Oxygen DITA-OT CSS-based PDF Publishing plugin 24.0
User Guide
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1. Overview

This section contains topics that provide a basic overview of the DITA-OT CSS-based PDF Publishing Plugin, technical details, and some additional resources to help you with your customizations.

Tip:
For more information and some tips in regard to publishing DITA documents to PDF using CSS, watch our Webinars:

• Transforming DITA documents to PDF using CSS, Part 1 – Page Definitions, Cover Page and PDF Metadata.
• Transforming XML and HTML documents to PDF using CSS, Part 2 – Lists, Tables and Images.
• Transforming XML and HTML documents to PDF using CSS, Part 3 – Global Page Layout.
• Transforming XML and HTML documents to PDF using CSS, Part 4 – Advanced Functionalities.

Resources

Customizing the PDF output requires knowledge of CSS, Paged Media, and DITA. The following list provides some resources to help you:


• CSS Paged Media - This is a part of the CSS specification that shows how to organize your publication in pages, how to use headers/footers, page breaks, and other page-related issues. The specification is available here: https://www.w3.org/TR/CSS2/page.html. Also, there is a set of hands-on examples in the Oxygen PDF Chemistry user guide: https://www.oxygenxml.com/doc/ug-chemistry/.

• **HTML5** - You will need a good knowledge of HTML5. You can find resources here: https://developer.mozilla.org/en-US/docs/Web/Guide/HTML/HTML5

• **Webinars** - Some helpful webinars are available on our website: https://www.oxygenxml.com/publishing_engine/videos.html?category=Webinars. They explain how to generate PDF from DITA documents using CSS, step-by-step.

**Related Information:**
DITA-OT DAY 2017: Using CSS to Style PDF Output

**Supported Processors**

The **DITA-OT CSS-based PDF Publishing Plugin** supports the following CSS processors:

• **Oxygen PDF Chemistry** - This is recommended processor because the built-in CSS files were fine-tuned for this processor. For example, metadata extraction *(on page 95)* only functions with this processor. If the plugin is started from an Oxygen XML Editor/Author distribution, a Chemistry installation is not needed.


**Technical Details**


It has the following transformation types:

• **pdf-css-html5** *(DITA Map PDF - based on HTML5 & CSS transformation)* - CSS styling applied over a merged HTML5 document (the merged DITA map converted to HTML5).

• **pdf-css-html5-single-topic** *(DITA PDF - based on HTML5 & CSS transformation)* - CSS styling applied over a merged HTML5 document (the merged DITA topic converted to HTML5).

This is how it works:

1. It expands all the topic references into a temporary clone of the map, resolving keys and reused content. For the single topic transformation the result is a file with the keys and content resolved.
2. It generates a structure for the table of contents and index. The result is a merged map with all the references resolved. When transforming a single topic, the TOC and Index are not added to the merged file, this includes only the contents of the topic.
3. Then it post-processes the merged map. It fixes some of the structure in the TOC and index, moves the *frontmatter* and *backmatter* to the correct places, transforms any change tracking and review processing instructions to elements that can be styled later, etc. The result is another merged map.

4. The merged DITA map or topic is transformed to a single HTML5 file.

   The generated HTML elements copy the class attributes from the original DITA elements. In this way you can either use selectors that were designed for DITA structure, or ones for the HTML

---

**Note:**

In the single topic transformation type (*DITA PDF - based on HTML5 & CSS*), these steps are simplified.
Increasing Memory Allocation for Java

If you are working with a large project with extensive metadata or key references, you may need to increase the amount of memory that is allocated to the Java process that performs the publishing.

When the Transformation is Started from Oxygen

To alter the memory allocation setting from the transformation scenario, follow these steps:

1. Open the Configure Transformation Scenario(s) dialog box.
2. Select your transformation scenario, then click Edit.
3. Go to the Advanced tab.
4. Locate the JVM Arguments and increase the default value. For instance, to set 2 gigabytes as the maximum amount of memory, you can use: `-Xmx2g`. If you do not specify the `-Xmx` value in this field, by default, the application will use a maximum of 512 megabytes when used with a 32-bit Java Virtual Machine and one gigabyte with a 64-bit Java Virtual Machine.

Note:
This memory setting is used by both the DITA-OT process and the Chemistry CSS processor.

When the Transformation is Started from the Command Line

There can be two situations where an out of memory error can be triggered:
• From the DITA-OT basic processing (the preparation of the merged XML document).
• From the Chemistry PDF CSS processor (the transformation of the merged XML document to PDF).

To solve both of them, you can change the value of the `ANT_OPTS` environment variable from a command line for a specific session.

**Example:** To increase the JVM memory allocation to 1024 MB for a specific session, issue the following command from a command prompt (depending on your operating system):

- **Windows**
  
  ```
  set ANT_OPTS=%ANT_OPTS% -Xmx1024M
  ```

- **Linux/macOS**
  
  ```
  export ANT_OPTS="$ANT_OPTS -Xmx1024M"
  ```

**Tip:** To persistently change the memory allocation, change the value allocated to the `ANT_OPTS` environment variable on your system.

If the Chemistry PDF CSS processor fails with an *Out Of Memory Error*, try adding the `baseJVMArgLine` parameter to the DITA-OT command line. For example:

```
-DbaseJVMArgLine=-Xmx984m
```

### Transformation Parameters

This list includes the most common customization parameters that are available in the DITA *Map PDF - based on HTML5 & CSS* transformation scenario. Other standard DITA-OT parameters were omitted for clarity, but they are still supported.

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<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>args.allow.external.coderefs</code></td>
<td>Enables the inclusion of code files that are located outside the DITA map folder hierarchy, referenced using the DITA <code>&lt;coderef&gt;</code> element. Allowed values are <code>yes</code> or <code>no</code> (default).</td>
</tr>
</tbody>
</table>
| `args.chapter.layout`    | Specifies whether chapter-level TOCs are generated for bookmaps. When set to `MINITOC`, a small section with links is added at the beginning of each chapter. The default is `BASIC`. For details, see: [Table of Contents on a Page (Mini TOC)](on page 127). Allow values:  
  
  - **BASIC** - No chapter TOC is created.  
  - **MINITOC** - A chapter-level TOC will be generated.  
  - **MINITOC-BOTTOM-LINKS** - A chapter-level TOC will be generated, with the links under the chapter description. |
### args.css

You can use this to specify a list of CSS URLs to be used in addition to those specified in the `dita.css.list` parameter or publishing template. The files must have URL syntax and be separated using semicolons.

### args.css.param.*

You can use this parameter pattern to set attributes on the root of the merged map. This means you can activate specific CSS rules from your custom CSS using custom attributes. For examples, see: [Styling Through Custom Parameters](on page 199).

### args.css.param.numbering

You can use this parameter to change the numbering of the first-level topics (chapters) and nested topics. Allowed values:

- **shallow** - Only the topics from the first level will be numbered (chapters). This is the default.
- **deep** - All the topics from the map will be numbered (nested topics up to level 3).
- **deep-chapter-scope** - Similar to deep, but in addition, the page numbers, figures, and table numbers are reset at the start of each first-level topic (chapter). The table and figure titles (and the links to them) are prefixed with the chapter numbers. The generic cross reference links contain both the first-level topic (chapter) numbers and the page numbers to avoid ambiguity. This parameter value is only available for the [DITA Map PDF - based on HTML5 & CSS](transformation scenario).
- **deep-chapter-scope-no-page-reset** - Similar to `deep-chapter-scope`, but the page numbers do not reset at the start of each first-level topic (chapter). The generic cross reference links contain only the page number. This parameter value is only available for the [DITA Map PDF - based on HTML5 & CSS](transformation scenario).

For more details, see [Numbering Types](on page 113).

### args.css.param.numbering-sections

Controls whether or not the sections are included in the table of contents. When set to **yes** (sections are included), they are numbered according the numbering scheme set by the `args.css.param.numbering` parameter.

### args.css.param.show-onpage-lbl

Controls whether or not the links will have an on page NN label after them. This parameter has different defaults, depending on the transformation type. For map transformations (pdf-css-html5 trans type), the default is **yes**. For topic transformations (pdf-css-html5-single-topic trans type), the default is **no**.

### args.css.param.title.layout

Changes the structure of the title element. In the output, the title area consists of two parts: one is the number of the chapter (and optionally,
the sections number), and one is the title text. This parameter allows a switch between normal text flow (in-line flow) and a table layout where the number is placed in one cell and the text in the other (to avoid wrapping text under the chapter number).

- **normal**
- **table** (avoid wrapping text under counter)

| **args.draft** | Specifies whether or not the content of `<draft-comment>` and `<required-cleanup>` elements is included in the output. Allowed values:
|                | - **no** (default) - No draft information is shown in the output.
|                | - **yes** - The draft information is shown in the output. |

| **args.figurelink.style** | Specifies how cross references to figures are styled in output. Allowed values:
|                          | - **NUMBER** - Only the number of the figures will be shown in links.
|                          | - **TITLE** - Only the title of the figures will be shown in links.
|                          | - **NUMTITLE** (default) - Both the title and number of the figures will be shown in links. |

| **args.gen.task.lbl** | Specifies whether or not to generate headings for sections within task topics. Allowed values: **YES** or **NO** (default). When set to **YES**, headings such as "About this task", "Before you begin", "Procedure", or "What to do next", are shown in the task contents. |

| **args.hyph.dir** | Specifies the directory that contains custom hyphenation dictionaries. For more details see: **Hyphenation (on page 150)**. |

| **args.input** | Specifies the main DITA map file for your documentation project. |

| **args.keep.output.debug.files** | Specifies whether or not the debug files generated during the transformation should be kept in the output folder. Allowed values: **YES** (default) or **NO**. |

| **args.output.base** | Specifies the name of the output file without a file extension. By default, the name of the PDF file is derived from the name of the DITA map file. This parameter allows you to override it. |

<p>| <strong>args.rellinks.group.mode</strong> | Specifies the related links grouping mode. All links can be grouped into a single &quot;Related Information&quot; group or links grouped by their target type (topic, task, or concept). Allowed values: <strong>single-group</strong> (default) or <strong>group-by-type</strong>. For more details see: <strong>How to Group Related Links by Type (on page 178)</strong>. |</p>
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<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>args.tablelink.style</td>
<td>Specifies how cross references to tables are styled in output. Allowed values:</td>
</tr>
<tr>
<td></td>
<td>• <strong>NUMBER</strong> - Only the number of the tables will be shown in links.</td>
</tr>
<tr>
<td></td>
<td>• <strong>TITLE</strong> - Only the title of the tables will be shown in links.</td>
</tr>
<tr>
<td></td>
<td>• <strong>NUMTITLE</strong> (default) - Both the title and number of the tables will be shown in links.</td>
</tr>
<tr>
<td>clean.temp</td>
<td>Specifies whether or not the DITA-OT deletes the files in the temporary directory after it finishes a build. Allowed values: <strong>yes</strong> (default) or <strong>no</strong>.</td>
</tr>
<tr>
<td>chemistry.security.policy</td>
<td>Specifies a Java policy file that applies to the Chemistry process. A template can be found here: plugins/com.oxygenxml.pdf.css/lib/oxygen-pdf-chemistry/config/chemistry.policy.</td>
</tr>
<tr>
<td>chemistry.security.workspace</td>
<td>Specifies a directory where the temporary files and font cache created by the Chemistry process need to be stored. This becomes required when the chemistry.security.policy parameter is set.</td>
</tr>
<tr>
<td>chemistry.security.resources.dir</td>
<td>Path to an additional folder that Chemistry will use to read its resources (CSS, images). The process already has read access to the input map folder, the publishing templates folder, and the OPE install folder. This optional parameter should only be used when the chemistry.security.policy parameter is set.</td>
</tr>
<tr>
<td>chemistry.security.resources.host</td>
<td>The host, specified as name:port, that Chemistry will use to get resources (e.g. CSS files, images, fonts). This optional parameter should only be used when the chemistry.security.policy parameter is set.</td>
</tr>
<tr>
<td>css.processor.path.anten-na-house</td>
<td>Path to the Antenna House executable file that needs to be run to generate the PDF (for example, C:\path\to\AHFCmd.exe on Windows).</td>
</tr>
<tr>
<td>css.processor.path.chemistry</td>
<td>Path to the <strong>Oxygen PDF Chemistry</strong> executable file that needs to be run to generate the PDF (for example, C:\path\to\chemistry.bat on Windows). If this parameter is not set, the plugin will use the system's PATH environment variable to locate and start <strong>Oxygen PDF Chemistry</strong>.</td>
</tr>
<tr>
<td>css.processor.path.prince</td>
<td>Path to the Prince executable file that needs to be run to generate the PDF (for example, C:\path\to\prince.exe on Windows).</td>
</tr>
<tr>
<td>css.processor.type</td>
<td>Specifies the processor to use for the transformation. Allowed values: <strong>chemistry</strong> (default), <strong>antenna-house</strong>, or <strong>prince</strong>.</td>
</tr>
<tr>
<td>default.language</td>
<td>Specifies the default language for source documents. Examples: <strong>fr</strong>, <strong>de</strong>, <strong>zh</strong>, etc. Depending on the transformation type, the actual number of supported languages can vary, see: <strong>Localization (on page 159)</strong>.</td>
</tr>
<tr>
<td>Parameter Name</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>drop.block.margins.at.page-boundary</strong></td>
<td>Specifies that the top and bottom margins associated with a block element should be discarded when the block is at the top or bottom of the page. Allowed values: YES (default) or NO.</td>
</tr>
<tr>
<td><strong>editlink.ditamap.edit.url</strong></td>
<td>Use this parameter to add an <em>Edit</em> link next to the topic title in the Web-Help output. When a user clicks the link, the topic is opened in Oxygen XML Web Author or Content Fusion where they can make changes that can be saved to a file server. The value should be set as the edit URL of the <em>main DITA map</em> used for publishing your output. The easiest way to obtain the URL is to open the map in Web Author or Content Fusion and copy the URL from the browser's address bar.</td>
</tr>
<tr>
<td><strong>editlink.additional.query.parameters</strong></td>
<td>You can use this optional parameter to add additional parameters to be appended to each generated edit link. Each parameter must start with &amp; (for example: &amp;tags-mode=no-tags).</td>
</tr>
<tr>
<td><strong>editlink.remote.ditamap.url</strong></td>
<td>Use this parameter in conjunction with editlink.web.author.url to add an <em>Edit</em> link next to the topic title in the PDF output. When a user clicks the link, the topic is opened in Oxygen XML Web Author where they can make changes that can be saved to a file server. The value should be set as the custom URL of the <em>main DITA map</em>. For example, a GitHub custom URL might look like this: <a href="https://getFileContent/oxyengxml/userguide/master/UserGuide.ditamap">https://getFileContent/oxyengxml/userguide/master/UserGuide.ditamap</a>.</td>
</tr>
<tr>
<td><strong>editlink.web.author.url</strong></td>
<td>This parameter needs to be used in conjunction with editlink.remote.ditamap.url to add an <em>Edit</em> link next to the topic title in the PDF output. When a user clicks the link, the topic is opened in Oxygen XML Web Author where they can make changes that can be saved to a file server. The value should be set as the URL of the Web Author installation. For example: <a href="https://www.oxygenxml.com/oxygen-xml-web-author/">https://www.oxygenxml.com/oxygen-xml-web-author/</a>.</td>
</tr>
<tr>
<td><strong>enable.latin.glyph.substitutions</strong></td>
<td>When set to yes (default), glyph substitution is enabled (if the particular font supports it). This applies to Latin-based scripts only (the substitutions are always enabled in other types of scripts). If you encounter problems rendering or copying accented glyphs (i.e. umlauts or other diacritics), it might be helpful to set this parameter to no to disable the font glyph substitutions. Another example of a case when you might need to disable the substitutions is a situation where an accented character cannot be mapped to a compound glyph, resulting in the glyph not being rendered in the PDF output.</td>
</tr>
</tbody>
</table>
### Warnings:

- Disabling substitutions also disables Latin ligatures.
- Disabling substitutions is not recommended unless absolutely necessary. It is better practice to use another font if you can find one that does not have the rendering issues.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>figure.title.placement</td>
<td>Controls the title placement of the figures, relative to the image. Possible values include top (default) and bottom.</td>
</tr>
<tr>
<td>fix.external.refs.com.oxygenxml</td>
<td>The DITA Open Toolkit usually has problems processing references that point to locations outside of the processed DITA map directory. This parameter is used to specify whether or not the application should try to fix such references in a temporary files folder before the DITA Open Toolkit is invoked on the fixed references. The fix has no impact on your edited DITA content. Allowed values: true or false (default).</td>
</tr>
<tr>
<td>hide.frontpage.toc.index.glossary</td>
<td>When set to yes, the generated structures (table of contents, index list, front page, etc.) are removed from the output. The default is no.</td>
</tr>
<tr>
<td>image.resolution</td>
<td>You can use this parameter to set the default resolution used by images. It works mainly on vector images since raster images have their resolution defined in their metadata. The default is 96 (dpi). For more information, see how to change images resolution (on page 179).</td>
</tr>
<tr>
<td>pdf.accessibility</td>
<td>When set to yes, the PDF output will be generated in compliance with the PDF/Universal Accessibility standard (also known as ISO 14289). The default is no.</td>
</tr>
<tr>
<td>pdf.version</td>
<td>Use this parameter to specify the version of the produced PDF. It has no impact on the set of PDF features used by the engine, but may be used to signal a compatibility level to the PDF readers. The default is 1.5.</td>
</tr>
<tr>
<td>pdf.security.restrict.printhq</td>
<td>Restricts high quality printing. Used for protecting the PDF Document. The restriction is off by default. Accepted values: yes or no.</td>
</tr>
<tr>
<td>pdf.security.restrict.assembledoc</td>
<td>Restricts assembling document (e.g. adding pages). Used for protecting the PDF Document. The restriction is off by default. Accepted values: yes or no.</td>
</tr>
<tr>
<td>pdf.security.restrict.accesscontent</td>
<td>Restricts extracting text and graphics. Used for protecting the PDF Document. The restriction is off by default. Accepted values: yes or no.</td>
</tr>
<tr>
<td>pdf.security.restrict.fillforms</td>
<td>Restricts filling in existing interactive forms. Used for protecting the PDF Document. The restriction is off by default. Accepted values: yes or no.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><code>pdf.security.restrict.annotations</code></td>
<td>Restricts filling in existing interactive forms. Used for protecting the PDF Document. The restriction is off by default. Accepted values: <strong>yes</strong> or <strong>no</strong>.</td>
</tr>
<tr>
<td><code>pdf.security.restrict.print</code></td>
<td>Restricts printing. Used for protecting the PDF Document. The restriction is off by default. Accepted values: <strong>yes</strong> or <strong>no</strong>.</td>
</tr>
<tr>
<td><code>pdf.security.restrict.copy</code></td>
<td>Restricts copying content. Used for protecting the PDF Document. The restriction is off by default. Accepted values: <strong>yes</strong> or <strong>no</strong>.</td>
</tr>
<tr>
<td><code>pdf.security.restrict.edit</code></td>
<td>Restricts copying content. Used for protecting the PDF Document. The restriction is off by default. Accepted values: <strong>yes</strong> or <strong>no</strong>.</td>
</tr>
<tr>
<td><code>pdf.security.user.password</code></td>
<td>User password. The document can be opened using this password. When the owner password parameter is not specified, the user password gives full rights to the people using it. When the owner password parameter is specified, the people can open the document using the user password but restrictions will apply. Missing by default.</td>
</tr>
<tr>
<td><code>pdf.security.owner.password</code></td>
<td>Owner password. There are no restrictions for people using this password.</td>
</tr>
<tr>
<td><code>pdf.security.encrypt.metadata</code></td>
<td>Encrypts the metadata. By default active when other security parameters are set. Accepted values: <strong>yes</strong> or <strong>no</strong>.</td>
</tr>
<tr>
<td><code>show.changes.and.comments</code></td>
<td>When set to <strong>yes</strong>, the user comments, colored highlights and tracked changes are shown in the output.</td>
</tr>
<tr>
<td><code>show.changes.and.comments-as.changebars</code></td>
<td>When set to <strong>yes</strong> (default) and the <code>show.changes.and.comments</code> parameter is also set to <strong>yes</strong>, the user comments and tracked changes are shown as change bars in the PDF output. This parameter can be used in conjunction with the <code>show.changes.and.comments-as.pdf.sticky.notes</code> parameter to choose whether the change bars are displayed in footnotes or sticky notes. You can override this from your customization CSS (on page 48).</td>
</tr>
<tr>
<td><code>show.changes.and.comments-as.pdf.sticky.notes</code></td>
<td>When set to <strong>yes</strong> (default) and the <code>show.changes.and.comments</code> parameter is also set to <strong>yes</strong>, the user comments and tracked changes are shown in the PDF output as sticky note annotations. When set to <strong>no</strong>, the comments and tracked changes are left in the document model and are styled by the default CSS rules as footnotes. You can override this from your customization CSS (on page 48).</td>
</tr>
<tr>
<td><code>show.changed.text.in.pdf.sticky.notes.content</code></td>
<td>When set to <strong>yes</strong> (default) and both the <code>show.changes.and.comments</code> and <code>show.changes.and.comments-as.pdf.sticky.notes</code> parameters are also set to <strong>yes</strong>, the inserted and deleted text is shown in the sticky note annotations. When set to <strong>no</strong>, only the <code>inserted</code> and <code>deleted</code> labels are shown in the annotations (this is useful for search scope).</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>show.image.map.area.numbers</td>
<td>When set to <strong>yes</strong>, a counter for each area from the image map will be displayed over the image, near the defined shape. The default is <strong>no</strong>.</td>
</tr>
<tr>
<td>show.image.map.area.shapes</td>
<td>When set to <strong>yes</strong>, each of the image map area shapes will be displayed with a translucent fill over the image. You can use this to debug your image maps. The default is <strong>no</strong>.</td>
</tr>
<tr>
<td>store-type</td>
<td>Setting this parameter to <strong>memory</strong> will increase the processing speed and thus, could help decrease the publishing time.</td>
</tr>
<tr>
<td>table.title.placement</td>
<td>Controls the placement of the title for tables. Possible values include <strong>top</strong> (default) and <strong>bottom</strong>.</td>
</tr>
<tr>
<td>table.title.repeat</td>
<td>Specifies whether or not a table caption should repeat on other pages when the table spans onto multiple pages. The caption is not repeated for tables nested in lists or other tables. Allowed values are <strong>yes</strong> (default) or <strong>no</strong>.</td>
</tr>
<tr>
<td>use.css.for.embedded.svg</td>
<td>When set to <strong>yes</strong> (default), the CSS files specified in the publishing template or by the <code>args.css</code> parameter are also applied on embedded SVG elements. Allowed values are <strong>yes</strong> and <strong>no</strong>.</td>
</tr>
<tr>
<td>use.navtitles.in.all.links</td>
<td>Specifies whether a <code>&lt;navtitle&gt;</code> defined in a topic or a topic reference should be used as the display name for all links or only in the table of contents. Allowed values are <strong>yes</strong> and <strong>no</strong> (default).</td>
</tr>
<tr>
<td>parallel</td>
<td>Specifies whether or not certain pre-processing tasks should be run in parallel. Setting this parameter to <strong>true</strong> may add a small increase to the publishing speed. Allowed values are: <strong>true</strong> and <strong>false</strong> (default).</td>
</tr>
</tbody>
</table>

The following parameters can be used to specify a publishing template:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pdf.publishing.template</td>
<td>Specifies the path to the folder containing the custom PDF template.</td>
</tr>
<tr>
<td>pdf.publishing.template.descriptor</td>
<td>Specifies the name of the descriptor file to be loaded from the PDF template folder or package. If it is not specified, the first encountered descriptor file will be loaded.</td>
</tr>
</tbody>
</table>

The following parameter is available on all DITA transformations when using the **Oxygen Publishing Engine**:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| args.disable.security.checks | Specifies whether or not to load external entities that are not solved through catalogs. For security reasons, the default is **no**. Allowed values:  
  
  - **yes**  
  - **no** (default) |
The following parameters are only available for the **DITA PDF - based on HTML5 & CSS** single DITA topic transformation scenario (**pdf-css-html5-single-topic** trans type):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>args.root.map</code></td>
<td>Specifies the path of the root map file used to expand the key references in the published topic.</td>
</tr>
<tr>
<td><code>args.enable.root.map.key-processing</code></td>
<td>Indicates whether or not the keys should be processed using the root map parameter.</td>
</tr>
<tr>
<td></td>
<td>Allowed values:</td>
</tr>
<tr>
<td></td>
<td>• auto (default)</td>
</tr>
<tr>
<td></td>
<td>• yes</td>
</tr>
<tr>
<td></td>
<td>• no</td>
</tr>
</tbody>
</table>

**Console Logging**

To activate the logging of the last processing stage, involving the usage of the Chemistry processor to generate the PDF from the merged HTML, use the `-verbose` DITA-OT parameter from the command line.

Note:
When the transformation is started from an **Oxygen** application, this parameter is automatically set.

**License Key**

**Chemistry License**

If you have an **Oxygen PDF Chemistry** license key, you will be able to generate PDF output that is not stamped with the **Chemistry** logo image.

To install your **Chemistry** license key:

- If you are using the version of **Chemistry** that comes bundled in **Oxygen XML Editor/Author**, save the license key text in a file with the name `licensekey.txt` and place it in the `DITA-OT-DIR/plugins/com.oxygenxml.pdf.css/lib/oxygen-pdf-chemistry` folder.
- If you are using another **Chemistry** installation, make sure you place the `licensekey.txt` file in that folder.

**Oxygen Publishing Engine License**

If you have purchased a license for the **Oxygen Publishing Engine**, you will be able to produce both PDF and WebHelp output without any restrictions.

To install your **Oxygen Publishing Engine** license key, save the license key text in a file with the name `licensekey.txt` and place it in the `DITA-OT-DIR` folder.
How to Protect PDF Files by Setting Security Permissions

You can restrict the use of the PDF files by specifying a set of permissions. The `pdf.security.*` parameters listed in the Transformation Parameters (on page 13) section can be used for this purpose.

For example, to permit only the users that have a password to access the document and also to restrict their printing and copying capability, you can use the following parameter combination:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pdf.security.owner.password</code></td>
<td><code>&lt;OWNER PASSWORD&gt;</code></td>
<td>People using this password will be able to open the document, with full permissions.</td>
</tr>
<tr>
<td><code>pdf.security.user.password</code></td>
<td><code>&lt;USER PASSWORD&gt;</code></td>
<td>People using this password will be able to open the document, but they will not be able to print.</td>
</tr>
<tr>
<td><code>pdf.security.restrict.print</code></td>
<td>yes</td>
<td>Restricts users from printing.</td>
</tr>
<tr>
<td><code>pdf.security.restrict.copy</code></td>
<td>yes</td>
<td>Restricts users from copying content.</td>
</tr>
</tbody>
</table>

⚠️ **Important:**

If you specify just the user password (without an owner password), then the people using it will be considered owners, and no restrictions will apply to them.
2. Publishing Templates

An Oxygen Publishing Template defines all aspects of the layout and styles for output obtained from the following transformation scenarios:

- WebHelp Responsive
- DITA Map PDF - based on HTML5 & CSS

It is a self-contained customization package stored as a ZIP archive or folder that can easily be shared with others. It provides the primary method for customizing the output.

