                    //** Delete any split files from a previous test run.
                    foreach (string file in Directory.GetFiles(Directory.GetCurrentDirectory(),
                                                               "spf-*.pdf"))
                    {
                        File.Delete(file);
                    }

                    // ** If nothing is specified then read the first PDF file.
                    string[] sourceFiles = Directory.GetFiles(Directory.GetCurrentDirectory(),
```

```
                                                    "*.pdf");
            if (sourceFiles.Length > 0)
                sourceFileName = sourceFiles[0];
            else
            {
                Console.WriteLine("Please specify a document to split.");
                Console.ReadKey();
                return;
            }
        }
        else
            sourceFileName = args[0];

        byte[] sourceFile = File.ReadAllBytes(sourceFileName);

        // ** Open the service and configure the bindings
        client = OpenService(SERVICE_URL);

        //** Set the absolute minimum open options
        OpenOptions openOptions = new OpenOptions();
        openOptions.OriginalFileName = Path.GetFileName(sourceFileName);
        openOptions.FileExtension = "pdf";

        // ** Set the absolute minimum conversion settings.
        ConversionSettings conversionSettings = new ConversionSettings();

        // ** Create the ProcessingOptions for the splitting task.
        ProcessingOptions processingOptions = new ProcessingOptions()
        {
            MergeSettings = null,
            SplitOptions = new FileSplitOptions()
            {
                FileNameTemplate = "spf-{0:D3}",
                FileSplitType = FileSplitType.ByNumberOfPages,
                BatchSize = 5,
                BookmarkLevel = 0
            },
            SourceFiles = new SourceFile[1]
            {
                new SourceFile()
                {
                    MergeSettings = null,
                    OpenOptions = openOptions,
                    ConversionSettings = conversionSettings,
                    File = sourceFile
                }
            }
        };

        // ** Carry out the splittng.
        Console.WriteLine("Splitting file " + sourceFileName);
        BatchResults batchResults = client.ProcessBatch(processingOptions);

        // ** Process the returned files
        foreach (BatchResult result in batchResults.Results)
        {
            Console.WriteLine("Writing split file " + result.FileName);
            File.WriteAllBytes(result.FileName, result.File);
        }

        Console.WriteLine("Finished.");
    }
    catch (FaultException<WebServiceFaultException> ex)
    {
        Console.WriteLine("FaultException occurred: ExceptionType: " +
                          ex.Detail.ExceptionType.ToString());
    }
    catch (Exception ex)
    {
        Console.WriteLine(ex.ToString());
    }
```

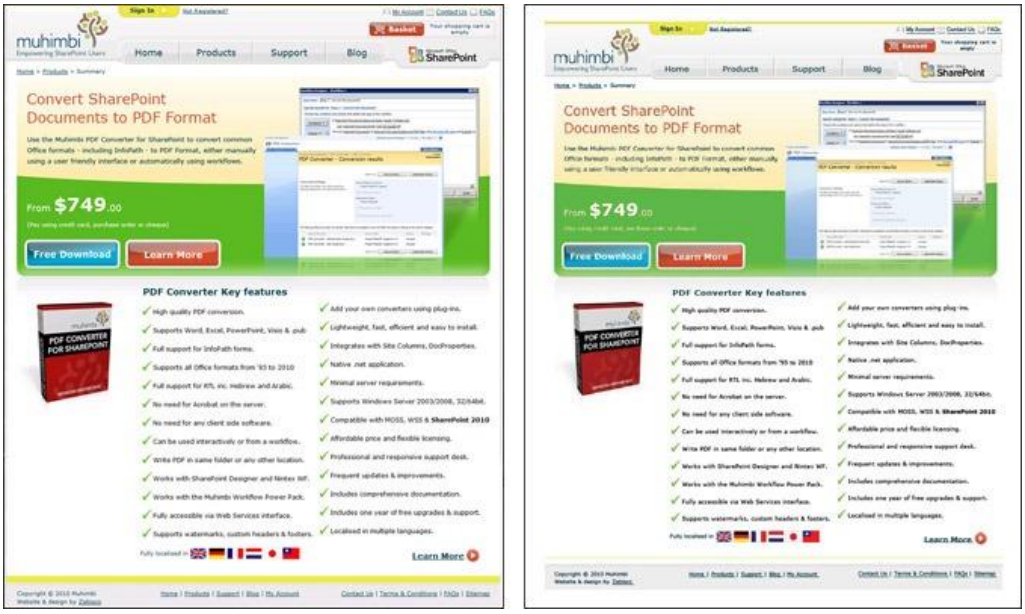
```
            finally
            {
                CloseService(client);
            }
            Console.ReadKey();
        }


        /// <summary>
        /// Configure the Bindings, endpoints and open the service using the specified address.
        /// </summary>
        /// <returns>An instance of the Web Service.</returns>
        public static DocumentConverterServiceClient OpenService(string address)
        {
            DocumentConverterServiceClient client = null;

            try
            {
                BasicHttpBinding binding = new BasicHttpBinding();
                // ** Use standard Windows Security.
                binding.Security.Mode = BasicHttpSecurityMode.TransportCredentialOnly;
                binding.Security.Transport.ClientCredentialType =
                                                            HttpClientCredentialType.Windows;
                // ** Increase the client Timeout to deal with (very) long running requests.
                binding.SendTimeout = TimeSpan.FromMinutes(30);
                binding.ReceiveTimeout = TimeSpan.FromMinutes(30);
                // ** Set the maximum document size to 50MB
                binding.MaxReceivedMessageSize = 50 * 1024 * 1024;
                binding.ReaderQuotas.MaxArrayLength = 50 * 1024 * 1024;
                binding.ReaderQuotas.MaxStringContentLength = 50 * 1024 * 1024;

