DITA Open Toolkit, version 2.1

Contents

Chapter 1

Getting Started with the DITA Open Toolkit

Topics:

The *Getting Started* guide is designed to provide a guided exploration of the DITA Open Toolkit. It is geared for an audience that has little or no knowledge of build scripts or DITA-OT parameters. It walks the novice user through installing the toolkit and building output.

Installing the distribution package

The DITA-OT distribution package can be installed on Linux, Mac OS X, and Windows. It contains everything that you need to run the toolkit except for Java.

Before you begin

- Ensure that you have Java JRE or JDK, version 7 or later installed.
- Ensure that you have HTML Help Workshop installed, if you want to generate HTML Help.

Procedure

1. Download the distribution package for your operating system from the project website at *www.dita-ot.org*.

Operating system	**File name**
Linux or Mac OS X	`dita-ot-2.1.1.tar.gz`
Windows	`dita-ot-2.1.1.zip`

2. Extract the contents of the package to the directory where you want to install the DITA-OT.
3. Optional: Add the absolute path for the `bin` directory to the *PATH* system variable.

   This defines the necessary environment variable to run the `dita` command from the command line.

   Tip: This step is recommended, as it allows the the `dita` command to be run from any location on the file system and makes it easier to transform DITA content from any folder.

Building output using the `dita` command

You can invoke DITA-OT and build output using the `dita` command.

Procedure

1. The DITA-OT client is a command-line tool, there is no graphic user interface. Open a terminal window by typing the following in the search bar:
   - On OS X and Linux, type `Terminal`.
   - On Windows, type `Command Prompt`.
2. From the terminal window, issue the following command:

```
install-dir/bin/dita -f transformation-type -i input-file -o output-dir
```

   where:

   - *install-dir* is the DITA-OT installation directory path.
   - *transformation-type* is the transformation type.
   - *input-file* is the DITA map or DITA file path that you want to process.
   - *output-dir* is the output directory path for generated output.

   If processing is successful, nothing is printed in the terminal window.

Example

If you have added the absolute path for the *`install-dir`*`/bin` directory to the *PATH* system variable as recommended in the previous topic, the following command generates HTML5 output for the `sequence.ditamap` file and writes the output to the `test` directory:

```
dita -f html5 -i samples/sequence.ditamap -o test
```

If the `dita` command is not on your *PATH*, use the following command:

```
install-dir/bin/dita -f html5 -i samples/sequence.ditamap -o
 test
```

Part I

DITA Open Toolkit User Guide

Topics:

The *DITA Open Toolkit User Guide* is designed to provide basic information about the DITA-OT. It is geared for an audience that needs information about installing, running, and troubleshooting the toolkit. It contains documentation of the DITA-OT parameters; it also contains release notes and information about what components have been tested.

Chapter 2

DITA Open Toolkit Overview

Topics:

- *DITA specification support*
- *Tested platforms and tools*

The DITA Open Toolkit (DITA-OT) is an open-source implementation of the OASIS DITA specification, which is developed by the OASIS DITA Technical Committee. The DITA-OT is a set of Java-based, open-source tools and Ant scripts that transform DITA content (maps and topics) into deliverable formats, including Eclipse Help, HTML Help, JavaHelp, PDF, and XHTML.

While the DITA standard is owned and developed by OASIS, the DITA-OT project is governed separately; the DITA-OT is an independent, open-source implementation of the DITA standard. The DITA-OT is available without charge and is licensed under the Apache 2.0 open-source licenses.

Related information

Apache License, version 2.0

DITA specification support

DITA Open Toolkit 2.1 supports the DITA 1.2 specification and provides initial preview support for DITA 1.3.

DITA 1.2 support

DITA Open Toolkit 2.1 supports the DITA 1.2 specification. Initial support for this specification was added in version 1.5 of the toolkit; versions 1.5.1 and 1.5.2 contain minor modifications to keep up with the latest drafts. The specification itself was approved at approximately the same time as DITA-OT 1.5.2, which contained the final versions of the DTD and Schemas. DITA-OT 1.6 updated the DITA 1.2 XSDs to address minor errata in the standard; the DTDs remain up to date.

Earlier versions of the DITA Open Toolkit contained a subset of the specification material, including descriptions of each DITA element. This material was shipped in source, CHM and PDF format. This was possible in part because versions 1.0 and 1.1 of the DITA Specification contained two separate specification documents: one for the architectural specification, and one for the language specification.

In DITA 1.2, each of these has been considerably expanded, and the two have been combined into a single document. The overall document is much larger, and including the same set of material would double the size of the DITA-OT package. Rather than include that material in the package, we've provided the links below to the latest specification material.

Highlights of DITA 1.2 support in the toolkit include:

- Processing support for all new elements and attributes
- Link redirection and text replacement using keyref
- New processing-role attribute in maps to allow references to topics that will not produce output artifacts
- New conref extensions, including the ability to reference a range of elements, to push content into another topic, and to use keys for resolving a conref attribute.
- The ability to filter content with controlled values and taxonomies, using the new Subject Scheme Map
- Processing support for both default versions of task (original, limited task, and the general task with fewer constraints on element order)
- Acronym and abbreviation support with the new <abbreviated-form> element
- New link grouping abilities available with headers in relationship tables
- OASIS Subcommittee specializations from the learning and machine industry domains (note that the core toolkit contains only basic processing support for these, but can be extended to produce related artifacts such as SCORM modules)

To find detailed information about any of these features, see the specification documents at OASIS. The DITA Adoption Technical Committee has also produced several papers to describe individual new features. In general, the white papers are geared more towards DITA users and authors, while the specification is geared more towards tool implementors, though both may be useful for either audience. The DITA Adoption papers can be found from that TC's main web page.

Related information

DITA 1.2 Specification (XHTML)

DITA 1.2 Specification (PDF)

DITA 1.2 Specification (zip of the DITA source)

DITA 1.2 Specification (zip of the HTML Help)

DITA Adoption Technical CommitteeContains links to many white papers about using new DITA 1.2 features.
Contains links to many white papers about using new DITA 1.2 features.

Building subsets of the specificationInformation about how to build subsets of the specification using the DITA Open Toolkit.
Information about how to build subsets of the specification using the DITA Open Toolkit.

DITA 1.3 support

DITA Open Toolkit 2.1 provides initial preview support for the DITA 1.3 specification.

Initial Preview Support for DITA 1.3 in DITA-OT 2.0

The following DITA 1.3 features were implemented in version 2.0 of the toolkit. Issue numbers correspond to the tracking number in the *GitHub issues tracker*.

- *#1649* Support DITA 1.3 link syntax (milestone 2)
- *#1636* Support DITA 1.3 cascade attribute (milestone 2)
- *#1635* Implement DITA 1.3 profiling (milestone 2)
- *#1651* Add new DITA 1.3 highlighting elements (milestone 4)
- *#1652* Add DITA 1.3 markup and xml domain support (milestone 4)
- *#1654* Add DITA 1.3 div element (milestone 4)

For the latest status information on DITA 1.3-related features in version 2.1, see the *DITA 1.3 label* in the GitHub issues tracker.

Tested platforms and tools

The DITA Open Toolkit (DITA-OT) has been tested against certain versions of Ant, ICU4J, JDK, operating systems, XML parsers, and XSLT processors.

Application	**Tested version**
Ant	Ant 1.7.1 Ant 1.8.2—1.8.4, 1.9.2-1.9.4
ICU for Java	ICU4J 3.4.4 ICU4J 49.1 ICU4J 54.1
JDK	IBM 1.7 Oracle 1.7
Operating system	Mac OS X 10.6—10.9 SLES 10 Windows XP Windows 7
XML parser	Xerces 2.9.0 Xerces 2.11.0
XSLT processor	Saxon 9 Saxon-B 9.1 Saxon-HE/PE/EE 9.5-9.6

Chapter 3

Installing the DITA Open Toolkit

Topics:

You can install the DITA Open Toolkit (DITA-OT) on Linux, Mac OS X, and Windows.

Prerequisite software

The prerequisite software that the DITA-OT requires depends on the types of transformations that you want to use.

Software required for core DITA-OT processing

The DITA-OT requires the following software applications:

JRE or JDK, version 7 or later	Provides the basic environment for the DITA-OT. You can download the Oracle JRE or JDK from *http://www.oracle.com/technetwork/java/javase/downloads/index.html*. 👉 **Note:** This is the *only* prerequisite software that you need to install. The remaining required software is included in the distribution packages.
Ant, version 1.7.1 or later	Provides the standard setup and sequencing of processing steps. You can download Ant from *http://ant.apache.org/*.
XSLT processor	Provides the main transformation services. It must be compliant with XSLT 2.0. The DITA-OT is tested with Saxon. You can download Saxon, version 9.1.0.8 from *http://saxon.sourceforge.net/*.

Software required for specific transformations

Depending on the type of output that you want to generate, you might need the following applications:

ICU for Java	ICU for Java is a cross-platform, Unicode-based, globalization library. It includes support for comparing locale-sensitive strings; formatting dates, times, numbers, currencies, and messages; detecting text boundaries; and converting character sets. You can download ICU for Java from *http://www.icu-project.org/download/*.
Microsoft Help Workshop	Required for generating HTML help. You can download the Help Workshop from *http://msdn.microsoft.com/en-us/library/windows/desktop/ms669985%28v=vs.85%29.aspx*.
XSL-FO processor	Required for generating PDF output. You can download FOP from *http://xmlgraphics.apache.org/fop/download.html*; you also can use Antenna House Formatter or RenderX.

See *Tested platforms and tools* for detailed information about versions of the prerequisite applications that have been tested with the current DITA-OT release.

Installing the distribution package

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Before you begin

- Ensure that you have Java JRE or JDK, version 7 or later installed.

- Ensure that you have HTML Help Workshop installed, if you want to generate HTML Help.

Procedure

1. Download the distribution package for your operating system from the project website at *www.dita-ot.org*.

Operating system	File name
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2. Extract the contents of the package to the directory where you want to install the DITA-OT.
3. Optional: Add the absolute path for the `bin` directory to the *PATH* system variable.

   This defines the necessary environment variable to run the `dita` command from the command line.

   Tip: This step is recommended, as it allows the the `dita` command to be run from any location on the file system and makes it easier to transform DITA content from any folder.

Chapter 4

Publishing DITA content

Topics:

You can use either Ant or the command-line tool to transform DITA content to the various output formats that are supported by the DITA Open Toolkit (DITA-OT).

DITA-OT transformations

The DITA Open Toolkit (DITA-OT) ships with several core transformations. Each core transformation represents an implementation of all processing that is defined by OASIS in the DITA specification.

DITA to Docbook

The docbook transformation converts DITA maps and topics into a Docbook output file. Complex DITA markup might not be supported, but the transformation supports most common DITA structures.

DITA to Eclipse Content

The eclipsecontent transformation generates normalized DITA files and Eclipse control files. It originally was designed for an Eclipse plug-in that dynamically rendered DITA content, but the output from the transformation can be used by other applications that work with DITA.

Normalized DITA files have been through the DITA Open Toolkit pre-processing operation. In comparison to the source DITA files, the normalized DITA file are modified in the following ways:

- Map-based links, such as those generated by map hierarchy and relationship tables, are added to the topics.
- Link text is resolved.
- Any DTD or Schema reference is removed.
- Class attributes that are defaulted in the DTD or Schema are made explicit in the topics.
- Map attributes that cascade are made explicit on child elements.

The normalized DITA files have an extension of `.xml`.

Related reference

Ant parameters: Eclipse content on page 69
Certain parameters are specific to the Eclipse content transformation.

DITA to Eclipse help

The eclipsehelp transformation generates XHTML output, CSS files, and the control files that are needed for Eclipse help.

In addition to the XHTML output and CSS files, this transformation returns the following files, where *mapname* is the name of the master DITA map.

File name	Description
`plugin.xml`	Control file for the Eclipse plug-in
`mapname``.xml`	Table of contents
`index.xml`	Index file
`plugin.properties`	
`META-INF/MANIFEST.MF`	

Related reference

Ant parameters: Eclipse Help on page 70
Certain parameters are specific to the Eclipse help transformation.

Related information

Official Eclipse Web site

DITA to HTML5

The html5 transformation generates HTML5 output and a table of contents (TOC) file.

The HTML5 output is always associated with the default DITA-OT CSS file (`commonltr.css` or `commonrtl.css` for right-to-left languages). You can use toolkit parameters to add a custom style sheet to override the default styles.

To run the HTML5 transformation, set the transtype parameter to html5.

Related reference

Ant parameters: HTML on page 73
Certain parameters are specific to the HTML5 and XHTML transformation.

DITA to HTML Help (CHM)

The htmlhelp transformation generates HTML output, CSS files, and the control files that are needed to produce a Microsoft HTML Help file.

In addition to the HTML output and CSS files, this transformation returns the following files, where *mapname* is the name of the master DITA map.

File name	**Description**
`*mapname*.hhc`	Table of contents
`*mapname*.hhk`	Sorted index
`*mapname*.hhp`	HTML Help project file
`*mapname*.chm`	Compiled HTML Help **Note:** This file is generated only if the HTML Help Workshop is installed on the build system.

Related reference

Ant parameters: HTMLHelp on page 71
Certain parameters are specific to the HTML Help transformation.

DITA to Open Document Type

The odt transformation produces output files that use the Open Document format, which is used by tools such as Open Office.

This transform returns an ODT document, which is a zip file that contains the ODF XML file (`content.xml`), referenced images, and default styling (in the file `styles.xml`).

Related reference

Ant parameters: Open Document Format on page 72
Certain parameters are specific to the ODT transformation.

DITA to PDF (PDF2)

The pdf (or pdf2) transformation generates PDF output.

This transformation was originally created as a plug-in and maintained outside of the main toolkit code. It was created as a more robust alternative to the demo PDF transformation in the original toolkit, and thus was known as PDF2. The plug-in was bundled into the default toolkit distribution with release 1.4.3.

Related reference

Ant parameters: PDF on page 72
Certain parameters are specific to the PDF transformation.

Creating Change Bars

The PDF2 transform can generate change (revision) bars with XSL-FO engines that support the fo:change-bar formatting object.

Note:

As of July 2015 the Antenna House Formatter and RenderX XEP FO engines support change bar generation but FOP 1.1 does not.

You can request revision bars in your PDF output by using the @changebar attribute of the DITAVAL <revprop> element. The DITA specification for @changebar simply says:

@changebar	When flag has been set, specify a changebar color, style, or character, according to the changebar support of the target output format. If flag has not been set, this attribute is ignored.

The PDF2 syntax for @changebar is a sequence of semicolon-delimited name/value pairs:

```
<revprop action="flag" val="rev01"
 changebar="color:black;style:solid;width:0.5pt"
/>
```

Each name/value corresponds to an attribute of the *XSL-FO fo:change-bar-begin element*. The available attributes and values are:

style	The style to use for the line, as for other XSL-FO rules (*@change-bar-style*). The value "solid" produces a solid rule. The default is "none".
color	Any color value recognized by XSL-FO, including the usual color names or a hex color value. The default is "black".
offset	The space as a measurement value (e.g., points (pt) or millimeters (mm)) to offset the bar from the edge of the text column.
placement	The side of the text column on which to place the change bar, one of "start" (left side for left-to-right languages) or "end" (right side for left-to-right languages). The default is "start".
width	The width of the rule as a measurement value. Typical values are "1pt" and "0.5pt" (hairline rule).

To get a rule at all you must specify a value for style, e.g. "style:solid" and should specify a value for width so you get an appropriately-sized rule, e.g., "width:0.5pt".

Note that XSL-FO 1.1 does not provide for revision "bars" that are not rules, so there is no standard way to get text revision indicators instead of rules, e.g. using a number in place of a rule. Antenna House Formatter does provide a proprietary extension to allow this but the PDF2 transform does not take advantage of it.

DITA to Rich Text Format

The wordrtf transformation produces an RTF file for use by Microsoft Word.

The structure of the generated RTF file is the same as the navigation structure in the DITA map. To avoid losing files in the final output, make sure the DITA map contains all topics that are referenced from any individual topics.

The wordrtf transformation has the following limitations:

- Flagging, filtering, and revision bars are not supported.
- Style attributes for tables are not supported.

- Tables within list items are not supported.
- Certain output styles supported by other DITA-OT transformations are not supported.

DITA to TocJS

The tocjs transformation generates HTML5 output, a frameset, and a JavaScript-based table of contents with expandable and collapsible entries. The transformation was originally created by Shawn McKenzie as a plug-in and was added to the default distribution in DITA-OT release 1.5.4.

The tocjs transformation was updated so that it produces HTML5 output and uses a default frameset.

DITA to troff

The troff transformation produces output for use with the troff viewer on Unix-style platforms, particularly for programs such as the man page viewer.

Each DITA topic generally produces one troff output file. The troff transformation supports most common DITA structures, but it does not support <table> or <simpletable> elements. Most testing of troff output was performed using the Cygwin Linux emulator.

DITA to XHTML

The xhtml transformation generates XHTML output and a table of contents (TOC) file. This was the first transformation created for the DITA Open Toolkit, and it is the basis for all the HTML-based transformations.

The XHTML output is always associated with the default DITA-OT CSS file (`commonltr.css` or `commonrtl.css` for right-to-left languages). You can use toolkit parameters to add a custom style sheets to override the default styles.

To run the XHTML transformation, set the transtype parameter to xhtml. If you are running the demo build, specify web rather than xhtml.

Related reference

Ant parameters: HTML on page 73
Certain parameters are specific to the HTML5 and XHTML transformation.

Publishing content with the `dita` command

DITA-OT includes a `dita` command-line tool. You can invoke the DITA-OT from the command-line tool and generate output.

Building output using the `dita` command

You can invoke DITA-OT and build output using the `dita` command.

Procedure

From the command prompt, issue the following command:

```
install-dir/bin/dita -i input-file -f
transformation-type -Dparameter-name=value -o output-dir
```

where:

- *install-dir* is the DITA-OT installation directory path.
- *input-file* is the DITA map or DITA file that you want to process.
- *transformation-type* is the transformation type.
- *parameter-name* is the name of an optional parameter.
- *value* is an applicable value for the optional parameter.
- *output-dir* is the output directory path for generated output.

Tip: If you add the `install-dir/bin` directory to the *PATH* system variable, you can invoke the `dita` command without the absolute path.

If processing is successful, nothing is printed on the terminal window.

If you do not specify an output directory, the `dita` command writes output to the `out` subdirectory of the current directory.

Example

The following command generates HTML5 output for the `sequence.ditamap` file and specifies that output is written to the `test` directory.

```
dita -i samples/sequence.ditamap -f html5 -o test
```

Publishing DITA content from Ant

You can use Ant to invoke the DITA Open Toolkit (DITA-OT) and generate output. This is the most robust method of transforming DITA content; you can use the complete set of parameters that are supported by the toolkit.

Related concepts

Ant on page 26
Ant is a Java-based, open-source tool that is provided by the Apache Foundation. It can be used to declare a sequence of build actions. It is well suited for both development and document builds. The toolkit ships with a copy of Ant.

Related reference

Ant parameters on page 63

Ant

Ant is a Java-based, open-source tool that is provided by the Apache Foundation. It can be used to declare a sequence of build actions. It is well suited for both development and document builds. The toolkit ships with a copy of Ant.

The DITA-OT uses Ant to manage the XSLT scripts that are used to perform the various transformation; it also uses Ant to manage intermediate steps that are written in Java.

The most important Ant script is the `build.xml` file. This script defines and combines common pre-processing and output transformation routines; it also defines the DITA-OT extension points.

Related tasks

Building output using Ant on page 27
You can build output by running the `ant` command and specifying the DITA-OT parameters at the command prompt. You also can use an Ant build script to provide the DITA-OT parameters.

Creating an Ant build script on page 27
Instead of typing the DITA-OT parameters at the command prompt, you might want to create an Ant build script that contains all of the parameters.

Publishing DITA content from Ant on page 26
You can use Ant to invoke the DITA Open Toolkit (DITA-OT) and generate output. This is the most robust method of transforming DITA content; you can use the complete set of parameters that are supported by the toolkit.

Related reference

Ant parameters on page 63

Apache Ant documentation

Building output using Ant

You can build output by running the `ant` command and specifying the DITA-OT parameters at the command prompt. You also can use an Ant build script to provide the DITA-OT parameters.

Procedure

1. Run the `startcmd` file that is applicable for your operating system.

   The `startcmd.bat` and `startcmd.sh` files are in the directory where you installed the DITA-OT.
2. To provide the DITA-OT parameters from the command prompt, issue the following command:

   ```
   ant -Dargs.input=input-file -Dtranstype=transformation-type -Dparameter-
   name=value
   ```

   where:

   - *install-dir* is the DITA-OT installation directory path.
   - *input-file* is the DITA map or DITA file that you want to process.
   - *transformation-type* is the transformation type.
   - *parameter-name* is the name of an optional parameter.
   - *value* is an applicable value for the optional parameter.
   - *output-dir* is the output directory path for generated output.

   If you do not specify an output directory, the DITA-OT writes the output to the `install-dir/out` directory.
3. If you use a build script, issue the following command:

   ```
   ant -f build-script target
   ```

   where:

   - *build-script* is name of the Ant build script.
   - *target* is an optional switch that specifies the name of the Ant target that you want to run. If you do not specify a target, the value of the @default attribute for the Ant project is used.

Related concepts

Ant on page 26
Ant is a Java-based, open-source tool that is provided by the Apache Foundation. It can be used to declare a sequence of build actions. It is well suited for both development and document builds. The toolkit ships with a copy of Ant.

Related tasks

Creating an Ant build script on page 27
Instead of typing the DITA-OT parameters at the command prompt, you might want to create an Ant build script that contains all of the parameters.

Related reference

Ant parameters on page 63

Apache Ant documentation

Creating an Ant build script

Instead of typing the DITA-OT parameters at the command prompt, you might want to create an Ant build script that contains all of the parameters.

Procedure

1. Create an XML file that contains the following content:

   ```
   <?xml version="1.0" encoding="UTF-8" ?>
   <project name="@project-name@" default="@default-target@" basedir=".">
   ```

```
  <property name="dita.dir" location="@path-to-DITA-OT@"/>

  <target name="@target-name@">
    <ant antfile="${dita.dir}${file.separator}build.xml">
      <property name="args.input" value="@DITA-input@"/>
      <property name="transtype" value="html5"/>
    </ant>
  </target>

</project>
```

You will replace the placeholder content (indicated by the @ signs) with content applicable to your environment.

2. Specify project information:
   a) Set the value of the @name attribute to X.
   b) Set the value of the @default attribute to the name of a target in the build script.

      If the build script is invoked without specifying a target, this target will be run.
3. Set the value of the dita.dir property to the location of the DITA-OT.

   This can be a fully qualified path, or you can specify it relative to the location of the Ant build script that you are writing.
4. Create the Ant target:
   a) Set the value of the @name attribute.
   b) Specify the value for the args.input property.
   c) Specify the value of the transtype property.
5. Save the build script.