Some possible customization methods include:

- Add additional template resources to customize the output (such as logos, Favicon, or CSS files).
- Extend the default processing by specifying one or more XSLT extension points.
- Specify one or more transformation parameters to customize the output.
- Customize various aspects of the output through simple CSS styling.
- For WebHelp Responsive output, change the layout of the main page or topic pages by customizing which components will be displayed and where they will be positioned in the page.

The following graphics are possible sample structures for Oxygen Publishing Template packages:

**Figure 1. Oxygen Publishing Template Package (WebHelp Responsive)**

```plaintext
<table>
<thead>
<tr>
<th>Resources (CSS, JS, Fonts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTML fragments</td>
</tr>
<tr>
<td>XSLT Extensions</td>
</tr>
<tr>
<td>HTML Page Layout Files</td>
</tr>
<tr>
<td>Template Descriptor</td>
</tr>
</tbody>
</table>

- publishing template
  - CSS
    - oxygen-skin.css
  - JS
  - fonts
  - HTML-Fragments
    - webhelp.fragment.footer.html
    - webhelp.fragment.before.logo_and_title.html
  - XSLT-Extensions
    - topic_page_extension.xsl
  - page-templates
    - wt_index.html
    - wt_search.html
    - wt_topic.html
    - wt_terms.html
  - template_descriptor.opt
```
Publishing Template Package Contents for PDF Customizations

An Oxygen Publishing Template for PDF output must contain a template descriptor file and at least one CSS file, and may contain other resources (such as graphics, XSLT files, etc.). All the template resources can be stored in either a ZIP archive or in a folder. It is recommended to use a ZIP archive because it is easier to share with others.

Template Descriptor File

Each publishing template includes a descriptor file that defines the meta-data associated with template. It is an XML file with certain elements that defines all the resources included in a template (such as CSS files, images, and transformation parameters).

The template descriptor file must have the .opt file extension and must be located in the templates' root folder.

A PDF template descriptor might look like this:

```xml
<publishing-template>
  <name>Flowers</name>

  <pdf>
    <tags>
      <tag>purple</tag>
      <tag>light</tag>
    </tags>
    <preview-image file="flowers-preview.png"/>
    <resources>
      <css file="flowers.css"/>
    </resources>
  </pdf>
</publishing-template>
```
Tip:
It is recommended to edit the template descriptor in Oxygen XML Editor/Author because it provides content completion and validation support.

Template Name and Description
Each template descriptor file requires a `<name>` element. This information is displayed as the name of the template in the transformation scenario dialog box.

Optionally, you can include a `<description>` and it displayed when the user hovers over the template in the transformation scenario dialog box.

```
<publishing-template>
  <name>Flowers</name>
  <description>Flowers themed light colored template</description>
...```

Template Author
Optionally, you can include author information in the descriptor file and it displayed when the user hovers over the template in the transformation scenario dialog box. This information might be useful if users run into an issue or have questions about a certain template.

If you include the `<author>` element, a `<name>` is required and optionally you can include `<email>`, `<organization>`, and `<organizationUrl>`.

```
<publishing-template>
  ...
  <author>
    <name>John Doe</name>
    <email>jdoe@example.com</email>
    <organization>ACME</organization>
    <organizationUrl>http://www.example.com/jdoe</organizationUrl>
  </author>
  ...
```

PDF Element
The `<pdf>` element contains various details about the template and its resources that define the PDF output. It is a required element if you intend on using a DITA Map to PDF transformation scenario. The elements that are allowed in this `<pdf>` section specify the template tags (on page 26), template preview image (on page...
resources (on page 27) (such as CSS files), transformation parameters (on page 27), or XSLT extensions (on page 28).

```xml
<pdf>
  <tags>
    ...
  </tags>
  <preview-image file="MyPreview.png"/>
  <resources>
    ...
  </resources>
  <parameters>
    ...
  </parameters>
</pdf>
```

**Template Tags**

The `<tags>` section provides meta information about the template (such as color theme). Each tag is displayed at the top of the Templates tab window in the transformation scenario dialog box and they help the user filter and find particular templates.

```xml
<publishing-template>
  ...
  <pdf>
    <tags>
      <tag>purple</tag>
      <tag>light</tag>
    </tags>
  </pdf>
</publishing-template>
```

**Template Preview Image**

The `<preview-image>` element is used to specify an image that will be displayed in the transformation scenario dialog box. It provides a visual representation of the template to help the user select the right template. The image dimensions should be 200 x 115 pixels and the supported image formats are: JPEG, PNG, or GIF.

You can also include an `<online-preview-url>` element to specify the URL of a published sample of your template. This will display an Online preview icon in the bottom-right corner of the image in the transformation scenario dialog box and if the user clicks that icon, it will open the specified URL in their default browser.

```xml
<publishing-template>
  ....
  <pdf>
    ...
  </pdf>
</publishing-template>
```
Template Resources

The `<resources>` section of the descriptor file specifies a set of resources (CSS files) that are used to customize various components in the generated output. These resources will be copied to the output folder during the transformation process. At least one CSS file must be included (using the `<css>` element).

```
<publishing-template>
  ...
  <pdf>
    ...
    <resources>
      <css file="css/custom_styles.css"/>
      <css file="css/custom_fonts.css"/>
    </resources>
  </pdf>
</publishing-template>
```

Note:
All relative paths specified in the descriptor file are relative to the template root folder.

Transformation Parameters

You can also set one or more transformation parameters in the descriptor file.

```
<publishing-template>
  ...
  <pdf>
    ...
    <parameters>
      ...
      <parameter name="show.changes.and.comments" value="yes"/>
    </parameters>
    </pdf>
  </pdf>
</publishing-template>
```

The following information can be specified in the `<parameters>` element:

**Parameter name**

The name of the parameter. It may be one of the transformation parameters listed in the Parameters tab of the DITA Map PDF - based on HTML5 & CSS transformation scenario or a DITA-OT PDF-based output parameter.

Note:
It is not recommended to specify an input/output parameter in the descriptor file (such as the input Map, DITAVAL file, or temporary directory).
Attention:
JVM arguments like -Xmx cannot be specified as a transformation parameter.

**Parameter Value**

The value of the parameter. It should be a relative path to the template root folder for file paths parameters.

**Parameter Type**

The type of the parameter: string or filepath. The string value is default.

After creating a publishing template and creating a publishing template, when you select the template in the transformation scenario dialog box, the Parameters tab will automatically be updated to include the parameters defined in the descriptor file. These parameters are displayed in italics.

**XSLT Extension Points**

The publishing templates support one or more XSLT extension points. They can be specified using the `<xslt>` element in the descriptor file using the following structure:

```xml
<publishing-template>
  ...
  <pdf>
    ...
    <xslt>
      <extension id="com.oxygenxml.pdf.css.xsl.merged2html5"
                 file="xslt/merged2html5Extension.xsl"/>
      <extension id="com.oxygenxml.pdf.css.xsl.merged2merged"
                 file="xslt/merged2mergedExtension.xsl"/>
    </xslt>
  </pdf>
</publishing-template>
```

For more information about the available extension points, see: XSLT Extensions for PDF Transformations (on page 33).

**Combining PDF and WebHelp Responsive Customizations in a Template Package**

An Oxygen Publishing Template package can contain both a PDF and WebHelp Responsive customization in the same template package and you can use that same template in both types of transformations. The template descriptor file can define the customization for both types by including both a `<webhelp>` and `<pdf>` element and some of the resources can be reused. Resources referenced in elements in the `<webhelp>` element will only be used for WebHelp transformations, and resources referenced in the elements in the `<pdf>` element will only be used in PDF transformations.
How to Create a Publishing Template

To create a customization, you can start from scratch or from an existing template, and then adapt it according to your needs.

Creating a Publishing Template Starting from Scratch

To create a new Oxygen Publishing Template, follow these steps:
1. Create a folder that will contain all the template files.

2. In Oxygen XML Editor/Author, open the new document wizard (use File > New or the New toolbar button), then choose the Publishing Template Descriptor template.

![Figure 3. Choosing the Publishing Template Descriptor Document Template](image)

3. Save the .opt file into your customization directory.

4. Open the .opt file in the editor and customize it to suit your needs. See: Publishing Template Package Contents for PDF Customizations (on page 24).

### Creating a Publishing Template Starting from an Existing Template

If you are using a WebHelp Responsive or DITA Map PDF - based on HTML5 & CSS transformation, the easiest way to create a new Oxygen Publishing Template (on page 208) is to select an existing template in the transformation scenario dialog box and use the Save template as button to save that template into a new template package that can be used as a starting point.

To create a new Oxygen Publishing Template, follow these steps:

1. Open the transformation scenario dialog box and select the publishing template you want to export and use as a starting point.

2. **Optional:** You can set one or more transformation parameters from the Parameters tab and the edited parameters will be exported along with the selected template. You will see which parameters will be exported in the dialog box that is displayed after the next step.

3. Click the Save template as button.
**Step Result:** This opens a template package configuration dialog box that contains some options and displays the parameters that will be exported to your template package.

4. Specify a name for the new template.

5. **Optional:** Specify a template description.

6. **Optional:** The same publishing template package can contain both a WebHelp Responsive and PDF customization and you can use the same template in both types of transformations (*DITA Map WebHelp Responsive* or *DITA Map to PDF - based on HTML5 & CSS*). You can use the Include WebHelp customization and Include PDF customization options to specify whether your custom template will include both types of customizations.

7. **Optional:** For **WebHelp Responsive** customizations, you can select the Include **HTML Page Layout Files** option if you want to copy the default **HTML Page Layout Files** in your template package. They are helpful if you want to change the structure of the generated HTML pages.

8. In the **Save as** field, specify the name and path of the ZIP file where the template will be saved.

   **Step Result:** A new ZIP archive will be created on disk in the specified location with the specified name.

9. Open the **.opt** file in the editor and customize it to suit your needs. See: *Publishing Template Package Contents for PDF Customizations (on page 24)*.

For more information about creating and customizing publishing templates, watch our video demonstration:

https://www.youtube.com/embed/zNmXfKWxO8

**Related Information:**

*Publishing Template Package Contents for PDF Customizations (on page 24)*

---

**How to Edit a Packed Publishing Template**

To edit an existing *Oxygen Publishing Template (on page 208)* package, follow these steps:

1. Unzip the ZIP archive associated with the *Oxygen Publishing Template* in a separate folder.

2. Link the folder associated with the template in the **Project** view.

3. Using the **Project** view, you can modify the resources (CSS, JS, fonts) within the **Oxygen Publishing Template** folder to fit your needs.

4. Open the publishing template descriptor file (**.opt** extension) in the editor and modify it to suit your needs.

5. **Optional:** Once you finish your customization, you can archive the folder as a ZIP file.

---

**How to Use a Publishing Template in a PDF Transformation**

**From Oxygen XML Editor/Author**

A publishing template can be used for PDF output from the *DITA Map PDF - based on HTML5 & CSS* transformation scenario (or from the *DITA PDF - based on HTML5 & CSS* transformation scenario).
The **Templates** tab in the transformation scenario dialog box displays all the templates that are available in your template gallery. To use a particular template in the transformation scenario, simply select it from this tab and then continue configuring the transformation using the other tabs to suit your needs.

To add the publishing template to your templates gallery, follow these steps:

1. Open the transformation scenario dialog box by editing a **DITA Map PDF - based on HTML5 & CSS** transformation (or a **DITA PDF - based on HTML5 & CSS** transformation scenario).

2. In the **Templates** tab, click the **Configure Publishing Templates Gallery** link to.

   **Step Result:** This will open the preferences page.

3. Click the **Add** button and specify the location of your template directory.

   **Step Result:** Your template directory is now added to the **Additional Publishing Templates Galleries** list.

4. Click **OK** to return to the transformation scenario dialog box.

   **Result:** All the templates contained in your template directory will be displayed in the preview pane along with all the built-in templates.

**From a Command Line**

You can use the **pdf.publishing.template** parameter to point to the *.*.opt (publishing template) file:

```bash
dita.bat
--input=map\test.ditamap
"-Dpdf.publishing.template=full_path_to_template_dir/my_template.opt"
--format=pdf-css-html5
...
```

Or use the two parameters to indicate the folder containing the publishing templates and the name of the publishing template file relative to that folder:

```bash
dita.bat
--input=map\test.ditamap
"-Dpdf.publishing.template=full_path_to_template_dir"
"-Dpdf.publishing.template.descriptor=my_template.opt"
--format=pdf-css-html5
...
```

**Tip:**

You can also start the **dita** process by passing it a **DITA OT Project File**. Inside the project file you can specify as parameters for the **webhelp-responsive** transformation type the WebHelp-related parameters.
How to Share a Publishing Template

To share a publishing template with others, following these steps:

1. Copy your template in a new folder in your project.
2. Go to Options > Preferences > DITA > Publishing and add that new folder to the list.
3. Switch the option as the bottom of that preferences page to Project Options.
4. Share your project file (.xpr).

XSLT Extensions for PDF Transformations

Since PDF output is primarily obtained by running XSLT transformations over the DITA input files, one customization method would be to override the default XSLT templates that are used by the PDF transformation.

The pdf-css-html5 transformation type uses two stages to transform the merged DITA map (the one that aggregates all the topics) to HTML5:

1. **Stage 1**: Makes some changes on the merged map (on page 49) and the result is a modified merged map. This stage can be altered by implementing the com.oxygenxml.pdf.css.xsl.merged2merged XSLT extension point. This extension overrides the stylesheets found in the following folder: DITA-OT-DIR\plugins\com.oxygenxml.pdf.css\xsl\merged2merged.

   **Note:**
   Use this when you need to filter DITA content.

2. **Stage 2**: Transforms the merged map (on page 49) to HTML5 and the result is a single HTML document. This stage can be altered by implementing the com.oxygenxml.pdf.css.xsl.merged2html5 XSLT extension point. This extension overrides the stylesheets found in the following folder: DITA-OT-DIR\plugins\com.oxygenxml.pdf.css\xsl\merged2html5.

   **Note:**
   Use this when you need to change the HTML structures generated for a specific DITA element.

These extension points can be used either from a Publishing Template or a DITA-OT extension plugin.

How to Use XSLT Extension Points for PDF Output from a Publishing Template

The examples in this section demonstrate how to use XSLT extension points from an Oxygen Publishing Template.
How to Style Codeblocks with a Zebra Effect

Suppose you want your codeblocks to have a particular background color for one line, and another color for the next line. One advantage of this coloring technique is that you can clearly see when text from the codeblock is wrapped.

This effect can be done by altering the HTML5 output, creating a div for each line from the code block, then styling them.

To add this functionality using an Oxygen Publishing Template, follow these steps:

1. If you have not already created a Publishing Template, you need to create one. For details, see How to Create a Publishing Template.

2. Link the folder associated with the publishing template to your current project in the Project view.

3. Using the Project view, create an xslt folder inside the project root folder.

4. In this folder, create an XSL file (for example, named merged2html5Extension.xsl) with the following content:

```xml
<?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"
    exclude-result-prefixes="xs"
    version="2.0">

    <xsl:template match="*[contains(@class, ' pr-d/codeblock ')]">
        <div class="zebra">
            <xsl:analyze-string regex="\n" select=".">
                <xsl:matching-substring/>
                <xsl:non-matching-substring>
                    <div>
                        <xsl:value-of select="."/>
                    </div>
                </xsl:non-matching-substring>
            </xsl:analyze-string>
        </div>
    </xsl:template>
</xsl:stylesheet>
```

5. Open the template descriptor file (on page 24) associated with your publishing template (the .opt file) and set the XSLT stylesheet created in the previous step with the com.oxygenxml.pdf.css.xsl.merged2html5 XSLT extension point:
6. Create a `css` folder in the publishing template directory. In this directory, save a custom CSS file with rules that style the `codeblock` structure. For example:

```css
div.zebra {
  font-family: courier, fixed, monospace;
  white-space: pre-wrap;
}

div.zebra > *:nth-of-type(odd){
  background-color: silver;
}
```

7. Open the **template descriptor file (on page 24)** associated with your **publishing template** (the `.opt` file) and reference your custom CSS file in the `resources` element:

```xml
<publishing-template>
  ...
  <pdf>
    ...
  </pdf>
  <resources>
    <css file="css/custom.css"/>
  </resources>
</publishing-template>
```

8. Edit the **DITA Map PDF - based on HTML5 & CSS** transformation scenario.

9. In the **Templates** tab, click the **Choose Custom Publishing Template** link and select your template.

10. Click **OK** to save the changes and run the transformation scenario.

**How to Remove the Related Links Section**

Suppose that you want the **related links** sections to be removed from the PDF output.

To add this functionality using an **Oxygen Publishing Template**, follow these steps:

1. If you have not already created a Publishing Template, you need to create one. For details, see **How to Create a Publishing Template**.

2. Link the folder associated with the publishing template to your current project in the **Project** view.

3. Using the **Project** view, create an `xslt` folder inside the project root folder.

4. In this folder, create an XSL file (for example, named `merged2mergedExtension.xsl`) with the following content:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
```
Oxygen DITA-OT CSS-based PDF Publishing plugin 24.0 | 2 - Publishing Templates | 36

5. Open the template descriptor file (on page 24) associated with your publishing template (the .opt file) and set the XSLT stylesheet created in the previous step with the com.oxygenxml.pdf.css.xsl.merged2merged XSLT extension point:

```xml
<publishing-template>
  ... 
  <pdf> 
    ... 
    <xslt>
      <extension
        id="com.oxygenxml.pdf.css.xsl.merged2merged"
        file="xslt/merged2mergedExtension.xsl"/>
    </xslt>
  </pdf>
</publishing-template>
```

6. Edit the DITA Map PDF - based on HTML5 & CSS transformation scenario.
7. In the Templates tab, click the Choose Custom Publishing Template link and select your template.
8. Click OK to save the changes and run the transformation scenario.

### How to Wrap Words in Markup

Suppose you want compound words that contain hyphens (or any other criteria) to be wrapped with inline elements (such as the HTML `<code>` element).

To add this functionality using an Oxygen Publishing Template, follow these steps:

1. If you have not already created a Publishing Template, you need to create one. For details, see How to Create a Publishing Template.
2. Link the folder associated with the publishing template to your current project in the Project view.
3. Using the Project view, create an xslt folder inside the project root folder.
4. In this folder, create an XSL file (for example, named merged2htmlExtension.xsl) with the following content:

```xml
<?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"
    exclude-result-prefixes="xs"
    version="2.0">
```
5. Open the template descriptor file (on page 24) associated with your publishing template (the .opt file) and set the XSLT stylesheet created in the previous step with the com.oxygenxml.pdf.css.xsl.merged2merged XSLT extension point:

```xml
<extension
id="com.oxygenxml.pdf.css.xsl.merged2merged"
```
6. Edit the DITA Map PDF - based on HTML5 & CSS transformation scenario.
7. In the Templates tab, click the Choose Custom Publishing Template link and select your template.
8. Click OK to save the changes and run the transformation scenario.

How to Convert Definition Lists into Tables

Suppose you want your definitions lists (dl) to be displayed as tables in your PDF output.

To add this functionality using an Oxygen Publishing Template, follow these steps:

1. If you have not already created a Publishing Template, you need to create one. For details, see How to Create a Publishing Template.
2. Link the folder associated with the publishing template to your current project in the Project view.
3. Using the Project view, create an xslt folder inside the project root folder.
4. In this folder, create an XSL file (for example, named merged2html5Extension.xsl) with the following content:

```xml
<?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"
    exclude-result-prefixes="xs"
    version="2.0">

    <xsl:template match="*[contains(@class, ' topic/dl ')]">
        <xsl:call-template name="setaname"/>
        <xsl:apply-templates select="*[contains(@class, ' ditaot-d/ditaval-startprop ')]" mode="out-of-line"/>
        <!-- Wrap in a table -->
        <table>
            <xsl:call-template name="commonattributes"/>
            <xsl:call-template name="setid"/>
            <xsl:apply-templates/>
        </table>
        <xsl:apply-templates select="*[contains(@class, ' topic/dlentry ')]" mode="out-of-line"/>
    </xsl:template>

    <xsl:template match="*[contains(@class, ' topic/dlentry ')]">
        <!-- Wrap in a table row -->
        <tr>
```

---

```xml
file="xslt/merged2mergedExtension.xsl"/>
</xsl>```
5. Open the template descriptor file (on page 24) associated with your publishing template (the .opt file) and set the XSLT stylesheet created in the previous step with the com.oxygenxml.pdf.css.xsl.merged2html5 XSLT extension point:

```xml
<publishing-template>

...<pdf>

...<xslt>

<extension

   id="com.oxygenxml.pdf.css.xsl.merged2html5"

   file="xslt/merged2html5Extension.xsl"/>

</xslt>

</xslt>

</publishing-template>
```

6. Edit the DITA Map PDF - based on HTML5 & CSS transformation scenario.
7. In the Templates tab, click the Choose Custom Publishing Template link and select your template.
8. Click OK to save the changes and run the transformation scenario.
How to Sort and Group Gloss Entries

Suppose that in your PDF output, you want your glossary entries (<glossentry>) to be sorted alphabetically and grouped by their first letter.

To add this functionality using an Oxygen Publishing Template, follow these steps:

1. If you have not already created a Publishing Template, you need to create one. For details, see How to Create a Publishing Template.

2. Link the folder associated with the publishing template to your current project in the Project view.

3. Using the Project view, create an xslt folder inside the project root folder.

4. In the newly created folder, create an XSL file (for example, named merged2html5Extension.xsl) with the following content:

```xml
<?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"
    exclude-result-prefixes="xs"
    version="2.0">

<xsl:template match="*[
    contains(@class, ' glossgroup/glossgroup ')
    | *
    [contains(@class, ' bookmap/glossarylist ')]"]">
    <!-- Get the original glossgroup node -->
    <xsl:variable name="result">
        <xsl:next-match/>
    </xsl:variable>
    <xsl:apply-templates select="$result" mode="sort-and-group"/>
</xsl:template>

<xsl:template match="node() | @*" mode="sort-and-group">
    <xsl:copy>
        <xsl:apply-templates select="node() | @*" mode="#current"/>
    </xsl:copy>
</xsl:template>

<xsl:template match="*[
    contains(@class, ' glossgroup/glossgroup ')
    | *
    [contains(@class, ' bookmap/glossarylist ')]" mode="sort-and-group">
    <!-- Copy the glossgroup -->
    <xsl:copy>
        <!-- Copy the glossgroup attributes -->
        <xsl:copy-of select="@*/">
            <!-- Copy all glossgroup children except glossentries -->
            <xsl:copy-of select="child::node()
                [not(contains(@class, ' glossentry/glossentry '))]"/>
        </xsl:copy-of>
    </xsl:copy>
</xsl:template>

```

---

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5. Open the **template descriptor file** (on page 24) associated with your *publishing template* (the .opt file) and set the XSLT stylesheet created in the previous step with the `com.oxygenxml.pdf.css.xsl.merged2html5` XSLT extension point:

```
<publishing-template>
  ...
  <pdf>
  ...
  <xslt>
    <extension
      id="com.oxygenxml.pdf.css.xsl.merged2html5"
      file="xslt/merged2html5Extension.xsl"/>
  </xslt>
</publishing-template>
```

6. Create a **css** folder in the publishing template directory. In this directory, save a custom CSS file with rules that style the *glossary* structure. For example:

```
*{class ~="glossgroup/label"} {
  margin-top: 1em;
```
7. Open the template descriptor file (on page 24) associated with your publishing template (the .opt file) and reference your custom CSS file in the resources element:

```xml
<publishing-template>
  ...
  <pdf>
    ...
    <resources>
      ...
      <css file="css/custom.css"/>
    </resources>
  </pdf>
</publishing-template>
```

8. Edit the DITA Map PDF - based on HTML5 & CSS transformation scenario.
9. In the Templates tab, click the Choose Custom Publishing Template link and select your template.
10. Click OK to save the changes and run the transformation scenario.

How to Use XSLT Extension Points for PDF Output from a DITA-OT Plugin

The examples in this section demonstrate how to use XSLT extension points from a DITA-OT plugin.

How to Style Codeblocks with a Zebra Effect

Suppose you want your codeblocks to have a particular background color for one line, and another color for the next line. One advantage of this coloring technique is that you can clearly see when text from the codeblock is wrapped.

This effect can be done by altering the HTML5 output, creating a `<div>` for each line from the code block, then styling them.

To add this functionality using a DITA-OT plugin, follow these steps:

1. In the DITA-OT-DIR\plugins\ folder, create a folder for this plugin (for example, com.oxygenxml.pdf.custom.codeblocks).
2. Create a plugin.xml file (in the folder you created in step 1) that specifies the extension point and your customization stylesheet. For example:
<plugin id="com.oxygenxml.pdf.custom.codeblocks">
    <feature extension="com.oxygenxml.pdf.css.xsl.merged2html5" file="custom_codeblocks.xsl"/>
</plugin>

3. Create your customization stylesheet (for example, custom_codeblocks.xsl) with the following content:

```xml
<?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"
    exclude-result-prefixes="xs"
    version="2.0">

    <xsl:template match="*[contains(@class, ' pr-d/codeblock ')]">
        <div class='zebra'>
            <xsl:analyze-string regex="\n" select="."/>
            <xsl:matching-substring/>
            <xsl:non-matching-substring>
                <div><xsl:value-of select="."/></div>
            </xsl:non-matching-substring>
            <xsl:analyze-string>
            </xsl:analyze-string>
        </div>
    </xsl:template>
</xsl:stylesheet>
```

4. Use the Run DITA-OT Integrator transformation scenario found in the DITA Map section in the Configure Transformation Scenario(s) dialog box.

5. Create a custom CSS file with rules that style the codeblock structure. For example:

```css
div.zebra {
    font-family: courier, fixed, monospace;
    white-space: pre-wrap;
}

div.zebra > :nth-of-type(odd) {
    background-color: silver;
}
```

6. Edit a DITA Map PDF - based on HTML5 & CSS transformation scenario and reference your custom CSS file (using the args.css parameter).

7. Run the transformation scenario.

**How to Remove the Related Links Section**

Suppose you want the related links sections to be removed from the PDF output.

To add this functionality using a DITA-OT plugin, follow these steps:
1. In the DITA-OT-DIR\plugins\ folder, create a folder for this plugin (for example, com.oxygenxml.pdf.custom.codeblocks).

2. Create a plugin.xml file (in the folder you created in step 1) that specifies the extension point and your customization stylesheet. For example:

```xml
<plugin id="com.oxygenxml.pdf.custom.related.links">
  <feature extension="com.oxygenxml.pdf.css.xsl.merged2merged"
           file="custom_related_links.xsl"/>
</plugin>
```

3. Create your customization stylesheet (for example, custom_related_links.xsl) with the following content:

```xml
<?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"
                 exclude-result-prefixes="xs"
                 version="2.0">
  <xsl:template match="*[contains(@class, ' topic/related-links ')]">
    <!-- Remove. -->
  </xsl:template>
</xsl:stylesheet>
```

4. Use the Run DITA-OT Integrator transformation scenario found in the DITA Map section in the Configure Transformation Scenario(s) dialog box.

5. Run the DITA Map PDF - based on HTML5 & CSS transformation scenario.

Sample Use-cases: Using XSLT and CSS for PDF Transformations

This section includes examples that can be used as a starting point for various customizations using XSLT and CSS.

How to Use a Bullet Instead of Numbers for Tasks Containing a Single Step

If a DITA Task only contains one step (<step> element), you probably want it to be rendered like an unordered list (displayed with a bullet instead of a number).