                // ** Specify an identity (any identity) in order to get it past .net3.5 sp1
                EndpointIdentity epi = EndpointIdentity.CreateUpnIdentity("unknown");
                EndpointAddress epa = new EndpointAddress(new Uri(address), epi);

                client = new DocumentConverterServiceClient(binding, epa);
                client.Open();

                return client;
            }
            catch (Exception)
            {
                CloseService(client);
                throw;
            }
        }

        /// <summary>
        /// Check if the client is open and then close it.
        /// </summary>
        /// <param name="client">The client to close</param>
        public static void CloseService(DocumentConverterServiceClient client)
        {
            if (client != null && client.State == CommunicationState.Opened)
                client.Close();
        }
    }
}
```

Compile the application and run it either from the command prompt, with a path to the PDF file to split on the command line, or – if a PDF file is present in the executable's folder – just run it.

Note that in this example we are programmatically configuring the WCF Bindings and End Points. If you wish you can use a declarative approach using the config file. For more information about working with WCF see http://msdn.microsoft.com/en-us/library/ms735119(v=VS.90).aspx

4.7 Converting HTML / web pages using a Web Service call

HTML to PDF Conversion is accessible via the web services based interface as well. The latest version of this tutorial is available on the Muhimbi Blog at http://blog.muhimbi.com/2010/08/convert-sharepoint-html-pages-to-pdf.html



Example of the original web page (left) and the converted PDF file (right)

Listed below is a simple C# example of how to carry out a conversion from your own code. The sample code is not complete as it calls into some shared functions from our main C# example to keep things short.

Our existing Java based examples can easily be extended to carry out the same type of conversions.

```
/// <summary>
/// Simple sample to convert either a URL or HTML code fragment to PDF format
/// </summary>
/// <param name="htmlOnly">A flag indicating if an HTML Code fragment (true)
/// or URL (false) should be converted.</param>
private void ConvertHTML(bool htmlOnly)
{
    DocumentConverterServiceClient client = null;

    try
    {
        string sourceFileName = null;
        byte[] sourceFile = null;

        client = OpenService("http://localhost:41734/Muhimbi.DocumentConverter.WebService/");

        OpenOptions openOptions = new OpenOptions();

        //** Specify optional authentication settings for the web page
        openOptions.UserName = "";
        openOptions.Password = "";
```

```
        if (htmlOnly == true)
        {
            //** Specify the HTML to convert
            sourceFile = System.Text.Encoding.UTF8.GetBytes("Hello <b>world</b>");
        }
        else
        {
            // ** Specify the URL to convert
            openOptions.OriginalFileName = "http://www.muhimbi.com/";
        }
        openOptions.FileExtension = "html";
        //** Generate a temp file name that is later used to write the PDF to
        sourceFileName = Path.GetTempFileName();
        File.Delete(sourceFileName);

        // ** Enable JavaScript on the page to convert.
        openOptions.AllowMacros = MacroSecurityOption.All;

        // ** Set the various conversion settings
        ConversionSettings conversionSettings = new ConversionSettings();
        conversionSettings.Fidelity = ConversionFidelities.Full;
        conversionSettings.PDFProfile = PDFProfile.PDF_1_5;
        conversionSettings.PageOrientation = PageOrientation.Portrait;
        conversionSettings.Quality = ConversionQuality.OptimizeForPrint;

        // ** Carry out the actual conversion
        byte[] convertedFile = client.Convert(sourceFile, openOptions, conversionSettings);

        // ** Write the PDF file to the local file system.
        string destinationFileName = Path.GetDirectoryName(sourceFileName) + @"\" +
                                     Path.GetFileNameWithoutExtension(sourceFileName) +
                                     "." + conversionSettings.Format;
        using (FileStream fs = File.Create(destinationFileName))
        {
            fs.Write(convertedFile, 0, convertedFile.Length);
            fs.Close();
        }

        // ** Display the converted file in a PDF viewer.
        NavigateBrowser(destinationFileName);
    }
    finally
    {
        CloseService(client);
    }
}
```

Both C# and Java based sample code is available from the Windows Start menu as well.

4.7.1 Inserting Page Breaks when converting HTML to PDF

The Muhimbi PDF Converter supports HTML page breaks using the standard 'page-break-after' CSS syntax. For example:

```
<html><body>
 <div style="page-break-after:always">Page 1</div>
 <div style="page-break-after:always">Page 2</div>
</body></html>
```

4.8 Converting PDF to PDF/A1b using a web service call

As of version 5.2 of the product, the Muhimbi PDF converter allows PDF files to be post processed for output as PDF/A. This does require some configuration changes, which are outlined in the Administration Guide under *Appendix – Post processing PDF output to PDF/A*.

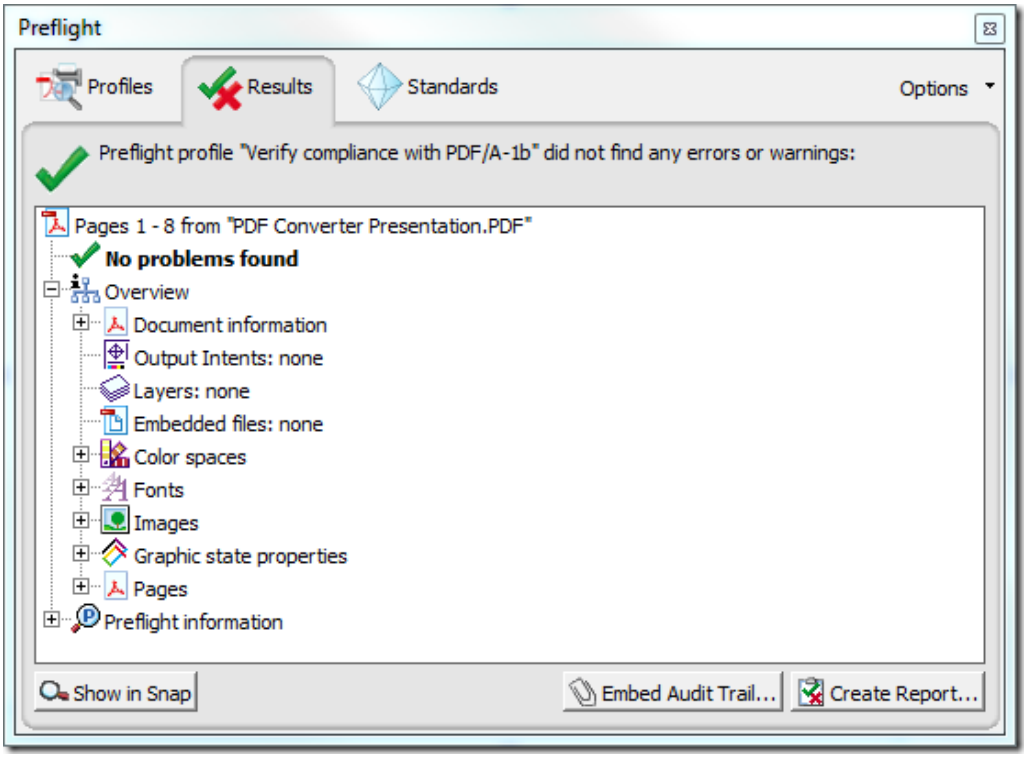
The on-line equivalent of this section can be found in the following blog post http://blog.muhimbi.com/2011/09/converting-pdf-document-to-pdfa1b-using.html

In this section we'll provide a simple .NET sample that invokes our Web Services interface to carry out the conversion from PDF to PDF/A1b. The code is nearly identical to the code to convert and watermark a simple MS-Word file (see 5.1) with the following exceptions.

1. *openOptions.FileExtension* is set to *pdf*.
2. *conversionSettings.PDFProfile* is set to *PDFProfile.PDF_A1B*.
3. The *client.ProcessChanges()* method is invoked rather than *client.Convert()*
4. All references to watermarks have been removed as they are not part of this sample.

You can apply the same changes to the Java sample in section 5.2 to carry out the same conversion using that language.

Some minor clean-up has been carried out as well to make the code even shorter. After running the example the resulting file validates perfectly according to Acrobat X Pro.



Sample Code

Listed below is sample code to convert PDF to PDF/A. You can either copy the code or open the VS project from the *Sample Code* folder in the *Start Menu*.

The sample code expects the path of the PDF file on the command line. If the path is omitted then the first PDF file found in the current directory will be used.

Please note that you need the PDF Converter Professional add-on license in addition to a valid PDF *Converter for SharePoint* or *PDF Converter Services* License in order to use this functionality.

1. Download and install version 5.2 of the Muhimbi PDF Converter Services or PDF Converter for SharePoint.
2. Install the prerequisites and enable PDF/A post processing in the service's configuration file as described in the Administration Guide under *Appendix – Post processing PDF output to PDF/A*.
3. Create a new Visual Studio C# Console application named *PDFA_Conversion*.
4. Add a Service Reference to the following URL and specify *ConversionService* as the namespace

   http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl
5. Paste the following code into *Program.cs*.
6. Make sure the output folder contains a PDF file.
7. Compile and execute the application. The converted PDF/A file will automatically be opened in your system's PDF reader.

```
using System;
using System.Diagnostics;
using System.IO;
using System.ServiceModel;
using Watermarking.ConversionService;

namespace PDFA_Conversion
{
    class Program
    {
     // ** The URL where the Web Service is located. Amend host name if needed.
     static string SERVICE_URL = http://localhost:41734/Muhimbi.DocumentConverter.WebService/";

        static void Main(string[] args)
        {
            DocumentConverterServiceClient client = null;
             try
            {
                // ** Determine the source file and read it into a byte array.
                string sourceFileName = null;
                if (args.Length == 0)
                {
                    // ** If nothing is specified then read the first PDF file from the folder.
                    string[] sourceFiles = Directory.GetFiles(
```

```
                                                Directory.GetCurrentDirectory(), "*.pdf");
            if (sourceFiles.Length > 0)
                sourceFileName = sourceFiles[0];
            else
            {
                Console.WriteLine("Please specify a document to convert to PDF/A.");
                Console.ReadKey();
                return;
            }
        }
        else
            sourceFileName = args[0];

        byte[] sourceFile = File.ReadAllBytes(sourceFileName);

        // ** Open the service and configure the bindings
        client = OpenService(SERVICE_URL);

        //** Set the absolute minimum open options
        OpenOptions openOptions = new OpenOptions();
        openOptions.OriginalFileName = Path.GetFileName(sourceFileName);
        openOptions.FileExtension = "pdf";