Example

The following Ant build script generates CHM and PDF output for the `userguide.ditamap` file.

```
<?xml version="1.0" encoding="UTF-8" ?>
<project name="Toolkit-documentation" default="all" basedir=".">

    <property name="dita.dir" location="C:\DITA-OT1.6.M5"/>

    <target name="all" description="build CHM and PDF"
 depends="chm,pdf"/>

    <target name="chm" description="build CHM">
        <ant antfile="${dita.dir}\build.xml">
            <property name="args.input" value="C:\dita-ot\src
\main\doc\userguide.ditamap"/>
            <property name="args.gen.task.lbl" value="YES"/>
            <property name="output.dir" value="C:\kje\temp\out"/
>
            <property name="transtype" value="htmlhelp"/>
        </ant>
    </target>

    <target name="pdf" description="build PDF">
        <ant antfile="${dita.dir}\build.xml">
            <property name="args.input" value="C:\dita-ot\src
\main\doc\userguide.ditamap"/>
            <property name="args.gen.task.lbl" value="YES"/>
            <property name="args.rellinks" value="nofamily"/>
            <property name="output.dir" value="C:\kje\temp\out"/
>
            <property name="transtype" value="pdf"/>
        </ant>
    </target>

</project>
```

In addition to the mandatory parameters (args.input and transtype), the chm and pdf targets each specify some optional parameters:

- The args.gen.task.lbl property is set to YES, which ensures that headings are automatically generated for the sections of task topics.
- The output.dir property specifies where the DITA-OT writes the output of the transformations.

The pdf target also specifies that related links should be generated in the PDF, but only those links that are created by relationship tables and <link> elements.

Finally, the all target simply specifies that both the chm and pdf target should be run.

What to do next

Another resource for learning about Ant scripts are the files in the `samples/ant_samples` directory. This directory contains the Ant build files used by the demo build, as well as templates that you can use to create Ant scripts.

Related concepts

Ant on page 26
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Related reference

Ant parameters on page 63

Apache Ant documentation

Chapter 5

Extending the DITA Open Toolkit

Topics:

Plug-ins can be used to extend the functionality and configure the DITA Open Toolkit.

Installing plug-ins

Plug-ins are distributed as zip files and can be installed using either the command line tool or Ant.

Procedure

Run plug-in installation process.

- Using the `dita` command line tool, run the installation command:

  ```
  dita -install plug-in-zip
  ```

- Using Ant, from the toolkit directory run the installation target:

  ```
  ant -f integrator.xml install -Dplugin.file=plug-in-zip
  ```

The *plug-in-zip* can be either a local file path or a URL.

Removing plug-ins

Plug-ins can be removed by running the uninstallation process.

Procedure

Run plug-in uninstallation process.

- Using the `dita` command line tool, run the uninstallation command:

  ```
  dita -uninstall plug-in-id
  ```

- Using Ant, from the toolkit directory run the uninstallation target:

  ```
  ant -f integrator.xml uninstall -Dplugin.id=plug-in-id
  ```

Chapter

6

Globalizing DITA content

Topics:

The DITA standard supports content that is written in or translated to any language. In general, the DITA Open Toolkit (DITA-OT) passes content through to the output format unchanged. The DITA-OT uses the values for the @xml:lang, @translate, and @dir attributes that are set in the source content to provide globalization support.

Related reference

Localization overview in the OASIS DITA standard

Modifying or adding generated text on page 109
Generated text is the term for strings that are automatically added by the build, such as "Note" before the contents of a <note> element.

Globalization support offered by the DITA-OT

The DITA Open Toolkit (DITA-OT) offers globalization support in the following areas: Generated text, index sorting, and bi-directional text.

Generated text	*Generated text* is text that is rendered automatically in the output that is generated by the DITA-OT; this text is not located in the DITA source files. The following are examples of generated text: • The word "Chapter" in a PDF file. • The phrases "Related concepts," "Related tasks," and "Related reference" in XHTML output.
Index sorting	The DITA-OT can use only a single language to sort indexes.
Bi-directional text	The DITA-OT contains style sheets (CSS files) that support both left-to-right (LTR) and right-to-left (RTL) languages.

When the DITA-OT generates output, it takes the first value for the @xml:lang attribute that it encounters, and then it uses that value to create generated text, perform index sorting, and determine which default CSS file is used. If no value for the @xml:lang attribute is found, the toolkit defaults to US English.

Supported languages: HTML-based transformations

The DITA Open Toolkit (DITA-OT) supports over 50 languages and language variants for the HTML-based transformations, for example, Eclipse Help, HTML Help, and TocJS.

Table 1: Supported languages: HTML-based transformations

Language	Language code
Arabic	ar or ar-eg
Belarusian	be or be-by
Brazilian Portuguese	pt-br
Bulgarian	bg or bg-bg
Catalan	ca-es
Chinese (simplified)	zh-cn or zh-hans
Chinese (traditional)	zh-tw or zh-hant
Croatian	hr or hr-hr
Czech	cs or cs-cz
Danish	da or da-dk
Dutch	nl or nl-nl
Dutch (Belgian)	nl-be
English (US)	en or en-us
English (British)	en-gb

Language	Language code
English (Canadian)	en-ca
Estonian	et or et-ee
Finnish	fi or fi-fi
French	fr or fr-fr
French (Belgian)	fr-be
French (Canadian)	fr-ca
French (Swiss)	fr-ch
German	de or de-de
German (Swiss)	de-ch
Greek	el or el-gr
Hebrew	he or he-il
Hindi	hi or hi-hi
Hungarian	hu or hu-hu
Icelandic	is or is-is
Indonesian	id or id-id
Italian	it or it-it
Italian(Swiss)	it-ch
Japanese	ja or ja-jp
Kazakh	kk or kk-kz
Korean	ko or ko-kr
Latvian	lv or lv-lv
Lithuanian	lt or lt-lt
Macedonian	mk or mk-mk
Malay	ms or ms-my
Norwegian	no or no-no
Polish	pl or pl-pl
Portuguese	pt or pt-pt
Romanian	ro or ro-ro
Russian	ru or ru-ru
Serbian (Cyrillic script)	sr, sr-rs, or sr-sp
Serbian (Latin script)	sr-latn-rs
Slovak	sk or sk-sk
Slovenian	sl or sl-si
Spanish	es or es-es

Language	Language code
Spanish (Latin American)	es-419
Swedish	sv or sv-se
Thai	th or th-th
Turkish	tr or tr-tr
Ukrainian	uk or uk-ua
Urdu	ur or ur-pk

Related reference

How to add support for new languages in XHTML on page 109
Generated text is the term for strings that are automatically added by the build, such as "Note" before the contents of a <note> element.

Supported languages: PDF transformations

The DITA Open Toolkit (DITA-OT) supports a smaller set of languages for the PDF (pdf2) transformation. This transformation was donated to the DITA-OT project after the project inception, and it uses a different and larger set of generated text than the HTML-based transformations.

Table 2: Supported languages: PDF transformation

Language	Language code
Chinese (simplified)	zh-cn or zh-hans
Dutch	nl or nl-nl
English (US)	en or en-us
Finnish	fi or fi-fi
French	fr or fr-fr
German	de or de-de
Hebrew	he or he-il
Italian	it or it-it
Japanese	ja or ja-jp
Romanian	ro or ro-ro
Russian	ru or ru-ru
Slovenian	sl or sl-SI
Spanish	es or es-es
Swedish	sv or sv-se

Chapter

7

Error messages and troubleshooting

Topics:

This section contains information about problems that you might encounter and how to resolve them.

DITA-OT error messages

The error messages generated by the DITA Open Toolkit contain a message ID, severity information, and message text. This topic lists each error message generated by the toolkit and provides additional information that might be helpful in understanding and resolving the error condition.

Each message ID is composed of a message prefix, a message number, and a letter that indicates the severity (I, W, E, or F). The toolkit uses the following severity scale:

Informational (I)	The toolkit encountered a condition of which you should be aware. For example, draft comments are enabled and will be rendered in the output.
Warning (W)	The toolkit encountered a problem that should be corrected. Processing will continue, but the output might not be as expected.
Error (E)	The toolkit encountered a more severe problem, and the output is affected. For example, some content is missing or invalid, or the content is not rendered in the output
Fatal (F)	The toolkit encountered a severe condition, processing stopped, and no output is generated.

Message ID	Severity	Message text	Additional details
DOTA001F	Fatal	"*%1*" is not a recognized transformation type. Supported transformation types are docbook, eclipsecontent, eclipsehelp, html5, htmlhelp, javahelp, odt, org.dita-ot.html, pdf, pdf2, tocjs, troff, wordrtf, xhtml.	Default transformation types that ship with the toolkit include xhtml, eclipsehelp, pdf (or pdf2), tocjs, htmlhelp, javahelp, odt, eclipsecontent, troff, docbook, and wordrtf. Additional transformation types may be available if toolkit plug-ins are installed.
DOTA002F	Fatal	Input file is not specified, or is specified using the wrong parameter.	The input parameter was not specified, so there is no DITA or DITAMAP file to transform. Ensure the parameter is set properly; see *DITA-OT Ant arguments* if you are unsure how to specify the input file.
DOTA003F	Fatal	Cannot find the user specified XSLT stylesheet '*%1*'.	An alternate stylesheet was specified to run in place of the default XSLT output process, but that stylesheet could not be loaded. Please correct the parameter to specify a valid stylesheet.
DOTA004F	Fatal	Invalid DITA topic extension '*%1*'. Supported values are '.dita' and '.xml'.	This optional parameter is used to set an extension for DITA topic documents in the temporary processing directory. Only "dita", ".dita", "xml", or ".xml" are allowed.
DOTA006W	Warning	Absolute paths on the local file system are not supported for the CSSPATH parameter. Please use a relative path or full URI instead.	If the CSSPATH uses an absolute path, it should be one that can still be accessed after the files are moved to another system (such as `http://www.example.org/`). Absolute paths on the local file system will be

Message ID	**Severity**	**Message text**	**Additional details**
			broken if the content is moved to a new system.
DOTA007E	Error	Cannot find the running-footer file "*%1*". Please double check the value to ensure it is specified correctly.	The running footer file, which contains content to be added to the bottom of each XHTML output topic, cannot be located or read. This is usually caused by a typo in the parameter value. You should also ensure that the value is not specified with "file:" as a prefix.
DOTA008E	Error	Cannot find the running-header file "*%1*". Please double check the value to ensure it is specified correctly.	The running header file, which contains content to be added to the top of each XHTML output topic, cannot be located or read. This is usually caused by a typo in the parameter value. You should also ensure that the value is not specified with "file:" as a prefix.
DOTA009E	Error	Cannot find the specified heading file "*%1*". Please double check the value to ensure it is specified correctly.	The running heading file, which contains content to be added to the <head> section of each XHTML output topic, cannot be located or read. This is usually caused by a typo in the parameter value. You should also ensure that the value is not specified with "file:" as a prefix.
DOTA011W	Warning	Argument "*%1*" is deprecated. This argument is no longer supported in the toolkit.	
DOTA012W	Warning	Argument "*%1*" is deprecated. Please use the argument "*%2*" instead.	
DOTA013F	Fatal	Cannot find the specified DITAVAL '*%1*'.	
DOTA066F	Fatal	Cannot find the user specified XSLT stylesheet '*%1*'.	An alternate stylesheet was specified to run in place of the default XSL-FO output process, but that stylesheet could not be loaded. Please correct the parameter to specify a valid stylesheet.
DOTA067W	Warning	Ignoring index-see '*%1*' inside parent index entry '*%2*' because the parent indexterm contains indexterm children. According to the DITA Specification, the index-see element should be ignored if the parent indexterm contains other indexterm children.	This condition is ignored, as instructed in the OASIS DITA Standard.
DOTA068W	Warning	Ignoring index-see-also '*%1*' inside parent index entry '*%2*' because the parent indexterm contains indexterm children. According to the DITA Specification, the index-see-also element should be ignored if the parent	This condition is ignored, as instructed in the OASIS DITA Standard.

Message ID	**Severity**	**Message text**	**Additional details**
		indexterm contains other indexterm children.	
DOTA069F	Fatal	Input file '*%1*' cannot be located or read. Ensure that file was specified properly and that you have permission to access it.	Please ensure that the input file path and file name were entered correctly.
DOTA069W	Warning	Target "*%1*" is deprecated. Remove references to this target from your custom XSLT or plug-ins.	
DOTJ005F	Fatal	Failed to create new instance for '*%1*'. Please ensure that '*%1*' exists and that you have permission to access it.	
DOTJ007E	Error	Duplicate condition in filter file for rule '*%1*'. The first encountered condition will be used.	
DOTJ009E	Error	Cannot overwrite file '*%1*' with file '*%2*'. The modified result may not be consumed by the following steps in the transform pipeline. Check to see whether the file is locked by some other application during the transformation process.	The transform was unable to create files properly during the transform; results may not be as expected.
DOTJ012F	Fatal	Failed to parse the input file '*%1*'.	This message may indicate an invalid input file (such as accidentally specifying a PDF file as input rather than a DITA map file), an input file that uses elements which are not allowed, are not part or a DITA file that has errors and cannot be parsed as XML. You could also be using a specialized DITA document type that needs external plug-ins in order to be parsed correctly. The message issued by the XML parser should provide additional information to help diagnose the cause.
DOTJ013E	Error	Failed to parse the referenced file '*%1*'.	This message may indicate a reference to an invalid file (such as accidentally referencing a PDF or unknown XML file as if it was DITA), a referenced file that uses elements which are not allowed, or a referenced DITA file that has errors and cannot be parsed as XML. You could also be using a specialized DITA document type that needs external plug-ins in order to be parsed correctly. The message issued by the XML parser should provide additional information to help diagnose the cause.

Message ID	Severity	Message text	Additional details
DOTJ014W	Warning	Found an indexterm element with no content. Setting the term to ***.	An empty <indexterm> element was found, and will appear in the index as ***. This index term should be removed from the source.
DOTJ018I	Informational	Log file '*%1*' was generated successfully in directory '*%2*'. Any messages from the transformation process are available in the log file; additional details about each message are available in the DITA-OT user guide.	
DOTJ020W	Warning	At least one plug-in in '*%1*' is required by plug-in '*%2*'. Plug-in '*%2*' cannot be loaded. Check and see whether all prerequisite plug-ins are installed in toolkit.	This will appear when one installed plug-in requires another in order to function correctly, but the required plug-in is not found. The installed plug-in will be ignored.
DOTJ021W	Warning	File '*%1*' will not generate output since it is invalid or all of its content has been filtered out by the ditaval file. Please check the file '*%1*' and the ditaval file to see if this is the intended result.	This may appear if filter conditions on the root element of a topic cause the entire topic to be filtered out. To remove this message, you could place any filter conditions on the reference to this file, which will prevent the build from accessing this file.
DOTJ022F	Fatal	Failed to parse the input file '*%1*' because all of its content has been filtered out. This will happen if the input file has filter conditions on the root element, and a ditaval excludes all content based on those conditions.	Either the input file or the ditaval file should change, otherwise your build is explicitly excluding all content.
DOTJ023E	Error	Failed to get the specified image file '*%1*', so it will not be included with your output.	Check whether the image exists in the source location or already exists in the output directory.
DOTJ025E	Error	The input to the "topic merge" transform process could not be found. Correct any earlier transform errors and try the build again, or see the DITA-OT User Guide for additional causes.	This message should only appear in the following cases: • Errors earlier in the transform prevented this step of the transform from running; correct any errors and try the build again. • An Ant build or plug-in is directly calling the toolkit's topic merge module, and is doing so improperly; in this case the Ant build or plug-in needs to be fixed. • In the past, problems have been encountered when calling this module with an absolute path; this should no longer be an issue, but may be fixed in older releases by updating the Ant build or plug-in.

Message ID	**Severity**	**Message text**	**Additional details**
DOTJ026E	Error	The "topic merge" did not generate any output. Correct any earlier transform errors and try the build again, or see the DITA-OT User Guide for additional causes.	This message should only appear if an Ant build or plug-in is directly calling the toolkit's topic merge module, or if earlier errors resulted in problems with some of the content. If the topic merge module is called correctly, then this indicates a program error that should be reported to the DITA-OT development team, at *DITA-OT bug and feature tracker*.
DOTJ028E	Error	No format attribute was found on a reference to file '*%1*', which does not appear to be a DITA file. If this is not a DITA file, set the format attribute to an appropriate value, otherwise set the format attribute to "dita".	When referencing a non-DITA file, the format attribute should indicate the type of file referenced (such as "html" for HTML topics or "pdf" for PDF files). Otherwise, the transform may attempt to parse the referenced document as a DITA topic.
DOTJ029I	Informational	No 'domains' attribute was found for element '<*%1*>'. This generally indicates that your DTD or Schema was not developed properly according to the DITA specification.	The domains attribute is used in specialized DITA documents to help determine which domain elements are legal. This message will only appear if DITA specialization was not defined properly.
DOTJ030I	Informational	No 'class' attribute for was found for element '<*%1*>'. This generally indicates that your DTD or Schema was not developed properly according to the DITA specification.	All specialized DITA elements must define a class attribute to provide ancestry information. This message will only appear a specialized DITA element did not define a class attribute.
DOTJ031I	Informational	No specified rule for '*%1*' was found in the ditaval file. This value will use the default action, or a parent prop action if specified. To remove this message, you can specify a rule for '*%1*' in the ditaval file.	This informational message is intended to help you catch filter conditions that may have been specified improperly; if the value is correct, no action is needed.
DOTJ033E	Error	No valid content is found in topicref '*%1*' during chunk processing. Please specify an existing and valid topic for the topicref.	
DOTJ034F	Fatal	Failed to parse the input file '*%1*' (the content of the file is not valid). If the input file '*%1*' does not have a DOCTYPE declaration, please make sure that all class attributes are present in the file.	DITA processing is based on class attributes defined for every element. Usually these are defaulted in the DTD or Schema; if no DTD or Schema is used, the class attributes must be explicitly included in the map or topic.
DOTJ035F	Fatal	The file "*%1*" referenced by "*%2*" is outside the scope of the input dita/map directory. If you want to lower the severity level, please use the Ant parameter 'outer.control', and set the value to "warn" or "quiet". Otherwise,	This will appear when a topic is outside the scope of the map; for example, if the main input map references "`../other-directory/some.dita`". The result would cause an output file to be created outside of the output

Message ID	**Severity**	**Message text**	**Additional details**
		move the referenced file "*%1*" into the input dita/map directory.	directory. See *DITA-OT Ant arguments (outer.control and generate.copy.outer)* for details.
DOTJ036W	Warning	The file "*%1*" referenced by "*%2*" is outside the scope of the input dita/map directory. If you do not want to see the warning message, please use the Ant parameter 'outer.control', and set the value to "quiet". Otherwise, move the referenced file "*%1*" into the input dita/map directory.	This will appear when a topic is outside the scope of the map; for example, if the main input map references "`../other-directory/some.dita`". The result would cause an output file to be created outside of the output directory. See *DITA-OT Ant arguments (outer.control and generate.copy.outer)* for details.
DOTJ037W	Warning	The XML schema and DTD validation function of the parser is turned off. Please make sure the input is normalized DITA with class attributes included, otherwise it will not be processed correctly.	DITA processing is based on class attributes defined for every element. Usually these are defaulted in the DTD or Schema; if validation against the DTD or Schema is turned off, the class attributes must be explicitly included in the map or topic.
DOTJ038E	Error	The tag "*%1*" is specialized from unrecognized metadata. Please make sure that tag "*%1*" is specialized from an existing metadata tag in the core DITA vocabulary.	This appears to indicate an error in creating specialized metadata elements. Please verify that the document type you are using is complete and complies with DITA Specialization rules.
DOTJ039E	Error	There is no target specified for conref push action "pushafter". Found in file="*%1*", element="*%2*". Please add <elementname conref="pushtarget" conaction="mark"> before current element.	Please see the topic on *Conref Push* in the DITA specification for details on expected syntax for this function.
DOTJ040E	Error	An element uses the attribute conaction="replace", but a conref attribute is not found in the expected location. Found in file="*%1*", element="*%2*".	Please see the topic on *Conref Push* in the DITA specification for details on expected syntax for this function.
DOTJ041E	Error	The attribute conref="*%1*" uses invalid syntax. The value should contain '#' followed by a topic or map ID, optionally followed by '/elemID' for a sub-topic element.	The conref attribute must be a URI reference to a DITA element. Please see the topic on *URI-based addressing* in the DITA specification for details on the expected syntax.
DOTJ042E	Error	Two elements both use conref push to replace the target "*%1*". Please delete one of the duplicate "replace" actions.	The conref push function was used to replace a single element with two or more alternatives. Only one element may directly replace another using conref push. See *Conref Push* in the DITA specification for more information about the conref push "replace" function.