```
...<steps>
  <step>
    <cmd>The step</cmd>
  </step>
</steps>
...```

Should be rendered as:
Instead of:

1. The step

To achieve this, you need to create an XSLT template that adds a special `@outputclass` attribute (with its value set to `single`) for the single step, then you need to match this attribute from the CSS and change its aspect.

1. In the customization XSL, add:

```xml
<xsl:template match="*[contains(@class, ' task/step ')]*[count(../*[contains(@class, ' task/step ')])) = 1]">
  <xsl:copy>
    <xsl:copy-of select="@*"/>
    <xsl:attribute name="outputclass" select="concat(@outputclass, ' single ')"/>
    <xsl:apply-templates/>
  </xsl:copy>
</xsl:template>
```

2. In your customization CSS (on page 48), add:

```css
*[@outputclass = "single"] {
  list-style-type: circle !important;
  margin-left: 2em;
}
```

Related Information:

How to Use XSLT Extension Points for PDF Output from a Publishing Template (on page 33)
3.

DITA-OT Extension Points

The DITA-OT CSS-based PDF Publishing Plugin supports DITA-OT extension points that can be used to expand the functionality of the transformation. The extension points are defined in the plugin.xml file. For more information, see DITA Open Toolkit Extension Points.

Related Information:
XSLT Extensions for PDF Transformations (on page 33)

How to Contribute a Custom CSS to the Transformation from a DITA-OT Plugin

This topic is intended for publishing architects/developers that need to deploy a customized DITA-OT.

Usually, the CSS styles can be passed to the transformation by referencing the CSS files using the args.css parameter. However, there are cases where you want to add some sort of "built-in" CSS that is applied in conjunction with the publishing template or CSS files referenced in the transformation.

For this, you need to use the com.oxygenxml.pdf.css.init extension point and set the value of the extension.css ANT property to the path of the custom CSS file:

1. In your plugin.xml file, add:

   `<feature extension="com.oxygenxml.pdf.css.init" file="init.xml"/>

2. Create a file named init.xml with the following ANT content:

   ```xml
   <root>
   <property name="extension.css" value="${dita.plugin.[com.my.plugin.id].dir}/css/my-custom.css"/>
   <!-- add here more init stuff if needed -->
   </root>
   ```

   **Note:**
   The name of the root element does not matter. The content of this element will be copied in an initialization template.

   **Important:**
   Make sure all file references begin with the ANT variable that is expanded to the base directory of your plugin.
Related Information:

How to Use XSLT Extension Points for PDF Output from a DITA-OT Plugin (on page 42)
Customizing PDF Output Using CSS

The publishing process is driven by a customization CSS.

Tip:
If you use the default Chemistry processor in Oxygen XML Editor/Author, you can use LESS instead of CSS. In this case, the customization files should have the .less extension.

To change the styling of the output for the DITA Map PDF - based on HTML5 & CSS and the DITA PDF - based on HTML5 & CSS transformation scenarios:

1. Create the CSS file that will contain all of your customizations. It is recommended to create this file in your project directory so you can edit it easily.
2. Add your custom CSS rules. As a good starting point you can:
   • Check the various topics in this section for assistance with specific types of customizations.
   • Use the Oxygen Styles Basket (on page 48) to generate basic selectors for common content.
3. For linking the CSS file, you have two options:
   • Create a publishing template, create the customization CSS file inside the template folder, and link it to the publishing template descriptor. For assistance, see Publishing Templates.
   • Choose an existing publishing template, then edit the scenario and set the full path to the custom CSS file as the value of the args.css parameter. The rules from custom CSS will override the rules from the template CSS files.
4. Run the transformation scenario.

Tip:
For more information and some tips in regard to publishing DITA documents to PDF using CSS, watch our Webinar: Transforming DITA documents to PDF using CSS, Part 1 – Page Definitions, Cover Page and PDF Metadata.

Oxygen Styles Basket

The Oxygen Styles Basket is a handy free-to-use web-based visual tool that helps you to fine-tune the CSS file that is used to customize your PDF or WebHelp output. You simply pick and mix aspects from galleries to add and adjust the rules in your custom CSS file.

It is based on galleries that you can use to pick and mix styling aspects to create a custom look and feel. Various different types of aspects can be selected to be integrated in the CSS stylesheet (such as fonts, tables, lists, spacing, code). It is also possible to re-upload a previously generated CSS for further customization.
You can see the results of your changes in the Preview pane or you can click the See Results toolbar button to see the results in a generated preview version of either PDF or WebHelp output. When you are finished with your customization, you can Download the results as a CSS file or a Publishing Template Package that you can use in your transformation process.

Figure 4. Oxygen Styles Basket Interface

Tip:
To see a visual demonstration of the Oxygen Styles Basket, watch our video:

https://www.youtube.com/embed/V1SbZeAiv7I

Debugging the CSS

If you notice that some of the CSS properties were not applied as expected, some of the tips offered in this topic might help you with the debugging process.

Merged Map File

Depending on the type of transformation, one or more merged map files are created at some point during the transformation stages. These files could be used to help debug unexpected results.

1. The first thing you should try is to check the file structure of the merged map file. This can be found in the out/pdf-css directory and it has the .merged.html file extension (you will also find a .merged.xml file that aggregates the entire ditamap structure). You can open the HTML files in Oxygen XML Editor/Author to examine the structure. Optionally, you can use the pretty print feature (Format and Indent) to make the structure easier to read.

2. Check that the CSS selectors are written correctly against the document structure.

3. If you still cannot identify the problem, then inspect how the styles are applied (you can try any of the methods listed below).
Inspecting the Applied Styles Using the Chrome Browser

To inspect the applied CSS styles using Chrome:

1. Open the file ending in `.merged.html`.
2. Click on the element you want to inspect.
3. Activate the Chrome Developer Tools by using > More Tools > Developer Tools, or press CTRL + SHIFT + I.

In the Rendering pane, select `print` from the Emulate CSS media section. This will activate the CSS selectors enclosed in `@media print { .. }`. 

5. In the Rendering pane, select print from the Emulate CSS media section. This will activate the CSS selectors enclosed in `@media print { .. }`. 


Note:
This allows you to debug the styling of elements, table of contents, and index, but not the styles of the page margin boxes (headers, footers) or page breaks.

Tip:
In the left pane of the Developer Tools interface, you can inspect elements and their styles in the Elements tab. You can click on any of the links to display the applied CSS files in the Styles tab in the right pane. Editing the styles in that pane results in a live preview of how the change will affect the output.

CAUTION:
Do not modify the built-in rules directly in the CSS files from the Oxygen XML Editor/Author installation. Instead, copy the rules to your own customization CSS.

Inspecting the Applied Styles Using Oxygen XML Editor/Author
To inspect styles:

1. In Oxygen XML Editor/Author, open the file ending in .merged.html.
2. [Optional] From the Styles toolbar, choose the + Print Ready entry. This will activate certain CSS selectors enclosed in @media print {...}.
3. Click on the element you want to style. Use the Inspect Styles action from the Contextual Menu. A specialized CSS Inspector view will show the built-in CSS rules.
Tip:
With this file open in Author mode, it might be helpful to switch the Tags Display Mode to Full Tags with Attributes. You might be able to identify the selector you need to style without using the CSS Inspector view.

Note:
This allows you to debug styling of elements, but not of the page margin boxes (headers, footers) or page breaks.

CAUTION:
Do not modify the built-in rules directly in the CSS files from the Oxygen XML Editor/Author installation. Instead, copy the rules to your own customization CSS.

Other techniques
These are some other techniques you may find useful:

• Add background and borders properties to the specific CSS rule. If they do not appear in the output then there is a problem with the rule selector.

• Try to use the !important notation to the property that is not applied, or make the selector more specific (you can add more parent selectors).

• To figure out how the elements are mapped to PDF, you can use this fragment in the customization CSS:

```css
* {
    border: 1pt solid blue !important;
}

*:before(1000) {
    content: oxy_name() !important;
    color: orange;
}

*:before(999) {
    content: "[ class='"attr(class)"'] " !important;
    color: orange;
}
```

This will show the element name, its class attribute, and will paint a blue border around each of the elements in the output. It will not show the page margin boxes or some content elements that were hidden.
How to Speed up CSS Development and Debugging

You can speed up your CSS development considerably by not invoking the entire pipeline of transforming your DITA maps to PDF. Instead, you can use the merged map (on page 49) and transform it directly to PDF.

1. Transform your DITA Map to PDF using the DITA Map PDF - based on HTML5 & CSS transformation scenario.
2. Open the merged file (on page 49) (*.merged.html) that is located in the output directory in the editor.
3. Configure an XML to PDF transformation with CSS scenario. Do not set CSS files here since the merged file already contains pointers to the stylesheets. This scenario uses the Chemistry CSS processor.
4. Optional: Enable the output of the CSS processor using the following preferences page: Options > Preferences > XML > PDF Processors > CSS Processor.

Now you can make incremental changes to the CSS stylesheet and quickly see the results by transforming the merged file directly.

**Fastpath:**
If your changes involve only element styling, with no specific paged media CSS rules and properties, you can simply open the merged file in a browser (such as Chrome or Firefox) and refresh at each CSS change, as shown in: Debugging the CSS (on page 49).

How to Write XPath Expressions

This topic contains some guidelines for writing XPath expressions. They are used to extract the content from the merged DITA map document.

This is an example where the product name meta-information is placed before the front page title:

```html
*[class~="front-page/front-page-title"]:before {
  text-align: left;
  content: oxy_xpath("/***/*[contains(@class, 'topic/prodname')]/text()][1]");
  display:block;
}
```

**Notes:**

- Do not use the DITA element names directly. You must use the DITA @class attribute instead, as these attributes are propagated to the merged elements (including HTML `<div>` elements) while the element names can be lost. By using the class selectors, you also cover DITA specializations.
- Use the `*[1]` XPath predicate to select the first value from the document. For example, `oxy_xpath("/***/*[contains(@class, 'topic/prodname')]/text()][1]")`. The meta-information
might be copied multiple times in the output, inherited by the `<topicref>` elements, so you can get many more values than expected.

- Do not use strings as values for the pseudo-elements content, as the string values are not supported for pseudo-elements. Instead, use the XPath directly.
- Use the **Oxygen XPath Builder view** to test the XPath expressions.

**Related Information:**

*How to Debug XPath Expressions (on page 54)*

**How to Debug XPath Expressions**

You can use the content extracted from the document using the `oxy_xpath` function in your pseudo-elements (`:before`, `:after`) or in string-set variables.

For example, the following XPath finds the publication author, set in the DITA map:

```xml
<map>
  <title>The Art of Bike Repair</title>
  <topicmeta>
    <author>John Doe</author>
  </topicmeta>
...
```

```css
:root {
    string-set: author oxy_xpath('//*[contains(@class, "front-page/front-page")]/*[contains(@class, "map/topicmeta")]/*[contains(@class, "topic/author")]//text()');
}
```

To debug an XPath expression:

1. Read the **XPath Expressions Guidelines (on page 53)**.
2. Begin by transforming your document using your customization CSS.
3. In the output folder, you will find a `[MAP_NAME].merged.html` file (or if you are using the DITA Map PDF - based on HTML5 & CSS transformation, a `[MAP_NAME].merged.html` file).
4. Open the merged file in the **Oxygen XML Editor/Author**.
5. Activate the **XPath Builder view** (Window > Show View > XPath/XQuery Builder).
6. Paste your XPath expression and click the **Execute XPath** button. Check if it returns the expected results.

The XPath builder has a function that allows it to display the document path of the current element from the editor (**Settings drop-down menu > Update on cursor move**). Alternatively, you can right-click the element in the merged document and select the **Copy XPath** action, then paste it in the XPath builder.
Default Page Definitions

All page definitions are found in: `[PLUGIN_DIR]css/print/p-pages-and-headers.css`.

**Note:**
This is listed solely for illustration purposes, as the plugin might use something different.

There are pages for the default page, chapter page, front matter page, back matter page, blank pages, index page, and large tables page.

**Default Page**

The default page imposes a header that contains the publication title, chapter, and section title. They alternate on the left or right side of the page:

```css
@page :left {
    @top-left {
        content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " | " counter(page);
        font-size:8pt;
    }
}

@page :right{
    @top-right {
        content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " | " counter(page);
        font-size:8pt;
    }
}
```

**Tip:**
To override the default rules defined for named pages (such as chapter or table of contents), you need to use more specific page rules that contain the page name:

```css
@page :left, table-of-contents:left, chapter:left {
    @top-left {
        content: "...";
    }
}
```
Chapter Page

This is inherited from the default page. The chapter page is associated to the topics marked as chapters, usually direct children of the map. It clears the header from the first page of each chapter. If you need to add other information to the chapter headers, make sure you override these rules in your CSS:

```css
@page chapter{
    /* Currently inherit from the default page. */
}

/* No headers on the chapter first page. */
@page chapter:first:left{
    @top-left {
        content: none;
    }
}

@page chapter:first:right{
    @top-right {
        content: none;
    }
}
```

Front Matter and Back Matter page

The bookmap front matter and back matter page. It clears the headers.

```css
@page matter-page {
    @top-left-corner { content:none }
    @top-left { content:none }
    @top-center { content:none }
    @top-right { content:none }
    @top-right-corner { content:none }
    @bottom-left-corner { content:none }
    @bottom-left { content:none }
    @bottom-center { content:none }
    @bottom-right { content:none }
    @bottom-right-corner{ content:none }
}
```
Blank Pages
The following example clears the header for the blank pages that may be created by a `page-break-before`, `page-break-after`, or by using double side pagination (on page 133):

```
@page :blank{
  @top-left {
    content: none;
  }
  @top-right {
    content: none;
  }
}
```

Index Page
The page that contains the index terms (appears only if there are such items in your topics). It uses a lower roman page number in the footer:

```
@page index {
  @top-left-corner    { content: none }
  @top-left           { content: none }
  @top-center         { content: none }
  @top-right          { content: none }
  @top-right-corner   { content: none }
  @bottom-left-corner { content: none }
  @bottom-left        { content: none }
  @bottom-center      { content: counter(page, lower-alpha) }
  @bottom-right       { content: none }
  @bottom-right-corner{ content: none }
}
@media oxygen-chemistry {
  @page index {
    column-count: 2;
    column-fill: auto;
  }
}
```

When transformed, the page layout is spread on two columns.

Large Tables Page
The big tables are placed on a rotated page, with orientation landscape:

```
@page landscape-page :right {
  size: landscape;
  @top-left {
```
```css
.content: none

@top-center {
    .content: none
}

@top-right {
    .content: none
}

@right-bottom {
    .content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " | " counter(page);
    font-size: 8pt;
    transform: rotate(90);
    vertical-align: middle;
    text-align: right;
}

@page landscape-page .left {
    size: landscape;

    @top-left {
        .content: none
    }

    @top-center {
        .content: none
    }

    @top-right {
        .content: none
    }

    @right-top {
        .content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " | " counter(page);
        font-size: 8pt;
        transform: rotate(90);
        vertical-align: middle;
        text-align: left;
    }
}
```
**Page Size**

This is where you can find information on how the page sizes are defined.

**Page Size - Built-in CSS rules**

The `[/PLUGIN_DIR]/css/print/p-page-size.css` file contains the default page rules. It uses the US-LETTER size (8.5 X 11 inches). The content of this file is:

```css
@page {
    padding-top: 0.2em;
    padding-bottom: 0.2em;
    size: us-letter;
    margin: 1in;
}
```

**Note:**

This is listed solely for illustration purposes, as the plugin might use something different.

**How to Change the Page Size**

Suppose you want to publish using the standard A4 page size, with a margin of 2cm.

In your customization CSS *(on page 48)*, use:

```css
@page {
    size: A4;
    margin: 2cm;
}
```

If you need different margins depending on the page side:

```css
@page {
    size: A4;
    margin: 2cm;
}
@page :left{
    margin-right: 4cm;
}
@page :right{
    margin-left: 4cm;
}
```

This would only increase the gutter margins or the inside margins needed for binding of the final book. The other margins would remain 2cm.
How to Change the Page Orientation

Suppose you want to publish on a landscape page orientation. The default is portrait, so you need to change it by using the size property. This will contain both the physical measurements and the orientation. In your customization CSS (on page 48), use:

```css
@page {
    size: us-letter landscape;
}
```

How to Change the Page Settings for a Specific Element

Suppose your publication mainly uses a portrait page orientation, but there are some topics that have wide images. To avoid having the images bleed outside of the page, you could use a wider page setting (landscape).

1. Mark the topic with an `@outputclass` attribute and give it a distinct value (for example, `wide`), you can set the attribute on the root element of the topic or on the `<topicref>` element from the map.

   Note:
   The `@outputclass` values from the `<topicref>` automatically propagate to the root of the topic from the merged map (on page 49).

2. In your customization CSS (on page 48), match the output class and associate it with a named page. In the following example, the page has a landscape orientation and small margins. This technique works for any element (e.g. a table or list) not just for a topic.

   ```css
   @page wide-page {
       size: letter landscape;
       margin: 0.5in;
   }
   *[outputclass = 'wide'] {
       page: wide-page !important;
   }
   ```

   Note:
   The `!important` rule is necessary to override the default page settings.

Page Headers and Footers

The page headers and footers use the string sets defined for publication, chapter, and section titles. These string-sets are defined in the numbering CSS (on page 109):

   `parttitle`
Set to the title of the current part (only for DITA bookmaps that use parts).

`chaptertitle`

Set to the title of the current chapter (Shallow and Deep numbering).

`sectiontitle`

Set to the title of each section (Deep numbering only).

To see where the default page rules are defined, see: Default Page Definitions (on page 55).

Although you may define string sets in your customization CSS, you need to take into account the fact that the string-set CSS property is not additive, and matching the same elements will end up breaking the current definitions. A very common use-case is to match the title element that is also used in the default CSS. The best approach, in this case, is to take a look at the rules from the numbering CSS (on page 109), copy the ones dealing with string sets to your customization, then alter the property definition by adding your definition to the existing ones (and not removing the existing ones).

Related Information:

Numbering (on page 109)

Page Headers and Footers - Built-in CSS

The headers and footers are part of the page definitions. To see how the default page layouts are defined, see: Default Page Definitions (on page 55).

How to Position Text in the Headers and Footers

By default, the name of the publication and chapter titles are placed in the `top-left` or `top-right` page margin boxes:

```css
@page :left {
    @top-left {
        content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " | " counter(page);
    }
}

@page :right {
    @top-right {
        content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " | " counter(page);
    }
}
```

If you want to change this, you should use the `content` CSS properties of other page margin boxes, and inhibit the ones in the above content. For example, to set the chapter title in the page top left corner, you can use:
@page :left {
    @top-left {
        content: none;
    }
    @top-left-corner {
        content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " |
        counter(page);
        white-space: nowrap;
        text-align: left;
    }
}

@page :right{
    @top-right {
        content: none;
    }
    @top-right-corner {
        content: string(maptitle) string(parttitle) string(chaptertitle) string(sectiontitle) " |
        counter(page);
        white-space: nowrap;
        text-align: right;
    }
}

Note:
The corner page margin boxes are fixed and limited as the available space. Above, the text-align and white-space properties are used to make the text bleed out of these boxes towards the center of the page. If you plan to add an image or artwork background, you should consider using the technique described in: How to Decorate the Header by Using a Background Image on the Entire Page (on page 72).

How to Display Chapter's Headers on First Page

By default, the header is not displayed on the first page of each chapter:

/* No headers on the chapter first page. */
@page chapter:first:if (section)
    @top-left {
        content: none;
    }
}
@page chapter:first:if (section)
If you want to display them on the first page, you just need to override the above default rules with the following default content:

```css
@page chapter:first:
  left {
    @top-left {
      content: string(maptitle) string(parttitle) string(chapertitle) string(sectiontitle) " | " counter(page);
    }
  }
@page chapter:first:
  right {
    @top-right {
      content: string(maptitle) string(parttitle) string(chapertitle) string(sectiontitle) " | " counter(page);
    }
  }
```

How to Change the Size of Headers and Footers

This is directly related to the page margins and size.

The headers and footers are placed in the so-called page margin boxes, a series of rectangular areas residing in the page margins.

To affect the margins of all page definitions, you may use the following rule:

```css
@page {
  margin-top: 3cm !important;
  margin-bottom: 3cm !important;
  margin-left: 2cm !important;
  margin-right: 2cm !important;
}
```

If you want to affect only a specific page, like the first page from chapters for instance, you must use more specific page selectors. See the Default Page Definitions (on page 55) for details.

Note that the page margin boxes fill the entire page margin. This means the margin-top, for example, dictates the height of the @top-left-corner, @top-left, @top-center, @top-right, @top-right-corner margin boxes. These cannot have margins on themselves, so to change the position of the content inside them, you must use padding properties:

```css
@page {
  @top-left {
    content: "...
    padding: 1cm;
  }
```
How to Change the Font of the Headers and Footers

To change the font for all the headers and footers, in your customization CSS (on page 48), add a CSS rule similar to this:

```css
@page {
  font-size: 12pt;
  font-family: "Arial";
}
```

Important:
These settings apply to all page margin boxes, but not to the text inside the page.

If you want to change the settings only for a specific page type (for example, the table of contents), use the name of the page:

```css
@page table-of-contents {
  font-size: 12pt;
  font-family: "Arial";
}
```

Related Information:
How to Change the Header of the Table of Contents (on page 124)

How to Change Header Text for Each Topic

It is possible to dynamically change the header depending on the content in a topic. The following example assumes that the data to be presented in the header is located in the metadata section of each topic. One way is to specify it in the DITA map by using the `<topicmeta>` element for the `<topicref>` topic reference:

```xml
...
<topicref href="topics/installing.dita">
  <topicmeta>
    <data name="header-data" value="ID778-3211"/>
  </topicmeta>
...
```

In the above example, there is set of key value pairs with the name header-data. This information is automatically copied into the content in the merged map file (on page 49), like this:

```xml
<topic ... >
  <title class="- topic/title ">Installing</title>
```
<shortdesc class="- topic/shortdesc ">You install components to make them available for your solution.</shortdesc>

This information can be extracted from the CSS:

```css
/* Define the string set variable that contains the text extracted from the data element */
*[class =~ "topic/topic"] *[class =~ "topic/data"] [name="header-data"] {
    string-set: hdrstr attr(value);
}

/* Using the value='none' stops applying the image. */
*[class =~ "topic/topic"] *[class =~ "topic/data"] [name="header-data"] [value="none"] {
    string-set: hdrstr "";
}

/* Use the string set variable in one of the page margin boxes. */
@page chapter {
    @top-left-corner {
        content: string(hdrstr);
    }
}
```

Notes:
The string set is applied to all pages that follow the data element, until another data element changes it:

```xml
...<topicref href="topics/installing.dita"
    <topicmeta>
        <data name="header-data" value="ID778-3211"/>
    </topicmeta>
</topicref>

<topicref href="..."> <!-- Uses the same value -->
    <topicref href="..."> <!-- Uses the same value -->
    <topicref href="..."> <!-- Uses the same value -->
    <topicref href="topics/change.dita"
        <topicmeta>
            <data name="header-data" value="ID990-3200"/>
        </topicmeta>
    </topicref>
</topicref>
```
How to Change Header Images for Each Chapter

It is possible to dynamically change an image in the header depending on the chapter. For this, you need to define an image reference in the metadata section of each chapter. One way is to specify it in the DITA map by using the `<topicmeta>` element for the `<chapter>` topic reference:

```xml
<chapter href="topics/installing.dita">
  <topicmeta>
    <data name="header-image" value="img/installing.png"/>
  </topicmeta>
</chapter>
```

In the above example, there is a set of key-value pairs with the name `header-image`. The `img/installing.png` is an image reference relative to the DITA map URI. This information is automatically copied into the content in the merged map file (on page 49), like this:

```xml
<title>Installing</title>
<shortdesc>You install components to make them available for your solution.</shortdesc>
```

This information can be picked up from CSS:

```css
/* Define the string set variable that contains an URL */
*{[class == "topic/topic"] *[class == "topic/data"]}[name="header-image"] { string-set: imgst oxy_url(oxy_xpath('/@xtrf'), attr(value)); }

/* Using the value='none' stops applying the image. */
*{[class == "topic/topic"] *[class == "topic/data"]}[name="header-image"][value="none"] { string-set: imgst ""; }
```
/* Use the string set variable in one of the page margin boxes. */

@page chapter {
    @top-left-corner {
        content: string(imgst);
        font-size: 0; /* remove the font ascent and descent */
    }
}

Details: The @value attribute is used to build a URL relative to the URI of the DITA map. To determine the base URI of the DITA map, the @xtrf attribute was used from the root element of the merged map document, extracted using the oxy_xpath function.

Notes:

- The image is always aligned vertically to the middle of available space from the page margin box.
- Make sure you use an image of the correct size. For example, if you want to place the image in the top-left corner of the page, assuming the top and left page margins are 1 in, then make sure the image is a square having a size of 1 in.
- The image is applied to all pages that follow the data element, until another data element changes it:

```xml
<chapter href="topics/installing.dita">
    <topicmeta>
        <data name="header-image" value="img/installing.png"/>
    </topicmeta>
</chapter>

<chapter href="...">
    <!-- Uses the same installing.png image -->
</chapter>

<chapter href="...">
    <!-- Uses the same installing.png image -->
</chapter>

<chapter href="...">
    <!-- Uses the same installing.png image -->
</chapter>

<chapter href="topics/change.dita">
    <topicmeta>
        <data name="header-image" value="img/change.png"/>
    </topicmeta>
</chapter>

<chapter href="...">
    <!-- Uses the same change.png image -->
</chapter>

<chapter href="...">
    <!-- Uses the same change.png image -->
</chapter>

<chapter href="...">
    <!-- Uses the same change.png image -->
</chapter>
```

To clear the image, use the none value:
How to Add a Multi-line Copyright Notice to the Footer

Suppose you want to add a footer with the following two lines of text at the end of each page that is shown on the right side:

© 2017 - My Company Ltd
All rights reserved

For this, you need to specify a rule that matches all the right pages and adds that content in the `bottom-center`. In your customization CSS (on page 48), add the following CSS rule:

```css
@page :right{
  @bottom-center {
    content: "© 2017 - My Company Ltd \A All rights reserved";
    font-size: 0.5em;
    color: silver;
  }
}
```

**Note:** Other page rules (such as the `table-of-contents`) override the contents of the `bottom-center` because they are more specific. If you need to also print the copyright in the TOC pages, then use this as the selector:

```css
@page :right, table-of-contents:right {
  ...
}
```

**Note:** To use new lines (`\n` characters) in your headers or footers, use the `\A` notation, as in the example above.

How to Add a Group of Topics to the Footer

To create a footer that contains the content of several topic files, but only on the last page, there are two possible approaches:
Method 1: Using the position:fixed CSS Property

1. Group all the footer topics under a single parent topic, under the last topic from your DITA map. For example, you can have the following map structure:

```
... End topic
    Footer container topic
        Footer content topic 1
        Footer content topic 2
```

2. Add an `@outputclass=footer` on the `<topic>` root element of the footer container topic, or on its `<topicref>` in the map.