        // ** Set the absolute minimum conversion settings.
        ConversionSettings conversionSettings = new ConversionSettings();
        conversionSettings.PDFProfile = PDFProfile.PDF_A1B;

        // ** Carry out the conversion.
        Console.WriteLine("Converting file " + sourceFileName + " to PDF/A.");
        byte[] convFile = client.ProcessChanges(sourceFile, openOptions,
                                                conversionSettings);

        // ** Write the converted file back to the file system using the same name.
        string destinationFileName = Path.GetFileName(sourceFileName);
        using (FileStream fs = File.Create(destinationFileName))
        {
            fs.Write(convFile, 0, convFile.Length);
            fs.Close();
        }
        Console.WriteLine("File converted to " + destinationFileName);
         // ** Open the generated PDF/A file in a PDF Reader
        Console.WriteLine("Launching file in PDF Reader");
        Process.Start(destinationFileName);
    }
    catch (FaultException<WebServiceFaultException> ex)
    {
        Console.WriteLine("FaultException occurred: ExceptionType: " +
                          ex.Detail.ExceptionType.ToString());
    }
    catch (Exception ex)
    {
        Console.WriteLine(ex.ToString());
    }
```

```
            finally
            {
                CloseService(client);
            }
            Console.ReadKey();
        }

        /// <summary>
        /// Configure the Bindings, endpoints and open the service using the specified address.
        /// </summary>
        /// <returns>An instance of the Web Service.</returns>
        public static DocumentConverterServiceClient OpenService(string address)
        {
            DocumentConverterServiceClient client = null;
            try
            {
                BasicHttpBinding binding = new BasicHttpBinding();
                // ** Use standard Windows Security.
                binding.Security.Mode = BasicHttpSecurityMode.TransportCredentialOnly;
                binding.Security.Transport.ClientCredentialType =
                                                            HttpClientCredentialType.Windows;
                // ** Increase the client Timeout to deal with (very) long running requests.
                binding.SendTimeout = TimeSpan.FromMinutes(30);
                binding.ReceiveTimeout = TimeSpan.FromMinutes(30);
                // ** Set the maximum document size to 50MB
                binding.MaxReceivedMessageSize = 50 * 1024 * 1024;
                binding.ReaderQuotas.MaxArrayLength = 50 * 1024 * 1024;
                binding.ReaderQuotas.MaxStringContentLength = 50 * 1024 * 1024;
                 // ** Specify an identity (any identity) in order to get it past .net3.5 sp1
                EndpointIdentity epi = EndpointIdentity.CreateUpnIdentity("unknown");
                EndpointAddress epa = new EndpointAddress(new Uri(address), epi);
                 client = new DocumentConverterServiceClient(binding, epa);
                client.Open();
                return client;
            }
            catch (Exception)
            {
                CloseService(client);
                throw;
            }
        }

        /// <summary>
        /// Check if the client is open and then close it.
        /// </summary>
        /// <param name="client">The client to close</param>
        public static void CloseService(DocumentConverterServiceClient client)
        {
            if (client != null && client.State == CommunicationState.Opened)
                client.Close();
        }
    }
}
```

4.9 Controlling which InfoPath views to Export to PDF

Being able to select which views to export is very useful as quite often different views are used for exporting a form to PDF. Sometimes using the *Print View* is good enough, but other times you need to export a different view or multiple views to PDF format. There are even occasions where different views are exported depending on the state of the data entered in the form.

As always, the best way to illustrate this is by example. The latest version of this tutorial is available on the Muhimbi Blog at the following URL:
http://blog.muhimbi.com/2010/08/controlling-which-views-to-export-to.html

4.9.1 Use a special view for exporting to PDF

In this scenario we have an Employee Review form with the following 3 views:

1. **Data entry view:** A view used for populating data using the InfoPath client or Forms Services. This is the default view.
2. **Print View:** A special view that is optimised for printing to a network laser printer. This is specified as View 1's Print View.
3. **PDF Export view:** A separate view that is used to export the InfoPath form to PDF format as it contains some information that should only show up in exported PDF files.

As *View 1* is the default view and *View 2* is the Print View for *View 1*, under normal circumstance the 2nd view is used for exporting to PDF. However, we want to use *View 3* for this purpose. We can achieve this by starting the name of View 3 with "_MuhimbiView". The Muhimbi PDF Converter will automatically detect all views that start with this name, export them all and merge them together into a single PDF file. Naturally these views can be hidden from the end user by marking them as such.

This is a great solution if you know beforehand that you will always be exporting the same view(s) to PDF format.

4.9.2 Determine at runtime which views to export

The previous solution, using view names that start with "_MuhimbiView", works great. However, sometimes you need to export a different view depending on the state of the data.

For example, our Expense Claim form consists of the following Views:

1. **Data Entry View 1:** Used by the employee to report expenses.
2. **Data Entry View 2:** Used by the manager to add comments and additional information.
3. **PDF Export View 1:** The view that is used to export the form to PDF format *before* the manager has reviewed the form.
4. **PDF Export View 2:** The view that is used to export the form to PDF format *after* the manager has reviewed the form.

We can implement this by adding a (hidden) text box named "_MuhimbiViews" (case sensitive **and using the default 'my' namespace**) to any of the views and populating it with the name of one or more comma separated view names. The Muhimbi PDF Converter will automatically pick up these names and export them to PDF format. If multiple views are specified then they are automatically concatenated together.

In addition to adding the "_MuhimbiViews" text field to the form, all the developer of the form needs to do is add a little bit of logic to the Submit event to specify in the "_MuhimbiViews" field which view name(s) to export.

4.9.3 View prioritisation rules

To determine which view or views to export, the Muhimbi PDF Converter uses the following prioritisation rules:

1. When using the web services interface, any *ConversionViews* specified in the *ConverterSpecificSettings* property will be converted. If this property is not set then the following rules will be used to determine which views to convert to PDF.
2. If a field named "_MuhimbiViews" is found anywhere in the InfoPath form then the content of this field is used to determine which views to export.
3. If the previous field does not exist, is empty or the specified view name does not exist then the converter looks at all view names that start with "_MuhimbiView".
4. If none of the previous options apply then the view marked as the Default View is exported.

Regardless of how a view or views are selected for export, if the selected view has a Print View specified than that view is given priority.

Do not use Muhimbi's View selection features in combination with InfoPath's 'Print multiple views' facility. The latter is given priority when converting to PDF.

When the final PDF file is assembled then all selected views are included first, followed by any converted attachments.

5 Working with watermarks

As described in chapter 3.4 *Watermarking*, the PDF Conversion Service contains a powerful watermarking engine that can be used to add visible and invisible watermarks to pages as well as adding headers, footers and other recurring items.

5.1 Watermarking in .NET

The following C# example shows how to decorate a document with the following watermarks:

1. The word 'Confidential' in the background of the cover page.
2. Page numbers in the right-hand side of the footer on all even pages.
3. Page numbers in the left-hand side of the footer on all odd pages.

The sample code expects the path of the PDF file on the command line. If the path is omitted then the first MS-Word file found in the current directory will be used.

Follow the steps described below to create the sample watermarking application.

1. Create a new Visual Studio C# Console application named *Watermarking*.
2. Add a *Service Reference* to the following URL and specify *ConversionService* as the namespace

   http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl

3. Paste the following code into Program.cs. Note that this code is practically identical to the sample provided in a previous chapter, with the exception of the *CreateWatermarks* method and the line that assigns the watermarks to the *ConversionSettings* object.