Message ID	**Severity**	**Message text**	**Additional details**
DOTJ043W	Warning	The conref push function is trying to replace an element that does not exist (element "*%1*" in file "*%2*").	The target for a conref push action does not exist; please make sure that the syntax is correct and that the target exists. See the topic on *URI-based addressing* in the DITA specification for details on the expected syntax. If the syntax is correct, it is possible that the target was filtered out of your build using a DITAVAL file.
DOTJ044W	Warning	There is a redundant conref action "pushbefore". Found in file="*%1*", element="*%2*". Please make sure that "mark" and "pushbefore" occur in pairs.	Please see the topic on *Conref Push* in the DITA specification for details on expected syntax for this function.
DOTJ045I	Informational	The key "*%1*" is defined more than once in the same map file. The reference href="*%2*" is ignored.	No response is needed if the keys are defined as expected; this is informational only, to help catch incorrectly defined keys.
DOTJ046E	Error	Conkeyref="*%1*" can not be resolved because it does not contain a key or the key is not defined. The build will use the conref attribute for fallback, if one exists.	See *the conkeyref definition* for details on expected syntax and usage.
DOTJ047I	Informational	Unable to find key definition for keyref="*%1*", href may be used as fallback if it exists.	This message is intended to help you locate incorrectly specified keys; if the key was specified correctly, this message may be ignored.
DOTJ049W	Warning	The attribute value *%1*="*%3*" on element "*%2*" does not comply with the specified subject scheme. According to the subject scheme map, the following values are valid for the *%1* attribute: *%4*	A DITA Subject Scheme map was used to limit values that are available to the specified attribute. Please correct the attribute so that it uses one of the allowed values.
DOTJ050W	Warning	Found an <index-see> or <index-see-also> reference to the term '*%1*', but that term is not defined in the index.	The Eclipse index will contain a value such as "See also otherEntry", but otherEntry does not exist in this index. The index reference will be broken unless this plug-in is *always* loaded into Eclipse with another plug-in that defines otherEntry as an index term.
DOTJ051E	Error	Unable to load target for coderef "*%1*".	The target for a coderef element, which specifies an external text-based file, could not be located or loaded. Please verify that the reference is correct. Note that for security reasons, references to code samples outside of the scope of the map directory are not supported by default, as this could allow a reference to access and display any restricted or hidden file on the system. If you are

Message ID	**Severity**	**Message text**	**Additional details**
			certain that the path is valid and the file should be loaded, the current workaround is to set a parameter to allow these references. See *DITA-OT Ant arguments (outer.control and generate.copy.outer)* for details.
DOTJ052E	Error	Code reference charset "*%1*" not supported. See the DITA-OT User guide for supported charset values on the format attribute.	The DITA-OT supports a special syntax on coderef elements to specify the character set of the target document. See *Extended functionality* on page 129 for details on the expected syntax.
DOTJ053W	Warning	Input file '*%1*' is not valid DITA file name. Please check '*%1*' to see if it is correct. The extensions ".dita" or ".xml" are supported for DITA topics.	By default, the DITA-OT supports the extensions "dita" and "xml" for DITA topics, as mandated by the DITA Specification. Please verify that your topics use one of these extensions, or configure the toolkit to allow additional extensions.
DOTJ054E	Error	Unable to parse invalid *%1* attribute value "*%2*"	
DOTJ055E	Error	Invalid key name "*%1*".	
DOTJ056E	Error	Invalid xml:lang "*%1*".	
DOTJ057E	Error	The id attribute value "*%1*" is not unique within the topic that contains it.	
DOTJ058E	Error	Both *%1* and *%2* attributes defined. A single element may not contain both generalized and specialized values for the same attribute.	
DOTJ059E	Error	Invalid key scope name "*%1*".	
DOTJ060W	Warning	Key "*%1*" was used in conkeyref but is not bound to a DITA topic or map. Cannot resolve conkeyref value "*%2*" as a valid conref reference.	
DOTJ061E	Error	Topic reference target is a DITA map but format attribute has not been set. Set format attribute value to "ditamap".	
DOTJ062E	Error	Invalid *%1* attribute value "*%2*".	
DOTJ063E	Error	The cols attibute is "*%1*" but number of colspec elements was *%2*.	
DOTJ064W	Warning	Chunk attribute uses both "to-content" and "by-topic" that conflict with each other. Ignoring "by-topic" token.	
DOTX001W	Warning	No string named '*%1*' was found for language '*%2*'. Using the default language '*%3*'. Add a mapping between	This build uses generated text, such as the phrase "Related information" (which is generated above

Message ID	Severity	Message text	Additional details
		default language and desired language for the string '*%1*'.	many link groups). The toolkit was unable to locate the string *%1* for your specified language, so the string will appear in the default language. This generally indicates that the toolkit's strings needs to be updated to support your language, or that your language setting is incorrect.
DOTX002W	Warning	The title element or attribute in the ditamap is required for Eclipse output.	The Eclipse help system requires a title in the project files generated from your map. Please add a title to your input map to get valid Eclipse help output.
DOTX003I	Informational	The anchorref attribute should either reference another dita map or an Eclipse XML TOC file. The value '*%1*' does not appear to reference either.	Eclipse uses anchor references to connect with other TOC files. For this to work in content generated from a DITA map, the anchorref element must reference either an existing Eclipse TOC XML file, or another DITA map (which will presumably also be converted to an Eclipse TOC).
DOTX004I	Informational	Found a navref element that does not reference anything. The navref element should either reference another dita map or an Eclipse XML file.	Eclipse builds use DITA's <navref> element to pull in other Eclipse TOC files. The build found a <navref> element that does not reference any other file; the element will be ignored.
DOTX005E	Error	Unable to find navigation title for reference to '*%1*'. The build will use '*%1*' as the title in the Eclipse Table of Contents.	To remove this message, provide a navigation title for the referenced object in the map or topic, or ensure that you are referencing a valid local DITA target.
DOTX006E	Error	Unknown file extension in href="*%1*". References to non-DITA resources should set the format attribute to match the resource (for example, 'txt', 'pdf', or 'html').	Set the format attribute to identify the format of the file. If the reference is to a DITA document, ensure that the document uses a valid DITA extension (default supported extensions are "dita" and "xml").
DOTX007I	Informational	Only DITA topics, HTML files, and images may be included in your compiled CHM file. The reference to "*%1*" will be ignored. To remove this message, you can set the toc="no" or processing-role="resource-only" attribute on your topicref.	The HTML Help compiler will only include some types of information in the compiled CHM file; the current reference will not be included.
DOTX008E	Error	File '*%1*' does not exist or cannot be loaded.	Ensure that the file exists and can be read. Note that the name of the file in this message may have be changed to use a standard dita topic file extension ('.dita' or '.xml'), instead of the original extension used by the file; it may

Message ID	**Severity**	**Message text**	**Additional details**
			also include a path to the temporary directory rather than to the original.
DOTX008W	Warning	File '*%1*' cannot be loaded, and no navigation title is specified for the table of contents.	To fix the table of contents, specify a navigation title in your map or ensure that the referenced file is local and can be accessed. Note that the name of the file in this message may have be changed to use a standard dita topic file extension ('.dita' or '.xml'), instead of the original extension used by the file; it may also include a path to the temporary directory rather than to the original.
DOTX009W	Warning	Could not retrieve a title from '*%1*'. Using '*%2*' instead.	No title was found in the specified topic, so the table of contents will use the indicated fallback value for this topic.
DOTX010E	Error	Unable to find target for conref="*%1*".	The conref attribute must be a URI reference to an existing DITA element. Please see the topic on *URI-based addressing* in the DITA specification for details on the expected syntax. Note that the name of the file in this message may have be changed to use a standard dita topic file extension ('.dita' or '.xml'), instead of the original extension used by the file; it may also include a path to the temporary directory rather than to the original. If the target element exists in your source file, check to make sure it is not filtered out of the build with a DITAVAL file (which will remove the target before conref processing runs).
DOTX011W	Warning	There is more than one possible target for the reference conref="*%1*". Only the first will be used. Remove the duplicate id in the referenced file.	When pulling content with a conref attribute, you may only pull from a single element, but the target ID appears twice in the referenced topic. Note that the name of the file in this message may have be changed to use a standard dita topic file extension ('.dita' or '.xml'), instead of the original extension used by the file; it may also include a path to the temporary directory rather than to the original.
DOTX012W	Warning	When you conref another topic or an item in another topic, the domains attribute of the target topic must be equal to or a subset of the current topic's domains attribute. Put your target under an appropriate domain.	This message is deprecated and should no longer appear in any logs.

Message ID	**Severity**	**Message text**	**Additional details**
		You can see the messages guide for more help.	
DOTX013E	Error	A element with attribute conref="*%1*" indirectly includes itself, which results in an infinite loop.	This may appear if (for example) you have a `<ph>` element that references another phrase, but that phrase itself contains a reference to the original. This will result in an infinite loop. The toolkit will stop following the conref trail when this is detected; you will need to correct the reference in your source files. Note that the name of the file in this message may have be changed to use a standard dita topic file extension ('.dita' or '.xml'), instead of the original extension used by the file; it may also include a path to the temporary directory rather than to the original.
DOTX014E	Error	The attribute conref="*%1*" uses invalid syntax. Conref references to a map element should contain '#' followed by an ID, such as mymap.ditamap#mytopicrefid.	The conref attribute must be a URI reference to a DITA element. Please see the topic on *URI-based addressing* in the DITA specification for details on the expected syntax.
DOTX015E	Error	The attribute conref="*%1*" uses invalid syntax. The value should contain '#' followed by a topic or map ID, optionally followed by '/elemID' for a sub-topic element.	The conref attribute must be a URI reference to a DITA element. Please see the topic on *URI-based addressing* in the DITA specification for details on the expected syntax. Note that the name of the file in this message may have be changed to use a standard dita topic file extension ('.dita' or '.xml'), instead of the original extension used by the file; it may also include a path to the temporary directory rather than to the original.
DOTX016W	Warning	A reference to "*%2*" appears to reference a DITA document, but the format attribute has inherited a value of "*%1*". The document will not be processed as DITA.	This warning is intended to catch instances where a non-DITA format setting unexpectedly cascades to a DITA topic, which will prevent the topic from being processed. To remove this message, set the format attribute directly on the indicated reference. Note that the name of the file in this message may have be changed to use a standard dita topic file extension ('.dita' or '.xml'), instead of the original extension used by the file; it may also include a path to the temporary directory rather than to the original.
DOTX017E	Error	Found a link or cross reference with an empty href attribute (href=""). Remove	Found a value such as <xref href="">link text</xref>. The empty

Message ID	Severity	Message text	Additional details
		the empty href attribute or provide a value.	href attribute is not serving a purpose and has caused problems with some tools in the past; you should remove the attribute entirely or specify a value.
DOTX018I	Informational	The type attribute on a topicref was set to '*%1*', but the topicref references a more specific '*%2*' topic. Note that the type attribute cascades in maps, so the value '*%1*' may come from an ancestor topicref.	The type attribute in DITA is intended to describe the type of the target; for example, a reference to a concept topic may use type="concept". Generally, this attribute is optional, and the DITA-OT build will automatically determine the value during processing. In this case, the type attribute lists a more general type than what is actually found. This is not an error but may result in unexpected sorting for links to this topic.
DOTX019W	Warning	The type attribute on a topicref was set to '*%1*', but the topicref references a '*%2*' topic. This may cause your links to sort incorrectly in the output. Note that the type attribute cascades in maps, so the value '*%1*' may come from an ancestor topicref.	The type attribute in DITA is intended to describe the type of the target; for example, a reference to a concept topic may use type="concept". Generally, this attribute is optional, and the DITA-OT build will automatically determine the value during processing. In this case, the specified type value does not match the target, which may cause your links to sort inappropriately.
DOTX020E	Error	Missing navtitle attribute or element for peer topic "*%1*". References must provide a local navigation title when the target is not a local DITA resource.	The DITA-OT is only able to dynamically retrieve titles when the target is a local (not peer or external) DITA resource.
DOTX021E	Error	Missing navtitle attribute or element for non-DITA resource "*%1*". References must provide a local navigation title when the target is not a local DITA resource.	The DITA-OT is only able to dynamically retrieve titles when the target is a local DITA resource.
DOTX022W	Warning	Unable to retrieve navtitle from target: '*%1*'. Using linktext (specified in topicmeta) as the navigation title.	The build was unable to get a title from the referenced topic; instead, a navigation title will be created based on the specified <linktext> element inside of <topicmeta>.
DOTX023W	Warning	Unable to retrieve navtitle from target: '*%1*'.	If the target is a local DITA topic, ensure the reference is correct and the topic is available. Otherwise, provide a navigation title, and ensure the scope and format attributes are set appropriately.
DOTX024E	Error	Missing linktext and navtitle for peer topic "*%1*". References must provide a local navigation title when the target is not a local DITA resource.	The DITA-OT is only able to dynamically retrieve titles and link text when the target is a local (not peer or external) DITA resource.

Message ID	**Severity**	**Message text**	**Additional details**
DOTX025E	Error	Missing linktext and navtitle for non-DITA resource "*%1*". References must provide a local navigation title when the target is not a local DITA resource.	The DITA-OT is only able to dynamically retrieve titles when the target is a local DITA resource.
DOTX026W	Warning	Unable to retrieve linktext from target: '*%1*'. Using navigation title as fallback.	The referenc to this document did not specify any link text for generated map-based links; the navigation title will be used as fallback.
DOTX027W	Warning	Unable to retrieve linktext from target: '*%1*'.	The referenced file did not specify any link text for generated map-based links, and no fallback text could be located. Any links generated from this reference will have incorrect link text.
DOTX028E	Error	Link or cross reference must contain a valid href or keyref attribute; no link target is specified.	The link or cross reference has no target specified and will not generate a link.
DOTX029I	Informational	The type attribute on a *%1* element was set to *%3*, but the reference is to a more specific *%4 %2*. This may cause your links to sort incorrectly in the output.	The type attribute in DITA is intended to describe the type of the target; for example, a reference to a concept topic may use type="concept". Generally, this attribute is optional, and the DITA-OT build will automatically determine the value during processing. In this case, the type attribute lists a more general type than what is actually found. This is not an error but may result in unexpected sorting for links to this topic.
DOTX030W	Warning	The type attribute on a *%1* element was set to *%3*, but the reference is to a *%4 %2*. This may cause your links to sort incorrectly in the output.	The type attribute in DITA is intended to describe the type of the target; for example, a reference to a concept topic may use type="concept". Generally, this attribute is optional, and the DITA-OT build will automatically determine the value during processing. In this case, the specified type value does not match the target, which may cause your links to sort inappropriately.
DOTX031E	Error	The file *%1* is not available to resolve link information.	The build attempted to access the specified file in order to retrive a title or short description, but the file could not be found. If the file exists, it is possible that a DITAVAL file was used to remove the file's contents from the build. Be aware that the path information above may not match the link in your topic.
DOTX032E	Error	Unable to retrieve link text from target: '*%1*'. If the target is not accessible at build time, or does not have a	When a link or cross reference does not have content, the build will attempt to pull the target's title for use as link text.

Message ID	Severity	Message text	Additional details
		title, provide the link text inside the reference.	If the target is unavailable, be sure to set the scope attribute to an appropriate value. If the target does not have a title (such as when linking to a paragraph), be sure to provide link text inside the cross reference.
DOTX033E	Error	Unable to generate link text for a cross reference to a list item: '*%1*'	An <xref> element specifies type="li", which indicates a link to a list item, but the item number could not be determined to use as link text. Please specify link text inside the reference, or ensure that you are referencing an available list item.
DOTX034E	Error	Unable to generate link text for a cross reference to an undered list item: '*%1*'	The cross reference goes to a list item in an unordered list. The process could not automatically generate link text because the list item is not numbered. Please provide link text within the cross reference.
DOTX035E	Error	Unable to generate the correct number for a cross reference to a footnote: '*%1*'	An <xref> element specifies type="fn", which indicates a link to a footnote, but the footnote number could not be determined to use as link text. Please specify link text inside the reference, or ensure that you are referencing an available footnote.
DOTX036E	Error	Unable to generate link text for a cross reference to a dlentry (the dlentry or term could not be found): '*%1*'	An <xref> element specifies type="dlentry", which indicates a link to a definition list entry, but the term could not be located to use as link text. Please specify link text inside the reference, or ensure that you are referencing an available definition list entry
DOTX037W	Warning	No title found for this document; using "***" in XHTML title bar.	No title was found for the current document, so the XHTML output file will set the <title> to "***". This value generally appears in the title bar at the top of a browser.
DOTX038I	Informational	The longdescref attribute on tag '*%1*' will be ignored. Accessibility for object elements needs to be handled another way.	The <object> element in XHTML does not support using longdescref for accessibility. To make the object accessible, you may need to add text before or after the element. You may also be able to handle it with a <param> element inside the object.
DOTX039W	Warning	Required cleanup area found. To remove this message and hide the content, build your content without using the DRAFT parameter.	This message is generated when creating draft output in order to help you locate all topics that need to be cleaned up; the cleanup items will

Message ID	Severity	Message text	Additional details
			appear in your output with styling that makes it stand out. The content will be hidden when the draft parameter is not active.
DOTX040I	Informational	Draft comment area found. To remove this message and hide the comments, build your content without using the DRAFT parameter.	This message is generated when creating draft output in order to help you locate all topics that have draft comments. Each comment will appear in your XHTML output; the comments will be hidden when the draft parameter is not active.
DOTX041W	Warning	Found more than one title element in a section. Using the first one for the section's title.	Because of the way XML and DITA are defined, it is generally not possible to prohibit adding a second title to a section during editing (or to force that title to come first). However, the DITA specification states that only one title should be used in a section. When multiple titles are found, only the first one will appear in the output.
DOTX042I	Informational	DITAVAL based flagging is not currently supported for inline phrases in XHTML; ignoring flag value on '*%1*' attribute.	If it is important to flag this piece of information, try placing a flag on the block element that contains your phrase. If you just want to have an image next to the phrase, you may place an image directly into the document.
DOTX043I	Informational	The link to '*%1*' may appear more than once in '*%2*'.	The DITA-OT is able to remove duplicate links in most cases. However, if two links to the same resource use different attributes or link text, it is possible for them to appear together. For example, if the same link shows up with role="next" and again with no specified role, it may show up as both the "Next topic" link and as a related link. Note that links generated from a <reltable> in a DITA Map will have the role attribute set to "friend".
DOTX044E	Error	The area element in an image map does not specify a link target. Please add an xref element with a link target to the area element.	The <area> element in an image map must provide a link target for the specified area. Please add an <xref> element as a child of <area> and ensure that it specifies a link target.
DOTX045W	Warning	The area element in an image map should specify link text for greater accessibility. Link text should be specified directly when the target is not a local DITA resource.	Cross reference text inside the <area> element is used to provide accessibility for screen readers that can identify different areas of an image map. If text cannot be retrieved automatically by referencing a DITA element, it

Message ID	Severity	Message text	Additional details
			should be specified directly in the cross reference.
DOTX046W	Warning	Area shape should be: default, rect, circle, poly, or blank (no value). The value '*%1*' is not recognized.	The specified value was passed as-is through to the area element in the XHTML.
DOTX047W	Warning	Area coordinates are blank. Coordinate points for the shape need to be specified.	The area element is intended to define a region in an image map; coordinates must be specified in order to define that region.
DOTX048I	Informational	In order to include peer or external topic '*%1*' in your help file, you may need to recompile the CHM file after making the file available.	The build will not look for peer or external topics before compiling your CHM file, so they may not be included. If you are referencing an actual HTML file that will not be available, it cannot be included in the project, and you should set the toc attribute to "no" on your topicref element. Otherwise, check to be sure your HTML file was included in the CHM; if it was not, you will need to place it in the correct location with your other output files and recompile.
DOTX049I	Informational	References to non-dita files will be ignored by the PDF, ODT, and RTF output transforms.	The PDF, ODT, and RTF output processes cannot automatically convert non-DITA content into DITA in order to merge it with the rest of your content. The referenced items are ignored.
DOTX050W	Warning	Default id "org.sample.help.doc" is used for Eclipse plug-in. If you want to use your own plug-in id, please specify it using the id attribute on your map.	Eclipse requires that an ID be specified when creating an Eclipse Help project; the toolkit expects to locate that ID on the root element of your input map.
DOTX052W	Warning	No string named '*%1*' was found when creating generated text; using the value '*%1*' in your output file.	The toolkit is attempting to add generated text, such as the string "Related information" that appears above links. The requested string could not be found in any language. Your output may contain a meaningful string, or it may contain a code that was intended to map to a string. This likely indicates an error in a plug-in or XSL override; either the string was requested incorrectly, or you will need to provide a mapping for the string in all of the languages you require.
DOTX053E	Error	A element that references another map indirectly includes itself, which results in an infinite loop. The original map reference is to '*%1*'.	This will occur if a map references another map, and then that second map (or another further nested map) references the original map. The result is an infinite nesting of maps; please

Message ID	**Severity**	**Message text**	**Additional details**
			correct the chain of map references to remove circular reference.
DOTX054W	Warning	Conflict text style is applied on the current element based on DITAVAL flagging rules. Please check ditaval and dita source to make sure there is no style conflict on the element which needs to be flagged.	This will occur when a DITAVAL file contains multiple styling rules that apply to the same element.
DOTX055W	Warning	Customized stylesheet uses deprecated template "flagit". Conditional processing is no longer supported using this template. Please update your stylesheet to use template "start-flagit" instead of deprecated template "flagit".	The "flagit" named template was deprecated in DITA-OT version 1.4, when the OASIS standard formalized the DITAVAL syntax. The template is removed in DITA-OT 1.6. Stylesheets that used this template need to be updated.
DOTX056W	Warning	The file '*%1*' is not available to resolve link information.	The build attempted to access the specified file in order to retrive a title or short description, but the file could not be found. If the file exists, it is possible that a DITAVAL file was used to remove the file's contents from the build. Another possibility is that the file is located outside of the scope of the main input directory, and was not available because the *onlytopic.in.map* parameter was specified. Be aware that the path information above may not match the link in your topic.
DOTX057W	Warning	The link or cross reference target '*%1*' cannot be found, which may cause errors creating links or cross references in your output file.	The link appears to use valid syntax to reference a DITA element, but that element cannot be found. Please verify that the element exists, and is not removed from the build by DITAVAL based filtering.
DOTX058W	Warning	No glossary entry was found associated with key '*%1*' on *%2* element. The build will try to determine the best display text and hover text for terms and abbreviations.	Processing for terms, acronyms, or abbreviated forms will associate the key from the element's keyref attribute with a glossentry (glossary entry) topic. This message will appear if the key was defined, but was not associated with a glossentry topic. The process will try to use the best available fallback (usually the title of the referenced topic).
DOTX060W	Warning	Key '*%1*' was used in an abbreviated-form element, but the key is not associated with a glossary entry. Abbreviated-form should ONLY be used to reference to a glossary entry.	Processing for abbreviated form elements will associate the key from the element's keyref attribute with a glossentry (glossary entry) topic. This message will appear if the key was defined, but was not associated with a glossentry topic. This element is only supported with keys that are associated

Message ID	**Severity**	**Message text**	**Additional details**
			with glossary topics; the element will not generate any output. Please correct the reference, or use a different element to reference your topic.
DOTX061W	Warning	ID '*%1*' was used in topicref tag but did not reference a topic element. The href attribute on a topicref element should only reference topic level elements.	According to the DITA Specification, references from maps should either go to DITA Maps, DITA Topics, or any non-DITA resource. References below the topic level should only be made from cross references (using <xref> or similar) inside of a topic. For details, see the href attribute description in the OASIS standard's definition of the *topicref element*.
DOTX062I	Informational	It appears that this document uses constraints, but the conref processor cannot validate that the target of a conref is valid. To enable constraint checking, please upgrade to an XSLT 2.0 processor.	
DOTX063W	Warning	The dita document '*%1*' is linked to from your content, but is not referenced by a topicref tag in the ditamap file. Include the topic in your map to avoid a broken link.	This will appear when generating PDF or ODT output that includes a link to a local topic, but the referenced topic is not part of the map itself. This will result in a broken link. You should include the topic in your map or remove the link from the build.
DOTX064W	Warning	The copy-to attribute [copy-to="*%1*"] uses the name of a file that already exists, so this attribute is ignored.	The copy-to attribute is used to copy a topic over a document that already exists. Please make sure that any copy-to attributes use a unique name so that the copy will not overwrite existing content.
DOTX065W	Warning	Two unique source files each specify copy-to="*%2*", which results in a collision. The value associated with href="*%1*" is ignored.	Two different topics are copied to the same location using copy-to; as a result, one of these files would be over-written. Only the first instance of this copy-to value will be recognized. Please correct the use of copy-to attributes.
DOTX066W	Warning	Template "*%1*" is deprecated. Remove references to this template from your custom XSLT or plug-ins.	This message indicates that your custom XSLT or plug-ins rely on templates that will be removed in an upcoming release. Typically this occurs when a named template has been converted to a mode template; any code that uses the deprecated template should be updated.

Message ID	**Severity**	**Message text**	**Additional details**
DOTX067E	Error	No string named '*%1*' was found for language '*%2*'. Add a mapping for the string '*%1*'.	This PDF build uses generated text, such as the phrase "Related information" (which is generated above many link groups). The toolkit was unable to locate the string *%1* for your specified language, so the string will appear in the default language. This generally indicates that the toolkit's strings needs to be updated to support your language, or that your language setting is incorrect.
DOTX068W	Warning	A topicref element that references a map contains child topicref elements. Child topicref elements are ignored.	
DOTX069W	Warning	Template mode "*%1*" is deprecated. Remove references to this template mode from your custom XSLT or plug-ins.	
DOTX070W	Warning	Target "*%1*" is deprecated. Remove references to this target from your custom Ant files.	
PDFJ001E	Error	Index entry '*%1*' is dropped, because corresponding group is not found.	
PDFJ002E	Error	Build stopped. Problems occured during Index preprocess task. Please check the messages above.	
PDFX001W	Warning	There is no index entry found which closing range for ID="*%1*".	
PDFX002W	Warning	There are multiple index entry found which is opening range for ID="*%1*" but there is only one which close it or ranges are overlapping.	
PDFX003W	Warning	There are multiple index entry found which closing range for ID="*%1*".	
PDFX004F	Fatal	Empty href was specified for some topic reference. Please correct your ditamap or bookmap file.	
PDFX005F	Fatal	Topic reference (href : *%1*) not found. Reference may be incorrect. Please correct your ditamap or bookmap file.	
PDFX006E	Error	Number of columns must be specified.	
PDFX007W	Warning	There is no index entry found which opening range for ID="*%1*".	
PDFX008W	Warning	Font definition not found for the logical name or alias '*%1*'.	

