DocBook with Eclipse

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Abstract

This document explains how to quickly start working with DocBook using your Eclipse Web Tools Platform (WTP) environment. WTP is required only for the XSLT features it provides. This article covers Mac, Linux, and Windows.

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1. Introduction

For this version of the article, I'm going to assume you have some reason to learn DocBook rather than try to provide a motivation. But just in case you stumbled on this document expecting an office suite replacement for products such as MS-Office, OpenOffice or LibreOffice, stop now. DocBook is not a WYSIWYG product. It has a considerable learning curve and should only be used by propeller-heads.

But perhaps you're already interested in DocBook but are wondering why use Eclipse to produce DocBook documents. I found Eclipse helpful for DocBook usage for the following reasons.

- Eclipse has built-in support for stylesheet transformations. You have to make sure you download the right edition (the J2EE edition is a safe bet).
- Eclipse has support for developing and running Ant scripts. You can get by without script support for your first few toy documents. But as you learn about the various parameters supported by the output configuration, provding the parameters via a command line becomes unwieldy.
- Eclipse has spell checking support within its XML editors.

2. Getting Files

DocBook is basically a set of stylesheets that convert our content-centric XML source files into a desired format. So acquiring DocBook amounts to acquiring these stylesheets.

2.1. DocBook Stylesheets

The DocBook stylesheets themselves are located at the following link.

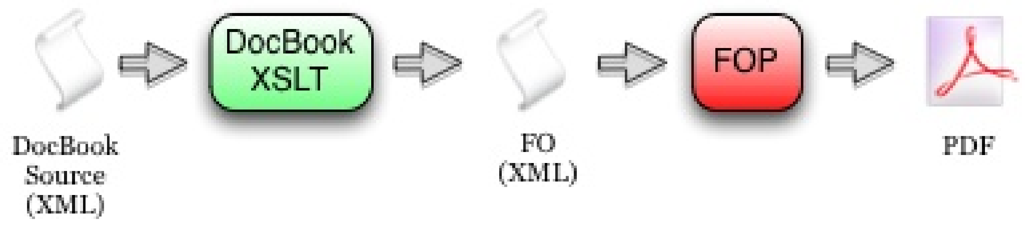
http://sourceforge.net/projects/docbook/files/docbook-xsl-ns/

Download the latest version in an archive format suitable for your OS.

2.2. Formatting Objects (FO)

If you want to generate PDF files, then there are a few more downloads. DocBook doesn't generate PDF files directly. Rather, it generates an XML document structured as *Formatting Objects*, or FO. A separate processor developed by an Apache project called *Formatting Object Processor* (FOP) takes the FO output from DocBook and produces a PDF file.

Figure 1. Generating PDF from DocBook



FOP may be downloaded from the Apache FOP project.

http://xmlgraphics.apache.org/fop/download.html

Choose the binary download. You'll be asked to choose a mirror. On the mirror site, choose the binaries folder and download the latest stable distribution in the archive format supported by your OS.

2.3. OFFO Hyphenation

FOP uses a hyphenation toolkit that is part of the OFFO project. The binary is downloaded from SourceForge.

http://sourceforge.net/projects/offo/

Download the file `offo-hyphenation-binary_v2.0.zip`.

3. Installing DocBook Files

Installing DocBook files pretty much amounts to unarchiving them. But it pays to plan things up front to ease the upgrade process when new versions of the stylesheets are released. The schemes described in this article differ slightly by OS.

Where you place files is somewhat arbitrary. This section is simply where I place them. Feel free to override these guidelines with any preference you may have.

3.1. Mac OS X

I configure the DocBook related stylesheets in `/usr/local/share`. One must have admin rights to set up here. If you don't have admin privileges, you may follow these steps substituting a location under your user directory.

1. Expand the DocBook stylesheets into `/usr/local/share`. The name of the directory created by expanding the archive should contain the version number of the stylesheets.

2. Create a soft link named `docbook` that points to the directory just created by expanding the archive.

   ```
   ln -s docbook-xml-ns-1.77.1 docbook
   ```

   Afterward, your directory should look similar to this.