```
using System;
using System.Collections.Generic;
using System.Diagnostics;
using System.IO;
using System.ServiceModel;
using Watermarking.ConversionService;

namespace Watermarking
{
    class Program
    {
      // ** The URL where the Web Service is located. Amend host name if needed.
      static string SERVICE_URL = "http://localhost:41734/Muhimbi.DocumentConverter.WebService/";

        static void Main(string[] args)
        {
            DocumentConverterServiceClient client = null;

            try
            {
                // ** Determine the source file and read it into a byte array.
                string sourceFileName = null;
                if (args.Length == 0)
                {
                    string[] sourceFiles = Directory.GetFiles(
                                                    Directory.GetCurrentDirectory(), "*.doc");
                    if (sourceFiles.Length > 0)
                        sourceFileName = sourceFiles[0];
                    else
                    {
                        Console.WriteLine("Please specify a document to convert and watermark.");
                        Console.ReadKey();
                        return;
                    }
                }
                else
                    sourceFileName = args[0];

                byte[] sourceFile = File.ReadAllBytes(sourceFileName);

                // ** Open the service and configure the bindings
                client = OpenService(SERVICE_URL);

                //** Set the absolute minimum open options
                OpenOptions openOptions = new OpenOptions();
                openOptions.OriginalFileName = Path.GetFileName(sourceFileName);
                openOptions.FileExtension = Path.GetExtension(sourceFileName);

                // ** Set the absolute minimum conversion settings.
                ConversionSettings conversionSettings = new ConversionSettings();
                conversionSettings.Fidelity = ConversionFidelities.Full;
                conversionSettings.Quality = ConversionQuality.OptimizeForPrint;

                // ** Get the list of watermarks to apply.
                conversionSettings.Watermarks = CreateWatermarks();

                // ** Carry out the conversion.
                Console.WriteLine("Converting file " + sourceFileName);
                byte[] convFile = client.Convert(sourceFile, openOptions, conversionSettings);

                // ** Write the converted file back to the file system with a PDF extension.
                string destinationFileName = Path.GetDirectoryName(sourceFileName) + @"\" +
                                             Path.GetFileNameWithoutExtension(sourceFileName) +
                                             "." + conversionSettings.Format;
                using (FileStream fs = File.Create(destinationFileName))
                {
                    fs.Write(convFile, 0, convFile.Length);
                    fs.Close();
                }
```

```
            Console.WriteLine("File converted to " + destinationFileName);

            // ** Open the generated PDF file in a PDF Reader
            Process.Start(destinationFileName);
        }
        catch (FaultException<WebServiceFaultException> ex)
        {
            Console.WriteLine("FaultException occurred: ExceptionType: " +
                              ex.Detail.ExceptionType.ToString());
        }
        catch (Exception ex)
        {
            Console.WriteLine(ex.ToString());
        }
        finally
        {
            CloseService(client);
        }
        Console.ReadKey();
    }


    /// <summary>
    /// Create the watermarks.
    /// </summary>
    /// <returns>An array of watermarks to apply</returns>
    public static Watermark[] CreateWatermarks()
    {
        List<Watermark> watermarks = new List<Watermark>();

        // ** Specify the default settings for properties
        Defaults wmDefaults = new Defaults();
        wmDefaults.FillColor = "#000000";
        wmDefaults.LineColor = "#000000";
        wmDefaults.FontFamilyName = "Arial";
        wmDefaults.FontSize = "10";