Message ID	Severity	Message text	Additional details
PDFX009E	Error	Attribute set reflection can't handle XSLT element *%1*.	
PDFX010W	Warning	Index generation is not supported in FOP.	
PDFX011E	Error	Both index-see and *%1* defined for index entry '*%2*'. Recovering by treating the index-see as an index-see-also.	
PDFX012F	Fatal	Unrecognized PDF formatter '*%1*'. Use "fop" for FOP, "xep" for RenderX XEP, or "ah" for AH Formatter.	
XEPJ001W	Warning	*%1*	
XEPJ002E	Error	*%1*	
XEPJ003E	Error	*%1*	

Other error messages

In addition to error messages generated by the DITA Open Toolkit, you might also encounter error messages generated by Java or other tools.

Out of Memory error

In some cases, you might receive a message stating the build has failed due to an `Out of Memory` error. Try the following approaches to resolve the problem:

1. Increase the memory available to Java; see *Increasing Java memory allocation* on page 59.
2. Reduce memory consumption by setting the generate-debug-attributes option to `false`. This option is set in the `lib/configuration.properties` file. This will disable debug attribute generation (used to trace DITA-OT error messages back to source files) and will reduce memory consumption.
3. Set `dita.preprocess.reloadstylesheet` Ant property to `true`. This will allow the XSLT processor to release memory when converting multiple files.
4. Run the transformation again.

java.io.IOException: Can't store Document

After running a JavaHelp transformation, you may receive a `java.io.IOException: Can't store Document` message.

This problem occurs when HTML files unrelated to the current transformation are found in the output directory. Delete the content of the output directory and run the transformation again.

Stack Overflow error

If you receive an error about a stack memory overflow, increase the JVM and run the transformation again. See *Increasing Java memory allocation* on page 59.

Log files

When you run the DITA-OT, key information is logged on the screen. This information can also be written to a log file. If you encounter a problem, you can analyze this information to determine the source of the problem and then take action to resolve it.

The logging behavior varies depending on whether you use the `dita` command, DITA-OT command-line tool, or Ant to invoke a toolkit build.

`dita` command	By default, only warning and error messages are written to the screen. If you use the -v option, logging will be more verbose and informative messages are also written out. The -l option can be used to write the log messages into a file.
Ant	By default, status information is written to the screen. If you issue the -l parameter, the build runs silently and the information is written to a log file with the name and location that you specified. (You also can use other Ant loggers; see the Ant documentation for more information.)

Accessing help for the dita command

You can access a list of supported parameters for the `dita` command by issuing the -help parameter.

Procedure

1. Run the `startcmd` file that is applicable for your operating system.

   The `startcmd.bat` and `startcmd.sh` files are in the directory where you installed the DITA-OT.
2. From the command prompt, issue the following command:

```
dita -help
```

Results

You can see the brief description of the supported parameters in the command-line window.

Determining the version of the DITA Open Toolkit

You can use the command-line tool to determine the version of the DITA-OT.

Procedure

1. Run the `startcmd` file that is applicable for your operating system.

   The `startcmd.bat` and `startcmd.sh` files are in the directory where you installed the DITA-OT.
2. From the command prompt, issue the following command:

```
java -jar lib/dost.jar -version
```

Enabling debug mode

When the debug mode is enabled, additional diagnostic information is written to the log file. This information, which includes environment variables and stack trace data, can help you determine the root cause of a problem.

Procedure

From the command prompt, add the following parameters:

Application	Parameters
`dita` command	-d or -debug
Ant	`-v -Dargs.debug=yes`

You also can add a <property> element to an Ant target in your build file, for example:

```
<property name="args.debug" value="yes"/>
```

Increasing Java memory allocation

If you are working with large documents with extensive metadata or key references, you will need to increase the memory allocation for the Java process. You can do this from the command-line prompt for a specific session, or you can increase the value of the ANT_OPTS environment variable.

Procedure

- To change the value for an specific session, from the command prompt, issue the following command:

Platform	Command
Windows	`set ANT_OPTS=%ANT_OPTS% -Xmx1024M`
Linux/OS X	`export ANT_OPTS=$ANT_OPTS -Xmx1024M`

  This increases the JVM memory allocation to 1024 megabytes. The amount of memory which can be allocated is limited by available system memory and the operating system.
- To persistently change the value, change the value allocated to the ANT_OPTS environment variable on your system.

Reducing processing time

Several configuration changes can significantly reduce DITA-OT processing time.

Disable debug attribute generation

The generate-debug-attributes parameter determines whether debugging attributes are generated in the temporary files. By changing the value to `false`, DITA-OT will no longer generate the `@xtrf` and `@xtrc` debug attributes. This will make it more difficult to track down the source file location from which a given issue may have originated, but it will reduce the size of the temporary files. As a result, XML parsing will take less time and overall processing time will be reduced.

Switch the order of conref and keyref processing

If your DITA source uses a lot of conrefs that in turn contain a lot of keyrefs, it may speed up processing if you reverse the order of the two in preprocessing. You simply need to have a copy of the `preprocess` Ant target in your plug-in and change the order there. The DITA specification is a good example of this, as the processing time is reduced to less than half of the original time.

Update: Since DITA-OT 2.0, this is the default processing order.

Use a fast disk for the temporary directory

DITA-OT keeps topic and map files as separate files and processes each file multiple times during preprocessing. Thus reading from disk, parsing XML, serializing XML, and writing to disk makes processing quite IO intensive. Use either an *SSD* or a *RAM disk* for temporary files, and never use a temporary directory that is not located on the same machine as where the processing takes place.

Reuse the JVM instance

For all but extremely large source sets, the JVM will not have enough time to warm-up. By reusing the same JVM instance, the first few DITA-OT conversions will be “normal”, but when the JIT starts to kick in, the performance increase may be 2-10 fold. This is especially noticeable with smaller source sets, as much of the DITA-OT processing is I/O intensive.

Use the latest Java version

DITA-OT 2.0 requires Java 7, but using the latest version Java 8 will further reduce processing time.

Collected links

SSD

RAM disk

Part II

DITA Open Toolkit Parameter Reference

Topics:

The *DITA Open Toolkit Parameter Reference* is designed to help users to locate information easily and quickly. It includes documentation for the DITA-OT parameters and configuration properties.

Chapter

8

Ant parameters

Topics:

Certain parameters apply to all DITA-OT transformations. Other parameters are common to the HTML-based transformations. Finally, some parameters apply only to the specific transformation types.

Related concepts

Ant on page 26
Ant is a Java-based, open-source tool that is provided by the Apache Foundation. It can be used to declare a sequence of build actions. It is well suited for both development and document builds. The toolkit ships with a copy of Ant.

Related tasks

Publishing DITA content from Ant on page 26
You can use Ant to invoke the DITA Open Toolkit (DITA-OT) and generate output. This is the most robust method of transforming DITA content; you can use the complete set of parameters that are supported by the toolkit.

Ant parameters: Common

Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

args.debug

Specifies whether debugging information is included in the log. The allowed values are yes and no; the default value is no.

args.draft

Specifies whether the content of <draft-comment> and <required-cleanup> elements is included in the output. The allowed values are yes and no; the default value is no.

Corresponds to XSLT parameter DRAFT in most XSLT modules.

Tip: For PDF output, setting the args.draft parameter to yes causes the contents of the <titlealts> element to be rendered below the title.

args.figurelink.style

Specifies how cross references to figures are styled in output. The allowed values are NUMBER, TITLE, and NUMTITLE.

Specifying NUMBER results in "Figure 5"; specifying TITLE results in the title of the figure. Corresponds to the XSLT parameter FIGURELINK.

Note: Support for PDF was added in DITA-OT 2.0. By default PDF uses the value NUMTITLE, which is not supported for other transform types; this results in "Figure 5. Title".

args.filter

Specifies a filter file to be used to include, exclude, or flag content.

args.gen.task.lbl

Specifies whether to generate headings for sections within task topics. The allowed values are YES and NO.

args.grammar.cache

Specifies whether the grammar-caching feature of the XML parser is used. The allowed values are yes and no; the default value is no.

Note: This option dramatically speeds up processing time. However, there is a known problem with using this feature for documents that use XML entities. If your build fails with parser errors about entity resolution, set this parameter to no.

args.input

Specifies the master file for your documentation project.

Typically this is a DITA map, however it also can be a DITA topic if you want to transform a single DITA file. The path can be absolute, relative to args.input.dir, or relative to the directory where your project's ant build script resides if args.input.dir is not defined.

args.input.dir

Specifies the base directory for your documentation project.

The default value is the parent directory of the file specified by args.input.

args.logdir

Specifies the location where the DITA-OT places log files for your project.

args.rellinks

Specifies which links to include in the output. The following values are supported:

- none – No links are included.

- all – All links are included.
- noparent – Parent links are not included.
- nofamily – Parent, child, next, and previous links are not included.

args.tablelink.style

Specifies how cross references to tables are styled. The allowed values are NUMBER, TITLE, and NUMTITLE.

Specifying NUMBER results in "Table 5"; specifying TITLE results in the title of the table. Corresponds to the XSLT parameter TABLELINK.

Note: Support for PDF was added in DITA-OT 2.0. By default PDF uses the value NUMTITLE, which is not supported for other transform types; this results in "Table 5. Title".

clean.temp

Specifies whether the DITA-OT deletes the files in the temporary directory after it finishes a build. The allowed values are yes and no; the default value is yes.

Specifies whether the DITA-OT deletes the files in the temporary directory after it finishes a build. The allowed values are yes and no; the default value is yes.

dita.dir

Specifies where the DITA-OT is installed.

dita.input.valfile

Specifies a filter file to be used to include, exclude, or flag content.

Notice: Deprecated in favor of the args.filter parameter.

dita.preprocess.reloadstylesheet.topicpull

Specifies whether the DITA-OT reloads the XSL style sheets that are used for the transformation. The allowed values are true and false; the default value is false.

dita.temp.dir

Specifies the location of the temporary directory.

The temporary directory is where the DITA-OT writes temporary files that are generated during the transformation process.

filter-stage

Specifies whether filtering is done before all other processing, or after key and conref processing. The allowed values are early and late; the default value is early.

Note: Changing the filtering stage may produce different results for the same initial data set and filtering conditions.

force-unique

Generate copy-to attributes to duplicate topicref elements. The allowed values are true and false; the default value is false.

generate-debug-attributes

Specifies whether the @xtrf and @xtrc debugging attributes are generated in the temporary files. The following values are supported:

- true (default) – Enables generation of debugging attributes
- false – Disables generation of debugging attributes

Note: Disabling debugging attributes reduces the size of temporary files and thus reduces memory consumption. However, the log messages no longer have the source information available and thus the ability to debug problems might deteriorate.

generate.copy.outer

Specifies whether to generate output files for content that is not located in or beneath the directory containing the DITA map file. The following values are supported:

- 1 (default) – Do not generate output for content that is located outside the DITA map directory.
- 3 – Shift the output directory so that it contains all output for the publication.

See *generate.outer.copy parameter* on page 69 for more information.

onlytopic.in.map

Specifies whether files that are linked to, or referenced with a @conref attribute, generate output. The allowed values are true and false; the default value is false.

If set to true, only files that are referenced directly from the map will generate output; the default value is false.

outer.control

Specifies how the DITA OT handles content files that are located in or below the directory containing the master DITA map. The following values are supported:

- fail – Fail quickly if files are going to be generated or copied outside of the directory.
- warn (default) – Complete the operation if files will be generated or copied outside of the directory, but log a warning.
- quiet – Quietly finish with only those files; do not generate warnings or errors.

Warning: Microsoft HTML Help Compiler cannot produce HTML Help for documentation projects that use outer content. The content files must reside in or below the directory containing the master DITA map file, and the map file cannot specify ".." at the start of the @href attributes for <topicref> elements.

output.dir

Specifies the name and location of the output directory.

By default, the output is written to `DITA-dir/out`.

processing-mode

Specifies how the DITA-OT handles errors and error recovery. The following values are supported:

- strict – When an error is encountered, the DITA-OT stops processing
- lax (default) – When an error is encountered, the DITA-OT attempts to recover from it
- skip – When an error is encountered, the DITA continues processing but does not attempt error recovery

root-chunk-override

Override for map chunk attribute value.

transtype

Specifies the output format.

You can create plug-ins to add new values for this parameter; by default, the following values are available:

- docbook
- eclipsehelp
- eclipsecontent
- html5
- htmlhelp
- javahelp

- odt
- pdf
- wordrtf
- troff
- xhtml

validate

Specifies whether the DITA-OT validates the content. The allowed values are true and false; the default value is true.

Ant parameters: Common HTML-based transformations

Certain parameters apply to all the HTML-based transformation types: Eclipse help, HTML Help, JavaHelp, TocJS, HTML5, and XHTML.

args.artlbl

Specifies whether to generate a label for each image; the label will contain the image file name. The allowed values are yes and no; the default value is no.

args.breadcrumbs

Specifies whether to generate breadcrumb links. The allowed values are yes and no; the default value is no.

Corresponds to the XSLT parameter BREADCRUMBS.

args.copycss

Specifies whether to copy the custom .css file to the output directory. The allowed values are yes and no; the default value is yes.

args.css

Specifies the name of a custom .css file.

args.csspath

Specifies the location of a copied .css file relative to the output directory.

Corresponds to XSLT parameter CSSPATH.

args.cssroot

Specifies the directory that contains the custom .css file.

DITA-OT will copy the file from this location.

args.dita.locale

Specifies the language locale file to use for sorting index entries.

Note: This parameter is not available for the XHTML transformation.

args.ftr

Specifies an XML file that contains content for a running footer.

Corresponds to XSLT parameter FTR.

Note: The XML file must contain valid XML. A common practice is to place all content into a <div> element.

args.gen.default.meta

Specifies whether to generate extra metadata that targets parental control scanners, meta elements with name="security" and name="Robots". The allowed values are yes and no; the default value is no.

Corresponds to the XSLT parameter genDefMeta.

args.hdf

Specifies an XML file that contains content to be placed in the document head.

args.hdr

Specifies an XML file that contains content for a running header.

Corresponds to the XSLT parameter HDR.

Note: The XML file must contain valid XML. A common practice is to place all content into a <div> element.

args.hide.parent.link

Specifies whether to hide links to parent topics in the HTML or XHTML output. The allowed values are yes and no; the default value is no.

Corresponds to the XSLT parameter NOPARENTLINK.

Notice: This parameter is deprecated in favor of the args.rellinks parameter.

args.indexshow

Specifies whether the content of <indexterm> elements are rendered in the output. The allowed values are yes and no; the default value is no.

args.outext

Specifies the file extension for HTML or XHTML output.

Corresponds to XSLT parameter OUTEXT.

args.xhtml.classattr

Specifies whether to include the DITA class ancestry inside the XHTML elements. The allowed values are yes and no; the default value is yes.

For example, the <prereq> element (which is specialized from section) would generate `class="section prereq`. The allowed values are yes and no; the default value is yes. Corresponds to the XSLT parameter PRESERVE-DITA-CLASS.

Note: Beginning with DITA OT release 1.5.2, the default value is yes. For release 1.5 and 1.5.1, the default value was no.

args.xsl

Specifies a custom XSL file to be used instead of the default XSL transformation.

The parameter must specify a fully qualified file name.

Related reference

Ant parameters: Eclipse content on page 69
Certain parameters are specific to the Eclipse content transformation.

Ant parameters: Eclipse Help on page 70
Certain parameters are specific to the Eclipse help transformation.

Ant parameters: HTMLHelp on page 71
Certain parameters are specific to the HTML Help transformation.

Ant parameters: JavaHelp on page 71
Certain parameters are specific to the JavaHelp transformation.

Ant parameters: HTML on page 73
Certain parameters are specific to the HTML5 and XHTML transformation.

generate.outer.copy parameter

Elaboration on how the generate.outer.copy parameter functions.

Background

This is an issue in the following situations:

- The DITA map is in a directory that is a peer to directories that contain referenced objects.
- The DITA map is in a directory that is below the directories that contain the referenced objects.

Let's assume that the directory structure for the DITA content looks like the following:

```
maps
topics
images
```

The DITA map is in the `maps` directory, the topics are in the `topics` directory, and the images are in the `images` directory.

Setting the generate.outer.copy parameter to 1

Let's assume that you run the HTML5 transformation and specify an output directory of `C:\A-test`. By default, The DITA-OT uses the generate.outer.copy parameter with a value of 1. Output is not built for the topics. You receive only the following output:

```
C:\A-test
--- index.html
--- commonltr.css
--- commonrtl.css
```

The `index.html` file contains the navigation structure, but all the links are broken, since no HTML5 files were built for the topics.

How do you fix this? By specifying a value of 3 for the generate.outer.copy parameter.

Setting the generate.outer.copy parameter to 3

Now your output directory structure looks like this:

```
C:\A-test
--- images\
--- maps\
--- topics\
```

The index.html file is in the maps directory, and the CSS and other files are located in the output directory, `C:\A-test`. Copying the output directory is simplified.

Ant parameters: Eclipse content

Certain parameters are specific to the Eclipse content transformation.

args.eclipse.provider

The provider name of the eclipse help output.

args.eclipse.version

The version number of the eclipse help output. Tip: The toolkit ignores the value of this property when processing an Eclipse Collection Map, eclipse.dtd.

Tip: The toolkit ignores the value of this property when processing an Eclipse Collection Map, eclipse.dtd.

args.eclipsecontent.toc

Specifies the name of the TOC file.

Related concepts

Eclipse content transformation on page 22
The eclipsecontent transformation generates normalized DITA files and Eclipse control files. It originally was designed for an Eclipse plug-in that dynamically rendered DITA content, but the output from the transformation can be used by other applications that work with DITA.

Related reference

Ant parameters: Common on page 64
Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

Ant parameters: Common HTML-based transformations on page 67
Certain parameters apply to all the HTML-based transformation types: Eclipse help, HTML Help, JavaHelp, TocJS, HTML5, and XHTML.

Ant parameters: Eclipse Help

Certain parameters are specific to the Eclipse help transformation.

args.eclipse.provider

Specifies the name of the person or organization that provides the Eclipse help.

The default value is DITA.

Tip: The toolkit ignores the value of this parameter when it processes an Eclipse map.

args.eclipse.symbolic.name

Specifies the symbolic name (aka plugin ID) in the output for an Eclipse Help project.

The @id value from the DITA map or the Eclipse map collection (Eclipse help specialization) is the symbolic name for the plugin in Eclipse. The default value is org.sample.help.doc.

Tip: The toolkit ignores the value of this parameter when it processes an Eclipse map.

args.eclipse.version

Specifies the version number to include in the output.

The default value is 0.0.0.

Tip: The toolkit ignores the value of this parameter when it processes an Eclipse map.

args.eclipsehelp.country

Specifies the region for the language that is specified by the args.

For example, us, ca, and gb would clarify a value of en set for the args.eclipsehelp.language parameter. The content will be moved into the appropriate directory structure for an Eclipse fragment.

args.eclipsehelp.language

Specifies the base language for translated content, such as en for English.

This parameter is a prerequisite for the args.eclipsehelp.country parameter. The content will be moved into the appropriate directory structure for an Eclipse fragment.

args.eclipsehelp.toc

Specifies the name of the TOC file.

Related concepts

Eclipse help transformation on page 22
The eclipsehelp transformation generates XHTML output, CSS files, and the control files that are needed for Eclipse help.

Related reference

Ant parameters: Common on page 64
Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

Ant parameters: Common HTML-based transformations on page 67
Certain parameters apply to all the HTML-based transformation types: Eclipse help, HTML Help, JavaHelp, TocJS, HTML5, and XHTML.

Ant parameters: HTMLHelp

Certain parameters are specific to the HTML Help transformation.

args.htmlhelp.includefile

Specifies the name of a file that you want included in the HTML Help.

Related concepts

HTML help transformation on page 23
The htmlhelp transformation generates HTML output, CSS files, and the control files that are needed to produce a Microsoft HTML Help file.

Related reference

Ant parameters: Common on page 64
Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

Ant parameters: Common HTML-based transformations on page 67
Certain parameters apply to all the HTML-based transformation types: Eclipse help, HTML Help, JavaHelp, TocJS, HTML5, and XHTML.

Ant parameters: JavaHelp

Certain parameters are specific to the JavaHelp transformation.

args.javahelp.map

Specifies the name of the ditamap file for a JavaHelp project.

args.javahelp.toc

Specifies the name of the file containing the TOC in your JavaHelp output.

Default value is the name of the ditamap file for your project .

Related concepts

JavaHelp transformation

Related reference

Ant parameters: Common on page 64
Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

Ant parameters: Common HTML-based transformations on page 67
Certain parameters apply to all the HTML-based transformation types: Eclipse help, HTML Help, JavaHelp, TocJS, HTML5, and XHTML.

Ant parameters: Open Document Format

Certain parameters are specific to the ODT transformation.

args.odt.img.embed

Determines whether images are embedded as binary objects within the ODT file. The allowed values are yes and no; the default value is yes.

Related concepts

ODT transformation on page 23
The odt transformation produces output files that use the Open Document format, which is used by tools such as Open Office.

Related reference

Ant parameters: Common on page 64
Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

Ant parameters: Other

These Ant parameters enable you to reload style sheets that the DITA-OT uses for specific pre-processing stages.

dita.preprocess.reloadstylesheet
dita.preprocess.reloadstylesheet.conref
dita.preprocess.reloadstylesheet.mapref
dita.preprocess.reloadstylesheet.mappull
dita.preprocess.reloadstylesheet.maplink
dita.preprocess.reloadstylesheet.topicpull

Specifies whether the DITA-OT reloads the XSL style sheets that are used for the transformation. The allowed values are true and false; the default value is false.

Tip: Set the parameter to true if you want to use more than one set of style sheets to process a collection of topics. The parameter also is useful for large projects that generate Java out-of-memory errors during transformation. Alternatively, you can adjust the size of your Java memory heap if setting `dita.preprocess.reloadstylesheet` for this reason.

Ant parameters: PDF

Certain parameters are specific to the PDF transformation.

args.bookmap-order

Specifies if the frontmatter and backmatter content order is retained in bookmap. The allowed values are retain and discard; the default value is discard.

args.bookmark.style

Specifies whether PDF bookmarks are by default expanded or collapsed. The allowed values are COLLAPSED, EXPANDED, and COLLAPSE.

args.chapter.layout

Specifies whether chapter level TOCs are generated. The allowed values are MINITOC and BASIC; the default value is MINITOC.

args.fo.userconfig

Specifies the user configuration file for FOP.

args.xsl.pdf

Specifies an XSL file that is used to override the default XSL transformation.

You must specify the fully qualified file name.

custom.xep.config

Specifies the user configuration file for RenderX.

customization.dir

Specifies the customization directory.

org.dita.pdf2.i18n.enabled

Enables I18N font processing. The following values are supported:

- true (default) – Enables I18N processing
- false – Disables I18N processing

pdf.formatter

Specifies the XSL processor. The following values are supported:

- ah – Antenna House Formatter
- fop (default) – Apache FOP
- xep – RenderX XEP Engine

publish.required.cleanup

Specifies whether draft-comment and required-cleanup elements are included in the output. The allowed values are yes and no.

The default value is the value of the args.draft parameter. Corresponds to XSLT parameter publishRequiredCleanup.

Notice: This parameter is deprecated in favor of the args.draft parameter.

retain.topic.fo

Specifies whether to retain the generated FO file. The allowed values are yes and no; the default value is no.