   ```
   /usr/local/share$ ls -l
   total 8
   lrwxr-xr-x   1 root  wheel    21 Jun  6 21:18 docbook@ -> docbook-xsl-ns-1.77.1
   drwxr-xr-x@ 46 root  wheel  1564 Jun  6 21:17 docbook-xsl-ns-1.76.1/
   drwxr-xr-x@ 51 root  wheel  1734 Jun  4 15:09 docbook-xsl-ns-1.77.1/
   drwxr-xr-x   7 root  wheel   238 Jun  7 18:22 java/
   /usr/local/share$
   ```

3. Expand the FOP and OFFO archives into the `/usr/local/share/java` directory. For the FOP directory, create a soft link as was done in the previous step. This is not necessary for the OFFO distribution since we are simply poaching its library, not referencing it. The `/usr/local/share/java` directory should look similar to this.

   ```
   /usr/local/share/java$ ls -l
   total 16
   lrwxr-xr-x   1 root  wheel    7 Jun  7 18:22 fop@ -> fop-1.0
   drwxr-xr-x@ 17 root  wheel  578 May 10 22:04 fop-1.0/
   drwxrwxr-x  10 root  wheel  340 Oct 29  2010 offo-hyphenation-binary/
   lrwxr-xr-x   1 root  wheel   13 Jun  6 20:10 xalan@ -> xalan-j_2_7_1
   drwxr-xr-x@ 12 root  wheel  408 Jun  6 19:29 xalan-j_2_7_1/
   /usr/local/share/java$
   ```

4. Copy `fop-hyph.jar` from the OFFO installation to the `fop/lib` directory. (Or you can simply hard link to it.)

This completes the file system set-up for Mac OS X.

4. New Eclipse Workspace

To configure a new Eclipse workspace for DocBook projects, install the XML/XSL templates from the Starter Kit to quicken the creation of new source files. These are located in the `templates` folder of the Starter Kit.

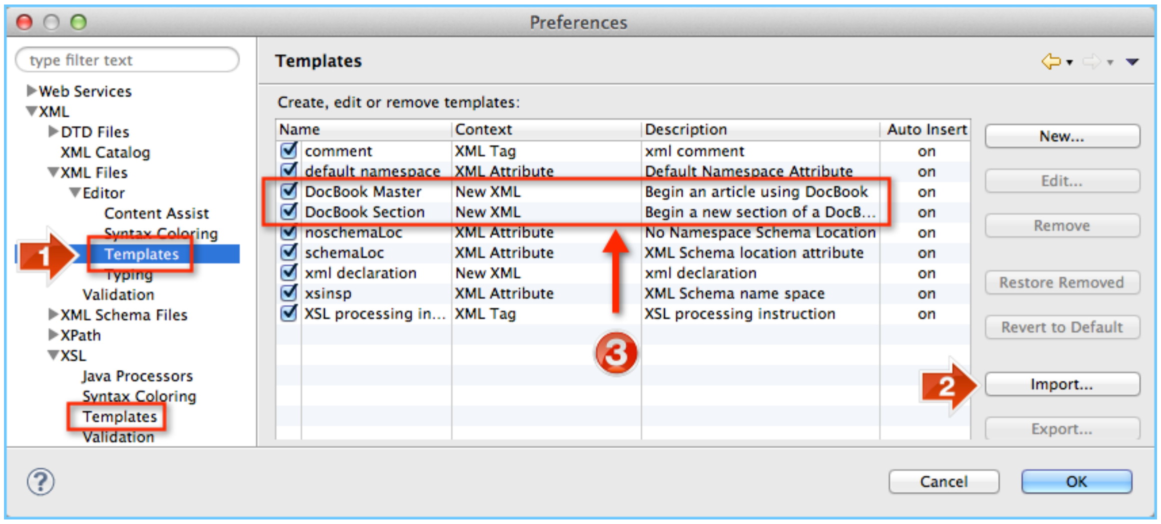
1. Import the DocBook Starter Kit [http://pglezen.github.io/DocBookEclipse/StarterKit.zip] as a plain Eclipse project or simply have the files somewhere handy.

2. Open Windows → Preferences of your Eclipse workspace. As shown in Figure 2, there are two templates to import.

3. First choose XML → XML Files → Editor → Templates and import `templates/xml/docbook-new.xml` from the Starter Kit. This will create two new creation templates for XML files named *DocBook Master* and *DocBook Section* as shown in Figure 2.

4. Then choose XML → XSL → Templates and import `templates/xsl/customization-pdf.xml` from the Starter Kit. This will create a single creation template for XSL files named *DocBook Customization*.