3. Use the CSS `position: fixed` property to position this topic to the bottom of the page:

```
*[outputclass ~="footer"] { 
    position: fixed;

    bottom: 0.5in;
    left: 0.5in;

    width:5in;
    height:200pt;
}
```

Note:

Make sure the width and height are enough for the content of the footer to fit. Be careful because the content might bleed out of the page. Use bottom and left values to position the block in the page.

Method 2: Using the float:footnote CSS Property

The second approach would be to declare the footer block as a footnote. Assuming the same DITA Map structure as above, you can use the following CSS fragment:

```
*[outputclass ~="footer"] { 
    float:footnote;
}

*[outputclass ~="footer"]:footnote-call{
    color:transparent;
    font-size:0;
}

*[outputclass ~="footer"]:footnote-marker{
    color:transparent;
}
```
Note:
Use transparent colors and/or zero size font to avoid the display of the footnote counters.

How to Add a Background Image to the Header

A common use-case is to add a background image to one of the page corners.

```css
@page :left {
    @bottom-left-corner{
        content: " ";
        background-image: url('https://www.oxygenxml.com/resellers/resources/OxygenXMLEditor_icon.svg');
        background-repeat:no-repeat;
        background-position:50% 50%;
    }
}
```

Important:
Always specify a `content` property. If not, the page margin box will not be generated.

Another use-case is to use the `@top-left` or `@top-right` page margin boxes. These boxes have an automatic layout and they can be very small if they have no content. If there is no text to be placed over the image, use a series of non-breaking spaces (`\A0`) to increase the box width as in the following example (alternatively, you can use the technique described in How to Decorate the Header by Using a Background Image on the Entire Page (on page 72)):

```css
@page :left {
    @top-left{
        content: '\A0\A0\A0\A0\A0\A0\A0\A0\A0\A0\A0\A0\A0\A0\A0\A0';
        background-image: url('https://www.oxygenxml.com/resellers/resources/OxygenXMLEditor_icon.svg');
        background-repeat:no-repeat;
        background-position:50% 50%;
    }
}
```

Note:
You can use raster image formats (such as PNG or JPEG), but it is best to use vector images (such as SVG or PDF). They scale very well and produce better results when printed. In addition, the text from
these images is searchable and can be selected (if the glyphs have not been converted to shapes) in the PDF viewer.

Related Information:
- Images and Figures (on page 178)
- How to Add a Background Image for the Cover (on page 86)
- How to Add a Link in Headers and Footers (on page 71)

How to Add a Link in Headers and Footers

Method 1: Using an SVG Link Attribute
It is possible to add a link inside the document header (or footer) by using the `<a>` element inside an SVG document. For example, suppose you have the following SVG document named `custom.svg`:

```xml
<svg viewBox="0 0 100 40" xmlns="http://www.w3.org/2000/svg">
    <text x="10" y="25">PDF Chemistry</text>
  </a>
</svg>
```

This creates an SVG link with `PDF Chemistry` displayed as its text (the content of the `<text>` element).

Note:
If you just want to add a link without text, you can define a rectangle that contains the link instead of text.

To display the link, you just need to set your SVG file as the content of one of the page margin boxes:

```css
@page {  
    @top-left {  
      content: url("custom.svg");  
    }  
}
```

Method 2: Using the CSS `-oxy-link` Property
It is also possible to add a link inside the document header (or footer) by using the `-oxy-link` property on the `@page` margin box declaration. The entire page margin box will behave as a link and will be clickable.

```css
@page {  
    @top-left {  
      content: "Link";  
      -oxy-link: "https://www.oxygenxml.com/#";  
      color: blue;  
    }  
}
```
How to Decorate the Header by Using a Background Image on the Entire Page

If you want to precisely position artwork and the page margin boxes are not sufficient, it is possible to use a background image for the entire page.

This technique consists of creating an image (SVG is the best since it is a vector image) as wide as the page that would contain the logo and placing other decorations at the desired locations. This offers the best results and the position of the artwork does not depend on the page margin contents.

Example:

```css
@page :left, chapter:left, chapter:first:left {
  background-image: url('img/page_background_image_with_logos_and_artwork_for_left_page.svg');
  background-repeat: no-repeat;
  background-position: 50% 50%;
}
```

For a list of all the possible page names, see: Default Page Definitions (on page 55).

Related Information:

How to Add a Background Image for the Cover (on page 86)

How to Style a Part of the Text from the Header

If you need to style a fragment of text (for example, a company slogan) with certain colors or font styles, you have several options:

- Use an SVG image as the background for a page margin box or for the entire page. See: How to Add a Background Image to the Header (on page 70).
- Use the `oxy_label` constructor. This is a function that creates a text label with a set of styles.

```css
@page {
  @top-right {
    content: oxy_label(text, "My Company", styles, "color:red; font-size: larger;")
      ,
    oxy_label(text, "Product", styles, "color:blue; text-decoration:underline;"));
  }
}
```

You can combine the `oxy_label` with `oxy_xpath`, to extract and style a piece of text from the document:

```css
content: oxy_label(text, oxy_xpath("/some.xpath"), styles, "color:blue; "));
```
Note:
These functions work only with the Chemistry CSS processor.

Note:
You cannot use `string()` inside an `oxy_label()`. As a workaround, to apply styling on the dynamic text retrieved by a `string()` function you can define some overall styles for the entire page margin box and then use the `oxy_label` to style differently the static text.

```css
@page {
  @top-right {
    color: red;
    content: oxy_label(text, "My Company", styles, "color:black")
    ,
    string(chaptitel); /* This inherits the styling from @top-right*/
  }
}
```

- Use two adjacent page margin boxes, and style them differently:

```css
@page {
  @top-center {
    content: "First part";
    color: red;
    text-align:right;
  }
  @top-left {
    content: "- Second part";
    color: blue;
    text-align:left;
  }
}
```

How to Simplify the Header (Keep Only the Chapter Title)

The headers display information such as `map title`, `part title`, `chapter title`, and `section title`, ending in the page number.

```css
content: string(maptitle) string(parttitle) string(chaptitel) string(sectiontitle) " | " counter(page);
```

This might be too much if you have long titles. The solution is to override the default header content.

In your customization CSS (on page 48), add the following CSS rule:
Important:

Some of the CSS default page rules are more important. If you see that the content does not change:

- Try to also specify the name of the page, to increase the specificity of the rules:

```css
@page :left, table-of-contents:left, chapter:left {
    ...
}
@page :right, table-of-contents:right, chapter:right {
    ...
}
```

- Add an `!important` classifier just before the semi-colon.

```css
@top-right {
    content: string(chaptertitle) " | " counter(page) !important;
}
```

How to Change the Header Separators (Between Sections and Chapter Titles)

There are some strings defined for part, chapter, and sections. Each of these strings start with the " | " character as a separator. For example, in the header of a page, you may find a sequence of strings:

```
My Publication | Introduction | Getting Started
```

1. "My Publication" is the value of the `maptitle` string.
2. "Introduction" is the value of the `chaptertitle` string.
3. "Getting Started" is the value of the `sectiontitle` string.

There might be cases where you want to change this separator. You will need to recompose the header content using the above string sets. Suppose you want to use "-" as a separator. In your customization CSS (on page 48), add the following CSS rule:

```css
content: string(chaptertitle) "-" counter(page) !important;
```
If you enabled the **deep numbering for chapters and subsections** *(on page 113)*, then use:

```css
/*
 * Alter the string sets that are shown in the header of the page.
 */
*{class =~ "map/map"}[p|numbering='deep'] *{class =~ "topic/topic"}[is-part] > *{class =~ "topic/title"} {
  string-set: parttitle " - " counter(part, upper-roman) " - " content(), chaptertitle "" ; /*
  Avoid propagating a past chapter title on a new part */
}
*{class =~ "map/map"}[p|numbering='deep'] *{class =~ "topic/topic"}[is-chapter]:not([is-part]) > *{class =~ "topic/title"} {
  string-set: chaptertitle " - " counter(chapter) " - " content();
}
*{class =~ "map/map"}[p|numbering='deep'] *{class =~ "topic/topic"}[is-chapter]:not([is-part]) > *{class =~ "topic/title"} > *{class =~ "topic/title"} {
  string-set: sectiontitle " - " counter(chapter) "." counter(section1) " - " content();
}
```

### How to Change the Header Styling Depending on Page Side

To modify the styling of the default page headers, add the following CSS rule in your [customization CSS](on page 48):

```css
@page :left {
  @top-left {
    color:navy;
    font-style:italic;
  }
  @top-right {
    color:red;
  }
}
```

If you intend to modify **just the headers of the table of contents**, use the `table-of-contents` page rule selector:

```css
@page table-of-contents:left {
  @top-left {
```
How to Use XPath Computed Data or Images in the Header or Footer

A very simple approach is to use the `oxy_xpath` directly in the `content` property:

```xml
@page front-page {
  @top-center {
    content: "Created: " oxy_xpath('//*[contains(@class, " topic/created ")[1]]');
  }
}
```

Example 1: Compute the Number of Words

The following example computes the number of words from the publication. It counts all the words, including the ones from the TOC, but does not take the static labels into account:

```xml
@page front-page {
  @bottom-center {
    content: "Number of words: "
    oxy_xpath("string-length(normalize-space(/)) - \n        string-length(translate(normalize-space///,' ','')) +1");
  }
}
```

Note:
The XPath expression from the page rules is evaluated in the context of the document root element, so you will need to use absolute expressions starting with `/` or `//`. This is different from the case when the `oxy_xpath` is used in CSS rules that match an element. In this case, the XPath expressions are evaluated in the context of the matched element and you can use relative paths.

Tip:
XPath 2.0 is supported (not schema aware).

Example 2: Retrieve Image from a Document and Insert it in the Header

Another example is to use an image from the document in the publication header:

```xml
<bookmeta>
  <metadata>
```

```xml
  ...
```
If the URL returned by `oxy_xpath` is not absolute, it is considered to be relative to the CSS file. To obtain an absolute URL from one relative to the XML document, you can use in the XPath expression functions like `resolve-uri` and `document-uri`:

```css
@page {
  @top-center {
    content: url("oxy_xpath('//*[contains(@outputclass, "cover-image")]//@href")");
  }
}
```

**Example 3: Insert the Current Date in the Footer**

Another example is to use the `oxy_xpath` function to compute the current date and insert it in the publication footer:

```css
@page {
  @bottom-left {
    content: oxy_xpath('current-date()');
  }
}
```

**Example 4: Picking up Metadata from the Original Map**

Another example is to use the `oxy_xpath` function to extract the title, or any other element text value from the original processed DITA map file. For this, you can use the `@xtrf` attribute that is set on the root element of the merged map. This attribute contains the URL of the input map.

```css
:root{
  string-set: maptitle oxy_xpath('document(@xtrf)/*[contains(@class, "map/map")]/*[contains(@class, "topic/title")]/text()');
}
```
How to Add a Line Under the Header

There are two ways to add a horizontal line under the header.

**Method 1: Add a Border in the Page Margin Boxes**

To add a horizontal line that would stretch across the width of the page, add a bottom border to each of the 5 margin boxes in the top side of the page (top-left-corner, top-left, top-center, top-right, top-right-corner).

If you consider that the space between the header and the bottom border is too large, you could also change the alignment by adding a `vertical-align: bottom;` declaration in the page margin boxes.

For example, if you need to set some text as a header in the top-left margin box and insert a horizontal line under it, the customization CSS would look something like this:

```css
@page chapter, chapter:first:
.left: right, front-page{
  padding-top: 1em;

  @top-left {
    content: "Custom header";
    color: gray;
    border-bottom: 1px solid black;
    vertical-align: bottom;
  }

  @top-center{
    content: " ";
    border-bottom: 1px solid black;
    vertical-align: bottom;
  }

  @top-right{
    content: " ";
    border-bottom: 1px solid black;
    vertical-align: bottom;
  }

  @top-right-corner{
    content: " ";
  }
```
**Note:**

The `padding-top: 1em;` is used to avoid the border at the bottom of the header that joins with the page content.

### Method 2: Use a Background Image

An alternative method is to add a horizontal line/border under an existing header (or in any other part of the page) using an SVG image, as described in [How to Add a Background Image to the Header](on page 70).

### How to Change the Headings Using a Parameter

Suppose you need to change the headings of your publication by specifying a static text in a parameter.

First, establish a name for your parameter (it must start with the `args.css.param.` prefix). For example, you could name it `args.css.param.heading.text`. It will have the text value that you will pass when starting the transformation. This parameter does not have to be registered anywhere as it will be automatically recognized and passed as an XML attribute on the root of the merged file, as specified in [Styling Through Custom Parameters](on page 199).

Next, alter your customization CSS to make use of the parameter value. In the example below, the text is placed in the central part of the header:

```css
@page front-page, table-of-contents, chapter {
    @top-center{
        content: oxy_xpath("/*/@heading.text");
    }
}
```

**Note:**

You can use any XPath 2.0 here. It will be executed in the context of the merged map document, so you can collect data from it. You can use `if/then/else` expressions if your parameter is a switch.

The text does not affect the first pages from the page sequences because the built-in CSS page rules *(on page 55)* clear the content from the headers. If you need the text content on all pages, you might
consider adding an `!important` keyword after the `content` property value, or increase the specificity of the page selectors, like this:

```css
@page front-page,
  table-of-contents,
  table-of-contents:first: left,
  table-of-contents:first: right,
  chapter:first: left,
  chapter:first: right{
    @top-center{
      ...
    }
  }
```

Another use case is to alter the string-sets that are used in the headers (not the headers directly), as it is explained here: How to Use XPath Computed Data or Images in the Header or Footer (on page 76). You can use this technique to alter the chapter titles as in the following example:

```css
*[class =~ "map/map"] *[numbering~='deep']
  *[class =~ "topic/topic"] *[is-chapter]:not([{is-part}) >
    *[class =~ "topic/title"] {
      string-set:
        chaptertitle " | " counters(chapter-and-sections, ".") " - "
        oxy_xpath("/*/@heading.text") content(),
        sectiontitle "";
    }
```

**Note:**
This is a rule copied from `p-numbering-deep.css` and it may change if future versions.

### How to Change the Headings depending on the Language

It is possible to customize the text displayed in the headings depending on the language of the publication.

In this case, you can simply use of the `@lang` attribute in your customization CSS. In the following example, the page counter displayed in the bottom part of the page is preceded by the word "Page", according to the selected language:

```css
@page chapter {
  @bottom-center {
    content: oxy_xpath("if (@lang='es') then 'Página' \
      else if (@lang='it') then 'Pagina' \
      else 'Page') " " counter(page);
  }
}
```
Note:
Backslashes (\) are used to split the XPath into multiple lines to make it easier to read.

Page Breaks

The page breaks can be controlled in multiple ways:

1. By creating an @page and assigning it to an element will create a page break between this element and the sibling elements that have a different page.
3. In your DITA topic, set the @outputclass attribute on the topic root (or any element) to contain one of the page-break-before, page-break-after, or page-break-avoid values. If you want to control the page breaking from the DITA map, use the @outputclass attribute on the <topicref>, with any of the values mentioned above.

Related Information:
Double Side Pagination (on page 133)
Oxygen PDF Chemistry: Controlling Page Breaks

Page Breaks - Built-in CSS

Page break properties are used in: [PLUGIN_DIR]css/print/p-page-breaks.css.

How to Avoid Page Breaks in Lists and Tables

To avoid splitting elements over two pages, you can use the page-break-inside CSS property. For example, if you want to impose this on tables and lists, then add the following rules to your customization CSS (on page 48):

```css
*[class =~ "topic/table"] { 
  page-break-inside:avoid;
}
*[class =~ "topic/ol"] { 
  page-break-inside:avoid;
}
*[class =~ "topic/ul"] { 
  page-break-inside:avoid;
}
```

Note:
Since the task steps are inherited from topic/ol, they will also not be split over two separate pages. However, if you want to allow this, add the following CSS rule:
How to Force a Page Break Before or After a Topic or Another Element

If you want to force a page break before all the second-level topics (for example, sections in chapters that are usually kept flowing one after another without page breaks), add the following in your customization CSS (on page 48):

```
*[class =~ "map/map"] > *[class =~ "topic/topic"] > *[class =~ "topic/topic"] {
  page-break-before: always;
}
```

If you want to force a page break for a specific topic, mark the topic (or any other element you need to control page breaking for) with an @outputclass attribute set to one of these values:

- **page-break-before**: Use this for a page break before the marked element.
- **page-break-after**: Use this for a page break after the marked element.
- **page-break-avoid**: Use this to avoid page breaks inside the marked element.

For example, to force a page break before a certain topic, use:

```html
<topic outputclass="page-break-before" ...>
```

**Note:**
You can set the output class on the <topicref> element from the DITA map instead of the <topic> element. In this way you can reuse the topic in another context where the page breaking is not necessary.

You can also control page breaking for lists, paragraphs, or any other block type elements. The following example avoids page breaks inside an ordered list:

```html
<ol outputclass="page-break-avoid" ...>
```

How to Add a Blank Page After a Topic

If you want to add a new blank page after a topic, add the following rules to your customization CSS (on page 48).

```html
*[class =~ "task/steps"] { 
  page-break-inside: auto;
}
```
Style the separating blank page:

```css
@page topic-separating-page{
    @top-left {
        content: "";
    }
    @top-right {
        content: "";
    }
    @top-center {
        content: "This page is blank";
    }
}
```

Associate this page to the :after pseudo-element of the topic:

```css
*:([class~="topic/topic"])[outputclass~="add-separator-page"]:after {
    content: " ";
    display: block;
    page: topic-separating-page;
}
```

In the XML content, on the `<topic>` element, set the `@outputclass` to the `add-separator-page` value.

```xml
<topic outputclass="add-separator-page"> ... </topic>
```

The :after pseudo-element will be created next to the topic content and will be placed on the `topic-separating-page`.

Use the page margin box selectors to override the default content from the headers/footers.

**Note:**

You can set the output class on the `<topicref>` element from the DITA map instead of the `<topic>` element. This allows you to reuse the topic in another context where the page breaking is not necessary.

### How to Enforce a Number of Lines from Paragraphs that Continue in Next Page

In typography, an *orphan* is the first line of a paragraph that appears alone at the bottom of a page (the paragraph continues on a subsequent page), while a *widow* is the last line of a paragraph that appears alone at the top of a page. The default is 2 for each of them. You can control this number by adding the following to your customization CSS *(on page 48)*:

```css
:root {
    widows:4;
}
```
Note:
As a difference from the W3C standard, the `widows` and `orphans` CSS properties are applied to lists as well (the default is 2). This means that a list that spans consecutive pages will have either zero or at least 2 lines on each of the pages.

How to Avoid Page Breaks Between Top-Level Topics (Chapters)

If you plan to publish a simple map with just one level of topics (such as a list of topics), then the automated page breaks between these topics might not be desired.

In this case, you can use the following CSS snippet to disable the page breaks between chapters:

```css
*[class ~= "topic/topic"] [is-chapter] {
  -oxy-page-group:auto;
}
```

Related Information:
Oxygen PDF Chemistry User Guide: Chapter Page Placement and Styling

Cover (Title) Page

Customizing the cover page is one of the most requested customization requests.

Cover Page - XML Fragment

The merged map file (on page 49) contains the `<oxy:front-page>` element, as a child of the root element. This contains the metadata and an `<oxy:front-page-title>` element with the title structure.

```xml
<bookmap xmlns:ditaarch="http://dita.oasis-open.org/architecture/2005/" ...>
    <bookmeta xmlns:dita-ot="http://dita-ot.sourceforge.net/ns/201007/dita-ot" ...
    </bookmeta>
    <oxy:front-page-title>
      <booktitle xmlns:dita-ot="http://dita-ot.sourceforge.net/ns/201007/dita-ot" class="- topic/title bookmark/booktitle ">
        <booklibrary class="- topic/ph bookmark/booklibrary ">Retro Tools</booklibrary>
      </booktitle>
      <mainbooktitle class="- topic/ph bookmark/mainbooktitle ">Tasks</mainbooktitle>
      <booktitlealt class="- topic/ph bookmark/booktitlealt ">Product tasks</booktitlealt>
    </booktitle>
  </oxy:front-page-title>
</oxy:front-page>
```
For the **DITA Map PDF - based on HTML5 & CSS** transformation type, the merged map is further processed resulting in a collection of HTML5 `<div>` elements. These elements preserve the original DITA `@class` attribute values and add a new value derived from the DITA element name.

```html
<div class="map/bookmap/bookmap" ... >
  <div class="front-page/front-page front-page">
    <div class="map/topicmeta/bookmap/bookmeta"...>
    ...
    </div>
  </div>
</div>
```

**Cover Page - Built-in CSS rules**

The element with the class `frontpage/frontpage` is associated with a page named `front-page` with no headers or footers. The front page title is styled with a bigger font. The built-in CSS rules are in [PLUGIN_DIR]/css/print/p-front-page.css.

```css
@media print {
  *[class="front-page/front-page"] { 
    page: front-page;
  }

  /* Prevents the front-page title margin collapsing */
  *[class="front-page/front-page"]:before(1000) { 
    display:block;
    content:\A;
    font-size:0;
  }

  *[class="front-page/front-page-title"] { 
    display:block;
    text-align:center;
    margin-top:3in;
    font-size:2em;
    font-family:arial, helvetica, sans-serif;
    font-weight:bold;
  }
}
```
How to Add a Background Image for the Cover

The simplest way is to create an SVG image as large as the entire physical page and set it as the background for the front-page. This makes it easy to accomplish a good positioning of the graphical elements or artwork. In the foreground, you can place text fragments using a series of :after pseudo-elements bound to the front page title.

To set the size to an SVG image, you should specify the @width and @height attributes on the <svg> root element using specified unit values (in, cm, etc.) This should be enough only if all the coordinates from your drawing have unit identifiers.

If you are using unit-less coordinates in your drawing like the following:

```
Polygon points="17.78 826.21 577.51 ...."
```

Next, make sure you also specify the @viewBox attribute on the <svg> root element that defines the abstract rectangle that contains the drawing:

```
<svg xmlns="http://www.w3.org/2000/svg" width="8.5in" height="11in" viewBox="0 0 600 850">
```

The following SVG document has the @width, @height, and @viewBox attributes. The width and height have physical units (in inches), while the view box and rectangle coordinates are unit-less.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE svg PUBLIC "-//W3C//DTD SVG 1.1//EN"
 "http://www.w3.org/Graphics/SVG/1.1/DTD/svg11.dtd">
<svg xmlns="http://www.w3.org/2000/svg" width="8.5in" height="11in" viewBox="0 0 110 110">
<desc>A gradient as big as a page.</desc>
```
This example shows a gradient. It is the size of a US-LETTER page and can be used in a publication using this page size.

Note:
You can use raster image formats (such as PNG or JPEG), but it is best to use vector images (such as SVG or PDF). They scale very well and produce better results when printed. In addition, the text from these images is searchable and can be selected (if the glyphs have not been converted to shapes) in the PDF viewer.

In your customization CSS *(on page 48)*, add the following:

```css
@page front-page {
    background-image: url("us-letter.svg");
    background-position: center;
    background-repeat: no-repeat;
    background-size: 100% 100%;
}
```

For smaller artworks, you can use `background-position` with percentage values to position and center the artwork (for example, a company logo):

```css
@page front-page {
    background-image: url("company-logo.svg");
    background-position: 50% 5%; /* The first is the alignment on the X axis, the second on the Y axis. */
    background-repeat: no-repeat;
}
```
How to Use Different Background Cover Images Based on Bookmap or Map Info

It is common to use the same CSS file for customizing multiple publications, and you may need to set a different cover for each of them. The solution is to use an XPath expression to extract some information from the document, and based on that, select the SVG images.

```css
@page front-page {
    background-image: url(oxy_xpath("\
    if(/*[@class, ' topic/prodname '])[1] = 'gardening') then 'bg-gardening.svg' else\
    if(/*[@class, ' topic/prodname '])[1] = 'soil') then 'bg-soil.svg'\
    else 'bg-default.svg'\
    "");
    background-position: center;
}
```

The backslash (\) is used to continue the expression string on the subsequent lines (there should be no spaces after it). For more use cases solved using XPath, see: Metadata (on page 95).

Related Information:
Oxygen PDF Chemistry: Graphics

How to Change Styling of the Cover Page Title

Match the front page title element in your customization CSS (on page 48) based on its class attribute:

```css
*[class =~ "front-page/front-page-title"] {
    margin-top: 1in;
    font-size: 3em;
}
```

Important:

Make sure the sum of the top and bottom margins and paddings for this element do not exceed the physical dimension of the page. If this happens, an extra blank page may appear before the cover page. Usually, it is enough to specify only the top margin.

How to Add Text to the Cover Page

If you need to add arbitrary text to the cover page, you can use the front page title element as an anchor and add as many blocks of text as you need after it, and style them differently.

In your customization CSS (on page 48), add the following:
To use content from the document, you can use the `oxy_xpath` function in the `content` property. For a more complex example, including the generation of a new page for the synthetic `:after` elements, see: [How to Show Metadata in the Cover Page (on page 100)](on page 100).

**Related Information:**
- [How to Show Metadata in the Cover Page (on page 100)](on page 100)

**How to Place Cover on the Right or Left Side**

In your customization CSS (on page 48), add the following CSS rules:

```
*[class =~ "front-page/front-page"] { 
    page-break-before: left;
}
```
Note:
This will create an empty page at the beginning of the publication, moving the cover content on the needed side.

For more information, see: Oxygen PDF Chemistry: Controlling Page Breaks.

Related Information:
Double Side Pagination (on page 133)

How to Add a Second Cover Page and Back Cover Page

It is possible to add a second cover page after the front-page by defining another page-selector:

```css
@page second-cover {
    @top-left {content: none};
    @top-right {content: none};
    @bottom-center {content: none};

    background-image: url("second-cover.svg");
    background-position: center;
    background-repeat: no-repeat;
    background-size: 100% 100%;
}

*[class ~= 'front-page/front-page']::after{
    page: second-cover;
    page-break-after: always;
    display: block;
    content: "\2002";
}
```

If you want to add a back cover page, you should use an :after pseudo element on the map itself:

```
*[class ~= "map/map"]::after
```

and bind it to another @page declaration:

```css
@page back-cover {
    @top-left {content: none};
    @top-right {content: none};
    @bottom-center {content: none};

    background-image: url("back-cover.svg");
    background-position: center;
    background-repeat: no-repeat;
    background-size: 100% 100%;
}```
Note:
For any background-image, it is recommended to use SVG instead of PNG (or JPG) because it scales it to the page size.

Tip:
To add multiple cover pages, use multiple-leveled pseudo selectors, such as :after(1), :after(2). Remember that the larger the value, the more distant the pseudo element is to the target element.

How to Dynamically Add a Second Cover Page
It is possible to dynamically set the path to the SVG image that will be displayed on the secondary cover page. First, you need to declare a <data> element in the bookmap's metadata that contains the URL to your cover image:

```
<bookmap>
  <booktitle>...
  </booktitle>
  <bookmeta>
    <metadata>
      <data name="second-cover-url" value="covers/second-cover.svg"/>
    </metadata>
  </bookmeta>
  ...
</bookmap>
```

Note:
This can also be done on a normal DITA map by using the <topicmeta> after the map's <title>.