If the configuration property org.dita.pdf2.use-out-temp is set to false, this parameter is ignored.

Related concepts

PDF transformation on page 23
The pdf (or pdf2) transformation generates PDF output.

Related reference

Ant parameters: Common on page 64
Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

Ant parameters: HTML

Certain parameters are specific to the HTML5 and XHTML transformation.

args.xhtml.contenttarget

Specifies the value of the @target attribute on the <base> element in the TOC file.

The default value is contentwin.

args.xhtml.toc

Specifies the base name of the TOC file.

args.xhtml.toc.class

Specifies the value of the @class attribute on the <body> element in the TOC file.

Found in `map2htmltoc.xsl`.

Related concepts

XHTML transformation on page 25
The xhtml transformation generates XHTML output and a table of contents (TOC) file. This was the first transformation created for the DITA Open Toolkit, and it is the basis for all the HTML-based transformations.

HTML5 transformation on page 22
The html5 transformation generates HTML5 output and a table of contents (TOC) file.

Related reference

Ant parameters: Common on page 64
Certain parameters apply to all transformations that are supported by the DITA Open Toolkit.

Ant parameters: Common HTML-based transformations on page 67
Certain parameters apply to all the HTML-based transformation types: Eclipse help, HTML Help, JavaHelp, TocJS, HTML5, and XHTML.

Chapter 9

Configuration properties

Topics:

- *plugin.properties file*
- *configuration.properties file*

The DITA-OT uses `.properties` files that store configuration settings for the toolkit and its plug-ins. The configuration properties are available to both Ant and Java processes, but unlike argument properties, they cannot be set at run time.

`plugin.properties` file

The `plugin.properties` file is used to store configuration properties that are set by the integration process. The file is located in the `lib/org.dita.dost.platform` directory; it is regenerated each time the integration process is run and so should not be edited manually.

`configuration.properties` file

The `lib/configuration.properties` file controls certain common properties, as well as some properties that control PDF processing.

default.language

Specifies the language that is used if the input file does not have the @xml:lang attribute set on the root element. By default, this is set to en. The allowed values are those that are defined in IETF BCP 47, *Tags for Identifying Languages*.

org.dita.pdf2.i18n.enabled

(PDF transformation only) Enables I18N font processing. The following values are allowed:

- true (default) — Enables I18N processing
- false — Disables I18N processing

plugindirs

A semicolon-separated list of directory paths that the DITA-OT searches for plug-ins to integrate; any relative paths are resolved against the DITA-OT base directory. Any immediate subdirectory that contains a `plugin.xml` file is integrated

plugin.ignores

A semicolon-separated list of directory names to be ignored during plug-in integration; any relative paths are resolved against the DITA-OT base directory.

Figure 1: Properties set in the `lib/configuration.properties` file

Chapter 10

`dita` command arguments and options

The `dita` command takes mandatory arguments to process DITA, manage plug-in, or print information about the command. Options can be used modify the command behaviour or provide additional configuration.

Usage

`dita` `-f` *name* `-i` *file* [*options*]
`dita` `-install` { *file url* }
`dita` `-uninstall` *id*
`dita` `-help`
`dita` `-version`

Arguments

-f, -format *name*

Specifies the output format.

-i, -input *file*

Specifies the master file for your documentation project. Typically this is a DITA map, however it also can be a DITA topic if you want to transform a single DITA file. The path can be absolute, relative to args.input.dir, or relative to current directory if args.input.dir is not defined.

-install *file*
-install *url*

Install plug-in from a local ZIP file or from a URL.

-uninstall *id*

Uninstall plug-in with the ID.

-h, -help

Print command usage help.

-version

Print version information and exit.

Options

-o, -output *dir*

Specifies the path of output directory; the path can be absolute or relative to current directory. By default, the output is written to `out` subdirectory of the current directory.

-filter *file*

Specifies a filter file to be used to include, exclude, or flag content.

-temp ***dir***

Specifies the location of the temporary directory.

-v, -verbose

Verbose logging.

-d, -debug

Debug logging.

-l, -logfile ***file***

Output logging messages into a file.

-D*property*=*value*

Specify a value for a parameter. Supported parameters are the same as Ant parameters and are transformation type specific.

-propertyfile ***file***

Load all properties from a file. Properties specified with -D option take precedence.

Related reference

Ant parameters on page 63

Chapter 11

Internal Ant properties

Reference list of Ant properties used by DITA-OT internally.

`include.rellinks`

A space-separated list of link roles to be output; the `#default` value token represents links without an explicit role (those for which no `@role` attribute is defined). Defined by `args.rellinks`, but may be overridden directly. Valid roles include:

- parent
- child
- sibling
- friend
- next
- previous
- cousin
- ancestor
- descendant
- sample
- external
- other

Part III

DITA Open Toolkit Developer Reference

Topics:

The *DITA Open Toolkit Developer Reference* is designed to provide more advanced information about the DITA-OT. It is geared to an audience that needs information about the DITA-OT architecture, extending the DITA-OT, and creating DITA-OT plug-ins.

Chapter 12

Architecture of the DITA Open Toolkit

Topics:

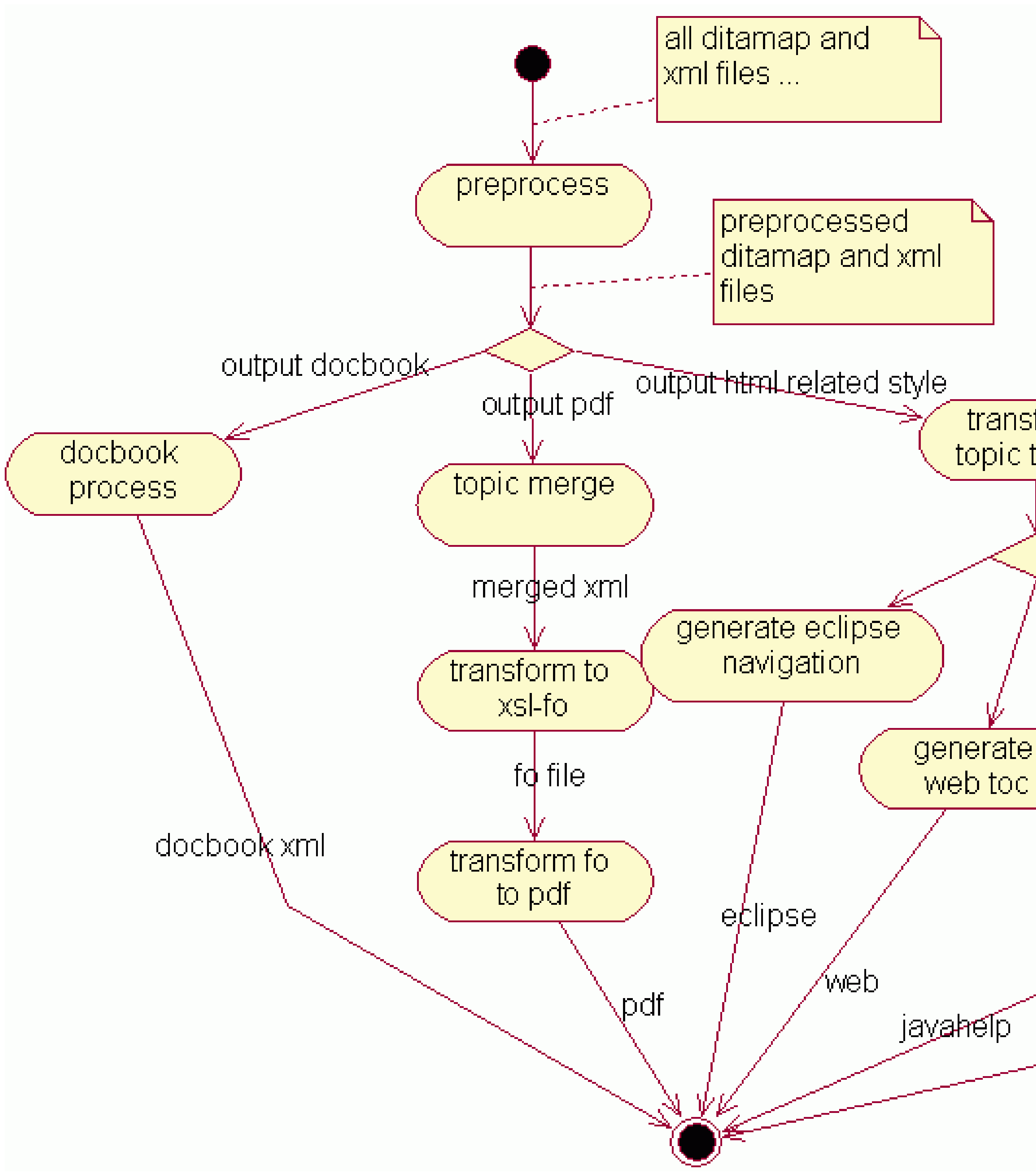
The DITA Open Toolkit is an open-source implementation of the OASIS specification for the Darwin Information Typing Architecture. The toolkit uses Ant, XSLT, and Java to transform DITA content (maps and topics) into different deliverable formats.

Processing structure

The DITA-OT implements a multi-stage, map-driven architecture to process DITA content. Each stage in the process examines some or all of the content; some stages result in temporary files that are used by later steps, while others stages result in updated copies of the DITA content. Most of the processing takes place in a temporary working directory; the source files themselves are never modified.

The DITA-OT is designed as a pipeline. Most of the pipeline is common to all output formats; it is known as the *pre-processing stage*. In general, any DITA process begins with this common set of pre-processing routines. Once the pre-processing is completed, the pipeline diverges based on the requested output format. Some processing is still common to multiple output formats; for example, Eclipse Help and HTML Help both use the same routines to generate XHTML topics, after which the two pipelines branch to create different sets of navigation files.

The following image illustrates how the pipeline works for some common output types: Docbook, PDF, Eclipse Help, XHTML, JavaHelp, and HTML Help.



Processing modules

The DITA-OT processing pipeline is implemented using Ant. Individual modules within the Ant script are implemented in either Java or XSLT, depending on such factors as performance or requirements for customization.

Virtually all Ant and XSLT modules can be extended by adding a plug-in to the toolkit; new Ant targets may be inserted before or after common processing, and new rules may be imported into common XSLT modules to override default processing.

XSLT modules

The XSLT modules use shell files. Typically, each shell file begins by importing common rules that apply to all topics. This set of common processing rules may in turn import additional common modules, such as those used for reporting errors or determining the document locale. After the common rules are imported, additional imports can be included in order to support processing for DITA specializations.

For example, XHTML processing is controlled by the `xsl/dita2xhtml.xsl` file. The shell begins by importing common rules that are applicable to all general topics: `xslhtml/dita2htmlImpl.xsl`. After that, additional XSLT overrides are imported for specializations that require modified processing. For example, an override for reference topics is imported in order to add default headers to property tables. Additional modules are imported for tasks, for the highlighting domain, and for several other standard specializations. After the standard XSLT overrides occur, plug-ins may add in additional processing rules for local styles or for additional specializations.

Java modules

Java modules are typically used when XSLT is a poor fit, such as for processes that make use of standard Java libraries (like those used for index sorting). Java modules are also used in many cases where a step involves copying files, such as the initial process where source files are parsed and copied to a temporary processing directory.

Processing order

The order of processing is often significant when evaluating DITA content. Although the DITA specification does not mandate a specific order for processing, the DITA-OT has determined that performing filtering before conref resolution best meets user expectations. Switching the order of processing, while legal, may give different results.

The DITA-OT project has found that filtering first provides several benefits. Consider the following sample that contains a <note> element that both uses conref and contains a @product attribute:

```
<note conref="documentA.dita#doc/note" product="MyProd"/>
```

If the @conref attribute is evaluated first, then documentA must be parsed in order to retrieve the note content. That content is then stored in the current document (or in a representation of that document in memory). However, if all content with product="MyProd" is filtered out, then that work is all discarded later in the build.

If the filtering is done first (as in the DITA-OT), this element is discarded immediately, and documentA is never examined. This provides several important benefits:

- Time is saved by discarding unused content as early as possible; all future steps can load the document without this extra content.
- Additional time is saved case by not evaluating the @conref attribute; in fact, documentA does not even need to be parsed.
- Any user reproducing this build does not need documentA. If the content is sent to a translation team, that team can reproduce an error-free build without documentA; this means documentA can be kept back from translation, preventing accidental translation and increased costs.

If the order of these two steps is reversed, so that conref is evaluated first, it is possible that results will differ. For example, in the code sample above, the @product attribute will override the product setting on the referencing note. Assume that the <note> elements in documentA is defined as follows:

```
<note id="note" product="SomeOtherProduct">This is an important note!</note>
```

A process that filters out product="SomeOtherProduct" will remove the target of the original conref before that conref is ever evaluated, which will result in a broken reference. Evaluating conref first would resolve the reference, and only later filter out the target of the conref. While some use cases can be found where this is the desired behavior, benefits such as those described above resulted in the current processing order used by the DITA-OT.

Pre-processing modules

The pre-processing operation is a set of steps that typically runs at the beginning of every DITA-OT transformation. Each step or stage corresponds to an Ant target in the build pipeline; the preprocess target calls the entire set of steps.

Generate lists (gen-list)

The `gen-list` step examines the input files and creates lists of topics, images, document properties, or other content. These lists are used by later steps in the pipeline. For example, one list includes all topics that make use of the conref attribute; only those files are processed during the conref stage of the build. This step is implemented in Java.

The result of this list is a set of several list files in the temporary directory, including `dita.list` and `dita.xml.properties`.

List file property	List file	List property	Usage
canditopicsfile	`canditopics.list`	canditopicslist	
codereffile	`coderef.list`	codereflist	topics with coderef
conreffile	`conref.list`	conreflist	Documents that contains conref attribute that need to be resolved in preprocess.
conrefpushfile	`conrefpush.list`	conrefpushlist	
conreftargetsfile	`conreftargets.list`	conreftargetslist	
copytosourcefile	`copytosource.list`	copytosourcelist	
copytotarget2sourcemapfile	`copytotarget2sourcemap.list`	copytotarget2sourcemaplist	
flagimagefile	`flagimage.list`	flagimagelist	
fullditamapandtopicfile	`fullditamapandtopic.list`	fullditamapandtopiclist	All of the ditamap and topic files that are referenced during the transformation. These may be referenced by href or conref attributes.
fullditamapfile	`fullditamap.list`	fullditamaplist	All of the ditamap files in dita.list
fullditatopicfile	`fullditatopic.list`	fullditatopiclist	All of the topic files in dita.list
hrefditatopicfile	`hrefditatopic.list`	hrefditatopiclist	All of the topic files that are referenced with an href attribute
hreftargetsfile	`hreftargets.list`	hreftargetslist	link targets
htmlfile	`html.list`	htmllist	resource files
imagefile	`image.list`	imagelist	Images files that are referenced in the content
keyreffile	`keyref.list`	keyreflist	Topics and maps which have key references.

List file property	List file	List property	Usage
outditafilesfile	`outditafiles.list`	outditafileslist	
relflagimagefile	`relflagimage.list`	relflagimagelist	
resourceonlyfile	`resourceonly.list`	resourceonlylist	
skipchunkfile	`skipchunk.list`	skipchunklist	
subjectschemefile	`subjectscheme.list`	subjectschemelist	
subtargetsfile	`subtargets.list`	subtargetslist	
tempdirToinputmapdir.relative.value			
uplevels			
user.input.dir			Absolute input directory path
user.input.file.listfile			Input file list file
user.input.file			Input file path, relative to input directory

Debug and filter (debug-filter)

The `debug-filter` step processes all referenced DITA content and creates copies in a temporary directory. As the DITA content is copied, filtering is performed, debugging information is inserted, and table column names are adjusted. This step is implemented in Java.

The following modifications are made to the DITA source:

- If a DITAVAL file is specified, the DITA source is filtered according to the entries in the DITAVAL file.
- Debug information is inserted into each element using the @xtrf and @xtrc attributes. The values of these attributes enable messages later in the build to reliably indicate the original source of the error. For example, a message might trace back to the fifth <ph> element in a specific DITA topic. Without these attributes, that count might no longer be available due to filtering and other processing.
- The table column names are adjusted to use a common naming scheme. This is done only to simplify later conref processing. For example, if a table row is pulled into another table, this ensures that a reference to "column 5 properties" will continue to work in the fifth column of the new table.

Copy related files (copy-files)

The `copy-files` step copies non-DITA resources to the output directory, such as HTML files that are referenced in a map or images that are referenced by a DITAVAL file.

Resolve keyref (keyref)

The `keyref` step examines all the keys that are defined in the DITA source and resolved the key references. Links that make use of keys are updated so that any @href value is replaced by the appropriate target; key-based text replacement is also performed. This step is implemented in Java.

Conref push (conrefpush)

The `conrefpush` step resolves "conref push" references. This step only processes documents that use conref push or that are updated due to the push action. This step is implemented in Java.

Conref (conref)

The `conref` step resolves conref attributes, processing only the DITA maps or topics that use the @conref attribute. This step is implemented in XSLT.

The values of the @id attribute on referenced content are changed as the elements are pulled into the new locations. This ensures that the values of the @id attribute within the referencing topic remain unique.

If an element is pulled into a new context along with a cross reference that references the target, both the values of the @id and @xref attributes are updated so that they remain valid in the new location. For example, a referenced topic might include a section as in the following example:

```
<topic id="referenced_topic">
  <title>...</title>
  <body>
    <section id="sect"><title>Sample section</title>
      <p>Figure <xref href="#referenced_topic/fig"/> contains an code sample
 that demonstrates ... .</p>
      <fig id="fig"><title>Code sample</title>
        <codeblock>....</codeblock>
      </fig>
    </section>
  </body>
</topic>
```

Figure 2: Referenced topic that contains a section and cross reference

When the section is referenced using a @conref attribute, the value of the @id attribute on the <fig> element is modified to ensure that it remains unique in the new context. At the same time, the <xref> element is also modified so that it remains valid as a local reference. For example, if the referencing topic has an @id set to "new_topic", then the conrefed <section> element may look like this in the intermediate document.

```
<section id="sect"><title>Sample section</title>
    <p>Figure <xref href="#new_topic/d1e25"/> contains an code sample that
 demonstrates ... .</p>
    <fig id="d1e25"><title>Code sample</title>
        <codeblock>....</codeblock>
    </fig>
</section>
```

Figure 3: Resolved conrefed <section> element after the conref step

In this case, the value of the @id attribute on the <fig> element has been changed to a generated value of "d1e25". At the same time, the <xref> element has been updated to use that new generated ID, so that the cross reference remains valid.

Move metadata (move-meta-entries)

The `move-meta-entries` step pushes metadata back and forth between maps and topics. For example, index entries and copyrights in the map are pushed into affected topics, so that the topics can be processed later in isolation while retaining all relevant metadata. This step is implemented in Java.

Resolve code references (coderef)

The `coderef` step resolves references made with the <coderef> element. This step is implemented in Java.

The <coderef> element is used to reference code stored externally in non-XML documents. During the pre-processing step, the referenced content is pulled into the containing <codeblock> element.

Resolve map references (mapref)

The `mapref` step resolves references from one DITA map to another. This step is implemented in XSLT.

Maps reference other maps by using the following sorts of markup:

```
<topicref href="other.ditamap" format="ditamap"/>
...
```

```
<mapref href="other.ditamap"/>
```

As a result of the mapref step, the element that references another map is replaced by the topic references from the other map. Relationship tables are pulled into the referencing map as a child of the root element (<map> or a specialization of <map>).

Pull content into maps (mappull)

The `mappull` step pulls content from referenced topics into maps, and then cascades data within maps. This step is implemented in XSLT.

The `mappull` step makes the following changes to the DITA map:

- Titles are pulled from referenced DITA topics. Unless the @locktitle attribute is set to "yes", the pulled titles replace the navigation titles specified on the <topicref> elements.
- The <linktext> element is set based on the title of the referenced topic, unless it is already specified locally.
- The <shortdesc> element is set based on the short description of the referenced topic, unless it is already specified locally.
- The @type attribute is set on <topicref> elements that reference local DITA topics. The value of the @type attribute is set to value of the root element of the topic; for example, a <topicref> element that references a task topic is given a @type attribute set to "task"".
- Attributes that cascade, such as @toc and print, are made explicit on any child <topicref >elements. This allows future steps to work with the attributes directly, without reevaluating the cascading behavior.

Chunk topics (chunk)

The `chunk` step breaks apart and assembles referenced DITA content based on the @chunk attribute in maps. This step is implemented in Java.

The DITA-OT has implemented processing for the following values of the @chunk attribute:

- select-topic
- select-document
- select-branch
- by-topic
- by-document
- to-content
- to-navigation

Related information

Chunking definition in the DITA 1.2 specification

Map based linking (maplink)

This step collects links based on a map and moves those links into the referenced topics. The links are created based on hierarchy in the DITA map, the @collection-type attribute, and relationship tables. This step is implemented in XSLT and Java.

The `maplink` module runs an XSLT stylesheet that evaluates the map; it places all the generated links into a single file in memory. The module then runs a Java program that pushes the generated links into the applicable topics.

Pull content into topics (topicpull)

The `topicpull` step pulls content into <xref> and <link> elements. This step is implemented in XSLT.

If an <xref> element does not contain link text, the target is examined and the link text is pulled. For example, a reference to a topic pulls the title of the topic; a reference to a list item pulls the number of the item. If the <xref> element references a topic that has a short description, and the <xref> element does not already contain a child <desc> element, a <desc> element is created that contains the text from the topic short description.

The process is similar for <link> elements. If the <link> element does not have a child <linktext> element, one is created with the appropriate link text. Similarly, if the <link> element does not have a child <desc> element, and the short description of the target can be determined, a <desc> element is created that contains the text from the topic short description.

Flagging in the toolkit

Beginning with DITA-OT 1.7, flagging support is implemented as a common preprocess module. The module evaluates the DITAVAL against all flagging attributes, and adds DITA-OT specific hints in to the topic when flags are active. Any extended transform type may use these hints to support flagging without adding logic to interpret the DITAVAL.

Evaluating the DITAVAL flags

Flagging is implemented as a reusable module during the preprocess stage. If a DITAVAL file is not used with a build, this step is skipped with no change to the file.

When a flag is active, relevant sections of the DITAVAL itself are copied into the topic as a sub-element of the current topic. The active flags are enclosed in a pseudo-specialization of the `<foreign>` element (referred to as a pseudo-specialization because it is used only under the covers, with all topic types; it is not integrated into any shipped document types).

`<ditaval-startprop>`

When any flag is active on an element, a `<ditaval-startprop>` element will be created as the first child of the flagged element:

```
<ditaval-startprop class="+ topic/
foreign ditaot-d/ditaval-startprop
 ">
```

The `<ditaval-startprop>` element will contain the following:

- If the active flags should create a new style, that style is included using standard CSS markup on the @outputclass attribute. Output types that make use of CSS, such as XHTML, can use this value as-is.
- If styles conflict, and a `<style-conflict>` element exists in the DITAVAL, it will be copied as a child of `<ditaval-startprop>`.
- Any `<prop>` or `<revprop>` elements that define active flags will be copied in as children of the `<ditaval-startprop>` element. Any `<startflag>` children of the properties will be included, but `<endflag>` children will not.

`<ditaval-endprop>`

When any flag is active on an element, a `<ditaval-endprop>` element will be created as the last child of the flagged element:

```
<ditaval-endprop class="+ topic/
foreign ditaot-d/ditaval-endprop ">
```

CSS values and `<styleconflict>` elements are not included on this element.