Figure 2. Importing XML/XSL Editor Templates



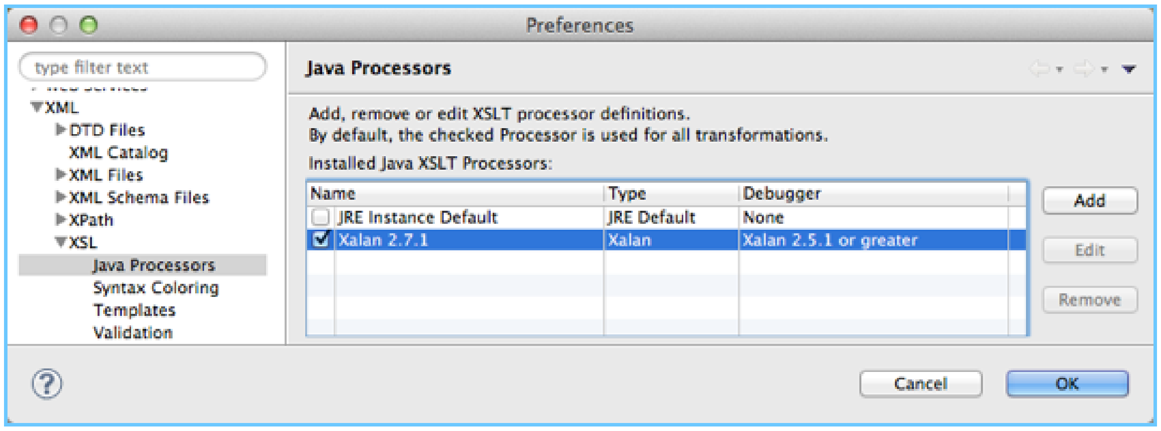
Create, edit or remove templates:

Name	Context	Description	Auto Insert
✓ comment	XML Tag	xml comment	on
✓ default namespace	XML Attribute	Default Namespace Attribute	on
✓ DocBook Master	New XML	Begin an article using DocBook	on
✓ DocBook Section	New XML	Begin a new section of a DocB...	on
✓ noschemaLoc	XML Attribute	No Namespace Schema Location	on
✓ schemaLoc	XML Attribute	XML Schema location attribute	on
✓ xml declaration	New XML	xml declaration	on
✓ xsinsp	XML Attribute	XML Schema name space	on
✓ XSL processing in...	XML Tag	XSL processing instruction	on

5. To use Xalan for XSL processing run configurations, navigate to XML → XSL → Java Processors as shown in Figure 3 and choose Xalan from the list.

   This is only meaningful if you intend to execute the DocBook stylesheets directly from an Eclipse run configuration. If you invoke the stylesheets from an Ant script as described in the next section, the Xalan processor is specified in the Ant script.

Figure 3. Choose Xalan for XSL Processing



Add, remove or edit XSLT processor definitions.
By default, the checked Processor is used for all transformations.

Installed Java XSLT Processors:

Name	Type	Debugger
☐ JRE Instance Default	JRE Default	None
✓ Xalan 2.7.1	Xalan	Xalan 2.5.1 or greater

5. Configuring a New DocBook Project

We need to configure our DocBook project dependencies independent of where we install them on our file system. Since we usually expect to source-control our DocBook source and build-scripts, we need to organize our Eclipse workspace so that file system and OS dependencies don't creep into source-controlled artifacts. This is accomplished on most platforms with soft links and build links.

1. Create a new project to hold the DocBook source. The type can be a simple project.

2. Create a directory named `softlinks`.

3. Make the DocBook and FOP installations *appear* to reside in our project under `softlinks` directory. Whether copies of those directories need to reside there depends on the OS platform. Linux and OS X support directory soft links. Windows does not. The Eclipse platform itself supports links for files, but not directories.

   Linux and OS X users can use the following technique.

   a. Open a terminal to the `softlinks` directory.

   b. Run the following command.

      `ln -s` {*`path to DocBook installation`*} docbook

   c. Run a similar command for the FOP folder.

      `ln -s` {*`path to FOP installation`*} fop

   Windows users must actually copy these folders into their Eclipse workspace under the `softlinks` directory. This is not a very attractive solution. I wasn't able to make the any of the following work in its place.

   - *Windows Shortcuts* - On a Windows desktop or file explorer, a Windows shortcut looks like the real thing. But it's actually a file with an .inf extension. In the Eclipse workspace, we get `docbook.inf` and `fop.inf`.

   - *Eclipse Links* - Eclipse provides a linking mechanism to refer to files and directories outside the workspace. Unfortunately, this linking information is stored in the `.project` metadata file that Eclipse uses for a project, not in workspace metadata. Thus it would also become source controlled and then imposed on others.