Next, you need to modify the page declaration inside your CSS stylesheet and replace the background-image property value with the result of the oxy_xpath() function:

```
@page second-cover {
  ...
  background-image: url(oxy_xpath("//*[contains(@class, 'bookmap/bookmeta')]///*[contains(@class, 'topic/data')]/@name='second-cover-url']/@value");
}
```
Tip:
You can reuse the same stylesheet on multiple maps. You just need to change the data value for each of them.

How to Add a Specific Number of Empty Pages After the Cover Page

In your customization CSS (on page 48), add the following CSS rules:

```css
@page my-blank-page {
  /* Hide the page numbers */
  @top-left {content: none};
  @top-right {content: none};
}

*[class =~ 'front-page/front-page']:after(1){
  page:my-blank-page;
  display:block;
  content: '\2002';
  color:transparent;
  page-break-after:always;
}

*[class =~ 'front-page/front-page']:after(2){
  page:my-blank-page;
  display:block;
  content: '\2002';
  page-break-after:always;
}

*[class =~ 'front-page/front-page']:after(3){
  page:my-blank-page;
  display:block;
  content: '\2002';
  page-break-after:always;
}
```

Note:
The \2002 character is a space that is not shown on the pages, but gives a value for the content property.
Related Information:
How to Force an Odd or Even Number of Pages in a Chapter (on page 135)

How to Add a Copyright Page after the Map Cover (Not for Bookmaps)

Regular DITA maps do not have the concept of a copyright notice. This is available only in the DITA bookmap structure.

If you are constrained to using a regular map and you need to add a copyright page between the front cover and the TOC, use the following technique:

In your customization CSS (on page 48), declare a new page layout:

```css
@page copyright-notice-page {
  @top-left {
    content:none; /* Clear the headers for the copyright page */
  }
  @top-right {
    content:none;
  }
}
```

The element with the class `front-page/front-page` element contains the title of the publication and generates the cover page. A synthetic `:after` element is created that follows this element and it is placed on a different page.

```css
*[class~="front-page/front-page"]:after{
  display:block;

  page: copyright-notice-page; /* Moves the synthetic element on a new page. */

  margin-top:90%; /* use margins to position the text in the page */
  margin-left: 5em;
  margin-right: 5em;

  content: "Copyright 2018-2019 MyCorp Inc. All rights reserved";

  text-align:center; /* More styling */
  color:blue;
}
```

If you need to add more content as blocks, use the `:after(2), :after(3)` pseudo-elements:

```css
*[class~="front-page/front-page"]:after(2){
  display:block;

  page: copyright-notice-page; /* Continue on the same page as the first ':after'. */

  content: "Some more styled text";
}
If you want to extract information from the document, use the `oxy_xpath()` function. For example, if the copyright info is stored in the map like this:

```xml
<map ...>
  <topicmeta>
    <copyright>
      <copyryear year="2018"/>
      <copyrholder>MyCorp Inc.</copyrholder>
    </copyright>
  </topicmeta>
...
```

then use this:

```css
*[class =~ "front-page/front-page"]:after(3) {
  display: block;
  page: copyright-notice-page;
  content:
  "Year: ">
    oxy_xpath('/*[contains(@class, " front-page/front-page " )]/*[contains(@class, " map/topicmeta ")]/*[contains(@class, " topic/copyright ")]/*[contains(@class, " topic/copyryear ")]/@year'
  "
    oxy_xpath('/*[contains(@class, " front-page/front-page " )]/*[contains(@class, " map/topicmeta ")]/*[contains(@class, " topic/copyright ")]/*[contains(@class, " topic/copyrholder ")]/text()');
    color: green;
}
```

**Related Information:**
*How to Debug XPath Expressions (on page 54)*

**How to Remove the Cover Page and TOC**

If you need to hide or remove the cover page, the table of contents or other structures, match the elements with a "front-page/front-page" and "toc/toc" classes in your customization CSS *(on page 48)*:

```css
*[class =~ 'map/map'] > *[class =~ 'toc/toc'] { display:none !important;
}
*[class =~ 'map/map'] > *[class =~ 'front-page/front-page']{
  display:none !important;
}
```
Metadata

DITA has a solid vocabulary for specifying metadata. There are <prolog> elements in the topics, and <topicmeta>, <bookmeta> elements in the bookmaps. They can be used to define authors, dates, audiences, organizations, etc. See: https://www.oxygenxml.com/dita/1.3/specs/archSpec/base/metadata-in-maps-and-topics.html

It is up to you to decide where this information should be presented, in the PDF content or in the PDF document properties.

Metadata - XML Fragment

In the merged map file (on page 49), the metadata section is placed inside the <oxy:front-page> element. This is different from the original placement in the map or bookmark (after the title), but allows for the usage of information from it in the title page.

Bookmaps

This is an example of a section taken from a merged bookmark. It only contains some of the possible metadata elements. The <bookmeta> metadata section is inherited from <topicmeta>.

```xml
  xmlns:opentopic-index="http://www.idiominc.com/opentopic/index" cascade="merge"
  class="- map/map bookmark/bookmap "
  ditaarch:DITAArchVersion="1.3" >


<bookmeta xmlns:dita-ot="http://dita-ot.sourceforge.net/ns/201007/dita-ot"
  class="- map/topicmeta bookmark/bookmeta ">

<author class="- topic/author ">Howe Tuduit</author>

<bookid class="- topic/data bookmark/bookid ">
  <isbn class="- topic/data bookmark/isbn ">071271271X</isbn>
  <booknumber class="- topic/data bookmark/booknumber ">SG99-9999-00</booknumber>
  <maintainer class="- topic/data bookmark/maintainer ">
    <organization class="- topic/data bookmark/organization ">ACME Tools</organization>
    <person class="- topic/data bookmark/person ">
    </person>
  </maintainer>
</bookid>

<bookrights class="- topic/data bookmark/bookrights ">
  ...
</bookrights>

<bookowner class="- topic/data bookmark/bookowner ">
```
For the DITA Map PDF - based on HTML5 & CSS transformation type, the merged map is further processed resulting in a collection of HTML5 `<div>` elements. These elements preserve the original DITA `@class` attribute values and add a new value derived from the DITA element name.

```html
<organization class="- topic/data bookmap/organization ">
  ACME Tools, Inc.
</organization>

<bookowner>
  
</bookrights>
  
</bookmeta>

<oxy:front-page-title>
  ...
  ...
</oxy:front-page-title>

<bookowner>

    <organization class="- topic/data bookmap/organization ">
      ACME Tools, Inc.
    </organization>

</bookowner>
</bookrights>
</bookmeta>

<oxy:front-page-title>
  ...
  ...
</oxy:front-page-title>

...
Maps

The maps have a more simple structure, they use the `<topicmeta>` element for metadata sections. This is also a simplified example, as there may be many more elements in the metadata section:

```xml
xmlns:opentopic-index="http://www.idiominc.com/opentopic/index"
cascade="merge" class="- map/map 
ditaarch:DITAArchVersion="1.3">
...
</map>


<topicmeta class="- map/topicmeta">
  <author class="- topic/author">Dan C</author>
  <metadata class="- topic/metadata">
    <prodinfo class="- topic/prodinfo">
      <prodname class="- topic/prodname">oXygen PDF CSS DITA Plugin</prodname>
    </prodinfo>
  </metadata>
  <audience/>
</topicmeta>
...

For the DITA Map PDF - based on HTML5 & CSS transformation type, the merged map is further processed resulting in a collection of HTML5 `<div>` elements. These elements preserve the original DITA `@class` attribute values and add a new value derived from the DITA element name.

```xml
xmlns:opentopic-index="http://www.idiominc.com/opentopic/index"
cascade="merge" class="- map/map 
ditaarch:DITAArchVersion="1.3">
...
</div>

<div class=" front-page/front-page front-page">
  <div class="- map/topicmeta topicmeta">
    <div class="- topic/author author">Dan C</div>
    <div class="- topic/metadata metadata">
      <div class="- topic/prodinfo prodinfo">
        <div class="- topic/prodname prodname">oXygen PDF CSS DITA Plugin</div>
      </div>
    </div>
  </div>
</div>
```
Metadata - Built-in CSS rules

The [PLUGIN_DIR]/css/print/p-meta.css file contains the rules that extract metadata.

How to Create a Searchable PDF

To make a PDF searchable, you need to add some `<keyword>` or `<indexterm>` elements inside bookmaps, maps, or topics. Most of the search engines will parse the resulting document and extract those keywords and create a search base.

**Note:**
Both `<keyword>` and `<indexterm>` elements can be combined inside the `<keywords>` element. They will be equally processed by the search engine.

In the generated PDF, keywords are displayed in the Document Properties.

**Bookmaps**
If you want your keywords to appear inside a bookmap, you need to define them inside the `<bookmeta>` element:

```xml
<bookmap>
  ...
  <bookmeta>
    <keywords>
      <keyword>web server</keyword>
      <keyword>hard disk</keyword>
    </keywords>
  </bookmeta>
</bookmap>
```

**Maps**
If you want your keywords to appear inside a map, you need to define them inside the `<topicmeta>` element:

```xml
<map>
  ...
  <topicmeta>
    <keywords>
      <keyword>flowers</keyword>
      <indexterm>care and preparation</indexterm>
      <keyword>seasons</keyword>
    </keywords>
  </topicmeta>
</map>
```
**Topics**
If you want your keywords to appear inside one or more topics, you need to define them inside the `<prolog>` element:

```xml
<topic>
  ...
  <prolog>
    <metadata>
      <keywords>
        <indexterm>iris</indexterm>
      </keywords>
    </metadata>
  </prolog>
</topic>
```

**Warning:**
Keywords must be at map level or at topic level, you cannot combine them.

---

**How to Add the Publication Audience to the Custom PDF Metadata**

The `audience` element indicates the users the publication is addressing. This can be placed inside a `<topicmeta>` element in a `<map>` as in the following example:

```xml
<map>
  ...
  <topicmeta>
    ...
    <audience type="programmer" job="programming" experiencelevel="expert"/>
  </topicmeta>
</map>
```

To collect the `@type` attribute, add the following in your customization CSS (on page 48):

```css
*.[class ~= "map/map"] > *.[class ~= "map/topicmeta"] > *.[class ~= "topic/audience"] {
  -oxy-pdf-meta-custom: "Audience" attr(type);
}
```

**Notice:**
It is best to use the class selector (such as `*[class ~= "map/topicmeta"]`) instead of `topicmeta` to cover cases where the elements are specialized (for instance, in a bookmap the `bookmeta` is a `topicmeta`, so your selector will also function for bookmaps, not only simple maps.

**Note:**
The selector begins with `map >` to choose the `<topic>` that is a direct child of the map, not other `<topicmeta>` elements from other `<topicref>` elements.
Tip:
You can define multiple key value pairs by separating them with commas:

-oxy-pdf-meta-custom: "Audience" attr(type), "Job" attr(job)

The metadata is displayed in the Custom tab of the Document Properties dialog box from Acrobat Reader:

How to Show Metadata in the Cover Page

The following CSS extensions are used in the subsequent examples:

- **oxy_xpath** - Executes an XPath expression and returns string content. Use this whenever you need to extract data from an element other than the one matched by the CSS rule selector.
- **:after(N)** - Creates more than one after pseudo-element. The argument value represents how far the generated content is from the real content. For example, in the second code snippet in the next section (on page 101), the content of the :after is closer to the title (upper) than the content of the :after(2).
Processing Bookmap Metadata

Suppose you need to present the **Author** and the **ISBN** (when it exists) just under the publication title and suppose your bookmap contains:

```xml
<bookmap id="taskbook">
  <booktitle>
    <booklibrary>Retro Tools</booklibrary>
    <mainbooktitle>Product tasks</mainbooktitle>
    <booktitlealt>Tasks and what they can do</booktitlealt>
  </booktitle>
  <bookmeta>
    <author>Howe Tuduit</author>
    <critdates>
      <created date="1/1/2015"/>
      <revised modified="3/4/2016"/>
      <revised modified="3/5/2016"/>
    </critdates>
    <bookid>
      <isbn>071271271X</isbn>
      <booknumber>SG99-9999-00</booknumber>
    </bookid>
  </bookmeta>
</bookmap>
```

The entire `<booktitle>` element content is displayed on the first page of the PDF, so if you need to add the information after it, in your **customization CSS (on page 48)**, add the following CSS rules:

```css
*[class ~="bookmap/booktitle"]:after {
  display: block;
  content: "by " oxy_xpath('//*[@class="bookmap/bookmeta "]/[@class="topic/author "]/*[@class="topic/author "]/text()');
  margin-top: 4em;
  text-align: center;
  color: gray;
}
*[class ~="bookmap/booktitle"]:after(2) {
  display: block;
  content: oxy_xpath('if(/*[@class="bookmap/isbn "] then concat("ISBN ", /*[@class="bookmap/isbn "])/text() else ")';
  text-align: center;
  color: gray;
}
```
Processing Ditamap Metadata
Suppose you need to present the Revision Date just under the publication title and suppose your ditamap contains:

```xml
<map>
  <title>Growing Flowers</title>
  <topicmeta>
    <critdates>
      <revised modified="2021-04-26"/>
    </critdates>
  </topicmeta>
... 
```

The entire `<title>` element content is displayed on the first page of the PDF, so if you need to add the information after it, in your customization CSS (on page 48), add the following CSS rules:

```css
*[class =~ "front-page/front-page-title"] > *[class =~ "topic/title"]:after {
  display: block;
  content: "last revision " (/*[contains(@class, " map/topicmeta ")==@modified;*/"@modified;"
  margin-top: 4em;
  text-align: center;
  color: gray;
}
```

**Note:**
The `[1]` predicate is used to avoid duplicated results as the `topicmeta` is included in all children topics.

Generating Synthetic Pages for Metadata
Suppose you need to show this information on a page that follows the title page, instead of on the title page. In this case, you need to prepare a named page and place the content in it. In your customization CSS (on page 48), add the following CSS rules:

```css
@page page-for-meta {
  background-color: yellow; /* Just to see it better*/
  @top-left-corner {
    content:""; /* Remove the default header */
  }
  @top-right-corner {
    content:""; /* Remove the default header */
  }
  ... *

*[class =~ "bookmap/booktitle"]:after {
  page: page-for-meta;

```
How to Show Metadata in the Header or Footer

The header and footer are composed of page margin boxes that can be populated with static text by using `string-sets`.

If you need to add some of the map metadata to the header of the front page (for example, the creation date), add the following CSS rules in your customization CSS (on page 48):

```css
*[class = "front-page/front-page"] >
  *[class = "map/topicmeta"] >
    *[class = "topic/critdates"] >
      *[class = "topic/created"]{
        string-set: mapcreated attr(date);
      }

@page front-page {
  @top-center {
    content: "Created: " string(mapcreated);
  }
}
```

**Note:**

The `front-page` is the name of a page that used to present the element with the class "front-page/front-page". The above page rule is combined with the default styles.

How to Remove or Change the PDF Keywords

The keywords defined in the prolog sections of topics are automatically collected and set as PDF keywords. These are shown by the readers in the PDF document properties window.

If you need to remove them, you can use the following CSS snippet in your customization CSS (on page 48):

```css
:root {
  -oxy-pdf-meta-keywords: "";
}
```

To change them, if you have a hard-coded list, you just enumerate each of them in the property content, separating them with comma:
If you need to extract them by other criteria from the merged map, you can use the `oxy_xpath()` function instead of the hard-coded list.

**How to Remove the PDF Publication Title Property**

The title defined in the PDF reader is automatically collected from the map's main title.

If you want to display the map name instead of the title, you can use one of the following rules in your customization CSS: (on page 48):

```css
/*
* Titles (maps).
*/
*[class = "front-page/front-page-title"] *[class = "topic/title"]:not([class = 'bookmap/booktitle']) {
  -oxy-pdf-meta-title: unset;
}

/*
* Titles (bookmaps).
*/
*[class = "front-page/front-page"] *[class = "bookmap/booktitle"] > *[class = "bookmap/mainbooktitle"] {
  -oxy-pdf-meta-title: unset;
}
```

**How to Change the PDF Publication Title Property**

The `<title>` element of a bookmap is quite complex and contains elements for the book library and an alternate title:

```
<booktitle>
  <booklibrary>Retro Tools</booklibrary>
  <mainbooktitle>Main Book Title</mainbooktitle>
  <booktitlealt>Book Title Alternative</booktitlealt>
</booktitle>
```

For the publication title, the built-in CSS uses only the content of the `<mainbooktitle>`. If you want to collect all of the text from the `<booktitle>`, you can add the following rule to your customization CSS: (on page 48):

```css
:root {
  -oxy-pdf-meta-title: oxy_xpath('//*[contains(@class, "bookmap/booktitlealt")]')[1]/text()';
  -oxy-pdf-meta-description: "";
}
```
An XPath expression is used to collect all the `<booktitlealt>` elements from the merged map, select the first one, then use its text. The built-in CSS uses the `<booktitlealt>` as the PDF description. In the example above, this property is cleared since it was moved as a title.

**How to Use Data Elements from the Map to Create Custom PDF Metadata**

To use a key value in the CSS, the key must be referenced from the content (either a topic or map). If you do not have it referenced, you may force a reference by using the `<topicmeta>` or `<bookmeta>` section of your map and a `<data>` element. This has no effect on the published content, but allows the CSS rules to use its content.

```xml
<bookmeta>
  ....
  <data keyref="my_key"/>
  ....
</bookmeta>
```

This is expanded in the merged HTML file to:

```html
<div class="- map/topicmeta bookmap/bookmeta topicmeta bookmeta">
  ...
  <div keyref="my_key" class="- topic/data data">
    <div class="- topic/keyword keyword">
      KEY VALUE</div>
  </div>
  ...
</div>
```

Suppose that you need the expanded key value in the footer of the publication. You can define a string-set on this `data` element:

```html
*[^class ^="topic/data"]&[keyref="my_key"] {  
  string-set: key-string content(text);
}
@page {  
  @bottom-left {  
    content: "My key is: " string(key-string) !important;
  }
}
```

Or you can use the value from a `:before` pseudo-element, like the one for the title:

```html
*[^class ^="topic/title"]:before {  
  content: oxy_xpath("///*[contains(@class, 'topic/data')][@keyref = 'my_key']//text()")
}
```

Another use-case is to use the key as a source for a custom PDF document property:
How to Control the PDF Viewer

The PDF document may contain settings for the PDF Viewer. This helps to make the viewing experience common for all of the readers. For example, you can specify the zoom level that the document is presented, or whether the outline view should be displayed.

There are several CSS properties you can use. These properties should be set on the root element. If they are set on multiple elements, the first one will be taken into account.

Examples

- To hide the PDF Viewer toolbar and menu bar:

  ```css
  :root {
    -oxy-pdf-viewer-hide-menubar: true;
    -oxy-pdf-viewer-hide-toolbar: true;
  }
  ```

- To make the document be displayed with a different zoom level:

  ```css
  :root {
    -oxy-pdf-viewer-zoom: 50%;
  }
  ```

- To make the PDF Viewer just as large as the displayed document (e.g. if there is a zoom level that makes the document smaller, then the window of the viewer will be just as big as the page):

  ```css
  :root {
    -oxy-pdf-viewer-fit-window: true;
  }
  ```

- If you need the pages to be displayed as a single continuous column (to be able to scroll in a single view port), use:

  ```css
  :root {
    -oxy-pdf-viewer-page-layout: one-column;
  }
  ```

  The supported include: `single-page, two-columns-left`, and more.

- To make the document outline view visible, use:

  ```css
  :root {
    -oxy-pdf-viewer-page-mode: use-outlines;
  }
  ```

  The supported values include: `use-thumbs, use-none`. For more details, see the list of Chemistry extension CSS properties.
Front Matter and Back Matter

The **front matter** is a series of topics that are usually placed after the cover page and before the TOC or the content.

The **back matter** is a series of topics that are usually placed after the content of the book.

Front Matter and Back Matter - XML Fragment

In the **merged map file** *(on page 49)*, the **frontmatter** topic references are wrapped in a `<frontmatter>` element that has the class `bookmap/frontmatter`. Then, the referenced content is marked with the attribute `@is-frontmatter="true"`:

```xml
<bookmap xmlns:ditaarch="http://dita.oasis-open.org/architecture/2005/" ...

    <oxy:front-page class="- front-page/front-page ">
        ...
    </oxy:front-page>

    <opentopic:map xmlns:ot-placeholder="http://suite-sol.com/namespaces/ot-placeholder" class="- toc/toc ">
        ...
        <frontmatter xmlns:dita-ot="http://dita-ot.sourceforge.net/ns/201007/dita-ot" class="- map/topicref bookmap/frontmatter ">
            ...
            <topicref class="- map/topicref " href="#unique_1" type="concept">
                ...
            </topicref>
        </frontmatter>
    </opentopic:map>

    <concept class="- topic/topic concept/concept ">
        is-frontmatter="true"
        topicrefclass="- map/topicref bookabstract ">
            ...
    </concept>

</bookmap>
```

For the **DITA Map PDF - based on HTML5 & CSS** transformation type, the merged map is further processed resulting in a collection of HTML5 `<div>` elements. These elements preserve the original DITA `@class` attribute values and add a new value derived from the DITA element name.

```xml
<div xmlns:ditaarch="http://dita.oasis-open.org/architecture/2005/" ...

    <div class=" front-page/front-page front-page">
        ...
    </div>

    <div class=" toc/toc toc">
        <div class=" map/topicref bookmap/frontmatter topicref frontmatter">
            ...
        </div>
    </div>

</div>
```
Note:
The process also applies for the backmatter topic references inside a `<backmatter>` element with the `bookmap/backmatter` class and referenced content with the `@is-backmatter="true"` attribute both in the merged map and merged HTML files.

Front Matter and Back Matter - Built-in CSS

The built-in CSS rules are in `PLUGIN_DIR/css/print/p-bookmap-frontmatter-backmatter.css`. By default, it associates the top-level topics that do not represent chapters to a `matter-page` style of page layout. Each child topic starts on a new page.

Related Information:
Page Headers and Footers (on page 60)

How to Remove Page Breaks Between Front Matter Child Topics

If you do not like the fact that all the topics that enter a bookmap frontmatter start on a new page, you can disable this by using the following rules in your customization CSS (on page 48):

```css
* [class =~ "map/map"] > * [class =~ "topic/topic"] [is-frontmatter] {
  page-break-before: auto;
}
```

How to Style the Front Matter and Back Matter Topics

Style all the Topics with the Same Aspect

All the topics referenced from the `<frontmatter>` and `<backmatter>` bookmap elements are formatted using the `matter-page` as defined in Default Page Definitions (on page 55). In the merged file, the `<backmatter>` and `<frontmatter>` elements are omitted, and their child topic content is matched using a CSS rule like the one below:

```css
* [class =~ "map/map"] > * [class =~ "topic/topic"] [is-backmatter],
* [class =~ "map/map"] > * [class =~ "topic/topic"] [is-frontmatter] {
  page: matter-page;
  ...
}
```

Style the Topics Depending on Their Role

There might be cases when you need to distinguish between certain types of topics that have different roles in your publication:
These are referenced from the DITA map by specialized `<topicref>` elements, with different class attribute values.

The class attribute values are then passed by the transformation process onto the corresponding topic elements from the merged map content. For example, a topic that was referenced by a `<preface>` map element now has a "map/preface" value in its `@topicrefclass` attribute:

```xml
<topic
    class="- topic/topic"
    id="unique_1"
    topicrefclass="- map/topicref map/preface"
>
    ...
</topic>
```

This can be used to match and apply various styling choices, or even a particular page layout:

```css
@page preface-page {
    background-color:silver;
    @top-center{
        content: "Custom Preface Header";
    }
}

*[class = "topic/topic"][@topicrefclass = "bookmap/preface"] {
    page: preface-page;
}
```

### Numbering

The topics in this section contain some technical details in case you need to fine-tune the way the numbering works.

#### Numbering - Built-in CSS

The built-in CSS rules are in:

- `[PLUGIN_DIR]/css/print/p-numbering-shallow.css`
- `[PLUGIN_DIR]/css/print/p-numbering-deep.css`
- `[PLUGIN_DIR]/css/print/p-numbering-deep-chapter-scope.css`
- `[PLUGIN_DIR]/css/print/p-numbering-deep-chapter-scope-no-page-reset.css`

The first CSS (shallow) contains rules that add a "Chapter NN" before the first-level topics from the publication, the second one (deep) contains rules that add a deep structure of counters on all topics referenced from the
map (at any level), the third one (chapter-scope) creates a chapter scope-oriented numbering (meaning that the numbering for pages, tables, figures, and links to them are reset for each chapter), and the last one is similar to the third except that page numbers do not reset. For more details, see Numbering Types (on page 113).

Numbering - Input XML Fragments

The numbering affects multiple logical parts of your publication, the table of contents, headers/footers, chapter titles, figures and tables titles:

The Table of Contents

The table of contents is a tree of `<topicref>` elements.

```xml
<map xmlns:ditaarch="http://dita.oasis-open.org/architecture/2005/" ...>
                   class=" front-page/front-page ">
   ... 
</oxy:front-page>
<opentopic:map xmlns:opentopic="http://www.idiominc.com/opentopic" class=" toc/toc ">
   <title class="- topic/title ">Publication Title</title>

   <topicref is-chapter="true" class="- map/topicref " ...>
      <topicmeta class="- map/topicmeta " ...>
         <navtitle href="#unique_1" class="- topic/navtitle ">Overview</navtitle>
      ... 
   </topicmeta>
   <topicref class="- map/topicref " ...>
      <topicmeta class="- map/topicmeta " data-topic-id="dcpp_resources">
         <navtitle href="#unique_2" class="- topic/navtitle ">Resources</navtitle>
      ... 
   </topicmeta>
   ... 
</topicref>
... 
</opentopic:map>
... 
</map>
```

Note:
The `<opentopic:map>` element contains the effective table of contents structure.

Note:
The TOC items are the elements with the class: `- map/topicref`. 
Note:
The ones identified as chapters have the @is-chapter attribute set.

For the DITA Map PDF - based on HTML5 & CSS transformation type, the merged map is further processed resulting in a collection of HTML5 `<div>` elements. These elements preserve the original DITA `@class` attribute values and add a new value derived from the DITA element name.

```html
<div class="- map/map map"> ...
  <div class=" front-page/front-page front-page"> ...
</div>
<div class=" toc/toc toc"> 
  <div class="- topic/title title">Publication Title</div> 
  <div is-chapter="true" class="- map/topicref topicref"> 
    <div href="#unique_1" class="- topic/navtitle navtitle">Overview</div> 
  </div> 
  <div class="- map/topicref"> 
    <div href="#unique_2" class="- topic/navtitle">Resources</div> 
  </div> 
</div> 
... 
</div> 
... 
</div>
```

The Header and Footers
These are based on string sets generated for the titles. The complete set of strings is defined in: `[INSTALLATION_DIR]/css/print/p-pages-and-headers.css`. The CSS rules that build the string sets are matching the map title from the front page and the titles from the content.