Any `<prop>` or `<revprop>` elements that define active flags will be copied in as children of `<ditaval-`

prop>. Any <endflag> children of the properties will be included, but <startflag> children will not.

Supporting flags in overrides or custom transform types

For most transform types, the <foreign> element should be ignored by default, because arbitrary non-DITA content may not mix well unless coded for ahead of time. If the <foreign> element is ignored by default, or if a rule is added to specifically ignore <ditaval-startprop> and <ditaval-endprop>, then the added elements will have no impact on a transform. If desired, flagging support may be integrated at any time in the future.

The processing described above runs as part of the common preprocess, so any transform that uses the default preprocess will get the topic updates. To support generating flags as images, XSLT based transforms can use default fallthrough processing in most cases. For example, if a paragraph is flagged, the first child of <p> will contain the start flag information; adding a rule to handle images in <ditaval-startprop> will cause the image to appear at the start of the paragraph content.

In some cases fallthrough processing will not result in valid output; for those cases, the flags must be explicitly processed. This is done in the XHTML transform for elements like <ol>, because fallthrough processing would place images in between <ol> and <li>. To handle this, the code processes <ditaval-startprop> before starting the element, and <ditaval-endprop> at the end. Fallthrough processing is then disabled for those elements as children of <ol>.

Example DITAVAL

Assume the following DITAVAL file is in use during a build. This DITAVAL will be used for each of the following content examples.

```
<?xml version="1.0" encoding="UTF-8"?>
<val>
  <!-- Define what happens in the case of conflicting styles -->
  <style-conflict background-conflict-color="red"/>

  <!-- Define two flagging properties that give styles (no
 image) -->
  <prop action="flag" att="audience" style="underline"
 val="user" backcolor="green"/>
  <prop action="flag" att="platform" style="overline" val="win"
 backcolor="blue"/>

  <!-- Define a property that includes start and end image flags
 -->
  <prop action="flag" att="platform" val="linux"
 style="overline" backcolor="blue">
    <startflag imageref="startlin.png"><alt-text>Start linux</
alt-text></startflag>
    <endflag imageref="endlin.png"><alt-text>End linux</alt-
text></endflag>
  </prop>

  <!-- Define a revision that includes start and end image flags
 -->
  <revprop action="flag" style="double-underline" val="rev2">
    <startflag imageref="start_rev.gif"><alt-
text>ssssssssssstart</alt-text></startflag>
    <endflag imageref="end_rev.gif"><alt-text>eeeeeeeeeeeeeend</
alt-text></endflag>
  </revprop>
</val>
```

Content example 1: adding style

Now assume the following paragraph exists in a topic. Class attributes are included, as they would normally be in the middle of the preprocess routine; @xtrf and @xtrc are left off for clarity.

```
<p audience="user">Simple user; includes style but no images</p>
```

Based on the DITAVAL above, audience="user" results in a style with underlining and with a green background. The interpreted CSS value is added to @outputclass on `<ditaval-startprop>`, and the actual property definition is included at the start and end of the element. The output from the flagging step looks like this (with newlines added for clarity, and class attributes added as they would appear in the temporary file):

The resulting file after the flagging step looks like this; for clarity, newlines are added, while @xtrf and @xtrc are removed:

```
<p audience="user" class="- topic/p ">
  <ditaval-startprop class="+ topic/foreign ditaot-d/ditaval-
startprop "
           outputclass="background-color:green;text-
decoration:underline;">
    <prop action="flag" att="audience" style="underline"
 val="user" backcolor="green"/>
  </ditaval-startprop>
  Simple user; includes style but no images
  <ditaval-endprop class="+ topic/foreign ditaot-d/ditaval-
endprop ">
    <prop action="flag" att="audience" style="underline"
 val="user" backcolor="green"/>
  </ditaval-endprop>
</p>
```

Content example 2: conflicting styles

This example includes a paragraph with conflicting styles. When the audience and platform attributes are both evaluated, the DITAVAL indicates that the background color is both green and blue. In this situation, the `<style-conflict>` element is evaluated to determine how to style the content.

```
<p audience="user" platform="win">Conflicting styles (still no
 images)</p>
```

The `<style-conflict>` element results in a background color of red, so this value is added to @outputclass on `<ditaval-startprop>`. As above, active properties are copied into the generated elements; the `<style-conflict>` element itself is also copied into the generated `<ditaval-startprop>` element.

The resulting file after the flagging step looks like this; for clarity, newlines are added, while @xtrf and @xtrc are removed:

```
<p audience="user" platform="win" class="- topic/p ">
  <ditaval-startprop class="+ topic/foreign ditaot-d/ditaval-
startprop "
           outputclass="background-color:red;">
    <style-conflict background-conflict-color="red"/>
    <prop action="flag" att="audience" style="underline"
 val="user" backcolor="green"/>
    <prop action="flag" att="platform" style="overline"
 val="win" backcolor="blue"/>
```

```
  </ditaval-startprop>
  Conflicting styles (still no images)
  <ditaval-endprop class="+ topic/foreign ditaot-d/ditaval-
endprop ">
    <prop action="flag" att="platform" style="overline"
 val="win" backcolor="blue"/>
    <prop action="flag" att="audience" style="underline"
 val="user" backcolor="green"/>
  </ditaval-endprop>
</p>
```

Content example 3: adding image flags

This example includes image flags for both @platform and @rev, which are defined in DITAVAL `<prop>` and `<revprop>` elements.

```
<ol platform="linux" rev="rev2">
  <li>Generate images for platform="linux" and rev="2"</li>
</ol>
```

As above, the `<ditaval-startprop>` and `<ditaval-endprop>` nest the active property definitions, with the calculated CSS value on @outputclass. The `<ditaval-startprop>` drops the ending image, and `<ditaval-endprop>` drops the starting image. To make document-order processing more consistent, property flags are always included before revisions in `<ditaval-startprop>`, and the order is reversed for `<ditaval-endprop>`.

The resulting file after the flagging step looks like this; for clarity, newlines are added, while @xtrf and @xtrc are removed:

```
<ol platform="linux" rev="rev2" class="- topic/ol ">
  <ditaval-startprop class="+ topic/foreign ditaot-d/ditaval-
startprop "
           outputclass="background-color:blue;text-
decoration:underline;text-decoration:overline;">
    <prop action="flag" att="platform" val="linux"
 style="overline" backcolor="blue">
      <startflag imageref="startlin.png"><alt-text>Start linux</
alt-text></startflag>
    </prop>
    <revprop action="flag" style="double-underline" val="rev2">
      <startflag imageref="start_rev.gif"><alt-
text>ssssssssssstart</alt-text></startflag>
    </revprop>
  </ditaval-startprop>
  <li class="- topic/li ">Generate images for platform="linux"
 and rev="2"</li>
  <ditaval-endprop class="+ topic/foreign ditaot-d/ditaval-
endprop ">
    <revprop action="flag" style="double-underline" val="rev2">
      <endflag imageref="end_rev.gif"><alt-
text>eeeeeeeeeeeeeend</alt-text></endflag>
    </revprop>
    <prop action="flag" att="platform" val="linux"
 style="overline" backcolor="blue">
      <endflag imageref="endlin.png"><alt-text>End linux</alt-
text></endflag>
    </prop>
  </ditaval-endprop>
```

```
</ol>
```

HTML-based processing modules

The DITA-OT ships with several varieties of HTML output, each of which follows roughly the same path through the processing pipeline. All HTML-based transformation begin with the same call to the pre-processing module, after which they generate HTML files and then branch to create the transformation-specific navigation files.

Common HTML-based processing

After the pre-processing operation runs, HTML-based builds each run a common series of Ant targets to generate HTML file. Navigation may be created before or after this set of common routines.

After the pre-processing is completed, the following targets are run for all of the HTML-based builds:

- If the arg.css parameter is passed to the build to add a CSS file, the `copy-css` target copies the CSS file from its source location to the relative location in the output directory.
- If a DITAVAL file is used, the `copy-revflag` target copies the default start- and end-revision flags into the output directory.
- The DITA topics are converted to HTML files. Unless the @chunk attribute was specified, each DITA topic in the temporary directory now corresponds to one HTML file. The`dita.inner.topics.xhtml` target is used to process documents that are in the map directory (or subdirectories of the map directory). The `dita.outer.topics.xhtml` target is used to process documents that are outside of the scope of the map, and thus might end up outside of the designated output directory. Various DITA-OT parameters control how documents processed by the `dita.outer.topics.xhtml` target are handled.

XHTML processing

After the XHTML files are generated by the common routine, the `dita.map.xhtml` target is called by the xhtml transformation. This target generates a TOC file called `index.html`, which can be loaded into a frameset.

HTML5 processing

After the HTML5 files are generated by the common routine, the `dita.map.xhtml` target is called by the html5 transformation. This target generates a TOC file called `index.html`, which can be loaded into a frameset.

Eclipse help processing

The eclipsehelp transformation generates XHTML-based output and files that are needing to create an Eclipse Help system plug-in. Once the normal XHTML process has run, the `dita.map.eclipse` target is used to create a set of control files and navigation files.

Eclipse use multiple files to control the plug-in behavior. Some of these control files are generated by the build, while others might be created manually. The following Ant targets control the Eclipse help processing:

`dita.map.eclipse.init`	Sets up various default properties
`dita.map.eclipse.toc`	Creates the XML file that defines an Eclipse table of contents
`dita.map.eclipse.index`	Creates the sorted XML file that defines an Eclipse index
`dita.map.eclipse.plugin`	Creates the `plugin.xml` file that controls the behavior of an Eclipse plug-in
`dita.map.eclipse.plugin.properties`	Creates a Java properties file that sets properties for the plug-in, such as name and version information
`dita.map.eclipse.manifest.file`	Creates a `MANIFEST.MF` file that contains additional information used by Eclipse

`copy-plugin-files`	Checks for the presence of certain control files in the source directory, and copies those found to the output directory
`dita.map.eclipse.fragment.language.init`	Works in conjunction with the `dita.map.eclipse.fragment.language.country.init` and `dita.map.eclipse.fragment.error` targets to control Eclipse fragment files, which are used for versions of a plug-in created for a new language or locale

Several of the targets listed above have matching templates for processing content that is located outside of the scope of the map directory, such as `dita.out.map.eclipse.toc`.

TocJS processing

The tocjs transformation was originally created as a plug-in that distributed outside of the toolkit, but it now ships bundled in the default packages. This HTML5-based output type creates a JavaScript based frameset with TOC entries that expand and collapse.

The following Ant targets control most of the TocJS processing:

`tocjsInit`	Sets up default properties. This target detects whether builds have already specified a name for JavaScript control file; if not, the default name `toctree.js` is used.
`map2tocjs`	Calls the `dita.map.tocjs` target, which generates the contents frame for TocJS output.
`tocjsDefaultOutput`	Ensures that the HTML5 processing module is run. If scripts are missing required information, such as a name for the default frameset, this target copies default style and control files. This target was add to the DITA-OT in version 1.5.4; earlier versions of the TocJS transformation created only the JavaScript control file by default.

HTML Help processing

The htmlhelp transformation created HTML Help control files. If the build runs on a system that has the HTML Help compiler installed, the control files are compiled into a CHM file.

Once the pre-processing and XHTML processes are completed, most of the HTML Help processing is handled by the following targets:

`dita.map.htmlhelp`	Create the HHP, HHC, and HHK files. The HHK file is sorted based on the language of the map.
`dita.htmlhelp.convertlang`	Ensures that the content can be processed correctly by the compiler, and that the appropriate code pages and languages are used.
`compile.HTML.Help`	Attempts to detect the HTML Help compiler. If the compiler is found, the full project is compiled into a single CHM file.

JavaHelp processing

The javahelp transformation runs several additional Ant targets after the XHTML processing is completed in order to create control files for the JavaHelp output.

There are two primary Ant targets:

`dita.map.javahelp`	Creates all of the files that are needed to compile JavaHelp, including a table of contents, sorted index, and help map file.
`compile.Java.Help`	Searches for a JavaHelp compiler on the system. If a compiler is found, the help project is compiled.

PDF processing modules

The PDF (formerly known as PDF2) transformation process runs the pre-processing routine and follows it by a series of additional targets. These steps work together to create a merged set of content, convert the merged content to XSL-FO, and then format the XSL-FO file to PDF.

The PDF process includes many Ant targets. During a typical conversion from map to PDF, the following targets are most significant.

map2pdf2	Creates a merged file by calling a common Java merge module. It then calls the `publish.map.pdf` target to do the remainder of the work.
publish.map.pdf	Performs some initialization and then calls the `transform.topic2pdf` target to do the remainder of processing.
transform.topic2pdf	Converts the merged file to XSL-FO, generates the PDF, and deletes the `topic.fo` file, unless instructed to keep it.

The transform.topic2pdf target uses the following targets to perform those tasks:

transform.topic2fo

Convert the merged file to an XSL-FO file. This process is composed of several Ant targets.

Ant target	**Description**
transform.topic2fo.index	Runs a Java process to set up index processing, based on the document language. This step generates the file `stage1.xml` in the temporary processing directory.
transform.topic2fo.flagging	Sets up preprocessing for flagging based on a DITAVAL file. This step generates the file `stage1a.xml` in the temporary processing directory.
transform.topic2fo.main	Does the bulk of the conversion from DITA to XSL-FO. It runs the XSLT based process that creates `stage2.fo` in

Ant target	Description
	the temporary processing directory
transform.topic2fo.i18n	Does additional localization processing on the FO file; it runs a Java process that converts `stage2.fo` into `stage3.fo`, followed by an XSLT process that converts `stage3.fo` into `topic.fo`.

transform.fo2pdf	Converts the `topic.fo` file into PDF using the specified FO processor (Antenna House, XEP, or Apache FOP).
delete.fo2pdf.topic.fo	Deletes the `topic.fo` file, unless otherwise specified by setting an Ant property or command-line option.

Open Document Format processing modules

The odt transformation creates a binary file using the OASIS Open Document Format.

The odt transformation begins with pre-processing. It then runs either the `dita.odt.package.topic` or `dita.odt.package.map` target, depending on whether the input to the transformation is a DITA topic or a DITA map. The following description focuses on the map process, which is made up of the following targets:

`dita.map.odt`	Converts the map into a merged XML file using the Java-based `topicmerge` module. Then an XSLT process converts the merged file into the `content.xml` file.
`dita.map.odt.stylesfile`	Reads the input DITA map, and then uses XSLT to create a `styles.xml` file in the temporary directory.
`dita.out.odt.manifest.file`	Creates the `manifest.xml` file

Once these targets have run, the generated files are zipped up together with other required files to create the output ODT file.

Chapter 13

Extending the DITA Open Toolkit

Topics:

There are several methods that can be used to extend the toolkit; not all of them are recommended or supported. The best way to create most extensions is with a plug-in; extended documentation for creating plug-ins is provided in the next section.

- Creating a plug-in can be very simple to very complex, and is generally the best method for changing or extending the toolkit. Plug-ins can be used to accomplish almost any modification that is needed for toolkit processing, from minor style tweaks to extensive, complicated new output formats.
- The PDF process was initially developed independently of the toolkit, and created its own extension mechanism using customization directories. Many (but not quite all) of the capabilities available through PDF customization directories are now available through plug-ins.
- Using a single XSL file as an override by passing it in as a parameter. For example, when building XHTML content, the XSL parameter allows users to specify a single local XSL file (inside or outside of the toolkit) that is called in place of the default XHTML code. Typically, this code imports the default processing code, and overrides a couple of processing routines. This approach is best when the override is very minimal, or when the style varies from build to build. However, any extension made with this sort of override is also possible with a plug-in.
- Editing DITA-OT code directly may work in some cases, but is not advised. Modifying the code directly significantly increases the work and risk involved with future upgrades. It is also likely that such modifications will break plug-ins provided by others, limiting the function available to the toolkit.

Related tasks

Installing plug-ins on page 32
Plug-ins are distributed as zip files and can be installed using either the command line tool or Ant.

Removing plug-ins on page 32
Plug-ins can be removed by running the uninstallation process.

Manually installing plug-ins

Plug-ins are generally distributed as zip files. There are two steps to installing a plug-in: unzipping and integrating.

About this task

It is possible to define a plug-in so that it may be installed anywhere, although most expect to be placed in `plugins/` directory inside of the DITA-OT. Most plug-ins do not require a specific install directory and can go in either of the default locations, but some may come with instructions for a particular install directory.

Procedure

1. The unzip the plug-in file to `plugins` subdirectory.

   The plug-in directory should be named after plug-in ID and version, for example `plugins/com.example.xhtml_1.0.0`.
2. Run plug-in integration process.

   - From the toolkit directory, run the following command to integrate all installed plug-ins:

     ```
     ant -f integrator.xml
     ```
   - Any build that uses the Java command line interface automatically runs the integrator before processing begins.
   - Ant based builds may import the `integrator.xml` file, and add `integrate` to the start of the dependency chain for the build.

     Note: The integration process in considered part of the installation process and running it before each conversion will incur a performance penalty.

   The integration process has two modes, lax and strict. In the strict mode the integration process will immediately fail if it encounters errors in plug-in configurations or installation process. In the lax mode, the integration process will continue to finish regardless of errors; the lax mode does not imply error recovery and may leave the DITA-OT installation into a broken state. The default mode is lax due to backwards compatibility, to run the integration in strict mode:

   ```
   ant -f integrator.xml strict
   ```

   To get more information about the integration process, run Ant in verbose mode:

   ```
   ant -f integrator.xml -verbose strict
   ```

Manually removing plug-ins

Plug-ins can be installed by removing the plug-in and running integration process.

Procedure

1. Remove plug-in installation directory.
2. Run integration process.

   ```
   ant -f integrator.xml
   ```

Rebuilding the DITA-OT documentation

The DITA-OT ships with Ant scripts that enable you to rebuild the toolkit documentation. This is especially helpful if your environment contains plug-ins that integrate additional messages into the toolkit.

Procedure

1. Change to the `docsrc` directory.
2. Run the following command:

   ```
   ant -f build.xml target
   ```

   The *target* parameter is optional and specifies a specific transformation type. It takes the following values:

   - html
   - htmlhelp
   - pdf

   If you do not specify an Ant target, all three output formats (HTML5, HTML help, and PDF) are generated.

Chapter

14

Creating plug-ins

Topics:

The DITA Open Toolkit comes with a built in mechanism for adding in extensions through plug-ins. These plug-ins may do a wide variety of things, such as adding support for specialized DITA DTDs or Schemas, integrating processing overrides, or even providing entirely new output transforms. Plug-ins are the best way to extend the toolkit in a way that is consistent, easily sharable, and easy to preserve through toolkit upgrades.

A plug-in consists of a directory, typically stored directly within the `plugins/` directory inside of the DITA-OT. Every plug-in is controlled by a file named `plugin.xml`, located in the plug-in's root directory.

Benefits of extending the toolkit through plug-ins include:

- Plug-ins are easily sharable with other users, teams, or companies; typically, all that is needed is to unzip and run a single integration step. With many builds, even that integration step is automatic.
- Allows overrides or customizations to grow from simple to complex over time, with no increased complexity to the extension mechanism.
- Plug-ins can be moved from version to version with an upgraded toolkit simply by unzipping again, or by copying the directory from one install to another; there is no need to re-integrate code based on updates to the core processing.
- Plug-ins can build upon each other. If you like a plug-in provided by one user, simply install that plug-in, and then create your own that builds on that extension. The two plug-ins can then be distributed to your team as a unit, or you can even share your own extensions with the original provider.

Plug-in configuration file

The `plugin.xml` controls all aspects of a plug-in, making each extension visible to the rest of the toolkit. The file uses pre-defined extension points to locate changes, and integrates those changes into the core code.

The root element of the plugin.xml file is `<plugin>`, and must specify an `id` attribute. The `id` attribute is used to identify the plug-in, as well as to identify whether pre-requisite plug-ins are available. The `id` attribute should follow the syntax rules:

```
id    ::= token('.'token)*
token ::= ( [0..9] | [a..zA..Z] | ’_’ | ’-’ )+
```

The `<plugin>` element supports the following child elements:

- `<feature>` defines an *extension* to contribute to a defined *extension point*. The following attributes are supported:

Attribute	Description	Required
`extension`	extension point identifier	yes
`value`	comma separated string value of the extension	either `value` or `file`
`file`	file path value of the extension, relative to `plugin.xml`	either `value` or `file`
`type`	type of the `value` attribute	no

- `extension-point` defines new a *extension point* that can be used by other plug-ins. The following attributes are supported:

Attribute	Description	Required
`id`	extension point identifier	yes
`name`	extension point name	no

- `<require>` defines plug-in dependencies. The following attributes are supported:

Attribute	Description	Required
`plugin`	vertical bar separated list of plug-ins that are required	yes
`importance`	flag whether plug-in is required or optional	no

- `<template>` defines files that should be treated as *templates*. The following attributes are supported:

Attribute	Description	Required
`file`	file path to the template, relative to `plugin.xml`	yes

- `<meta>` defines metadata. The following attributes are supported:

Attribute	Description	Required
`type`	metadata name	yes
`value`	metadata value	yes

Any extension that is not recognized by the DITA-OT is ignored; all elements other than `<plugin>` are optional. Since version 1.5.3 multiple extension definitions within a plug-in configuration file are combined; in older versions only the last extension definition is used.

Extending the XML Catalog

The XML Catalogs extension point is used to update the XML Catalogs used to resolve DTD or Schema document types, or to add URI mappings. This is required in order to support DITA specializations or new DITA document type shells.

To do this, first create a catalog with only your new values, using the OASIS Catalog format, and place that in your plug-in. Local file references in the catalog should be relative to the location of the catalog. The following extension points are available to work with catalogs.

`dita.specialization.catalog.relative` **`dita.specialization.catalog`**	Adds the content of the catalog file defined in `file` attribute to main DITA-OT catalog file. **Remember:** The `dita.specialization.catalog` extension is deprecated. Use `dita.specialization.catalog.relative` instead.
`org.dita.pdf2.catalog.relative`	Adds the content of the catalog file defined in `file` attribute to main PDF plug-in catalog file.

Example

This example assumes that "`catalog-dita.xml`" contains an OASIS catalog for any DTDs or Schemas inside this plug-in. The catalog entries inside of `catalog-dita.xml` are relative to the catalog itself; when the plug-in is integrated, they will be added to the core DITA-OT catalog (with the correct path).

```
<plugin id="com.example.catalog">
  <feature extension="dita.specialization.catalog.relative"
 file="catalog-dita.xml"/>
</plugin>
```

Adding new targets to the Ant build process

The Ant conductor extension point is used to make new targets available to the Ant processing pipeline. This may be done as part of creating a new transform, extending pre-processing, or simply to provide Ant targets for the use of other plug-ins.

`dita.conductor.target.relative` **`dita.conductor.target`**	Add Ant import to main Ant build file. **Remember:** The `dita.conductor.target` extension is deprecated. Use `dita.conductor.target.relative` instead.

Example

To extend Ant processing, first place your extensions in an Ant project file within your plug-in, such as `myAntStuff.xml`. Next, create a small wrapper file `myAntStuffWrapper.xml` in the same directory:

```
<dummy> <import file="myAntStuff.xml"/> </dummy>
```

Then create the following feature:

```
<plugin id="com.example.ant">
  <feature extension="dita.conductor.target.relative"
 file="myAntStuffWrapper.xml"/>
</plugin>
```

When the plug-in is integrated, the imports from `myAntStuffWrapper.xml` will be copied into `build.xml` (using the correct path). This makes targets in `myAntStuff.xml` available to any other processing.