4. Copy the `build` folder of the Starter Kit into your new project. This includes a `build-core.xml` that defines source dependencies and sets a few global properties. The other files reference `build-core.xml` and generate specific output formats.

5. Create the following folders in your new project.

   - `images` - used for storing image files.

   - `out` - stores generated output for each of the output types.

   - `src` - the source for your document content.

6. In most cases, you will want to create a subdirectory of `out` for each output type. These directories contain files that control the presentation of your documents. (The `src` directory determines the content). If you generate PDF output, a `pdf` folder would contain the customization layer. If you generate HTML or EPUB output, the `html` or `epub` folder would contain the your CSS files.

You're ready to start writing your DocBook source!

6. External Tools Configuration

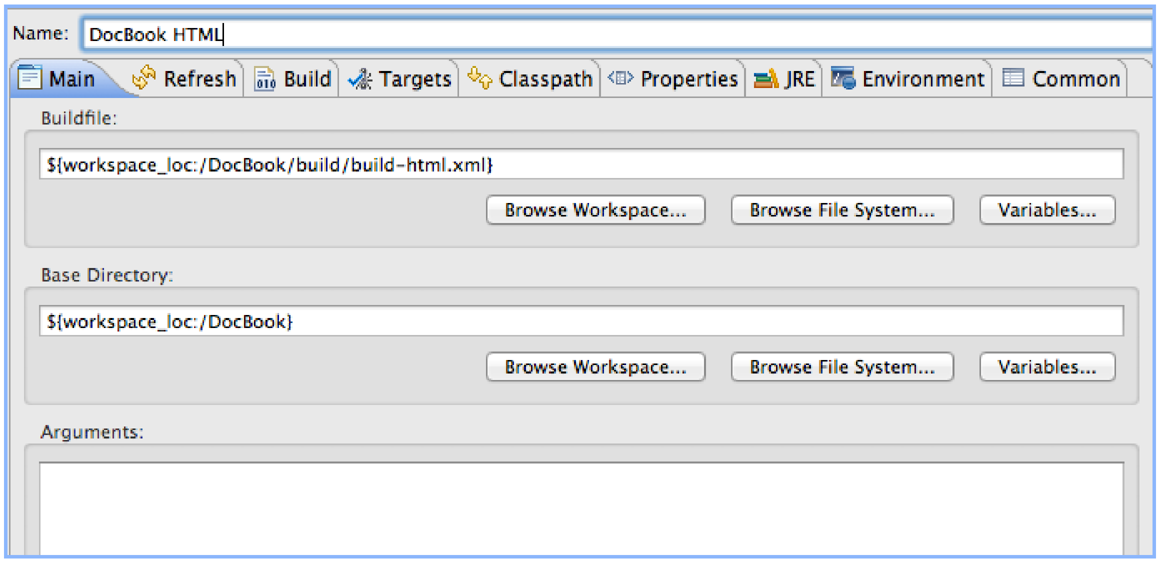
Eclipse uses an *external tools configuration* to execute external tools. One of the most common external tool is the Ant build script. Several Ant scripts are included in the Starter Kit. The most convenient way to execute these scripts is to execute them from a external tool configuration that stores its parameters and dependencies in a single place and is invoked at the click of a button.

The external tools configuration dialog is invoked from Run → External Tools → External Tools Configurations. Right-click on Ant Build and select New. This panel has several tabs to be configured. These are described in the sections below.

6.1. Main Tab

In the main tab enter the name of the build. A good convention to follow is a short name for the document followed by the format of the build. In the example shown in Figure 2 the configuration for the HTML build of this document is named "DocBook HTML."

Figure 4. External Tools Configuration - Main Tab



Name: DocBook HTML

Buildfile:
${workspace_loc:/DocBook/build/build-html.xml}

Base Directory:
${workspace_loc:/DocBook}

Arguments:

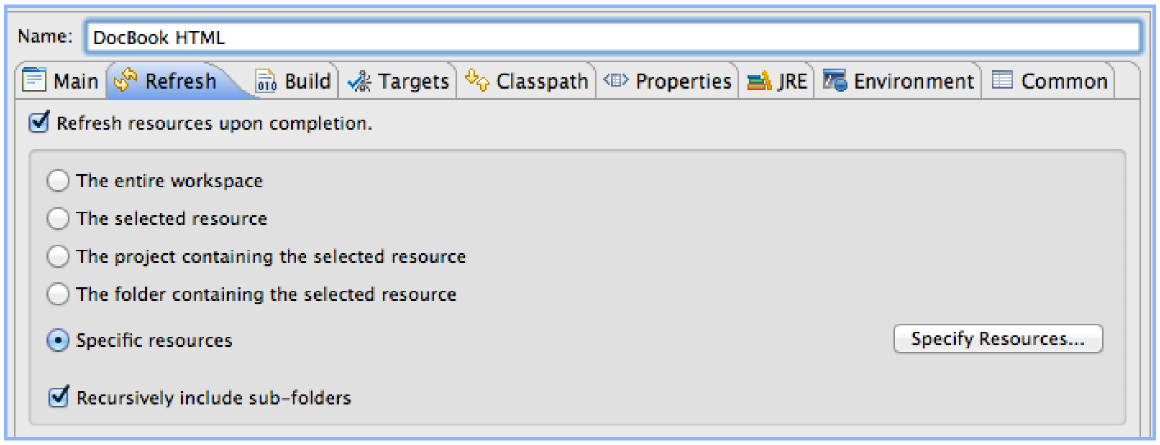
The Buildfile field holds the location of the Ant script. The simplest way to complete this field is to click the Browse Workspace... button and navigate to `<project>/builds/build-html.xml`. In a similar way complete the Base Directory field. Set it to the root of the workspace.

6.2. Refresh Tab

Eclipse often caches elements of its workspaces to improve performance. Changes that an external tool makes to the file system are not immediately noticed by the Eclipse workspace. This can always be remedied manually by selecting an altered resource (or folder containing it) and pushing the F5 on your keyboard. This tab provides for accomplishing this automatically. Several operations are available. The trick is to only refresh as much as you need since the more you ask to be refreshed, the longer it takes. In our case, we want to refresh the `out` directory since that is where our build scripts place their artifacts.

Check the box marked Refresh resources upon completion. We won't necessarily have a resource selected when the build script is run, so it's safest to choose Specify resources and click its button. Choose the `out` directory.

Figure 5. External Tools Configuration - Refresh Tab



[✓] Refresh resources upon completion.

- ( ) The entire workspace
- ( ) The selected resource
- ( ) The project containing the selected resource
- ( ) The folder containing the selected resource
- (●) Specific resources

[✓] Recursively include sub-folders

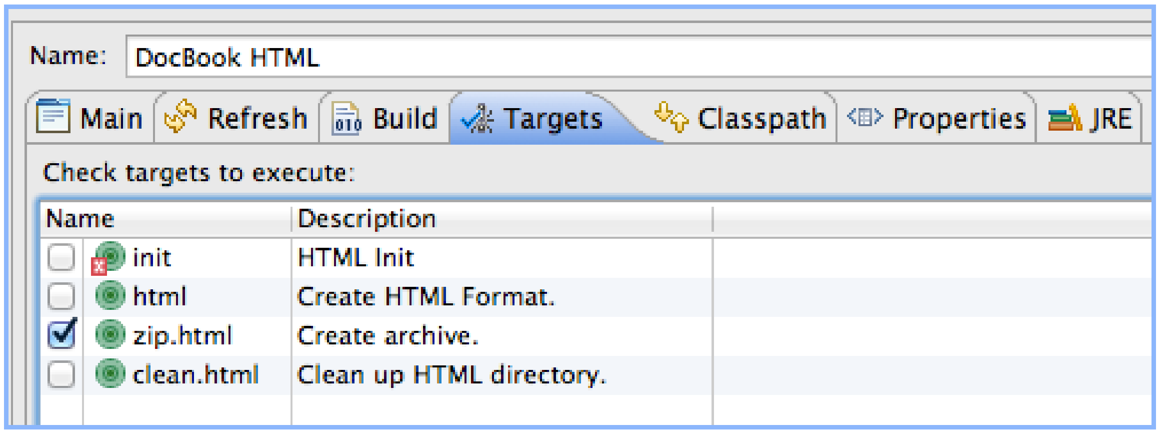
6.3. Build Tab

Uncheck the Build before launch box. In this case, the Ant script is doing all the necessary building. No workspace builds are necessary.

6.4. Targets Tab

An Ant script often has several *targets* that represent the production of some artifact. This panel allows one to choose a particular one. In the example shown in Figure 6, the zip.html box is selected. As it happens, This task declares a dependency on html and init. So those get built, too.