```html
  <oxy:front-page-title>
    <title class="- topic/title">Publication Title</title>
  </oxy:front-page-title>
</oxy:front-page>
```
For the DITA Map PDF - based on HTML5 & CSS transformations:

```xml
<div class="front-page/front-page front-page">
    <div class="front-page-title/front-page-title front-page-title">
        <div class="topic/title title">Publication Title</div>
    </div>
</div>
```

The main content is organized as follows:

```xml
<map xmlns:ditaarch="#http://dita.oasis-open.org/architecture/2005/" ...>
    ...
    <opentopic:map xmlns:opentopic="#http://www.idiominc.com/opentopic" ...
    ...
</opentopic:map>

<topic is-chapter="true" oid="dcpp_overview">
    <title class="- topic/title ">Overview</title>
    <body class="- topic/body ">
        ...
    </body>
</topic>

<topic class="- topic/topic " id="unique_2" oid="dcpp_resources">
    <title class="- topic/title ">Resources</title>
    ...
</topic>

<topic class="- topic/topic " id="unique_2" oid="dcpp_parameters">
    <title class="- topic/title ">Parameters</title>
    ...
</topic>
```

For the DITA Map PDF - based on HTML5 & CSS transformations:

```xml
<div class="map/map map" ...>
    ...
    <div class="toc/toc toc">
        ...
    </div>
</div>

<div is-chapter="true" oid="dcpp_overview" class="- topic/topic topic">
    <div class="- topic/title title">Overview</div>
    <div class="- topic/body body">...
</div>

<div class="- topic/topic topic" id="unique_2" oid="dcpp_resources">
    <div class="- topic/title title">Resources</div>
```
The title elements have the class: `- topic/title`. The actual element name can be different.

### Numbering Types

The type of numbering that appears in your publication is controlled by the `args.css.param.numbering` parameter.

This parameter activates various sets of CSS rules from the built-in CSS. By default, only the first-level topics (the chapters) are numbered (shallow numbering). The following values are accepted:
<table>
<thead>
<tr>
<th>Value</th>
<th>Chapters</th>
<th>Sections/ Nested Topics</th>
<th>Figures &amp; Tables</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>shallow</td>
<td>numbered</td>
<td>no</td>
<td>counted from the start of the publication</td>
<td>from the start of the publication</td>
</tr>
<tr>
<td>deep</td>
<td>numbered</td>
<td>numbered</td>
<td>counted from the start of the publication</td>
<td>from the start of the publication</td>
</tr>
<tr>
<td>deep-chapter-scope</td>
<td>numbered</td>
<td>numbered</td>
<td>numbering is restarted at the beginning of each chapter, adds the chapter number in their titles (and in the links to them), and in the list of tables and list of figures sections</td>
<td>restarted at the beginning of each chapter</td>
</tr>
<tr>
<td>deep-chapter-scope-no-page-reset</td>
<td>numbered</td>
<td>numbered</td>
<td>numbering is restarted at the beginning of each chapter, adds the chapter number in their titles (and in the links to them), and in the list of tables and list of figures sections</td>
<td>from the start of the publication</td>
</tr>
</tbody>
</table>

**Note:**
When using any of the deep numbering types, no distinction is made between sections and nested topics. For example, if a topic contains two sections, followed by another nested topic, the sections will be numbered with 1 and 2, and the nested topic with 3.

**Notice:**
The `deep-chapter-scope` and `deep-chapter-scope-no-page-reset` values are only available for the DITA Map PDF - based on HTML5 & CSS transformation scenario.

**Examples**

**Shallow**

Each chapter (or first-level topic) is numbered, but sections/nested topics are not numbered. Figures, tables, and pages are numbered sequentially from the start of the publication and they do not reset.
All chapters (or first-level topics) and sections/nested topics are numbered (these are also prefixed with the chapter number). Figures, tables, and pages are numbered sequentially from the start of the publication and they do not reset.

1. First Chapter
   
   Page 1
   
   Topic 1.1
   
   Table 1
   
   Topic 1.2
   
   Table 2
It will result in the following content inside the PDF:

1. Introduction.................................................................1
2. Care and Preparation.....................................................2
   2.1. Pruning.................................................................2
   2.2. Garden Preparation................................................3
3. Flowers by Season.......................................................4
   3.1. Spring Flowers......................................................4
      3.1.1. Iris.................................................................4
      3.1.2. Snowdrop.......................................................6
...

List of Figures
  Figure 1: Iris

List of Tables
  Table 1: Flowers

Deep Chapter Scope

Each chapter (or first-level topic) is independent (so it can be read separately, as a separate part of your publication). The sections/nested topics, pages, figures, and table counters (and links to them) restart at each chapter. The general cross reference links also display the chapter number before the page number to clearly specify the target.
Deep Chapter Scope No Page Reset

Each chapter (or first-level topic) is independent (so it can be read separately, as a separate part of your publication). The sections/nested topics, figures, and table counters (and links to them) restart at each chapter, but the page numbers do not reset. The generic cross reference links contain only the page number.
It will result in the following content inside the PDF:

1. Introduction .............................................................................................................1
2. Care and Preparation .............................................................................................2
   2.1. Pruning .............................................................................................................2
   2.2. Garden Preparation .........................................................................................3
3. Flowers by Season ..................................................................................................4
   3.1. Spring Flowers ...............................................................................................4
      3.1.1. Iris ...........................................................................................................4
      3.1.2. Snowdrop ...............................................................................................6
   ...

List of Figures
   Figure 3-1: Iris

List of Tables
   Table 2-1: Flowers

Tip:
When using deep numbering, if you want to exclude sections from being numbered, see How to Include Topic Sections in TOC (on page 120).

How to Reset Page Numbering

By default, pages are numbered from the start of the publication, but in some cases, you may need to restart the page number at a certain location in your content (for example, at the first part/chapter).

Note:
The following sections do not apply for args.css.param.numbering="deep-chapter-scope" and args.css.param.numbering="deep-chapter-scope-no-page-reset" parameter values because they already define a specific numbering scheme.

Reset Page Numbering in Shallow Context

To reset the page counter at the first part/chapter when the args.css.param.numbering="shallow" parameter value is set, use the following rules in your customization CSS (on page 48):
Reset Page Numbering in Deep Context

To reset the page counter at the first part/chapter when the `args.css.param.numbering="deep"` parameter value is set, use the following rules in your customization CSS (on page 48):

```
*[class ~="map/map"] > *[class ~="toc/toc"] + *[class
== "topic/topic"][is-chapter],
*[class ~="map/map"] > *[class ~="topic/topic"][is-frontmatter] + *[class
== "topic/topic"][is-chapter] {
    counter-reset: page 1;
}
*[class ~="map/map"] > *[class ~="toc/toc"] + *[class
== "topic/topic"][is-part],
*[class ~="map/map"] > *[class ~="topic/topic"][is-frontmatter] + *[class
== "topic/topic"][is-part] {
    counter-reset: page 1 section1;
}
*[class ~="map/map"][numbering ^="deep"] > *[class ~="toc/toc"] + *[class
== "topic/topic"][is-chapter],
*[class ~="map/map"][numbering ^="deep"] > *[class ~="topic/topic"][is-frontmatter] + *[class
== "topic/topic"][is-chapter] {
    counter-reset: page 1 section1;
}
*[class ~="map/map"][numbering ^="deep"] > *[class ~="toc/toc"] + *[class
== "topic/topic"][is-part],
*[class ~="map/map"][numbering ^="deep"] > *[class ~="topic/topic"][is-frontmatter] + *[class
== "topic/topic"][is-part] {
    counter-reset: page 1 chapter chapter-and-sections;
}
```

How to Remove the 'Chapter NN' Prefix from Table of Contents and Content.

If you are using the shallow numbering CSS (this is the default), and you want to hide the “Chapter” prefix, use the following rules in your customization CSS (on page 48):

For the TOC:

```
*[class ~="topic/topicmeta"] > *[class ~="topic/navtitle"]:before {
    display:none !important;
}
```

For the titles in the content, change the content of the title :before (this example just uses the chapter number):

```
*[class ~="topic/topic"][is-chapter]:not([is-part]) > *[class ~="topic/title"]:before {
    content: counter(chapter) "." !important;
}
```
How to Use Part, Chapter, and Subtopics Numbers in Links

This topic is applicable if you have enabled deep numbering *(on page 113)*. Suppose you have a link in the third chapter that points to a paragraph in the second subtopic of the first chapter and you need this structural information (1.2) presented to the user, just after the link text. To do this, you can use the target-counters CSS function to extract the entire context of the counters from the target. The chapter-and-sections built-in counter is already updated with both the chapter number and the nested topics:

```
*.[class ~="topic/xref"]*:after {
    content: target-counters(attr(href), chapter-and-sections, ".") !important;
}
```

This counter does not include the part number, so be careful when linking between parts (consider adding the target part number explicitly):

```
*.[class ~="topic/xref"]*:after {
    content: "[" target-counter(attr(href), part, upper-roman) "]" target-counters(attr(href), chapter-and-sections, ".") ""]" !important;
    color:blue;
}
```

Related Information:

Numbering Types *(on page 113)*

How to Include Topic Sections in TOC

To include topic sections in the table of contents, set the `args.css.param.numbering-sections` transformation parameter *(on page 13)* to yes. In this case, they are numbered according the numbering scheme set by the `args.css.param.numbering` parameter *(on page 113)*.

If you want to prevent topic sections from being numbered in your output, set the value of the `args.css.param.numbering-sections` parameter to no.

Table of Contents

The table of contents is a hierarchy of topic titles with links to the topic content.

For plain maps, the TOC is automatically generated. For DITA bookmaps, you will need to add a `<toc>` element in the `<booklists>` element (inside the `<frontmatter>`):

```
<bookmap>
    ...
    <frontmatter>
        <booklists>
            <toc/>
            <figurelist/>
            <tablelist/>
        </booklists>
    </frontmatter>
</bookmap>
```
Related Information:
Table of Contents on a Page (Mini TOC) (on page 127)
List of Tables/ Figures (on page 131)
Index (on page 139)

Table of Contents - XML Fragment

In the merged map file (on page 49), the <opentopic:map> contains a hierarchy of <topicref> elements, or other elements (such as <chapter> or <part>) that are specializations of <topicref>.

Each of the <topicref> elements include a metadata section that includes the topic title.

<bookmap ...

:oxy:front-page ...
:oxy:front-matter ...

<opentopic:map xmlns:opentopic="http://www.idiominc.com/opentopic" class="- toc/toc">


<booktitle class="- topic/title bookmap/booktitle">
  <booklibrary class="- topic/ph bookmap/booklibrary ">Retro Tools</booklibrary>
  <mainbooktitle class="- topic/ph bookmap/mainbooktitle ">Tasks</mainbooktitle>
  <booktitlealt class="- topic/ph bookmap/booktitlealt ">Product Tasks</booktitlealt>
</booktitle>

.chapter is-chapter="true"
  class="- map/topicref bookmap/chapter " href="#unique_5" type="topic">
  <topicmeta class="- map/topicmeta " data-topic-id="installing">
    <navtitle href="#unique_5" class="- topic/navtitle ">Installing</navtitle>
  ...
  </topicmeta>

  <topicref class="- map/topicref " href="#unique_6" type="task">
    <topicmeta class="- map/topicmeta " data-topic-id="installstorage">
      <navtitle href="#unique_6" class="- topic/navtitle ">Installing</navtitle>
  ...
  </topicmeta>

...
For the DITA Map PDF - based on HTML5 & CSS transformation type, the merged map is further processed resulting in a collection of HTML5 `<div>` elements. These elements preserve the original DITA `@class` attribute values and add a new value derived from the DITA element name.
Note:
The `<oxy:toc-title>` element is used as a placeholder for the name of the TOC. For instance, you can use the string "Contents", specified on a pseudo-element, in the CSS.

Table of Contents - Built-in CSS

The built-in CSS rules are in: `[PLUGIN_DIR]/css/print/p-toc.css`.

Related Information:
Page Headers and Footers (on page 60)

How to Increase TOC Depth

By default, only the first three levels of topics are displayed in the Table of Contents of the PDF output.

The CSS rule (see Table of Contents - Built-in CSS (on page 123)) that hides topics on higher levels is:

```css
/* Hide sections below level 3. */
*[class = "map/topicref"][is-chapter] >
  *[class = "map/topicref"]:not([is-chapter]) >
  *[class = "map/topicref"] >
  *[class = "map/topicref"] {
    display: none;
  }
```

If you want to increase the TOC depth so that topic references on level 3 or higher are visible, you can overwrite this rule in your customization CSS like this:

```css
*[class = "map/topicref"][is-chapter] >
  *[class = "map/topicref"]:not([is-chapter]) >
  *[class = "map/topicref"] >
  *[class = "map/topicref"] {
    display: block;
  }
```

How to Style the Table of Contents Entries

Note:
Each of the items from the table of contents is an element that has the `map/topicref` class.

The following example uses the italic font for the label and changes the color and style of the connecting line between the title and the page number.

In your customization CSS (on page 48), add the following two selectors:

```css
/* The toc item label - the topic title */
*[class = "map/topicref"] *{class = "topic/navtitle"} {
```
And if you need to alter the indent of the nested table of content items, use the following selector:

```css
*[class ~="map/topicref"] *[class ~="map/topicref"] {  margin-left: 1em; }
```

The numbers can be styled like this:

```css
*[class ~="map/topicref"][is-chapter = "true"] > *[class ~="map/topicmeta"] > *[class ~="topic/navtitle"] {  font-size: 2em; }
```

How to Change the Header of the Table of Contents

In the built-in CSS, there is a page named `table-of-contents`. The default is to have the word 'Contents' in its header (this is localized, using the `toc-header` string defined in the `p-18n.css`) alternating in the left or right side of the header:

```css
@page table-of-contents:left {  @top-left {     content: string(toc-header) " | " counter(page, lower-roman);     font-size: 8pt;  } }
@page table-of-contents:right {  @top-right {     content: string(toc-header) " | " counter(page, lower-roman);  }
```
If you need to change this string, or change the color, you should use the following @page selectors as a starting point in your customization CSS (on page 48):

```css
@page table-of-contents:
  @top-left {
    content: "My publication table of contents | " counter(page, lower-roman);
    color:red;
  }

@page table-of-contents:
  @top-right {
    content: "My publication table of contents | " counter(page, lower-roman);
    color:red;
  }
```

Related Information:
Localization (on page 159)

How to Make the Table of Contents Start on an Odd Page

In your customization CSS (on page 48), add the following snippet for the table-of-contents page:

```css
@page table-of-contents{
  -oxy-initial-page-number: auto-odd;
}
```

Related Information:
Double Side Pagination (on page 133)

How to Display a Topic Before the Table of Contents

To display a topic before the table-of-contents page, follow these steps:

1. Make sure the topic is referenced on the first level in the DITA map.
2. Set the @outputclass to before-toc on the <topicref>.

```xml
<topicref href="pathToMyTopic" outputclass="before-toc"/>
```

Result: When the PDF is processed, the topic will automatically appear before the table of contents.
How to Display Short Descriptions in the TOC

To display the short descriptions from the topics in the table of contents, you need to make the `<shortdesc>` element visible.

The following example only makes the short descriptions associated with the chapters visible. The chapters are level one topics and are marked in the merged DITA document TOC with the attribute `@is-chapter`.

In your customization CSS (on page 48), add the following CSS selector:

```css
*[class ~="map/topicref"]@[is-chapter ="true"] > *[class ~="map/topicmeta"] > *[class ="map/shortdesc"] {
  display:block; /* The default is none - the shortdesc is hidden. */
  color:gray;
}
```

Note:
If you need all the TOC item short descriptions to be visible, remove the `[is-chapter]` condition.

How to Remove Entries from the TOC

To remove entries from the table of contents, set the `@toc="no"` attribute on the topicrefs from the map that need to be removed. This is sometimes desirable for the topics listed in the frontmatter or backmatter when using a bookmark.

How to Hide the TOC

To hide the TOC, you have multiple options:

- [Recommended] Use a DITA `<bookmap>` instead of a `<map>`, and omit the `<toc>` element from the `<booklists>`. An example bookmark can be found in the DITA 1.3 Spec.
- Use the transformation parameter: `hide.frontpage.toc.index.glossary (on page 18)`.
- Use a `display:none` property to hide the element that contains the TOC structure, and also remove it from the PDF bookmarks tree:

```css
*[class ="map/map"] > *[class ="toc/toc"] {
  display:none;
}
```

```css
*[class ="map/map"] > *[class ="toc/toc"] > *[class ="toc/title"]{
  bookmark-label: none;
  -ah-bookmark-label: none;
}
```
Related Information:
Transformation Parameters *(on page 13)*

## Table of Contents on a Page (Mini TOC)

To add a mini table of contents for each chapter, you need to:

- Use DITA bookmaps instead of regular maps.
- Set the `args.chapter.layout` transformation parameter to either of the following values: **MINITOC** or **MINITOC-BOTTOM-LINKS**.

**Note:**
If the chapter does not have child topics, it will not have a mini TOC in the PDF output.

### Layout for MINITOC

This table of contents is positioned between the chapter title and the chapter child topics. It consists of a list of links pointing to the child topics, positioned in the left side of the page, and a description in the right side. This content is collected from the topic file referenced by the chapter `topicref` in the map.

---

**Chapter 1. Introduction**

**Topics:**
- **About this framework.**
- **Description**

**DITA Open Toolkit**, or **DITA-OT** for short, is a set of Java-based, open-source tools that provide processing for content authored in the Darwin Information Typing Architecture.

The **DITA Open Toolkit** documentation provides information about installing, running, configuring and extending the toolkit.

**About this framework.**

The framework is **DITA**.

**Description**

The framework is composed by a large set of modules.
Layout for MINITOC-BOTTOM-LINKS

This table of contents is positioned between the chapter title and the chapter child topics. It consists of a chapter description and list of links pointing to the child topics, under the description. This description is collected from the topic file referenced by the chapter `<topicref>` in the map.

The above chapter example has the following DITA map fragment:

```dita
<chapter href="topics/chapter-introduction.dita">
  <topicref href="topics/introduction-about.dita" />
  <topicref href="topics/introduction-description.dita" />
</chapter>
```

The `chapter-introduction.dita` file provides the description content that is in the right side of the page. The children `<topicref>` elements generate the mini TOC links.

Table of Contents for Chapters (Mini TOC) - XML Fragment

In the merged XML file, the mini TOC is built from a related links section and some `<div>` elements that wrap the entire mini TOC and the description area.

  `chapter/minitoc`
Wraps the entire structure, including the content of the chapter `<topicref>`.

**chapter/minitoc-links**

Wraps the `<related-links>` element. Note that the label of the related links list is internationalized.

**chapter/minitoc-desc**

Contains the entire content of the topic file referenced by the chapter `<topicref>` element in the map.

```xml
<div class="- topic/div chapter/minitoc">
  <div class="- topic/div chapter/minitoc-links">
    <related-links class="- topic/related-links">
      <linklist class="- topic/linklist">
        <desc class="- topic/desc">
          <ph class="- topic/ph chapter/minitoc-label">Topics:</ph>
        </desc>
        <link class="- topic/link " href="#unique_2" type="topic" role="child">
          <linktext class="- topic/linktext">About this framework.</linktext>
        </link>
        <link class="- topic/link " href="#unique_3" type="topic" role="child">
          <linktext class="- topic/linktext">Description</linktext>
        </link>
      </linklist>
      <div class="wh_related_links">
        <nav role="navigation" class="- topic/related-links related-links">
          ...
        </nav>
      </div>
    </related-links>
  </div>
  <div class="- topic/div chapter/minitoc-desc">
    <shortdesc class="- topic/shortdesc">DITA Open Toolkit, or DITA-OT for short, is a set of Java-based, open-source tools that provide processing for content authored in the Darwin Information Typing Architecture</shortdesc>
    <body class="- topic/body">
      <p class="- topic/p">The DITA Open Toolkit documentation provides information about installing, running, configuring and extending the toolkit.</p>
    </body>
  </div>
</div>
```

When using the `pdf-css-html5` transformation, this structure is converted to a set of HTML elements, preserving the class values:

```xml
<div class="- topic/div chapter/minitoc div minitoc">
  <div class="- topic/div chapter/minitoc-links div minitoc-links">
    <div class="wh_related_links">
      <nav role="navigation" class="- topic/related-links related-links">
        ...
      </nav>
    </div>
  </div>
</div>
```
Customizing PDF Output Using CSS

Table of Contents for Chapters (Mini TOC) - Built-in CSS

The built-in CSS rules are in: [PLUGIN_DIR]/print/p-chapters-minitoc.css.

How to Style the Table of Contents for Chapters (Mini TOC)

Suppose that you do not want the links and the chapter description to be side by side, but instead place the links above the description. Also, you may choose to remove the label above the links and put all the links in a colored rectangle with decimal numbers before them.
In your customization CSS *(on page 48)*, add the following selectors:

```css
/* Change from inline to blocks to stack them one over the other. */

*[class~="chapter/minitoc-desc"],
*[class~="chapter/minitoc-links"] {
  display: block;
  width: 100%;
}

/* No need for the 'Topics:' label. */

*[class~="chapter/minitoc-links"] *[class~="topic/desc"] {
  display: none;
}

/* Add background for the links list. */

*[class~="chapter/minitoc-links"] {
  background-color: silver;
  padding: 0.5em;
}

/* Remove the border and the padding from the description. We do not need that separator. */

*[class~="chapter/minitoc-desc"] {
  border-left: none;
  padding-left: 0;
}

/* Add a number before each of the links. */

*[class~="chapter/minitoc-links"] *[class~="topic/link"] {
  display: list-item;
  list-style-type: decimal;
  margin-left: 1em;
}
```

Related Information:
How to Speed up CSS Development and Debugging *(on page 53)*

List of Tables/Figures

To activate these:
1. The map must be a DITA bookmap.
2. There must be a `<figurelist>` or `<tablelist>` in the frontmatter or backmatter. In the following example, both of the lists are added just after the table of contents (the `<toc>` element is the placeholder where the table of contents will be created):

```xml
<frontmatter>
  <booklists>
    <toc/>
    <figurelist/>
    <tablelist/>
  </booklists>
</frontmatter>
```

How to Set a Header for a List of Tables/Figures

Suppose you want to set the headline "Figure List" on the second and subsequent pages associated to a list of figures and something similar for a list of tables.

Start by associating pages to the list of figures and tables from the merged file:

```css
*[class~="placeholder/tablelist"] {  
  page:tablelist;  
  color:green; 
}
*[class~="placeholder/figurelist"]{  
  page:figurelist;  
  color:green; 
}
```

**Note:**
The "placeholder/tablelist" is the class name of the output generated from the `<tablelist>` bookmap element.

Then define the pages:

```css
@page figurelist {  
  @top-left { content: none; }  
  @top-center { content: "Figure List"; }  
  @top-right { content: none; }  
}
@page figurelist:first {  
  @top-left { content: none; }  
  @top-center { content: none; }  
  @top-right { content: none; }  
}```
How to Remove the Numbers Before a List of Tables or Figures

Suppose you need to remove the "Figure NN" prefix before each entry of a list of figures.

An entry in the generated list of figures from the merged map looks like this:

```html
<entry class="listentry/entry" href="#unique_6_Connect_42_fig_rjy_spn_xgb">
  <prefix class="listentry/prefix">Figure</prefix>
  <number class="listentry/number">4</number>
  <title class="topic/title">This is another figure</title>
</entry>
```

For the HTML merged map, the element names are all `<div>` elements but they have the same class.

So, to hide the label and the number, use:

```css
* [class~="listentry/prefix"],
* [class~="listentry/number"] {
  display: none;
}
```

This works for both a list of tables and list of figures since the structure of each entry is the same.

To make it more specific (for example, to apply it only for the list of figures), you can add the selector:

```css
* [class~="placeholder/figurelist"] * [class~="listentry/prefix"],
* [class~="placeholder/figurelist"] * [class~="listentry/number"] {
  display: none;
}
```

Double Side Pagination

By default, the processor generates pages that are mirror images (the right page has the header on the right side, the left pages have the header on the left side). The chapters follow one another with no constraint on the page side.
Note:
For a plain DITA map, the chapters are the `<topicref>` elements that are placed on the first level. For bookmaps, the chapters are the topics referenced by a `<chapter>` element.

This section contains information about how to position the start of the chapters on an odd folio number. Some of the CSS rules given here as examples are already listed in: `[INSTALLATION_DIRECTORY]/css/print/p-optional-double-side-pagination.css`. You may choose to import this file from your customization CSS (on page 48).

How to Start Chapters on Odd Pages

A common use case is to arrange the chapters of the publication to start on an odd page number.

In your customization CSS (on page 48), add the following:

```css
@page chapter {
  -oxy-initial-page-number: auto-odd;
}
@page table-of-contents {
  -oxy-initial-page-number: auto-odd;
}
```

Supported values for `-oxy-initial-page-number` include: `auto`, `auto-even`, `auto-odd`, or a number.

How to Style the Empty (Blank) Pages

By making the chapters start on an odd page, the CSS processor might add blank pages to the previous page sequence as padding.

To style those blank pages add the following code in your customization CSS (on page 48):

```css
@page chapter:blank, table-of-contents:blank {
  @top-left      { content: none; }
  @top-center    { content: none; }
  @top-right     { content: none; }
  @bottom-left   { content: none; }
  @bottom-center { content: none; }
  @bottom-right  { content: none; }
}
```

Note:
This just removes the headers and footers, but you can use a background image or a header with "Intentionally left blank" text.
Related Information:
How to Add a Background Image for the Cover (on page 86)

How to Force an Odd or Even Number of Pages in a Chapter

Another use case is to specify a number of pages for a section. Suppose that you have a table of contents that follows the cover page and you need to have an even number of pages. Hence, the next chapter would start on an even page.

In your customization CSS (on page 48), use the -oxy-force-page-count property with an even value:

```css
@page table-of-contents {
    -oxy-force-page-count: even;
}
```

Supported values for -oxy-force-page-count include: even, odd, end-on-even, end-on-odd, auto, no-force.

How to Style the First page of a Chapter

You can use the :first page rule selector to control how the first page of a chapter looks. Suppose that you have defined the following layout for your default page and you want to put the publication title (the maptile string ) on the header of the first page (instead of the chapter name that is displayed on this page):

In your customization CSS (on page 48), add the following:

```css
@page chapter:first {
    @top-right-corner { content: string(maptile); }
    @top-left { content: none; }
}
```

Multiple Column Pages

This section contains information about how to handle pages that have multiple columns.

How to Use a Two Column Layout

Change Layout for Predefined Pages.

First you need to identify which of the pages need to be changed. Pages are already defined for the cover page, table of contents, chapter content, and others. The complete list is here: Default Page Definitions (on page 55).

Next, add the column-count and column-gap properties to that page. For example:

```css
@page chapter{
    column-count:2;
    column-gap:1in;
}
```
If you need some of the elements to expand on all the columns, use the `column-span:all` CSS property. The next snippet makes the chapter titles span both columns:

```css
 *[class ^="topic/topic"]>[is-chapter] > *[class ^="topic/title"] { 
    column-span:all;
}
```

**Limitation:**
You cannot use multiple column configurations on the same page. Oxygen DITA-OT CSS-based PDF Publishing plugin only takes the `column-count` and `column-gap` properties into account if they are set on `@page` rules, not on elements from the content.