Adding Ant targets to the pre-process pipeline

Every step in the pre-process pipeline defines an extension point before and after the step, to allow plug-ins to integrate additional processing. This allows a plug-in to insert a new step before any pre-processing step, as well as before or after the entire preprocess pipeline.

The group of preprocessing steps defines extension points before and after the full preprocessing chain.

`depend.preprocess.pre`	Preprocessing pre-target; extending this target runs your Ant target before the full preprocess routine begins.
`depend.preprocess.post`	Preprocessing post-target; extending this target runs your Ant target after the full preprocess routine completes.

In addition, there are extension points to execute an Ant target before individual preprocessing steps.

`depend.preprocess.clean-temp.pre`	Clean temp pre-target
`depend.preprocess.gen-list.pre`	Generate list pre-target
`depend.preprocess.debug-filter.pre`	Debug and filter pre-target
`depend.preprocess.conrefpush.pre`	Content reference push pre-target
`depend.preprocess.move-meta-entries.pre`	Move meta entries pre-target
`depend.preprocess.conref.pre`	Content reference pre-target
`depend.preprocess.coderef.pre`	Code reference pre-target
`depend.preprocess.mapref.pre`	Map reference pre-target
`depend.preprocess.keyref.pre`	Resolve key reference pre-target
`depend.preprocess.mappull.pre`	Map pull pre-target
`depend.preprocess.chunk.pre`	Chunking pre-target
`depend.preprocess.maplink.pre`	Map link pre-target
`depend.preprocess.topicpull.pre`	Topic pull pre-target
`depend.preprocess.copy-files.pre`	Copy files pre-target

`depend.preprocess.copy-image.pre`	Copy images pre-target
`depend.preprocess.copy-html.pre`	Copy HTML pre-target
`depend.preprocess.copy-flag.pre`	Copy flag pre-target
`depend.preprocess.copy-subsidiary.pre`	Copy subsidiary pre-target
`depend.preprocess.copy-generated-files.pre`	Copy generated files pre-target

Example

The following feature adds "myAntTargetBeforeChunk" Ant target to be executed before the chunk step in preprocessing. It assumes that an Ant file defining that target has already been integrated.

```
<plugin id="com.example.extendchunk">
  <feature extension="depend.preprocess.chunk.pre"
 value="myAntTargetBeforeChunk"/>
</plugin>
```

When integrated, the Ant target "myAntTargetBeforeChunk" will be added to the Ant dependency list so that it always runs immediately before the Chunk step.

Integrating a new transformation type

Plug-ins may integrate an entirely new transformation type. The new transformation type can be very simple, such as an XHTML build that creates an additional control file; it can also be very complex, adding any number of new processing steps.

The transtype extension point is used to define a new transformation type, which makes use of targets in your Ant extensions. When a transformation type is defined, the build expects Ant code to be integrated to define the transform process. The Ant code must define a target based on the name of the transformation type; if the transformation type is "mystuff", the Ant code must define a target named dita2mystuff.

`dita.conductor.transtype.check`	Add a new value to the list of valid transformation type names.
`dita.transtype.print`	Declare the transformation type as a print type.

Example

The following feature defines a transformation type of "newtext" and declares it as a print type; using this transformation type will cause the build to look for a target `dita2newtext`, defined in a related Ant extension from the third feature:

```
<plugin id="com.example.newtext">
  <feature extension="dita.conductor.transtype.check"
 value="newtext"/>
  <feature extension="dita.transtype.print" value="newtext"/>
  <feature extension="dita.conductor.target.relative"
 file="antWrapper.xml"/>
</plugin>
```

Override styles with XSLT

The XSLT import extension points are used to override various steps of XSLT processing. For this, the extension attribute indicates the step that the override applies to; the `file` attribute is a relative path to the override within the current plugin. The plugin installer will add an XSL import statement to the default code so that your override becomes a part of the normal build.

The following XSLT steps are available to override in the core toolkit:

`dita.xsl.xhtml`	Overrides default (X)HTML output (including HTML Help and Eclipse Help). The referenced file is integrated directly into the XSLT step that generates XHTML.
`dita.xsl.xslfo`	Overrides default PDF output (formerly known as PDF2). The referenced file is integrated directly into the XSLT step that generates XSL-FO for PDF.
`dita.xsl.docbook`	Overrides default DocBook output.
`dita.xsl.rtf`	Overrides default RTF output.
`dita.xsl.eclipse.plugin`	Overrides the step that generates plugin.xml for Eclipse.
`dita.xsl.conref`	Overrides the preprocess step that resolves conref.
`dita.xsl.topicpull`	Overrides the preprocess step "topicpull" (the step that pulls text into <xref> elements, among other things).
`dita.xsl.mapref`	Overrides the preprocess step "mapref" (the step that resolves references to other maps).
`dita.xsl.mappull`	Overrides the preprocess step "mappull" (the step that updates navtitles in maps and causes attributes to cascade).
`dita.xsl.maplink`	Overrides the preprocess step "maplink" (the step that generates map-based links).
`dita.xsl.troff-ast`	Overrides the intermediate block-and-phrase format generated as input to troff processing.
`dita.xsl.troff`	Overrides the XSL that converts block-and-phrase intermediate markup into troff.

Example – Overriding XHTML header processing

The following two files represent a complete, simple style plug-in.

The `plugin.xml` file declares an XSLT file that extends XHTML processing:

```
<?xml version="1.0" encoding="UTF-8"?>
<plugin id="com.example.brandheader">
  <feature extension="dita.xsl.xhtml" file="xsl/header.xsl"/>
</plugin>
```

The `xsl/header.xsl` XSLT file referenced above in `plugin.xml` overrides the default header processing to provide a (theoretical) banner:

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet version="1.0"
                xmlns:xsl="http://www.w3.org/1999/XSL/
Transform">
  <xsl:template name="gen-user-header">
```

```
    <div><img src="http://www.example.com/company_banner.jpg"
              alt="Example Company Banner"/></div>
  </xsl:template>
</xsl:stylesheet>
```

Example – Overriding troff formatting

To apply custom formatting for your own domain to the intermediate markup generated as input to troff processing, create a plugin that extends `dita.xsl.troff-ast` and specify the path to your custom XSL as follows:

```
<feature extension="dita.xsl.troff-ast" file="xsl/your-
domain.xsl"/>
```

Modifying or adding generated text

Generated text is the term for strings that are automatically added by the build, such as "Note" before the contents of a <note> element.

The generated text extension point is used to add new strings to the default set of generated text. There are several reasons you may want to use this:

- It can be used to add new text for your own processing extensions; for example, it could be used to add localized versions of the string "User response" to aid in rendering troubleshooting information.
- It can be used to override the default strings in the toolkit; for example, it could be used to reset the English string "Figure" to "Fig".
- It can be used to add support for new languages (for non-PDF transforms only; PDF requires more complicated localization support). For example, it could be used to add support for Vietnamese or Gaelic; it could also be used to support a new variant of a previously supported language, such as Australian English.

`dita.xsl.strings`	Add new strings to generated text file.

Example: adding new strings

First copy the file `xsl/common/strings.xml` to your plug-in, and edit it to contain the languages that you are providing translations for ("en-us" must be present). For this sample, copy the file into your plug-in as `xsl/my-new-strings.xml`. The new strings file will look something like this:

```
<?xml version="1.0" encoding="utf-8"?>
<!-- Provide strings for my plug-in; this plug-in supports
     English, Icelandic, and Russian. -->
<langlist>
  <lang xml:lang="en"     filename="mystring-en-us.xml"/>
  <lang xml:lang="en-us"  filename="mystring-en-us.xml"/>
  <lang xml:lang="is"     filename="mystring-is-is.xml"/>
  <lang xml:lang="is-is"  filename="mystring-is-is.xml"/>
  <lang xml:lang="ru"     filename="mystring-ru-ru.xml"/>
  <lang xml:lang="ru-ru"  filename="mystring-ru-ru.xml"/>
</langlist>
```

Next, copy the file `xsl/common/strings-en-us.xml` to your plug-in, and replace the content with your own strings (be sure to give them unique name attributes). Do the same for each language that you are providing a translation for. For example, the file `mystring-en-us.xml` might contain:

```
<?xml version="1.0" encoding="utf-8"?>
<strings xml:lang="en-us">
  <str name="String1">English generated text</str>
  <str name="Another String">Another String in English</str>
</strings>
```

Use the following extension code to include your strings in the set of generated text:

```
<plugin id="com.example.strings">
  <feature extension="dita.xsl.strings" file="xsl/my-new-
strings.xml"/>
</plugin>
```

The string is now available to the "getString" template used in many DITA-OT XSLT files. For example, if processing in a context where the xml:lang value is "en-us", the following call would return "Another String in English":

```
<xsl:call-template name="getString">
  <xsl:with-param name="stringName" select="'Another String'"/>
</xsl:call-template>
```

Note: If two plug-ins define the same string, the results will be non-deterministic, so multiple plug-ins should not try to create the same generated text string. One common way to avoid this problem is to ensure the name attributes used to look up the string value are related to the ID or purpose of your plug-in.

Example: modifying existing strings

The process for modifying existing generated text is exactly the same as for adding new text, except that the strings you provide override values that already exist. To begin, set up the `xsl/my-new-strings.xml` file in your plug-in as in the previous example.

Next, copy the file `xsl/common/strings-en-us.xml` to your plug-in, and choose the strings you wish to change (be sure to leave the name attribute unchanged, because this is the key used to look up the string). Create a strings file for each language that needs to modify existing strings. For example, the new file `mystring-en-us.xml` might contain:

```
<?xml version="1.0" encoding="utf-8"?>
<strings xml:lang="en-us">
  <str name="Figure">Fig</str>
  <str name="Draft comment">ADDRESS THIS DRAFT COMMENT</str>
</strings>
```

To integrate the new strings, use the same method as above to add these strings to your `plugin.xml` file. Once this plug-in is integrated, where XHTML output previously generated the term "Figure", it will now generate "Fig"; where it previously generated "Draft comment", it will now generate "ADDRESS THIS DRAFT COMMENT". The same strings in other languages will not be modified unless you also provide new versions for those languages.

Note: If two plug-ins override the same string in the same language, the results will be non-deterministic (either string may be used under different conditions). Multiple plug-ins should not override the same generated text string for a single language.

Example: adding a new language

The process for adding a new language is exactly the same as for adding new text, except you are effectively just translating an existing strings file. To begin, set up the `xsl/my-new-strings.xml` file in your plug-in as in the previous examples. In this case, the only difference is that you are adding a mapping to new languages; for example, the following file would be used to set up support for Vietnamese:

```
<?xml version="1.0" encoding="utf-8"?>
<!-- Map languages with xml:lang="vi" or xml:lang="vi-vn"
     to the translations in this plug-in. -->
<langlist>
  <lang xml:lang="vi"     filename="strings-vi.xml"/>
  <lang xml:lang="vi-vn"  filename="strings-vi.xml"/>
</langlist>
```

Next, copy the file `xsl/common/strings-en-us.xml` to your plug-in, and rename it to match the language you wish to add. For example, to support Vietnamese strings you may want to pick a name like `strings-vi.xml`. In that file, change the `xml:lang` attribute on the root element to match your new language.

Once the file is ready, translate the contents of each `<str>` element (be sure to leave the name attribute unchanged). Repeat this process for each new language you wish to add.

To integrate the new languages, use the same method as above to add these strings to your `plugin.xml` file. Once this plug-in is integrated, non-PDF builds will include support for Vietnamese; instead of generating the English word "Caution", the element `<note type="caution" xml:lang="vi">` may generate something like "*chú ý*".

Note: If two plug-ins add support for the same language using different values, the results will be non-deterministic (translations from either plug-in may be picked up under different conditions).

Related tasks

Globalizing DITA content on page 33

Related reference

Languages supported by the core toolkit on page 34
The DITA Open Toolkit (DITA-OT) supports over 50 languages and language variants for the HTML-based transformations, for example, Eclipse Help, HTML Help, and TocJS.

Passing parameters to existing XSLT steps

Plug-ins can define new parameters to be passed from the Ant build into existing XSLT pipeline stages, usually to have those parameters available as global `<xsl:param>` values within XSLT overrides.

To create new parameters, create a file `insertParameters.xml` which contains one or more Ant `<param>` elements. It also needs a <dummy> wrapper element around the parameters. For example, the following parameter will be passed in to the XSLT file with a value of `${antProperty}`, but only if that parameter is defined:

```
<dummy>
  <!-- Any Ant code allowed in xslt task is possible. Common example: -->
  <param name="paramNameinXSLT" expression="${antProperty}"
 if="antProperty"/>
</dummy>
```

Pass the value using the following extensions:

`dita.conductor.html.param`	Pass parameters to HTML and HTML Help XSLT

`dita.conductor.xhtml.param`	Pass parameters to XHTML and Eclipse Help XSLT
`dita.conductor.xhtml.toc.param`	Pass parameters to XHTML TOC XSLT
`dita.conductor.eclipse.toc.param`	Pass parameters to Eclipse Help TOC XSLT
`dita.preprocess.conref.param`	Pass parameters to conref XSLT
`dita.preprocess.mapref.param`	Pass parameters to mapref XSLT
`dita.preprocess.mappull.param`	Pass parameters to mappull XSLT
`dita.preprocess.topicpull.param`	Pass parameters to topicpull XSLT
`dita.conductor.pdf2.param`	Pass parameters to PDF2 XSLT

Example

The following plug-in will pass the parameters defined inside of `insertParameter.xml` as input to the XHTML process. Generally, an additional XSLT override will make use of the parameter to do something new with the generated content.

```
<plugin id="com.example.newparam">
  <feature extension="dita.conductor.xhtml.param"
 file="insertParameters.xml"/>
</plugin>
```

Adding Java libraries to the classpath

If your Ant or XSLT extensions require additional Java libraries in the classpath, you can add them to the global DITA-OT classpath with the following feature.

`dita.conductor.lib.import`	Add Java libraries to DITA-OT classpath.

Example

The following plug-in adds the compiled Java code from `myJavaLibrary.jar` into the global DITA-OT classpath. XSLT or Ant code can then make use of the added code.

```
<plugin id="com.example.addjar">
  <feature extension="dita.conductor.lib.import"
 file="myJavaLibrary.jar"/>
</plugin>
```

Now assume that in this case myJavaLibrary.jar performs some validation step in the middle of processing, and you always want it to run immediately before the conref step. In that case you need to make use of several features in this plug-in

- The JAR file must be added to the classpath.
- An Ant target must be created that uses this class, and the Ant wrapper integrated into the code.
- The Ant target must be added to the dependency chain for conref.

In this extended example, the files might look something like this.

```
plugin.xml:
<?xml version="1.0" encoding="UTF-8"?>
<plugin id="com.example.samplejava">
  <!-- Add the JAR file to the DITA-OT CLASSPATH -->
  <feature extension="dita.conductor.lib.import"
 file="com.example.sampleValidation.jar"/>
```

```
  <!-- Integrate the Ant code -->
  <feature extension="dita.conductor.target.relative"
 file="antWrapper.xml"/>
  <!-- Define the Ant target that is called, and the location
 (before conref) -->
  <feature extension="depend.preprocess.conref.pre"
 value="validateWithJava"/>
</plugin>

antWrapper.xml imports the new Ant code:
<?xml version="1.0" encoding="UTF-8"?>
<dummy>
  <import file="calljava-antcode.xml"/>
</dummy>

calljava-antcode.xml:
<?xml version="1.0" encoding="UTF-8"?>
<project default="validateWithJava">
  <target name="validateWithJava">
    <java classname="com.example.sampleValidation">
      <!-- The class was added to dost.class.path (the DITA-OT
 classpath) -->
      <classpath refid="dost.class.path"/>
    </java>
  </target>
</project>
```

Adding diagnostic messages

Plug-in specific warning and error messages can be added to the set of messages supplied by the DITA-OT. These messages can then be used by any XSLT override.

`dita.xsl.messages`	Add new messages to diagnostic message file.

Example

To add your own messages, create the new messages in an XML file such as `myMessages.xml`:

```
<dummy>
  <!-- See resources/messages.xml for the details. -->
  <message id="DOTXmy-msg-numW" type="WARN">
    <reason>Message text</reason>
    <response>How to resolve</response>
  </message>
</dummy>
```

There are three components to the message ID:

1. The prefix DOTX is used by all DITA-OT XSLT transforms, and must be part of the ID.
2. This is followed by the message number ("my-msg-num" in the sample above). By convention, this should be a three digit integer.
3. Finally, a letter corresponds to the severity. This should be one of:
    - I = Informational, used with type="INFO"
    - W = Warning, used with type="WARN"
    - E = Error, used with type="ERROR"
    - F = Fatal, used with type="FATAL"

Once the message file is defined, it is incorporated with this extension:

```
<plugin id="com.example.newmsg">
  <feature extension="dita.xsl.messages" file="myMessages.xml"/>
</plugin>
```

XSLT modules can then generate the message using the following call:

```
<xsl:call-template name="output-message">
  <xsl:with-param name="msgnum">my-msg-num</xsl:with-param>
  <xsl:with-param name="msgsev">W</xsl:with-param>
</xsl:call-template>
```

Managing plug-in dependencies

The `<require>` element in a `plugin.xml` file is used to create a dependency on another plug-in. The `<require>` element requires the `plugin` attribute in order to reference the dependency.

If the current plug-in requires a plug-in with `id="plugin-id"` before it can be installed, it would include the following:

```
<require plugin="plugin-id">
```

Prerequisite plug-ins are integrated before the current plug-in is integrated. This does the right thing with respect to XSLT overrides. If your plug-in is a specialization of a specialization, it should `<require>` its base plug-ins, in order from general to specific.

If a prerequisite plug-in is missing, a warning will be printed during integration. To suppress this, but keep the integration order if both plug-ins are present, add `importance="optional"` to the `<require>` element.

If your plug-in can depend on any one of several optional plug-ins, separate the plug-in ids with a vertical bar. This is most useful when combined with importance="optional":

Example

The following plug-in will only be installed if the plug-in with id="com.example.primary" is available. If that one is not available, a warning will be generated during the integration process.

```
<plugin id="com.example.builds-on-primary">
  <!-- ...extensions here -->
  <require plugin="com.example.primary"/>
</plugin>
```

The following plug-in will only be installed if either the plug-in with id="pluginA" or the plug-in with id="pluginB" are available. If neither of those are installed, the current plug-in will be ignored.

```
<plugin id="pluginC">
  <!-- ...extensions here -->
  <require plugin="pluginA|pluginB" importance="optional"/>
</plugin>
```

Version and support information

The following extension points are used by convention to define version and support info within a plug-in.

- `package.support.name`

- `package.support.email`
- `package.version`

Note: The toolkit does not currently do anything with these values, but may do so in the future.

The `package.version` value should follow the syntax rules:

```
version    ::= major ( '.' minor ( '.' micro ( '.' qualifier )? )? )?

major      ::= number
minor      ::= number
micro      ::= number
qualifier ::= ( [0..9] | [a..zA..Z] | ’_’ | '-' )+
```

The default value is `0.0.0`.

Example

```
<plugin id="com.example.WithSupportInfo">
  <feature extension="package.support.name" value="Joe the
 Author"/>
  <feature extension="package.support.email"
 value="joe@example.com"/>
  <feature extension="package.version" value="1.2.3"/>
</plugin>
```

Creating a new plug-in extension point

If your plug-in needs to define its own extension point in an XML file, add the string "`_template`" to the filename before the file suffix. During integration, this file will be processed like the built-in DITA-OT templates.

Template files are used to integrate most DITA-OT extensions. For example, the file `dita2xhtml_template.xsl` contains all of the default rules for converting DITA topics to XHTML, along with an integration point for plug-in extensions. When the integrator runs, the file dita2xhtml.xsl is recreated, and the integration point is replaced with references to all appropriate plug-ins.

To mark a new file as a template file, use the `<template>` element.

The template extension namespace has the URI `http://dita-ot.sourceforge.net`. It is used to identify elements and attributes that have a special meaning in template processing. This documentation uses a prefix of `dita:` for referring to elements in the template extension namespace. However, template files are free to use any prefix, provided that there is a namespace declaration that binds the prefix to the URI of the template extension namespace.

`dita:extension` element

The `dita:extension` elements are used to insert generated content during integration process. There are two required attributes:

- The `id` attribute defines the extension point ID which provides the argument data.
- The `behavior` attribute defines which processing action is used.

Supported values for `behavior` attribute:

`org.dita.dost.platform.CheckTranstypeAction`	Create Ant condition elements to check if the `${transtype}` property value equals a supported transformation type value.

`org.dita.dost.platform.ImportAntLibAction`	Create Ant `pathelement` elements for *library imported extension point*. The `id` attribute is used to define the extension point ID.
`org.dita.dost.platform.ImportPluginCatalogAction`	Include plug-in metadata catalog content.
`org.dita.dost.platform.ImportPluginInfoAction`	Create plug-in metadata Ant properties.
`org.dita.dost.platform.ImportStringsAction`	Include plug-in string file content base on *generated text extension point*. The `id` attribute is used to define the extension point ID.
`org.dita.dost.platform.ImportXSLAction`	Create `xsl:import` elements based on *XSLT import extension point*. The `id` attribute is used to define the extension point ID.
`org.dita.dost.platform.InsertAction`	Include plug-in conductor content based on *Ant import extension point*. The `id` attribute is used to define the extension point ID.
`org.dita.dost.platform.InsertAntActionRelative`	Include plug-in conductor content based on *relative Ant import extension point*. The `id` attribute is used to define the extension point ID.
`org.dita.dost.platform.InsertCatalogActionRelative`	Include plug-in catalog content based on *catalog import extension point*. The `id` attribute is used to define the extension point ID.
`org.dita.dost.platform.ListTranstypeAction`	Create a pipe delimited list of supported transformation types.

`dita:extension` attribute

The `dita:extension` attribute is used to process attributes in elements which are not in template extension namespace. The value of the attribute is a space delimited tuple, where the first item is the name of the attribute to process and the second item is the action ID.

Supported values:

`depends org.dita.dost.platform.InsertDependsAction`	Ant target dependency list is processed to replace all target names which start with an open curly bracket and end with a close curly bracket. The value of the extension point is the ID between the curly brackets.

Example

The following plug-in defines `myBuildFile_template.xml` as a new template for extensions, and two new extension points.

```
<plugin id="com.example.new-extensions">
  <extension-point id="com.example.new-extensions.pre"
                   name="Custom target preprocess"/>
  <extension-point id="com.example.new-extensions.content"
                   name="Custom target content"/>
  <template file="myBuildFile_template.xml"/>
</plugin>
```

When the integrator runs, this will be used to recreate `myBuildFile.xml`, replacing Ant file content based on extension point use.