        // *************** 'Confidential' Text **************

        // ** 'Confidential' watermark for front page
        Watermark confidential = new Watermark();
        confidential.Defaults = wmDefaults;
        confidential.StartPage = 1;
        confidential.EndPage = 1;
        confidential.Rotation = "-45";
        confidential.Width = "500";
        confidential.Height = "500";
        confidential.HPosition = HPosition.Center;
        confidential.VPosition = VPosition.Middle;
        confidential.ZOrder = -1;

        // ** Create a new Text element that goes inside the watermark
        Text cfText = new Text();
        cfText.Content = "Confidential";
        cfText.FontSize = "40";
        cfText.Width = "500";
        cfText.Height = "500";
        cfText.Transparency = "0.10";

        // ** And add it to the list of watermark elements.
        confidential.Elements = new Element[] { cfText };

        // ** And add the watermark to the list of watermarks
        watermarks.Add(confidential);

        // *************** Watermark for Odd pages **************

        Watermark oddPages = new Watermark();
        oddPages.Defaults = wmDefaults;
        oddPages.StartPage = 3;
        oddPages.PageInterval = 2;
```

```
            oddPages.Width = "600";
            oddPages.Height = "50";
            oddPages.HPosition = HPosition.Right;
            oddPages.VPosition = VPosition.Bottom;

            // ** Add a horizontal line
            Line line = new Line();
            line.X = "1";
            line.Y = "1";
            line.EndX = "600";
            line.EndY = "1";
            line.Width = "5";

            // ** Add a page counter
            Text oddText = new Text();
            oddText.Content = "Page: {PAGE} of {NUMPAGES}";
            oddText.Width = "100";
            oddText.Height = "20";
            oddText.X = "475";
            oddText.Y = "15";
            oddText.LineWidth = "-1";
            oddText.FontStyle = FontStyle.Regular;
            oddText.HAlign = HAlign.Right;

            // ** And add it to the list of watermark elements
            oddPages.Elements = new Element[] { line, oddText };

            // ** And add the watermark to the list of watermarks
            watermarks.Add(oddPages);

            // *************** Watermark for Even pages **************

            Watermark evenPages = new Watermark();
            evenPages.Defaults = wmDefaults;
            evenPages.StartPage = 2;
            evenPages.PageInterval = 2;
            evenPages.Width = "600";
            evenPages.Height = "50";
            evenPages.HPosition = HPosition.Left;
            evenPages.VPosition = VPosition.Bottom;

            // ** No need to create an additional line,re-use the previous one

            // ** Add a page counter
            Text evenText = new Text();
            evenText.Content = "Page: {PAGE} of {NUMPAGES}";
            evenText.Width = "100";
            evenText.Height = "20";
            evenText.X = "25";
            evenText.Y = "15";
            evenText.LineWidth = "-1";
            evenText.FontStyle = FontStyle.Regular;
            evenText.HAlign = HAlign.Left;

            // ** And add it to the list of watermark elements
            evenPages.Elements = new Element[] { line, evenText };

            // ** And add the watermark to the list of watermarks
            watermarks.Add(evenPages);

            return watermarks.ToArray();
        }


        /// <summary>
        /// Configure the Bindings, endpoints and open the service using the specified address.
        /// </summary>
        /// <returns>An instance of the Web Service.</returns>
        public static DocumentConverterServiceClient OpenService(string address)
        {
            DocumentConverterServiceClient client = null;
```

```
            try
            {
                BasicHttpBinding binding = new BasicHttpBinding();
                // ** Use standard Windows Security.
                binding.Security.Mode = BasicHttpSecurityMode.TransportCredentialOnly;
                binding.Security.Transport.ClientCredentialType =
                                                            HttpClientCredentialType.Windows;
                // ** Increase the client Timeout to deal with (very) long running requests.
                binding.SendTimeout = TimeSpan.FromMinutes(30);
                binding.ReceiveTimeout = TimeSpan.FromMinutes(30);
                // ** Set the maximum document size to 50MB
                binding.MaxReceivedMessageSize = 50 * 1024 * 1024;
                binding.ReaderQuotas.MaxArrayLength = 50 * 1024 * 1024;
                binding.ReaderQuotas.MaxStringContentLength = 50 * 1024 * 1024;

                // ** Specify an identity (any identity) in order to get it past .net3.5 sp1
                EndpointIdentity epi = EndpointIdentity.CreateUpnIdentity("unknown");
                EndpointAddress epa = new EndpointAddress(new Uri(address), epi);

                client = new DocumentConverterServiceClient(binding, epa);

                client.Open();

                return client;
            }
            catch (Exception)
            {
                CloseService(client);
                throw;
            }
        }

        /// <summary>
        /// Check if the client is open and then close it.
        /// </summary>
        /// <param name="client">The client to close</param>
        public static void CloseService(DocumentConverterServiceClient client)
        {
            if (client != null && client.State == CommunicationState.Opened)
                client.Close();
        }

    }
}
```

4. Make sure the output folder contains an MS-Word file.
5. Compile and execute the application.

5.2 Watermarking in Java

The following Java based sample code is identical to the example provided in section 4.2 with the exception that the *Watermarks* property in the *ConversionSettings* class is now populated with a simple watermark that prints the word 'Confidential' on the front page in combination with the current date.

For details on how to setup your Java environment and generate the Web Service proxies see the before mentioned section 4.2