### Change Layout for a Specific Topic.

If you need to have a different column layout just for one topic, you can use the following technique:

1. Define an `outputclass` on the topic root element.

```xml
<topic outputclass="two_columns" ...
```

2. Define a CSS rule that changes the `page` property for the matching element.

```css
 *[class ^="two_columns"],
 *[outputclass ^="two_columns"]{
    page: two_column_page !important;
}
```

**Tip:**
In the selector, use the `class` attribute for the HTML transformation, or `outputclass` for the direct transformation, or leave them both if you are not sure.

**Note:**
The topics from the first level use the `chapter page`. You must use `!important` because the built-in rules are more specific and you need to override the `page` property.

3. Define a page layout.

```css
 @page two_column_page {
    column-count: 2;
}
```

Note that the topic will be separated from other sibling topics with different page layouts by page breaks.

**Related Information:**
Page Formatting in Oxygen PDF Chemistry
PDF Bookmarks

The PDF Bookmarks are used to generate a hierarchical structure similar to a table of contents in a specialized view of your PDF Reader.

By default, the titles defined in the topics are used as bookmark labels.

PDF Bookmarks - Built-in CSS

The PDF bookmarks are generated by matching the titles from the topics in the content. The built-in CSS rules are in: [PLUGIN_DIR]/css/print/p-bookmarks.css.

How to Change the Bookmark Labels using the Navigation Title

To change the bookmark labels, you can specify a navigation title in a DITA map or topic. This will be used as the bookmark label instead of the topic title in the table of contents and the bookmark views. There are two possibilities to do specify it:

1. Place a `<navtitle>` element in the topic reference in the DITA map:

```xml
...<topicref href="topics/my_topic.dita" locktitle="yes">
   <topicmeta>
      <navtitle>Introduction</navtitle>
   </topicmeta>
</topicref>...
```

Note:
As a best practice, a `@locktitle` attribute with the value 'yes' is needed to activate the navigation title. The plugin applies the navigation title even if the attribute is missing.

2. Place a `<navtitle>` element in the topic, as a title alternative.

```xml
<topic id="other_topic" xml:lang="en-us">
   <title>Normal Title</title>
   <titlealts>
      <navtitle>Navigation Title</navtitle>
   </titlealts>
   <body>...
```

How to Control the Depth of the Sections From the PDF Bookmarks.

By default, the PDF bookmarks are generated for up to 7 levels. If you need to limit them (for example to 2 levels), you can use the following CSS rules in your customization CSS (on page 48):
These rules clear the labels generated by the titles starting with the depth 3 (the topic nesting level is given by the selectors *[class="topic/topic"]).

**How to Specify the Open/Closed PDF Bookmark State**

If you want to specify the initial state for the bookmarks (opened/expanded or closed/collapsed), you can use the `bookmark-state` property in your customization CSS (on page 48).

For example, to specify that all bookmarks for the first three levels are opened (expanded) in the initial state, use:

```css
*[class="topic/topic"] > *[class="topic/title"],
*[class="topic/topic"] *[class="topic/topic"] > *[class="topic/title"],
*[class="topic/topic"] *[class="topic/topic"] *[class="topic/topic"] > *[class="topic/title"] {
  bookmark-state: open;
}
```

**How to Remove the Numbering From the PDF Bookmarks**

By default, the PDF bookmark labels are generated while taking the text set before the chapters titles into account. Since this usually contains the part, chapter, or section numbers, the PDF Bookmarks will make use of them.

The solution is to remove the `content(before)` from the `bookmark-label`, leaving just the `content(text)`.

In your customization CSS (on page 48), add the following CSS rules:

```css
*[class="topic/topic"] > *[class="topic/title"] {
  bookmark-label: content(text);
  -ah-bookmark-label: content();
}
```
Important:
This is a simple example that does not use the possible navigation titles, just the content of the
<title> element. Copy and modify the built-in CSS for the full CSS rule that matches the <title> and
<titlealts> elements:

```
*[class~="topic/topic"]:has(*[class~="topic/titlealts"])) > *[class~="topic/title"] {...}
```

Related Information:
Numbering (on page 109)

Index

The content of an <indexterm> element is used to produce an index entry in the generated index. You can nest
<indexterm> elements to create multi-level indexes. The content is not output as part of the topic content, only
as part of the index tree.

To add an index to your publication, you just need to add <indexterm> elements inside the <prolog> section
(inside a <metadata> element):

```
<title>The topic title.</title>
<prelog>
<metadata>
  <keywords>
    <indexterm>Installing</indexterm><indexterm>Water Pump</indexterm></keywords>
  </metadata>
</prolog>
<body>
.....
```

or in the content itself:

```
... 
<p>Open the lid then turn the body pump to the right.
<indexterm>Installing <indexterm>Water Pump</indexterm></indexterm> 
</p>
...
```

If you are using a bookmap, you need to specify where the index list should be presented (for instance in the
backmatter of the book. Technically, it is possible to also add it to the frontmatter, but this is unusual). This is
done using an <indexlist> element in the <booklists> element (inside the <backmatter>):

```
<bookmap>
  ...
  <chapter href="tasks/troubleshooting.dita">
```
For plain maps, the index list is automatically added at the end of the publication, with no need to modify the map.

Index - XML Fragment

In the merged map file (on page 49), the structure that holds the index tree is the `<opentopic-index:index.groups>` element.

```
<map class="- map/map ">
  <oxy:front-page>
    ...
  </oxy:front-page>
  <opentopic:map xmlns:opentopic="http://www.idiominc.com/opentopic">
    ...
  </opentopic:map>
  <topic class="- topic/topic ">
    <title class="- topic/title ">Request Support</title>
    ...
  </topic>
  <opentopic-index:index.groups id="d16e5548">
    ...
  </opentopic-index:index.groups>
</map>
```

Each of the groups contain:

- A label, the starting letter ("T" in the following example).
- A tree of `<opentopic-index:index.entry>` elements.

```
<opentopic-index:index.group>
  <opentopic-index:index.label>T</opentopic-index:index.label>
  <opentopic-index:index.entry value="table of contents">
    <opentopic-index:formatted-value>table of contents</opentopic-index:formatted-value>
    <opentopic-index:refID value="table of contents:">
```
Each of the entries contain:

- The formatted value (\texttt{<opentopic-index:formatted-value>}).
- A link to the publication content (\texttt{<opentopic-index:refID>/<oxy:index-link>}).
- Possibly other child entries.

For the DITA Map PDF - based on HTML5 & CSS transformation type, the merged map is further processed resulting in a collection of HTML5 \texttt{div} elements. These elements preserve the original DITA \texttt{@class} attribute values and add a new value derived from the DITA element name.
The index group content becomes:

```html
<div class="index/group group">
  <div class="index/label label">T</div>
  <div class="index/entry entry">
    <div class="index/formatted-value formatted-value">table of contents</div>
    <div class="index/link link" href="#d16e3988">[d16e3988]</div>
  </div>
</div>

<div class="index/entry entry">
  <div class="index/formatted-value formatted-value">change header</div>
  <div class="index/link link" href="#d16e4176">[d16e4176]</div>
</div>

<div class="index/entry entry">
  <div class="index/formatted-value formatted-value">style</div>
  <div class="index/link link" href="#d16e4120">[d16e4120]</div>
</div>
```

**Index - Built-in CSS**

All index styling is found in: `[PLUGIN_DIR]css/print/p-index.css`.

**How to Style the Index Page Title and the Grouping Letters**

In your customization CSS *(on page 48)*, add the following CSS rules:

```css
* [class ~="index/groups"] * [class ~="index/group"] * [class ~="index/label"] {  
  font-size:1.5em;  
  color:navy;  
}
```
How to Style the Index Terms Labels

In your customization CSS (on page 48), add the following CSS rule:

```css
*{class := "index/groups"}:before {
    content: "- Index - ";
    color:navy;
    font-size: 4em;
}
```

The result is:

```
- Index -
  F    
  footer 37 
  H    
  header 37 
  T    
  table of contents 32 
  change header 35 
  style 34
```
How to Add Filling Dots Between the Index Labels and the Page Numbers

Suppose you want the leader CSS content to generate a row of dots. It is necessary that the parent entry has the text justified.

In your customization CSS (on page 48), add the following CSS rule:

```css
*[^class~="index/formatted-value"],
*[^class~="index/refid"] {
  display:inline;
}

/* Hide the sequences of links that actually do not contain links. */
*[^class~="index/group"] *[^class ~="index/entry"] > *[^class~="index/refid"]{display:none;}

*[^class~="index/group"] *[^class ~="index/entry"] >
*[^class="index/refid"]:has(*[^class~="index/link"]){display:inline;}

*[^class~="index/group"] *[^class~="index/entry"] {
  text-align:justify;
}

*[^class~="index/group"] *[^class ~="index/entry"] > *[^class~="index/refid"]:before{
  content:leader('.');
}
```

The output now contains the dots:
How to Change the Index Page Number Format and Reset its Value

The page number is reset at the beginning of the index page by the built-in CSS rule:

```css
/*[class == "index/groups"] {  
    counter-reset: page 1;  
}*/
```

If you want to start the page counter from a different initial number, just change the value of this counter. For example, to continue the normal page counting, use:

```css
/*[class == "index/groups"] {  
    counter-reset: none;  
}*/
```

If you need to style the page number differently (for example, using decimals), add the following CSS rule in your customization CSS (on page 48):

```css
@page index {  
    @bottom-center {  
        content: counter(page, decimal)  
    }  
}
```

How to Impose a Table-like Index Layout

In case you need to place the index labels and links on the same line but with some extra alignment constraints, you can use inline blocks to give the index a table-like appearance:
You need to place the elements that have the following class on the same line:

- **index/formatted-value**
  - This is the text of the index term.
- **index/refid**
  - This element contains a list of links.

A fixed width is used for the formatted value and the links container (almost half of the available width). To achieve the index hierarchical layout, set progressive padding to the formatted value text.

In your customization CSS *(on page 48)*, add the following CSS rule:

```css
/* Hide the sequences of links that actually do not contain links. */

*[class~="index/formatted-value"],
*[class~="index/refid"]{
  display:inline-block;
}

*[class~="index/formatted-value"]{  
  width:45%;
}

*[class~="index/refid"] {  
  width:45%;
}
```
To avoid bleeding of the index term label, you may need to mark it as being hyphenated:

```
*{class=*"index/formatted-value"}*
  hyphens:auto;
```
To activate hyphenation, see: How to Enable Hyphenation for Entire Map (on page 152).

## Appendices

The `<appendices>` element that is available in the DITA bookmap has a special behavior (based on its sibling nodes):

1. If the bookmap contains `<part>` elements, the `<appendices>` will behave as a part.
2. If the bookmap contains `<chapter>` (and no `<part>`) elements, the `<appendices>` will behave as a chapter.

### Note:

The behavior includes page-break, numbering, and title rendering.

For example, if I define a bookmap with a `<part>` element, I will obtain:

```xml
<part>
  <chapter/>
  <topicref/>
  <chapter/>
</part>
<appendices> <!-- Appendices behaves like a Part -->
  <appendix/> <!-- Appendix behaves like a Chapter -->
  <appendix/>
</appendices>
```

For another example, if I define a bookmap with a `<chapter>` element only, I will obtain:

```xml
<chapter/>
  <topicref/>
  <chapter/>
<appendices> <!-- Appendices behaves like a Chapter -->
  <appendix/> <!-- Appendix behaves like a TopicRef -->
  <appendix/>
</appendices>
```

### Warning:

If the `<appendices>` element is not defined and the `<appendix>` is used directly instead, then it will behave like a *Part* or *Chapter* using the same pattern as for `<appendices>`.

## How To Control Page Break Within Appendices

If you define a bookmap with `<appendices>` and some `<appendix>` elements, you may want the parent `<appendices>` to be on a separate page than its children. This is done automatically if the bookmap contains `<part>` elements. Otherwise, you may need to use the following in your CSS:
Footnotes

Footnotes are pieces of information placed at the bottom of the page. A footnote has a number that is left in the content (the footnote call) and the same value placed before the footnote text (the footnote marker).

Footnotes - Built-in CSS

Footnote properties are defined in [PLUGIN_DIR]css/print/p-foot-notes.css.

How to Change Style of the Footnote Markers and Footnote Calls

To bold the footnotes numbers and use some colors, add the following rules to your customization CSS (on page 48):

```css
*{class =~ "topic/fn"}:footnote-call {
  font-weight: bold;
  color:red;
}

*{class =~ "topic/fn"}:footnote-marker {
  font-weight: bold;
  color:red;
}
```

Related Information:

https://www.oxygenxml.com/doc/ug-chemistry/topics/ch_footnotes.html

How to Add a Separator Above the Footnotes

The @footnote part of a @page declaration controls the style of the separator between the page content and the footnotes. For the content, you should set a leader. The leader uses a letter or a line style to fill the entire width of the page.

```xml
@page {
  margin:0.5in;
  ....
  @footnote {
    content: leader(solid);
    color:silver;
  }
}
```
To create a dotted line, you can use the dot character: leader('.') Other commonly used characters are: "-" (dash) and "._" (underscore).

**How to Reset the Footnotes Counter**

There are cases where you want to reset the footnote counter.

For example, if you need to reset it at the beginning of each chapter, add the following rules to your customization CSS (on page 48):

```css
*[class =~ "bookmap/chapter"],
*[class =~ "topic/topic"]{is-chapter} { 
  counter-reset: footnote 1;
}
```

Or you can mark any element with an @outputclass value, match that value, and reset the counter at any point in your counter:

```css
<p outputclass="reset-footnotes"/>

*[@outputclass =~ "reset-footnotes"] { 
  counter-reset: footnote 1;
}
```

**Hyphenation**

Hyphenation specifies how words should be hyphenated when text wraps across multiple lines.

The transformation plugin uses the capabilities of the PDF Chemistry processor to perform hyphenation.

**Hyphenation Dictionaries**

The Oxygen DITA-OT CSS-based PDF Publishing plugin provides built-in hyphenation patterns for the following languages:

<table>
<thead>
<tr>
<th>Code</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>da</td>
<td>Danish</td>
</tr>
<tr>
<td>de</td>
<td>German</td>
</tr>
<tr>
<td>de_CH</td>
<td>German (Switzerland)</td>
</tr>
<tr>
<td>en</td>
<td>English</td>
</tr>
<tr>
<td>en-GB</td>
<td>English (Great Britain)</td>
</tr>
<tr>
<td>es</td>
<td>Spanish</td>
</tr>
<tr>
<td>fr</td>
<td>French</td>
</tr>
<tr>
<td>it</td>
<td>Italian</td>
</tr>
</tbody>
</table>
The built-in hyphenation pattern license terms are listed in the XML files in the `\[CHEMISTRY_INSTALL_DIR\]/config/hyph` folder. Most of them comply with the LaTeX distribution policy.

### Installing New Hyphenation Dictionaries

Oxygen DITA-OT CSS-based PDF Publishing plugin uses the TeX hyphenation dictionaries converted to XML by the OFFO project: [https://sourceforge.net/projects/offo/](https://sourceforge.net/projects/offo/).

The `.xml` files allow you to access the licensing terms and you can use them as a starting point to create customized dictionaries (see How to Alter a Hyphenation Dictionary (on page 151)).

The `.hyp` files are the compiled dictionaries that the Oxygen DITA-OT CSS-based PDF Publishing plugin actually uses.

The hyphenation dictionaries are located in: `\[OPE_INSTALL_DIR\]/plugins/com.oxygenxml.pdf.css/lib/oxygen-pdf-chemistry/config/hyph`.

One simple way to add more dictionaries:

1. Download and extract the `offo-hyphenation-compiled.zip` file. This file is a bundle of many dictionary files.
3. If you just need a single dictionary, place the `.hyp` or `.xml` file in the `\[DITA_OT_DIR\]/plugins/com.oxygenxml.pdf.css/lib/oxygen-pdf-chemistry/config/hyph` directory.

### How to Alter a Hyphenation Dictionary

The hyphenation dictionaries are stored as XML files in the `\[OPE_INSTALL_DIR\]/plugins/com.oxygenxml.pdf.css/lib/oxygen-pdf-chemistry/config/hyph` directory.

You can copy the dictionaries you need to change in another directory, then use the `-hyph-dir` parameter to refer them inside your transformation.

<table>
<thead>
<tr>
<th>Code</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>nb</td>
<td>Norwegian Bokmål</td>
</tr>
<tr>
<td>nl</td>
<td>Dutch</td>
</tr>
<tr>
<td>ro</td>
<td>Romanian</td>
</tr>
<tr>
<td>ru</td>
<td>Russian</td>
</tr>
<tr>
<td>sv</td>
<td>Swedish</td>
</tr>
<tr>
<td>th</td>
<td>Thai</td>
</tr>
<tr>
<td>pt</td>
<td>Portuguese</td>
</tr>
<tr>
<td>da</td>
<td>Danish</td>
</tr>
</tbody>
</table>

---

**Code Language**

- `nb`: Norwegian Bokmål
- `nl`: Dutch
- `ro`: Romanian
- `ru`: Russian
- `sv`: Swedish
- `th`: Thai
- `pt`: Portuguese
- `da`: Danish
Each file is named with the language code and has the following structure:

```xml
<hyphenation-info>
  <hyphen-min before="2" after="3"/>
  <exceptions>
    o-mni-bus
    ...
  </exceptions>
  <patterns>
    préémi3nent.
    proémi3nent.
    surémi3nent.
    ....
  </patterns>
</hyphenation-info>
```

To change the behavior of the hyphenation, you can modify either the patterns or the exceptions sections:

### exceptions

Contains the list of words that are not processed using the patterns, each on a single line. Each of the words should indicate the hyphenation points using the hyphen ("-"") character. If a word does not contain this character, it will not be hyphenated.

For example, `o-mni-bus` will match the `omnibus` word and will indicate two possible hyphenation points.

**Note:**

Compound words (i.e. e-mail) cannot be controlled by exception words.

### patterns

Contains the list of patterns, each on a single line. A pattern is a word fragment, not a word. The numbers from the patterns indicate how desirable a hyphen is at that position.

For example, `tran3s2act` indicates that the possible hyphenation points are "tran-s-act" and the preferable point is the first one, having the higher score of "3".

**How to Enable Hyphenation for Entire Map**

To enable hyphenation for your entire map:
1. Make sure you set an `@xml:lang` attribute on the root of your map, or set the `default.language` parameter in the transformation.

2. In your customization CSS (on page 48), add:

```css
:root {
  hyphens: auto;
}
```

3. To except certain elements from being hyphenated, use `hyphens:none`. The following example excludes the `<keyword>` elements from being hyphenated:

```css
*.[class ~="topic/keyword"] {
  hyphens: none;
}
```

---

## How to Enable/Disable Hyphenation for Tables

To enable hyphenation for your entire map:

1. Make sure you set an `@xml:lang` attribute on the root of your map or your table elements.

2. The built-in CSS already has the following rule defined that activates hyphenation:

```css
*.[class ~="topic/table"] {
  hyphens: auto;
}
```

### Note:

To disable table hyphenation, add the following in your customization CSS (on page 48):

```css
*.[class ~="topic/table"] {
  hyphens: none;
}
```

3. To prevent certain elements from being hyphenated, use `hyphens:none`. The following example excludes the `<keyword>` elements from being hyphenated:

```css
*.[class ~="topic/keyword"] {
  hyphens: none;
}
```

---

## How to Disable Hyphenation for a Word

To disable hyphenation for a specific word, there are several possible approaches:

- If the word is a compound (like “T-shirt”) and you want to keep it on the same line, you have two options:
  
  **Manual Approach**
Wrap the word in an inline element with the `@outputclass` attribute set. In the CSS, change its style to `white-space: nowrap;`. For example:

```
.. <ph outputclass="no-hyphenation">T-shirt</ph>...

*[outputclass ~= "no-hyphenation"] {
  white-space: nowrap;
}
```

**Automatic Approach**

A better alternative to this is to write an XSLT extension that matches the text nodes and performs automatic markup (to see an example, go to How to Wrap Words in Markup (on page 36) in the XSLT Extensions for PDF Transformations (on page 33) section). Then match the `compound-word` class the same as in the previous example:

```
*[outputclass ~= "compound-word"] {
  white-space: nowrap;
}
```

**Another Alternative**

In all the compound words from your documentation, replace the hyphen ("-") with a non-breaking hyphen character U+2011 (or XML notation &#2211;).

Then change the `autocorrect` settings to automatically replace the compound word with its equivalent. For example: "T-shirt" would be replaced with "T[‑]shirt".

- If the word is not a compound, you have two options:
  - Use one of the approaches listed above.
  - Alter the hyphenation dictionaries as explained in: How to Alter a Hyphenation Dictionary (on page 151).

**Accessibility**

By default, the PDF documents produced using this plugin are partially accessible in the sense that most of the paragraphs, tables, lists, headers, and footers are tagged automatically so a PDF reader can use this information to present the content.

**Related Information:**
- Oxygen PDF Chemistry: Accessibility

**Accessibility - Built-in CSS**

Accessibility properties are defined in `[PLUGIN_DIR]css/print/p-accessibility.css`.

**How to Create Fully Accessible Documents**

To make your documents fully accessible (PDF/UA1 compliant), do the following:
1. The accessibility standard requires that all the fonts be embedded in the PDF. To force font embedding, you have to specify fonts for all elements and for all page margin boxes in your customization CSS (on page 48). For instance, you can use:

```css
body { font-family: Arial }
@page {
    @top-left { font-family: Arial }
    @top-right { font-family: Arial }
    @top-center { font-family: Arial }
    @top-left-corner { font-family: Arial }
    @top-right-corner { font-family: Arial }
    @bottom-left { font-family: Arial }
    @bottom-right { font-family: Arial }
    @bottom-center { font-family: Arial }
    @bottom-left-corner { font-family: Arial }
    @bottom-right-corner { font-family: Arial }
}
```

2. Create a new transformation scenario, based on the DITA Map PDF - based on HTML5 & CSS built-in scenario.

3. In the Parameters tab, change the value of the `pdf.accessibility` parameter to `yes`.

4. Run the transformation.

## Fonts

Fonts are an important part of the publication. Your font selection should take into consideration both design and the targeted ranges of characters.

To use them in the customization CSS (on page 48):

- You can place the font files in the same folder as your CSS and use a `@font-face` definition to reference them.
- You can use web fonts (for example, Google Fonts), and import the CSS snippet into your CSS.
- You can use system fonts.

All these techniques are explained in: Oxygen PDF Chemistry User Manual: Fonts.

### How to Avoid Characters Being Rendered as #

When the processor renders text with a font that does not include certain characters, those characters are replaced with the `#` symbol. This can easily be seen from Oxygen's Results view. For example:

```
[CH] Glyph " fav not available in font "Roboto-Regular".
```

To prevent this, make sure you use the proper font.
As an example, suppose the right arrow character is used in a definition list like this:

```xml
<dlentry>
  <dt>→</dt>
  <dd><ph>This is the right arrow.</ph></dd>
</dlentry>
```

If the font does not include this character, the output will look something like this:

```
# This is the right arrow.
```

To fix this you can either:

1. Install Arial Unicode MS font on your system. This is one of the PDF processor fallback fonts. Starting with version 24 there are additional fonts used as fallback as SimSun, Malgun Gothic and more, so if one of these are found on the system they will be used directly.
2. Specify the fallback font in your customization.

For the second case, if you use *Times New Roman* for the entire publication, you could add *Symbol* as the fallback font. In your customization CSS *(on page 48)*, add:

```css
*[class ~="topic/dlentry"] {
  font-family: "Times New Roman", Symbol;
}
```

To change the font for the entire publication, not just an element, you can use:

```css
:root {font-family: "Times New Roman", Symbol !important; }
```

```css
$page {
  @top-left {font-family: "Times New Roman", Symbol !important; }
  @top-right {font-family: "Times New Roman", Symbol !important; }
  @top-center {font-family: "Times New Roman", Symbol !important; }
  @top-left-corner {font-family: "Times New Roman", Symbol !important; }
  @top-right-corner {font-family: "Times New Roman", Symbol !important; }
  @bottom-left {font-family: "Times New Roman", Symbol !important; }
  @bottom-right {font-family: "Times New Roman", Symbol !important; }
  @bottom-center {font-family: "Times New Roman", Symbol !important; }
  @bottom-left-corner {font-family: "Times New Roman", Symbol !important; }
  @bottom-right-corner {font-family: "Times New Roman", Symbol !important; }
}
```

**Tip:**

On Windows, one simple way to determine the font needed to display the text is to copy the text fragment that has rendering problems from the DITA source document and paste it into Microsoft
WordPad or Word. It will automatically select a font capable of rendering the text. Simply click on the text to see the name of the font from the "Font" ribbon toolbar. Then you can use it as a fallback font in the CSS. Make sure there are no licensing restrictions on that particular font.

Warning:
Even if the message is a warning, sometimes it can lead to a failed transformation. This usually occurs for really special characters (different from letters or common characters).

How to Set Fonts in Titles and Content

Suppose that in your customization CSS (on page 48), you have defined your font (for example, Roboto) using a Google web font:

```css
@import url('https://fonts.googleapis.com/css?family=Roboto');
```

You can force a font on all elements, then style the ones that need to be different. The advantage of this method is that you do not need to trace all elements that have a font family defined in the built-in CSS files, you just reset them all.

In your customization CSS (on page 48), add an `!important` rule that associates a font to all the elements from the document:

```css
* {
    font-family: "Roboto" !important;
}
```

Note:
If you want to use the :root selector instead of the * sector, without the !important qualifier, the elements that have a predefined font specified in the built-in CSS will keep that font. If your content uses non-Latin glyphs, it is possible that the built-in fonts do not render them.

Next, identify the selectors for the elements that need to be styled with a different font than the one associated above. For information on how to do this, see: Debugging the CSS (on page 49).

For example, if you want the titles or the pre-formatted text to have a different font from the rest, matched by the above * selector, you need to use more specific CSS selectors:

```css
*{class="front-page/front-page-title"},
*{class="topic/title"} {
    font-family: Arial !important;
}

*{class="pr-d/codeph"},
*{class="topic/pre"} {
    font-family: monospace !important;
}
```
How to Use Fonts for Asian Languages

For Asian languages, you must use a font or a sequence of fonts that cover the needed character ranges. If the characters are not found, the # symbol is used.

When you specify a sequence of fonts, if the glyphs are not found in the first font, the next font is selected, and so on until one is found that includes all the glyphs. A common font sequence for Asian languages is as follows:

```css
font-family: Calibri, SimSun, "Malgun Gothic", "Microsoft JhengHei";
```

To apply this font sequence, see: How to Set Fonts in Titles and Content (on page 157).

Some of the Asian fonts do not have italic, bold, or bold-italic variants. In this case, you may use the regular font file with multiple font face definitions to simulate (synthesize) the missing variants. You need to use the -oxy-simulate-style:yes CSS property in the font face definition as explained in: Using Simulated/Synthetic Styles in Oxygen Chemistry.

How to Use Asian Fonts in Linux

For Asian languages on Linux distributions, PDF Chemistry automatically uses DejaVu and Noto CJK as fallback fonts for Serif, Sans-Serif, and Monospace content.