Figure 6. External Tools Configuration - Targets Tab



Check targets to execute:

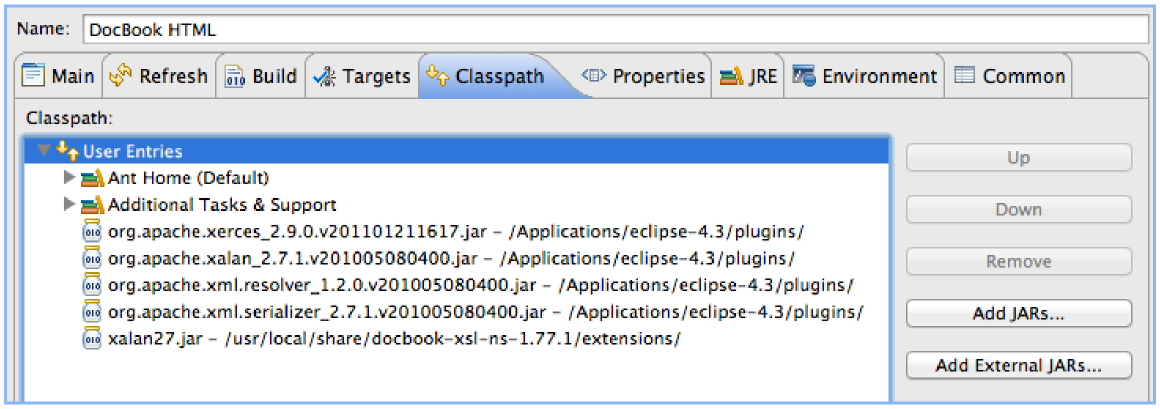
	Name	Description
☐	init	HTML Init
☐	html	Create HTML Format.
✓	zip.html	Create archive.
☐	clean.html	Clean up HTML directory.

The init button shows an error marker because it it is defined in a separate Ant script called `build-core.xml` that is referenced by all the other scripts. The Eclipse Ant editor is not yet smart enough to follow relationships across files. Fortunately Ant itself is.

6.5. Classpath Tab

This is the trickiest one. We need to include all the JARs that DocBook will need to parse and transform DocBook source. The Xerces and Xalan libraries can be downloaded from Apache's Xalan and Xerces sites. But since they are also included with the Eclipse distributions, it's easy just to reference them from the Eclipse plugin directory. Select the User Entries root element in the list and on the right click the Add External JARs.... Navigate to the `plugins` subdirectory of your Eclipse install root and select the four files in Figure 7 that begin with `org.apache.x`.

Figure 7. External Tools Configuration - Targets Tab



Name: DocBook HTML

Classpath:

- User Entries
  - Ant Home (Default)
  - Additional Tasks & Support
  - org.apache.xerces_2.9.0.v201101211617.jar – /Applications/eclipse-4.3/plugins/
  - org.apache.xalan_2.7.1.v201005080400.jar – /Applications/eclipse-4.3/plugins/
  - org.apache.xml.resolver_1.2.0.v201005080400.jar – /Applications/eclipse-4.3/plugins/
  - org.apache.xml.serializer_2.7.1.v201005080400.jar – /Applications/eclipse-4.3/plugins/
  - xalan27.jar – /usr/local/share/docbook-xsl-ns-1.77.1/extensions/

The DocBook Xalan extensions, `xalan27.jar`, are in the `extensions` subdirectory of the DocBook installation.

6.6. Copy Configurations

Creating the external tool configuration isn't that hard if you know what you're doing. But it's easy to forget if you haven't done it in a while. After you've followed these instructions once, it's easier to copy an existing configuration than to create a new one from scratch. You'll change the build file and choose different build targets. But the classpaths will stay the same.

This will be demonstrated by creating an exernal tools configuration for a PDF build. Open the External Tool Configurations as before. Right click the DocBook HTML entry and select Duplicate. This creates a new entry called DocBook HTML (1). It has most of the settings you already need. Make the following changes.

1. Change the name to DocBook PDF.
2. Change the build fil to `build-pdf.xml`.
3. Choose pdf in the Targets tab.
4. Click the Run button to test.

A similar process can be used for creating an EPUB build. The same technique can be used for build of other DocBook projects, not just different renderings of the same DocBook project. Just add these extra steps.

- On the Main tab, select the new project for the Base Directory field.
- On the Refresh tab select the new `out` folder for the new project.

7. References

[1] DocBook: The Definitive Guide, April, 2012. Norman Walsh. Online: http://docbook.org/tdg51/en/html/

[2] DocBook XSL: The Complete Guide, Fourth Edition, September, 2007. Bob Stayton. Online: http://www.sagehill.net/docbookxsl/index.html