```
package com.muhimbi.app;

import com.muhimbi.ws.*;
import java.io.*;
import java.net.URL;
import java.util.List;
import javax.xml.bind.JAXBElement;
import javax.xml.namespace.QName;

public class WsClient {

  private final static String DOCUMENTCONVERTERSERVICE_WSDL_LOCATION =
        "http://localhost:41734/Muhimbi.DocumentConverter.WebService/?wsdl";

  public static void main(String[] args) {
    try {
      if (args.length != 1) {
        System.out.println("Please specify a single file name on the command line.");

      } else {
        // ** Process command line parameters
        String sourceDocumentPath = args[0];
        File file = new File(sourceDocumentPath);
        String fileName = getFileName(file);
        String fileExt = getFileExtension(file);
        System.out.println("Converting file " + sourceDocumentPath);

        // ** Initialise Web Service
        DocumentConverterService_Service dcss = new DocumentConverterService_Service(
            new URL(DOCUMENTCONVERTERSERVICE_WSDL_LOCATION),
            new QName("http://tempuri.org/", "DocumentConverterService"));
        DocumentConverterService dcs = dcss.getBasicHttpBindingDocumentConverterService();

        // ** Only call conversion if file extension is supported
        if (isFileExtensionSupported(fileExt, dcs)) {
          // ** Read source file from disk
          byte[] fileContent = readFile(sourceDocumentPath);

          // ** Converting the file
          OpenOptions openOptions = getOpenOptions(fileName, fileExt);
          ConversionSettings conversionSettings = getConversionSettings();
          byte[] convertedFile = dcs.convert(fileContent, openOptions, conversionSettings);

          // ** Writing converted file to file system
          String destinationDocumentPath = getPDFDocumentPath(file);
          writeFile(convertedFile, destinationDocumentPath);
          System.out.println("File converted sucessfully to " + destinationDocumentPath);

        } else {
          System.out.println("The file extension is not supported.");
        }
      }
    } catch (IOException e) {
       System.out.println(e.getMessage());
    } catch (DocumentConverterServiceGetConfigurationWebServiceFaultExceptionFaultFaultMessage e){
       printException(e.getFaultInfo());
```

```
    } catch (DocumentConverterServiceConvertWebServiceFaultExceptionFaultFaultMessage e) {
        printException(e.getFaultInfo());
    }
  }

  public static OpenOptions getOpenOptions(String fileName, String fileExtension) {
    ObjectFactory objectFactory = new ObjectFactory();
    OpenOptions openOptions = new OpenOptions();
    // ** Set the minimum required open options. Additional options are available
    openOptions.setOriginalFileName(objectFactory.createOpenOptionsOriginalFileName(fileName));
    openOptions.setFileExtension(objectFactory.createOpenOptionsFileExtension(fileExtension));
    return openOptions;
  }

  public static ConversionSettings getConversionSettings() {
    ConversionSettings conversionSettings = new ConversionSettings();
    // ** Set the minimum required conversion settings. Additional settings are available
    conversionSettings.setQuality(ConversionQuality.OPTIMIZE_FOR_PRINT);
    conversionSettings.setRange(ConversionRange.ALL_DOCUMENTS);
    conversionSettings.getFidelity().add("Full");
    conversionSettings.setFormat(OutputFormat.PDF);
    conversionSettings.setWatermarks(getWatermarks());
    return conversionSettings;
  }

  public static JAXBElement<ArrayOfWatermark> getWatermarks()
  {
    ObjectFactory objectFactory = new ObjectFactory();
    ArrayOfWatermark watermarks = new ArrayOfWatermark();

    // ** Specify some of the default settings for properties
    Defaults wmDefaults = new Defaults();
    wmDefaults.setFillColor(objectFactory.createDefaultsFillColor("#FF0000"));
    wmDefaults.setFontFamilyName(objectFactory.createDefaultsFontFamilyName("Arial"));

    // ** 'Confidential' watermark for front page
    Watermark confidential = new Watermark();
    confidential.setDefaults(objectFactory.createContainerDefaults(wmDefaults));
    confidential.setStartPage(1);
    confidential.setEndPage(1);
    confidential.setRotation(objectFactory.createElementRotation("-15"));
    confidential.setWidth(objectFactory.createElementWidth("500"));
    confidential.setHeight(objectFactory.createElementHeight("250"));
    confidential.setHPosition(HPosition.CENTER);
    confidential.setVPosition(VPosition.ABSOLUTE);
    confidential.setY(objectFactory.createElementY("275"));
    confidential.setZOrder(-1);

    // ** Create a new Text element that goes inside the watermark
    Text cfText = new Text();
    cfText.setContent(objectFactory.createTextContent("Confidential - {DATE}"));
    cfText.setFontSize(objectFactory.createTextFontSize("40"));
    cfText.getFontStyle().add("Bold");
    cfText.getFontStyle().add("Italic");
    cfText.setWidth(objectFactory.createElementWidth("500"));
    cfText.setHeight(objectFactory.createElementHeight("250"));
    cfText.setTransparency(objectFactory.createElementTransparency("0.10"));

    // ** And add it to the list of watermark elements.
    ArrayOfElement cfElements = new ArrayOfElement();
    cfElements.getElement().add(cfText);
    confidential.setElements(objectFactory.createContainerElements(cfElements));

    // ** And add the watermark to the list of watermarks
    watermarks.getWatermark().add(confidential);

    return objectFactory.createConversionSettingsWatermarks(watermarks);
  }

  public static String getFileName(File file) {
    String fileName = file.getName();
```