```
<project xmlns:dita="http://dita-ot.sourceforge.net">
  <target name="dita2custom"
```

```
          depends="dita2custom.init,
                   {com.example.new-extensions.pre},
                   dita2xhtml"
          dita:extension="depends
 org.dita.dost.platform.InsertDependsAction">
    <dita:extension id="com.example.new-extensions.content"

 behavior="org.dita.dost.platform.InsertAction"/>
  <target>
</project>
```

Example plugin.xml file

The following is a sample of a `plugin.xml` file. This file adds support for a new set of specialized DTDs, and includes an override for the XHTML output processor.

This `plugin.xml` file would go into a directory such as `DITA-OT/plugins/music/` and referenced supporting files would also exist in that directory. A more extensive sample using these values is available in the actual music plug-in, available at the *DITA-OT download page* at SourceForge

```
<plugin id="org.metadita.specialization.music">
  <feature extension="dita.specialization.catalog.relative"
 file="catalog-dita.xml">
  <feature extension="dita.xsl.xhtml" file="xsl/
music2xhtml.xsl"/>
</plugin>
```

Chapter

15

XHTML migration for flagging updates in DITA-OT 1.7

This topic is primarily of interest to developers with XHTML transform overrides written prior to DITA-OT 1.7. Due to significant changes in the flagging process with the 1.7 release, some changes may be needed to make overrides work properly with DITAVAL based flagging. The new design is significantly simpler than the old design; in many cases, migration will consist of deleting old code that is no longer needed.

Which XHTML overrides need to migrate?

If your override does not contain any code related to DITAVAL flagging, then there is nothing to migrate.

If your builds do not make use of DITAVAL based flagging, but calls the deprecated flagging templates, then you should override but there is little urgency. You will not see any difference in the output, but those templates will be removed in a future release.

If you do make use of DITAVAL based flagging, try using your override with 1.7. Check the elements you override:

1. In some cases flags may be doubled. This will be the case if you call routines such as "`start-flagit`".
2. In some cases flags may be removed. This will be the case if you call shortcut routines such as "`revtext`" or "`revblock`".
3. In other cases, flags may still appear properly, in which case migration is less urgent

For any migration that needs migration, please see the instructions that follow.

Deprecated templates in DITA-OT 1.7

All of the old DITAVAL based templates are deprecated in DITA-OT 1.7. If your overrides include any of the following templates, they should be migrated for the new release; in many cases the templates below will not have any effect on your output, but all instances should be migrated.

- The "`gen-style`" template used to add CSS styling
- The "`start-flagit`" and "`end-flagit`" templates used to generate image flags based on property attributes like @audience
- The "`start-revflag`" and "`end-revflag`" templates, used to generate images for active revisions
- Shortcut templates that group these templates into a single call, such as:
    - "`start-flags-and-rev`" and "`end-flags-and-rev`", used to combine flags and revisions into one call

    - `"revblock"` and `"revtext"`, both used to output start revisions, element content, and end revisions
    - The modes `"outputContentsWithFlags"` and `"outputContentsWithFlagsAndStyle"`, both used to combine processing for property/revision flags with content processing
- All other templates that make use of the `$flagrules` variable, which is no longer used in any of the DITA-OT 1.7 code
- All templates within `flag.xsl` that were called from the templates listed above
- Element processing handled with mode="elementname-fmt", such as `mode="ul-fmt"` for processing unordered lists and `mode="section-fmt"` for sections.

What replaces the templates?

The new flagging design described in the preprocess design section now adds literal copies of relevant DITAVAL elements, along with CSS based flagging information, into the relevant section of the topic. This allows most flags to be processed in document order; in addition, there is never a need to read the DITAVAL, interpret CSS, or evaluate flagging logic. The `htmlflag.xsl` file contains a few rules to match and process the start/end flags; in most cases, all code to explicitly process flags can be deleted.

For example, the common logic for most element rules before DITA-OT 1.7 could be boiled down to the following:

Match element
Create `"flagrules"` variable by reading DITAVAL for active flags
Output start tag such as `<div>` or `<span>`
Call `"commonattributes"` and ID processing
Call `"gen-style"` with `$flagrules`, to create DITAVAL based CSS
Call `"start-flagit"` with `$flagrules`, to create start flag images
Call `"start-revflag"` with `$flagrules`, to create start revision images
Output contents
Call `"end-revflag"` with `$flagrules`, to create end revision images
Call `"end-flagit"` with `$flagrules`, to create end flag images
Output end tag such as `</div>` or `</span>`

In DITA-OT 1.7, style and images are typically handled with XSLT fallthrough processing. This removes virtually all special flag coding from element rules, because flags are already part of the document and processed in document order. The sample above is reduced to:

Match element
Output start tag such as `<div>` or `<span>`
Call `"commonattributes"` and ID processing
Output contents
Output end tag such as `</div>` or `</span>`

Migrating `"gen-style"` named template

Calls to the `"gen-style"` template should be deleted. There is no need to replace this call for most elements.

The `"gen-style"` template was designed to read a DITAVAL file, find active style-based flagging (such as colored or bold text), and add it to the generated @style attribute in HTML.

With DITA-OT 1.7, the style is calculated in the pre-process flagging module. The result is created as @outputclass on a `<ditaval-startprop>` sub-element. The `"commonattributes"` template now includes a line to process that value; the result is that for every element that calls `"commonattributes"`, DITAVAL style will be processed when needed. Because virtually every element includes a call to this common template, there is little chance that your override needs to explicitly process the style. The new line in `"commonattributes"` that handles the style is:

```
<xsl:apply-templates select="*[contains(@class,'
 ditaot-d/ditaval-startprop ')]/@outputclass"
 mode="add-ditaval-style"/>
```

Migrating `"start-flagit"`, `"start-revflag"`, `"end-flagit"`, and `"end-flagit"` named templates

Calls to these templates fall into two general groups.

If the flow of your element rule is to create a start tag like `<div>`, `"start-flagit"`/`"start-revflag"`, process contents, `"end-revflag"`/`"end-flagit"`, end tag - you just need to delete the calls to these templates. Flags will be generated simply by processing the element contents in document order.

If the flow of your element rule processes flags outside of the normal document-order. There are generally two reasons this is done. The first case is for elements like `<ol>`, where flags must appear before the `<ol>` in order to create valid XHTML. The second is for elements like `<section>`, where start flags are created, followed by the title or some generated text, element contents, and finally end flags. In either of these cases, support for processing flags in document order is disabled, so they must be explicitly processed out-of-line. This is done with the following two lines (one for start flag/revision, one for end flag/revision):

```
Create starting flag and revision images:
<xsl:apply-templates select="*[contains(@class,'
 ditaot-d/ditaval-startprop ')]" mode="out-of-
line"/>

Create ending flag and revision images:
<xsl:apply-templates select="*[contains(@class,'
 ditaot-d/ditaval-endprop ')]" mode="out-of-line"/
>
```

For example, the following lines are used in DITA-OT 1.7 to process the `<ul>` element (replacing the 29 lines used in DITA-OT 1.6):

```
<xsl:template match="*[contains(@class,' topic/ul
 ')]">
  <xsl:apply-templates select="*[contains(@class,'
 ditaot-d/ditaval-startprop ')]" mode="out-of-
line"/>
  <xsl:call-template name="setaname"/>
  <ul>
    <xsl:call-template name="commonattributes"/>
    <xsl:apply-templates select="@compact"/>
    <xsl:call-template name="setid"/>
    <xsl:apply-templates/>
  </ul>
  <xsl:apply-templates select="*[contains(@class,'
 ditaot-d/ditaval-endprop ')]" mode="out-of-line"/
>
  <xsl:value-of select="$newline"/>
</xsl:template>
```

Migrating "start-flags-and-rev" and "end-flags-and-rev"

- "start-flags-and-rev" is equivalent to calling "start-flagit" followed by "start-revflag"; it should be migrated as in the previous section.
- "end-flags-and-rev" is equivalent to calling "end-revflag" followed by "end-flagit"; it should be migrated as in the previous section.

Migrating "revblock" and "revtext"

Calls to these two templates can be replaced with a simple call to `<xsl:apply-templates/>`.

Migrating modes "outputContentsWithFlags" and "outputContentsWithFlagsAndStyle"

Processing an element with either of these modes can be replaced with a simple call to `<xsl:apply-templates/>`.

Migrating mode="elementname-fmt"

Prior to DITA-OT 1.7, many elements were processed with the following logic:

```
Match element
    Set variable to determine if revisions are
 active and $DRAFT is on
    If active
        create division with rev style
            process element with mode="elementname-
fmt"
        end division
    Else
        process element with mode="elementname-fmt"

Match element with mode="elementname-fmt"
    Process as needed
```

Beginning with DITA-OT 1.7, styling from revisions is handled automatically with the "commonattributes" template. This means there is no need for the extra testing, or the indirection to `mode="elementname-fmt"`. These templates are deprecated, and element processing will move into the main element rule. Overrides that include this indirection may remove it; overrides should also be sure to match the default rule, rather than matching with `mode="elementname-fmt"`.

Chapter 16

Customizing PDF output

You can build a DITA-OT plug-in that contains a customized PDF transformation.

About this task

This topic demonstrates the process of building a plug-in (com.example.print-pdf) that creates a new transformation type: print-pdf. The print-pdf transformation has the following characteristics:

- Uses A4 paper
- Renders figures with a title at the top and a description at the bottom
- Use em dashes as the symbols for unordered lists

Procedure

1. In the `plugins` directory, create a directory named `com.example.print-pdf`.
2. In the new `com.example.print-pdf` directory, create a plug-in configuration file (`plugin.xml`) that declares the new print-pdf transformation and its dependencies.

```
<?xml version='1.0' encoding='UTF-8'?>
<plugin id="com.example.print-pdf">
  <require plugin="org.dita.pdf2"/>
  <feature
 extension="dita.conductor.transtype.check"
 value="print-pdf"/>
  <feature extension="dita.transtype.print"
 value="print-pdf"/>
  <feature
 extension="dita.conductor.target.relative"
 file="integrator.xml"/>
</plugin>
```

Figure 4: `plugin.xml` file

3. Add an Ant script (`integrator.xml`) to define the transformation type.

```
<?xml version='1.0' encoding='UTF-8'?>
<project name="com.example.print-pdf">
  <target name="dita2print-pdf.init">
    <property name="customization.dir"
 location="${dita.plugin.com.example.print-
pdf.dir}/cfg"/>
  </target>
  <target name="dita2print-pdf"
 depends="dita2print-pdf.init, dita2pdf2"/>
```

```
</project>
```

Figure 5: `integrator.xml` file

4. In the new plug-in directory, add a `cfg/catalog.xml` file that specifies the custom XSLT style sheets.

```
<?xml version="1.0" encoding="UTF-8"?>
<catalog prefer="system"
 xmlns="urn:oasis:names:tc:entity:xmlns:xml:catalog">
  <uri name="cfg:fo/attrs/custom.xsl" uri="fo/
attrs/custom.xsl"/>
  <uri name="cfg:fo/xsl/custom.xsl" uri="fo/
xsl/custom.xsl"/>
</catalog>
```

Figure 6: `cfg/catalog.xml` file

5. Create the `cfg/fo/attrs/custom.xsl` file, and add attribute and variable overrides to it.
   For example, add the content highlighted with bold to change the page size to A4.

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet xmlns:xsl="http://
www.w3.org/1999/XSL/Transform"
                version="2.0">
  <!-- Change page size to A4 -->
  <xsl:variable name="page-width">210mm</
xsl:variable>
  <xsl:variable name="page-height">297mm</
xsl:variable>
</xsl:stylesheet>
```

Figure 7: `cfg/fo/attrs/custom.xsl` file

6. Create the `cfg/fo/xsl/custom.xsl` file, and add XSLT overrides to it.
   For example, the following code changes the rendering of <figure> elements.

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet xmlns:xsl="http://
www.w3.org/1999/XSL/Transform"
                xmlns:xs="http://
www.w3.org/2001/XMLSchema"
                xmlns:fo="http://
www.w3.org/1999/XSL/Format"
                version="2.0">
  <!-- Move figure title to top and description
 to bottom -->
  <xsl:template match="*[contains(@class,'
 topic/fig ')]">
    <fo:block xsl:use-attribute-sets="fig">
      <xsl:call-template
 name="commonattributes"/>
      <xsl:if test="not(@id)">
        <xsl:attribute name="id">
          <xsl:call-template name="get-id"/>
        </xsl:attribute>
      </xsl:if>
      <xsl:apply-templates
 select="*[contains(@class,' topic/title ')]"/>
```

```
      <xsl:apply-templates
 select="*[not(contains(@class,' topic/title ')
 or contains(@class,' topic/desc '))]"/>
      <xsl:apply-templates
 select="*[contains(@class,' topic/desc ')]"/>
    </fo:block>
  </xsl:template>
</xsl:stylesheet>
```

Figure 8: `cfg/fo/xsl/custom.xsl` file

7. Create an English-language variable-definition file (`cfg/common/vars/en.xml`) and make any necessary modifications to it.
   For example, the following code removes the period after the number for an ordered-list item; it also specifies that the bullet for an unordered list item should be an em dash.

```
<?xml version="1.0" encoding="UTF-8"?>
<vars xmlns="http://www.idiominc.com/opentopic/
vars">
  <!-- Remove dot from list number -->
  <variable id="Ordered List Number"><param
 ref-name="number"/></variable>
  <!-- Change unordered list bullet to an em
 dash -->
  <variable id="Unordered List
 bullet">&#x2014;</variable>
</vars>
```

Figure 9: `cfg/common/vars/en.xml` file

Results

The new plug-in directory has the following layout and files:

```
com.example.print-pdf/
  cfg/
    common/
      vars/
        en.xml
    fo/
      attrs/
        custom.xsl
      xsl/
        custom.xsl
    catalog.xml
  integrator.xml
  plugin.xml
```

What to do next

Run the integration process to install the plug-in and make the print-pdf transformation available.

Chapter

17

Implementation dependent features

Chunking

Supported chunking methods:

- select-topic
- select-document
- select-branch
- by-topic
- by-document
- to-content
- to-navigation.

When no chunk attribute values are given, no chunking is performed.

Note: In effect, for HTML based transformation types this is equivalent to select-document and by-document defaults.

Error recovery:

- When two tokens from the same category are used, no error or warning is thrown.
- When an unrecognized chunking method is used, no error or warning is thrown.

Filtering

Error recovery:

- When there are multiple `revprop` elements with the same val attribute, no error or warning is thrown
- When multiple prop elements define a duplicate attribute and value combination, attribute default, or fall-back behaviour, DOTJ007E error is thrown.

Debug attributes

The debug attributes are populated as follows:

xtrf	absolute system path of the source document
xtrc	element counter that uses the format `element-name ":" integer-counter ";" line-number ":" column-number`

Image scaling

If both height and width attributes are given, image is scaled non-uniformly.

If scale attribute is not an unsigned integer, no error or warning is thrown during preprocessing.

Map processing

When a `topicref` element that references a map contains child `topicref` elements, DOTX068W error is thrown and the child `topicref` elements are ignored.

Link processing

When the value of `href` attribute is not a valid URI reference, DOTJ054E error is thrown. Depending on *error recover mode*, error recover may be attempted.

Copy-to processing

When the `copy-to` attribute is specified on a `topicref`, the content of the `shortdesc` element is not used to override the short description of the topic.

Chapter 18

Extended functionality

Topics:

Code reference processing

Charset definition

DITA-OT supports defining the code reference target file encoding using the `format` attribute. The supported format is:

```
format (";" space* "charset=" charset)?
```

If charset is not defined system default charset will be used. If charset is not recognized or supported, DOTJ052E error is thrown and system default charset is used as a fall-back.

```
<coderef href="unicode.txt" format="txt; charset=UTF-8"/>
```

Line range extraction

Code reference can extract only a given line ranges with `line-range` pointer in the URI fragment. The format is:

```
uri ("#line-range(" start ("," end)? ")" )?
```

Start and end line numbers start from 1 and are inclusive. If end range is omitted, range ends in last line of the file.

```
<coderef href="Parser.scala#line-range(5, 10)" format="scala"/>
```

Only lines from 5 to 10 will be included in the output.

RFC 5147

DITA-OT implements line position and range from *RFC 5147*. The format for line range is:

```
uri ("#line=" start? "," end? )?
```

Start and end line numbers start from 0 and are inclusive and exclusive, respectively. If the start range is omitted, range starts from the first line; if end range is omitted, range ends in last line of the file. The format for line position is:

```
uri ("#line=" position )?
```

Position line number starts from 0.

```
<coderef href="Parser.scala#line=4,10" format="scala"/>
```

Only lines from 5 to 10 will be included in the output.

Appendix A

DITA and DITA-OT resources

Topics:

In addition to the DITA-OT documentation, there are other resources about DITA and the DITA-OT that you might find helpful.

Web-based resources

There are many vital DITA resources online, including the Yahoo! dita-users group and the DITA-OT project page at dita.xml.org.

DITA-OT project page at dita.xml.org	The DITA-OT project page at dita.xml.org provides news about the latest toolkit builds, plans for the next milestone release, and other rapidly-changing information. It also contains release notes for all past and upcoming releases.
Yahoo! dita-users group	The DITA-OT project page at dita.xml.org provides news about the latest toolkit builds, plans for the next milestone release, and other rapidly-changing information. It also contains release notes for all past and upcoming releases.
Home page for the OASIS DITA Technical Committee	The OASIS DITA Technical Committee develops the DITA standard.

DITA Open Toolkit 2.1.1 Release Notes

DITA Open Toolkit 2.1.1 is a maintenance release that includes fixes for reported issues.

Requirements

DITA Open Toolkit Release 2.1 requires the Java Runtime Environment (JRE) or Java Development Kit (JDK), version 7 or later.

Resolved issues

The following items are included in DITA Open Toolkit Release 2.1. Issue numbers correspond to the tracking number in the *GitHub issues tracker*.

Maintenance Release 2.1.1

DITA Open Toolkit Release 2.1.1 includes the following bug fixes:

- Whitespace in `<image>` elements is now ignored in PDF output to prevent errors when rendering XSL:FO.
  - *#1985* XEP error: Element 'fo:external-graphic' must be empty
- Any proportional table column widths expressed in the CALS table model as "*" are now normalized to the equivalent "1*" value to prevent errors while generating XHTML output.
  - *#1978* colwidth="*" causes Fatal Error! Cannot convert string "" to a double
- In DITA Open Toolkit 2.0.1, the line ending characters in shell files were inadvertently changed to Windows (CRLF) line endings. The correct UNIX (LF) line endings have now been restored.
  - *#1954* bin/ant throws errors when executed in Ubuntu shell

Feature requests and changes

DITA Open Toolkit Release 2.1 includes the following new features and changes:

- In PDF output, inline `<codeph>` elements in topic titles now inherit the font size from the surrounding title text.
  - *1874* Codephrase used in topic title has very small font
- Image metadata processing has been refactored to improve the processing speed by determining width and height without reading the entire image into memory.
  - *1883* Faster implementation for ImgUtils.getWidth/getHeight
- Obsolete CHM configuration files have been removed from the PDF2 plugin.
  - *1897* DITA OT 2.1.dev chm properties folder in org.dita.pdf2

Milestone 1 included the following new features and changes:

- The `chapterBody` XSL template mode has been refactored to create additional HTML5 groups in the generated HTML `<body>` element.

  DITA topics are now mapped to the HTML5 `<article>` element, DITA `<section>` to `<section>`, and DITA `<fig>` to `<figure>`.

  HTML5 `@aria-labelledby` accessibility attributes are also generated to associate each article with its heading. This helps to improve the accessibility and interoperability of HTML output by providing structural information to assistive technologies such as screen readers.
  - *1179* Added HTML generation extension for body content

- Additional file formats referenced from `<image>` elements are now copied to output. Any references that are not DITA, DITA map, or image, are now treated as resources and also copied, so you no longer need extra `<copy>` operations in your project build scripts to include such assets in output.
  - *1687* More recognized default resource extensions in the plugins base
- DITA-OT now fails with a fatal error (DOTA013F) if a specified .ditaval filter file is not available. This ensures that unexpected output is not generated if the filter file is missing or invalid.
  - *1703* Link to missing DITAVAL file should show a relevant error code in the console
- The generate-debug-attributes and processing-mode configuration options have been moved to runtime properties, so you can now pass these parameters at build time to specify whether the `@xtrf` and `@xtrc` debugging attributes should be generated, and how the DITA-OT handles errors and error recovery. For more information, see *common Ant paramters*.
  - *1799* Move configuration options to runtime properties
- The deprecated Java command line tool has been removed in favor of the `dita` command introduced in DITA-OT 2.0.

  If you previously generated output via a Java command sequence such as

  ```
  java -jar lib/dost.jar /i:input-file /transtype:transformation-type
   /parameter-name:value
  ```

  you should now use the following syntax instead:

  ```
  dita -f transformation-type -i input-file -o output-dir
  ```

  - *1800* Remove old Java command line tool
- The custom `FileUtils` code used to handle input and output in earlier versions of DITA-OT has been replaced with the *Apache Commons IO* utilities library.
  - *1803* Use Commons IO
- Support for the args.odt.img.embed parameter has been removed from OpenDocument format transformations.

  The previous default behavior was to embed images as Base64-encoded text, but editors do not use this as a default. Instead, office packages such as LibreOffice will convert embedded images into linked images on opening and saving an ODT file.

  - *1832* Remove support for args.odt.img.embed
- Keydef processing has been removed from the XHTML rendering code

  Keys are now resolved in one preprocessing step, whereas in earlier versions of DITA-OT, the XHTML code returned to the `keydef.xml` file to look up targets for phrase elements and pull in text when needed. This change affects non-linking elements that can't take `@href` attributes, such as `<ph>`, `<keyword>`, `<cite>`, `<dt>`, `<term>`, and `<indexterm>` (when `$INDEXSHOW` is active).

  - *1837* Remove keydef processing from XHTML rendering code
- A new `dita.parser` extension point has been added to allow plug-ins to contribute a custom parser for DITA files.

  If a custom DITA parser is defined, the preprocessing routines will use it during the gen-list and debug-filter stages to output DITA XML.

  - *1847* Extension-point for custom DITA parsers

Bugs

DITA Open Toolkit Release 2.1 provides fixes for the following bugs:

- *1513* Suspected memory leak in OT bug preprocess
- *1694* Cannot convert string to double
- *1854* integrator.xml should also load the necessary "commons-io.jar"

- *1870* PDF2 output plugin fails rendering tables
- *1872* Link to index term repeats itself
- *1877* Searchtitle Incorrectly Used for HTML Title
- *1888* build.xml help target documentation is incorrect ant interface
- *1889* @class missing from choicetable XHTML output
- *1890* properties table XHTML output
- *1894* Fix unitless length-to-pixels
- *1921* Error reported during flagging
- *1922* Index continued markers don't work if both primary and its secondary entries continue
- *1927* In the key() function, the node supplied in the third argument (or the context node if absent) must be in a tree whose root is a document node
- *1932* when running ./dita, console shows "No such file or directory" when directory contains spaces

Milestone 1 provided fixes for the following bugs:

- *1415* Filtering doesn't support default for rev flagging
- *1840* Keyref processing doesn't use only first keyword or term
- *1849* Some XSLT XPaths do not properly use the @class attribute to select elems

Maintenance Release 2.0.1

Note: DITA Open Toolkit Release 2.1 also included the following bug fixes that were released earlier this year with maintenance version 2.0.1.

- *#1744* copy-to attribute not processed correctly (error DOTX008E) in XHTML transtype on a topicref included in a child map
- *#1790* FO: Xref processing does not handle case of key with no remote resource or link text
- *#1806* IDs are not preserved on <bodydiv> element
- *#1808* DITA-OT 2.0: PDF bookmarks (TOC, index) not in language indicated in source files
- *#1810* DITA-OT 2.0: typo in PDF-plugin, xsl/fo/toc.xsl ("boookmap")
- *#1811* Filtering doesn't support @deliveryTarget
- *#1813* Mappull step fails with nested concept
- *#1814* Task with links and nested task fails in XHTML
- *#1815* Convert String to double Error message when we try to generate pdf
- *#1826* OT 2.0: Map with subject scheme and non-below map fails