```
    return fileName.substring(0, fileName.lastIndexOf('.'));
  }

  public static String getFileExtension(File file) {
    String fileName = file.getName();
    return fileName.substring(fileName.lastIndexOf('.') + 1, fileName.length());
  }

  public static String getPDFDocumentPath(File file) {
    String fileName = getFileName(file);
    String folder = file.getParent();
    if (folder == null) {
      folder = new File(file.getAbsolutePath()).getParent();
    }
    return folder + File.separatorChar + fileName + '.' + OutputFormat.PDF.value();
  }

  public static byte[] readFile(String filepath) throws IOException {
    File file = new File(filepath);
    InputStream is = new FileInputStream(file);
    long length = file.length();
    byte[] bytes = new byte[(int) length];

    int offset = 0;
    int numRead;
    while (offset < bytes.length
        && (numRead = is.read(bytes, offset, bytes.length - offset)) >= 0) {
      offset += numRead;
    }
    if (offset < bytes.length) {
      throw new IOException("Could not completely read file " + file.getName());
    }
    is.close();
    return bytes;
  }

  public static void writeFile(byte[] fileContent, String filepath) throws IOException {
    OutputStream os = new FileOutputStream(filepath);
    os.write(fileContent);
    os.close();
  }

  public static boolean isFileExtensionSupported(String extension, DocumentConverterService dcs)
    throws DocumentConverterServiceGetConfigurationWebServiceFaultExceptionFaultFaultMessage
    {
      Configuration configuration = dcs.getConfiguration();
      final JAXBElement<ArrayOfConverterConfiguration> converters = configuration
          .getConverters();
      final ArrayOfConverterConfiguration ofConverterConfiguration = converters.getValue();
      final List<ConverterConfiguration> cList = ofConverterConfiguration
          .getConverterConfiguration();

      for (ConverterConfiguration cc : cList) {
        final List<String> supportedExtension = cc.getSupportedFileExtensions()
                .getValue().getString();
        if (supportedExtension.contains(extension)) {
          return true;
        }
      }
    return false;
  }

  public static void printException(WebServiceFaultException serviceFaultException) {
    System.out.println(serviceFaultException.getExceptionType());
    JAXBElement<ArrayOfstring> element = serviceFaultException.getExceptionDetails();
    ArrayOfstring value = element.getValue();
    for (String msg : value.getString()) {
      System.out.println(msg);
    }
  }
}
```

6 Troubleshooting

Although the MDCS is a robust and efficient solution, some questions may arise during the day to day operation of the software. This section provides some pointers to answer common questions.

If you still have questions after reading this chapter then please check out the links in chapter 1 *Introduction*.

6.1 Problems parsing the WSDL

By default the MDCS uses *localhost* as the base address. Most web service client libraries deal with this correctly, however if the service is exposed using a different machine name then you may need to update the *base address*. For details see section 3.3.4 in the Administration Guide.

6.2 Converting documents takes a long time

In general the PDF Converter performs extremely well. However, depending on the size and complexity of the documents that are being converted, the conversion process may take some time to execute.

If conversion requests timeout then please have a look at the Administration Guide, section 2.4.4.

6.3 The PDF file does not look the same as the source file

Although the MDCS converts documents with very high fidelity and reliability, there are some situations that may cause the converted documents to look different from the source files. The main reasons for this are as follows:

1. One or more fonts used by the document are not installed on the Document Conversion Server. Ask your Administrator to install the correct fonts.
2. The spacing of the characters in InfoPath documents doesn't look correct. Unfortunately InfoPath 2007 does not deal well with certain fonts, even when these fonts have been installed on the server. Try using a different font, creating a separate InfoPath *Print View* or switching to InfoPath 2010.

6.4 An evaluation message is displayed in each converted document

When an *evaluation* message is displayed in each converted document then something may be wrong with your license or your license has not been installed. Please see section 2.3 of the Administration Guide for more details about installing the license.

6.5 InfoPath Forms fail to convert

When InfoPath documents fail to convert then please consult *Appendix - Using InfoPath with External Data Sources* in the Administration Guide or visit http://support.muhimbi.com/entries/21278696-my-infopath-form-fails-to-convert-how-can-i-troubleshoot-this

6.6 Converting non supported files

The PDF Converter supports a large number of source file formats. Support for additional formats can be added by following the instructions in the Administration Guide under *Appendix - Creating Custom Converters*.

Appendix - Licensing

All Muhimbi products are licensed in a way that allows maximum flexibility. Please familiarise yourself with the licensing agreement, particularly section 3 – *Grant of License*, before purchasing our software.

For details see:

1. How we license:
   http://blog.muhimbi.com/2010/01/how-we-license-our-products-make-sure.html
2. The License Agreement:
   http://www.muhimbi.com/Software-License-Agreement.aspx
3. Licensing FAQ:
   http://www.muhimbi.com/support/faqs.aspx#Licensing

In summary we support the following license types. Please refer to the resources above for exact details:

	Number of servers	Unlimited Web Applications	Unlimited Web Farms	Unlimited Locations	Redis-tributable	Includes Source code
Server License	1	☑				
Enterprise License	Unlimited	☑	☑	☑		
OEM License	Unlimited	☑	☑	☑	☑	
Source Code License	Unlimited	☑	☑	☑	☑	☑

Please note that some older SharePoint specific license types have been discontinued. However, these are still valid for those customers that have purchased them in the past. Please see the License Agreement for details about these old style licenses.

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