**Warning:**

On some distributions, the Noto CJK fonts are not available. In this case, you need to install them using the system package manager:

- fonts-noto-cjk on Debian family distributions (e.g. Ubuntu).
- google-noto-cjk-fonts on Red Hat family distributions (e.g. CentOS).

How to Add a New Asian Font

If you want to add a specific font for Asian languages, you need to declare it inside your customization CSS (on page 48). The following example uses the Noto Sans Tamil font-family:

```css
/* Font Declaration */
@font-face {
  font-family: "Noto Sans Tamil";
  font-style: normal;
  font-weight: 400;
  src: url(../fonts/ttf/notosanstamil/NotoSansTamil-Regular.ttf);
}
```

@font-face {

Localization

The **DITA Map PDF - based on HTML5 & CSS** transformation type supports a large number of languages for customizing localization. In this type of transformation, the intermediary merged DITA map is transformed to HTML5 using the DITA-OT built-in support, so the customization of the internationalization (the labels for chapters, parts, figures, tables, notes, etc.) can be achieved by following the DITA-OT recommendations: [Customizing Generated Text](#).

It is recommended that you do this customization on a DITA-OT distribution deployed outside of the **Oxygen** installation. Otherwise, you will lose the customization when upgrading **Oxygen**. You can contact the **Oxygen support team** to ask for the **Oxygen Publishing Engine** package.

Supported Languages (HTML5 and CSS)

There are over 20 supported languages. For the full list of supported languages (and their codes), see [https://www.dita-ot.org/3.2/topics/globalization-languages.html](https://www.dita-ot.org/3.2/topics/globalization-languages.html).

How to Select a Language (HTML5 and CSS)

There are two ways to switch the labels to a specific language:

- Alter the DITA maps and/or topics to have the `@xml:lang` attribute set on the root element with one of the supported values (i.e. `fr`, `de`, `zh`, `ru`).
- If changing the files is not an option, you can alter the value of the `default.language` transformation parameter to the desired language code.

How to Add Support for a New Language

If the list of supported languages does not include the language you need, you can create a custom dictionary. The DITA-OT documentation offers a good insight on how to do it: [https://www.dita-ot.org/3.2/topics/plugin-addgeneratedtext.html](https://www.dita-ot.org/3.2/topics/plugin-addgeneratedtext.html)

In addition to that, you need to alter CSS files. Some of the labels come from CSS files located in the `[PLUGIN_DIR]/css/print/i18n/` directory.
You should use one of the files as a template, copy its rules to your customization CSS (on page 48), and then translate the labels. Make sure you also change the :lang selector to match your language code.

**Comments, Highlights, and Tracked Changes**

The comments and tracked changes can be made visible in the PDF output by setting the show.changes.and.comments transformation parameter to yes.

![Figure 5. Chemistry Annotations in Acrobat Reader](image)

By default, they are shown as PDF text annotations (sticky notes). These are graphical markers in the document content and are also listed in the Comments section when opening the output file in Acrobat Reader.

**Note:**

Comments with the Mark as Done flag selected appear with a check mark in the Comments section and with a Completed label (☑ John Doe Completed).

To avoid rendering the elements as PDF annotations and show them as footnotes instead, you can use the show.changes.and.comments.as.pdf.sticky.notes transformation parameter set to no.

The comments and changes are included in the merged map file (on page 49) either as XML elements (<oxy-insert>, <oxy-delete>, <oxy-comment>, <oxy-attributes>) in the case of the XML merged map, or as HTML elements with similar classes (oxy-insert, oxy-delete, oxy-comment, oxy-attributes) in the case of the HTML merged map. Sub-elements contain meta-information about each change.

**Tip:**

These elements are automatically recognized and transformed in PDF annotations when using Chemistry as PDF processor.

**Note:**

The inserted text, deleted text, and deleted markup are included in the sticky notes, you can change this behavior by using the show.changed.text.in.pdf.sticky.notes.content parameter (on page 19).
Comments and Tracked Changes - XML Fragment

This section contains information about how each type of tracked change is structured in the merged map XML file (on page 49).

Insertions

For an insertion type of tracked change, the structure that defines the insertion details is inside the range (<oxy-range-start> to <oxy-range-end>), the inserted text is highlighted by an <oxy-insert-hl> element, and the details are stored in the <oxy-insert> element.

```xml
<oxy:oxy-range-start id="sc_1" hr_id="1"/>

  <oxy:oxy-insert href="#sc_1" hr_id="1">
    <oxy:oxy-author>dan</oxy:oxy-author>
    <oxy:oxy-content>insert</oxy:oxy-content>
    <oxy:oxy-date>2018/03/15</oxy:oxy-date>
    <oxy:oxy-hour>09:38:29</oxy:oxy-hour>
    <oxy:oxy-tz>+02:00</oxy:oxy-tz>
  </oxy:oxy-insert>

  <oxy:oxy-insert-hl>This is an insert!!</oxy:oxy-insert-hl>

<oxy:oxy-range-end hr_id="1"/>
```

Comments

Similar to insertions, comments are defined in a range (<oxy-range-start> to <oxy-range-end>), the comment details is in the <oxy-comment> element, and the highlighted content is wrapped in the <oxy-comment-hl> element.

```xml
<oxy:oxy-range-start id="sc_1" hr_id="1"/>

  <oxy:oxy-comment href="#sc_1" hr_id="1">
    <oxy:oxy-author>dan</oxy:oxy-author>
    <oxy:oxy-comment-text>This is a comment.</oxy:oxy-comment-text>
    <oxy:oxy-date>2018/03/15</oxy:oxy-date>
    <oxy:oxy-hour>09:56:59</oxy:oxy-hour>
    <oxy:oxy-tz>+02:00</oxy:tz>
  </oxy:oxy-comment>

  <oxy:oxy-comment-hl>Context</oxy:oxy-comment-hl>
```

Related Information:
Transformation Parameters (on page 13)
Debugging the CSS (on page 49)
Note:
Comments that are marked as done have a flag="done" attribute:

```xml
<oxy:oxy-comment href="#sc_6" hr_id="6" flag="done">
```

### Attribute changes

The attribute changes are more complex. The range is empty, and is directly above the affected element (the one that has modified attributes). The `<oxy-attributes>` element contains details about multiple attribute changes, each stored in the `<oxy-attributed-change>` element.

```xml
<oxy:oxy-attributes href="#sc_3" hr_id="3">

  <oxy:oxy-attribute-change type="inserted" name="platform">
    <oxy:oxy-author>dan</oxy:oxy-author>
    <oxy:oxy-current-value>windows</oxy:oxy-current-value>
    <oxy:oxy-date>2018/03/15</oxy:oxy-date>
    <oxy:oxy-hour>10:05:04</oxy:oxy-hour>
    <oxy:oxy-tz>+02:00</oxy:oxy-tz>
  </oxy:oxy-attribute-change>

  ...

  <oxy:oxy-attribute-change type="removed" name="audience">
    ...
  </oxy:oxy-attribute-change>

</oxy:oxy-attributes>
```

### Deletions

For a deletion, there are some elements that define the start and end of the deletion, and the highlighted text is wrapped in the `<oxy-delete-hl>` element.

```xml
<oxy:oxy-range-start id="sc_2" hr_id="2"/>
<br>
<oxy:oxy-delete-hl>This is a deleted text.</oxy:oxy-delete-hl>
<br>
<oxy:oxy-range-end hr_id="2"/>
```
There is a structure that offers details about the deletion change, using the `<oxy-delete>` element. This is linked to the above deletion range by the same ID value:

```html
<oxy-delete href="#sc_2" hr_id="2">
  <oxy-author>dan</oxy-author>
  <oxy-content><img href="../img/ex.gif"></oxy-content>
  <oxy-date>2018/03/14</oxy-date>
  <oxy-hour>11:38:06</oxy-hour>
  <oxy-tz>+02:00</oxy-tz>
</oxy-delete>
```

### Colored Highlights
To show some text as highlighted with a background color:

```html
<oxy-color-hl color="rgba(140,255,140,50)">Some colored text.</oxy-color-hl>
```

### Comments and Tracked Changes - HTML Fragment
This section contains information about how each type of tracked change is structured in the merged map HTML file *(on page 49)*.

#### Insertions
For an insertion type of tracked change, the structure that defines the insertion details is inside a range (`oxy-range-start` to `oxy-range-end`), the inserted text is highlighted by a `<span>` element with the class `oxy-insert-hl`, and the details are stored in a `<span>` element with the `oxy-insert` class.

```html
<oxy-range-start id="sc_1" hr_id="1"/>
  <oxy-insert href="#sc_1" hr_id="1">
    <oxy-author>dan</oxy-author>
    <oxy-content>insert</oxy-content>
    <oxy-date>2018/03/15</oxy-date>
    <oxy-hour>09:38:29</oxy-hour>
    <oxy-tz>+02:00</oxy-tz>
  </oxy-insert-hl>This is an insert!!</ oxy-insert>
<oxy-range-end hr_id="1"/>
```

#### Comments
Similar to insertions, comments are defined in a range (`oxy-range-start` to `oxy-range-end`), the comment details in an element with the class `oxy-comment`, and the highlighted content is wrapped in the `oxy-comment-hl` element.

```html
<oxy-range-start id="sc_1" hr_id="1"/>
  <oxy-comment href="#sc_1" hr_id="1">
    <oxy-author>dan</oxy-author>
    <oxy-content>insert</oxy-content>
    <oxy-date>2018/03/15</oxy-date>
    <oxy-hour>09:38:29</oxy-hour>
    <oxy-tz>+02:00</oxy-tz>
  </oxy-comment-hl>This is a comment!!</ oxy-comment>
<oxy-range-end hr_id="1"/>
```
Note:
Comments that are marked as done have a flag="done" attribute:

```html
<oxy-comment href="#sc_6" hr_id="6" flag="done">
```

Attribute changes

The attribute changes are more complex. The range is empty, and is directly above the affected element (the one that has modified attributes). The element with the class oxy-attributes contains details about multiple attribute changes, each stored in an element with the class oxy-attribute-change.

```
<element>

<oxy-range-start id="sc_3" hr_id="3" />
<oxy-range-end hr_id="3" />

<oxy-attributes href="#sc_3" hr_id="3" >

<oxy-attribute-change type="inserted" name="platform">

<oxy-author>dan</oxy-author>
<oxy-current-value>windows</oxy-current-value>
<oxy-date>2018/03/15</oxy-date>
<oxy-hour>10:05:04</oxy-hour>
<oxy-tz>+02:00</oxy-tz>

</oxy-attribute-change>

....

<oxy-attribute-change type="removed" name="audience">

....

</oxy-attribute-change>

</element>
```
Deletions

For a deletion, there are some elements that define the start and end of the deletion, and the highlighted text is wrapped in an element with the class `oxy-delete-hl`.

```html
<span class="oxy-range-start" id="sc_2" hr_id="2"/>
<span class="oxy-delete-hl">This is a deleted text. </span>
<span class="oxy-range-end" hr_id="2"/>
```

There is a structure that offers details about the deletion change, using the element with the class `oxy-delete`. This is linked to the above deletion range by the same ID value:

```html
<span class="oxy-delete" href="#sc_2" hr_id="2">
  <span class="oxy-author">dan</span>
  <span class="oxy-content"><image href="../img/ex.gif"></span>
  <span class="oxy-date">2018/03/14</span>
  <span class="oxy-hour">11:38:06</span>
  <span class="oxy-tz">+02:00</span>
</span>
```

Colored Highlights

To show some text as highlighted with a background color:

```html
<span class="oxy-color-hl color="rgba(140,255,140,50)">Some colored text.</span>
```

Comments and Tracked Changes - Built-in CSS

The built-in CSS that controls the way tracked changes and comments are displayed is found in: `[PLUGIN_DIR]css/print/p-side-notes.css`

How to Style Changed or Commented Text

To style the highlighted text from the document content, use the `<oxy-comment-hl>` element (or `<oxy-delete-hl>`, `<oxy-insert-hl>`, respectively, by local name or class name):

```
oxy-comment-hl,
  .oxy-comment-hl {
    color:magenta;
  }
```

Note:
The class name selector is useful when using the DITA Map PDF - based on HTML5 & CSS or DITA PDF - based on HTML5 & CSS transformation scenarios.

If you want to change the small labels that define the affected start and end ranges (they are a number formatted like: "[n] .. [/n]" where n is the number of the change), you can use the following selectors:
Use `display:none` if you want to hide them.

If you want to change the background color of the comment footnote (assuming you set the `show.changes.and.comments.as.pdf.sticky.notes` transformation to `no`), add the following snippet in your customization CSS (on page 48):

```css
oxy-comment,
.oxy-comment {
  background-color: inherit;
  border: 2pt solid yellow;
}
```

Similarly, you can style the other footnotes for `<oxy-attributes>`, `<oxy-delete>`, and `<oxy-insert>` elements.

### How to Hide Tracked Change Footnotes

This topic is relevant if you have set the `show.changes.and.comments.as.pdf.sticky.notes` transformation parameter to `no`, and therefore the changes are shown as footnotes instead of PDF annotations.

In some cases, when your document contains a lot of tracked changes, you may need to hide the footnotes associated with the insertions, deletions, or attribute changes. Using the following example, the deletions and insertions are hidden, but the comments remain visible. In your customization CSS (on page 48), add:

```css
oxy-attributes,
oxy-delete,
oxy-insert{
  float:none;
  display:none;
}
```

### How to Show Only Change Bars Without Other Styling for Tracked Changes

It is possible to only display the change bars for tracked changes (inserted or deleted content) in the PDF document while hiding the other styling for the tracked changes. This is helpful if you want to see the document in a final version while still seeing change bars where content was inserted or deleted.
To achieve this, follow these steps:

1. Set the `show.changes.and.comments` parameter to `yes` and the `show.changes.and.comments.as.pdf.sticky.notes` parameter to `no`.

   **Step Result:** The first parameter causes tracked changes to be visible in your document and styled (e.g. insertions are blue and underlined, while deletions are red with a strike-through). Changing the second parameter to `no` causes the tracked changes to be displayed as a footnote instead of a PDF annotation.

2. Hide the footnotes by adding the following in your customization CSS (on page 48):

   ```css
   .oxy-attributes,
   .oxy-comment,
   .oxy-delete,
   .oxy-insert {
     float: initial;
     display: none;
   }
   ```

3. Remove the change range markers (the { and } symbols):

   ```css
   .oxy-range-start:before,
   .oxy-range-end:before {
     content:none;
   }
   ```

4. Remove the styling for the insertions and deletions:

   ```css
   .oxy-insert-hl{
     color:unset;
     text-decoration:none;
   }
   .oxy-delete-hl {
     content: "\200b";
     text-decoration:none;
   }
   .oxy-comment-hl{
     background-color:unset;
   }
   .oxy-color-hl[\color] {
     background-color:unset;
   }
   ```

5. **[Optional]** You can improve the visibility of the change bars with this construct:

   ```css
   .oxy-range-start[is-changebar]:before(100) {
     -oxy-changebar-color: red;
     -oxy-changebar-width: 3pt;
   }
   ```
Troubleshooting

This section contains information about fixing various change tracking, highlights and comments publishing problems.

Highlights are Spanning Unexpectedly to the End of the Page

Problem

Tracked changes and highlights span beyond what is expected.

Cause

If the change tracking insertions, comments, or highlights span over an area that is larger than expected, the markup that signals their end is missing.

Solution

To fix this, open the topic where the highlights start and check if the XML processing instructions that define the end of the highlighted interval are correct. The intervals are defined as follows:

For highlights:

```xml
<?oxy_custom_start type="oxy_content_highlight" color="140,255,140"?>
<?oxy_custom_end?>
```

For comments:

```xml
<?oxy_comment_start author="dan" timestamp="20201102T092905+0200" comment="Test"?>
<?oxy_comment_end?>
```

For inserted text:

```xml
<?oxy_insert_start author="dan" timestamp="20201102T093034+0200"?>
<?oxy_insert_end?>
```

Make sure all the ending processing instructions are located before the root element end tag.

Draft Watermarks

A watermark is an image displayed as the background of a printed document and it is faded enough to keep the publication text readable. Draft watermarks are used to indicate that a document is under construction or has not yet been approved.

How to Add a Draft Watermark on All Pages

To add a draft watermark to all of your publication pages, you can use the following page selector in your customization CSS (on page 48):

```css
@page {
    background-image: url("draft.svg");
    background-position: center;
}
```
If you have already set a background image for other pages (for example, the front-page or table-of-contents), the above selector won’t change them, as they are more specific.

The best practice is to use a different draft.css CSS file that imports the customization CSS where the rest of the style changes reside. If you need to publish the content as a draft, use the draft.css in your transformation scenario, otherwise directly reference the customization CSS (on page 48).

Related Information:
Images and Figures (on page 178)

How to Add a Draft Watermark Depending on Metadata

Suppose you want to apply a Draft watermark until your DITA bookmap is approved and the map is approved when an <approved> element has been added to the metadata section (for example, in the bookmeta/bookchangehistory element).

```xml
<bookmeta>
  <author>John</author>
  <critdates>
    <created date="1/1/2015"/>
    <revised modified="3/4/2016"/>
    <revised modified="3/5/2016"/>
  </critdates>
  <bookchangehistory>
    <approved/>
  </bookchangehistory>
  ...
</bookmeta>
```

Use `oxy_xpath` every time you need to probe the value from an element other than the one matched by the CSS selector, and test the expression on the merged HTML file using the Oxygen XPath Builder view.

You can either use a page selector that imposes the draft watermark on the entire page surface (recommended):

```css
@page {
  background-image: url(oxy_xpath('if (/bookmeta/bookchangehistory/approved) then "" else "./././images/draft-watermark.png" '));
  background-position: center;
  background-repeat: no-repeat;
  background-color: inherit;
}
```

or use an element selector that restricts the watermark image only to the page area covered by that element:
The `body` selector is used here in case you want to apply the DITA Map PDF - based on HTML5 & CSS transformation type. You can use another element selector to target a specific part of your publication (for example, marking only the tables as drafts).

**Flagging Content**

In DITA, you can mark certain content to flag it or draw attention to it. This is done by defining a flag in a DITAVAL file.

You can attach the DITAVAL file to the DITA map using the `<ditavalref>` element in the map, or by specifying it in the `args.filter` transformation parameter.

In the following example, all the elements that have the attribute `@product` set to `YourProd` is flagged to have a purple background:

```
<val>
  ...
  <prop action="flag" att="product" val="YourProd" backcolor="purple"/>
  ...
</val>
```

**How to Flag Content Using Change Bars**

As an example, to add a change bar (revision mark) for particular content, you can use the following in the DITAVAL file:

```
<val>
  <revprop action="flag"
    changebar="color:blue;style:solid;width:2pt;offset:1.25mm;placement:start" val="new"/>
</val>
```

This would result in any content that is marked with `@rev="new"` having a blue change bar.
How to Flag Content Using Images

You can mark the elements that match a specific profiling condition using images (one for the start, one for the end). The image references are relative to the DITAVAL file.

```xml
<val>
  <prop action="flag"
      att="product" val="MyProd"
      bgcolor="blue"
      color="yellow">
    <startflag imageref="startflag.jpg">
      <alt-text>This is the start of my product info</alt-text>
    </startflag>
    <endflag imageref="endflag.jpg">
      <alt-text>This is the end of my product info</alt-text>
    </endflag>
  </prop>
</val>
```

Styling the Content

If you need to change the styles of the elements from the topic contents, you should create a customization CSS (on page 48) and then add CSS rules. To create the CSS rules, you can use the development tools described in Debugging the CSS (on page 49).

Reusing the Styling for WebHelp and PDF Output

If you are using the pdf-css-html5 transformation type, then the generated HTML5 document that is later converted to PDF is very similar to the generated HTML5 pages from the WebHelp Responsive output.

This is an output example from the WebHelp transformation:

```html
<h1 class="title topictitle1" id="ariaid-title2">Care and Preparation</h1>
<div class="body">
  <p class="shortdesc">When caring ...</p>
  <p class="p">When caring for your flower garden you want ...</p>
</div>
```

And the same example from the PDF transformation (note the additional emphasized class values):

```html
<h1 class="- topic/title title topictitle1" id="ariaid-title2">Care and Preparation</h1>
<div class="- topic/body body">
  <p class="- topic/shortdesc shortdesc">When caring ...</p>
  <p class="- topic/p p">When caring for your flower garden you want ...</p>
</div>
```
It makes sense to reuse the same CSS rules you developed for one transformation type to the other. The main rule is to use the short class names instead of the long ones. For example, to style the short descriptions with italic font, use:

```
.shortdesc {
    font-style: italic;
}
```

The rule of thumb is that if you have a CSS rule that successfully styles an element in WebHelp, it should apply without any modification in the PDF output.

**Titles**

Titles can be styled by matching the `topic/title` class attribute.

```
*[class~="topic/title"] {
    color:navy;
}
```

**How to Avoid Wrapping the Title Text Without Indentation**

By default, the chapter/section number is on the same line as the title text. If the title is too long, the text wraps to the next line without any indentation.

```
4.5.5 This is a long title
   text that wraps.
```

If you want the wrapped text to include indentation, you need to set the value of the `args.css.param.title.layout` transformation parameter to `table`. This results in the chapter/section number being placed in one cell while the rest of the title content is in another cell with wrapped text and it is displayed with an indent:

```
4.5.5 This is a long title
   text that wraps.
```

**Equations**

This processor supports MathML equations.

**How to Change the Font of MathML Equations**

Suppose that you need to change the font of MathML equations from the documentation, and also add some padding. The MathML fragments are wrapped in elements that have the class `equation-d/equation-block` or `equation-d/equation-inline`, so you can match them with:

```
*[class="#="equation-d/equation-block"],
*[class="#="equation-d/equation-inline"][
    font-family:*courier new*;
    font-size:1.5em;
```
padding: 1em;
}

Note:
An equation can be rendered using multiple classes of fonts (e.g. the serif, sans serif, monospace, fraktur, and doublestruck classes. Depending on each of the equation symbols, a class is selected for it. The font specified in the CSS rule (as in the preceding example), applies only to the serif class. However, if a symbol codepoint is not covered by the currently selected class fonts, it falls back to the font specified in the CSS.

Attention:
Some of the fonts may not be supported. In that case, a default serif font is used.

Lists
You can style the list item markers or other properties.

Note:
The lists are treated differently than ordinary block elements in the sense that their margins are not collapsed with the margins of the neighboring blocks or lists. This is also visible for nested lists.

How to Style the List Markers
For the media print, the default CSS rules for the list items use the :marker pseudo-class.

@media print {
  *[class="topic/li"]:marker {
    text-align: center;
    font-weight: bold;
  }
  *[class="topic/ol"] > *[class="topic/li"]:marker {
    margin-left: 0.25in;
  }
}

To eliminate the bold font weight for the items form ordered lists then add the following rules to your customization CSS (on page 48):

  *[class="topic/ol"] > *[class="topic/li"]:marker {
    font-weight: normal;
  }

For the unordered lists:
How to Continue List Numbering

It is possible to continue the numbering of an ordered list even when the content is split on multiple `<ol>` elements.

You just need to define an `@outputclass` attribute on the lists where numbering should continue:

```html
<ol outputclass="continue">
  <li>Third Item</li>
</ol>
```

Then set the following content inside your CSS customization:

```css
* [class~="topic/ol"] { 
  counter-reset: list-counter;
}

* [class~="topic/ol"][outputclass="continue"] { 
  counter-reset: none;
}

* [class~="topic/ol"] > * [class~="topic/li"] { 
  counter-increment: list-counter;
}

* [class~="topic/ol"] > * [class~="topic/li"]:marker { 
  content: counter(list-counter) ".\00a0";
}
```

How to Change the Numbering System of Ordered Lists

It is possible to change all lists to have a different numbering system and there are several methods that can be used to achieve this.

**Use the `list-style-type` CSS Property.**

The Chemistry engine supports the following types: decimal, decimal-leading-zero, lower-roman, upper-roman, lower-latin, upper-latin, lower-alpha, upper-alpha.
Change the Content of the `:marker` CSS Pseudo-Element.

The following example emulates the Cyrillic numbering for the list items for an ordered list that has the `@outputclass` attribute set to `cyrillic`:

```css
/* [class ~= "topic/ol"] { */

  list-style-type: lower-roman;

/* } */
```

Important:

This example will work only for lists up to 28 items. You will have to extend it for longer lists!

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:marker { */

  width: 3em;

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(1):marker { */

  content: "а"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(2):marker { */

  content: "б"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(3):marker { */

  content: "в"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(4):marker { */

  content: "г"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(5):marker { */

  content: "д"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(6):marker { */

  content: "е"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(7):marker { */

  content: "ж"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(8):marker { */

  content: "з"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(9):marker { */

  content: "и"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(10):marker { */

  content: "к"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(11):marker { */

  content: "л"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(12):marker { */

  content: "м"

/* } */
```

```css
/* [class ~= "topic/ol"] [outputclass ~= "cyrillic"] > * [class ~= "topic/li"]:nth-of-type(13):marker { */

  content: "н"

/* } */
```
Links

Links allow the users to navigate through the documentation.

How to Remove 'on page NNN' Link Label

For printed material, it is usually desirable for the links to display a label after the text content (such as "on page 54"). This makes it easier the user to identify the target page. However, if the produced PDF is not printed...
and is intended only for electronic use, this label may create clutter and make the document harder to read. To eliminate this label, add the following in your customization CSS (on page 48):

```css
*[class =~ "topic/xref"][href]:after,
*[class =~ "topic/link"][href]:after {
  content: none !important;
}
```

Another use-case is to remove the labels only from links shown in tables cells, and leave the others as they are. For this, you could use a more specific selector:

```css
*[class =~ "topic/entry"] *[class =~ "topic/xref"][href]:after{
  content: none !important;
}
```

### How to Change Link Styles

Suppose you want the links to be bold and with an underline. In your customization CSS (on page 48), add this snippet:

```css
*[class =~ "topic/xref"][href]:after,
*[class =~ "topic/link"][href]:after {
  font-weight: bold;
  text-decoration: underline;
}
```

### How to Hide Descriptions in Related Links Sections

The link descriptions that come from DITA relationship tables or related link elements within topics, are structured in the merged map (on page 49) like this:

```xml
<related-links class="- topic/related-links ">
  <linkpool class="- topic/linkpool ">
    <link class="- topic/link ">
      ... 
      <linktext class="- topic/linktext ">Salvia</linktext>
      <desc class="- topic/desc ">The salvia plant</desc>
    </link>
  </linkpool>
  ...
</related-links>
```

If you need to hide these descriptions, add the following code in your customization CSS (on page 48):

```css
*[class =~ "topic/link"] > *[class =~ "topic/desc"] {
  display: none;
}
```
How to Group Related Links by Type

By default, all links from DITA relationship tables or related link elements within topics are grouped under one "Related information" heading:

<table>
<thead>
<tr>
<th>Related information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Topic</td>
</tr>
<tr>
<td>Target Concept</td>
</tr>
<tr>
<td>Target Task</td>
</tr>
</tbody>
</table>

It is possible to group the links by target type (topic type) by setting the `args.rellinks.group.mode=group-by-type` parameter. The output will look like this:

<table>
<thead>
<tr>
<th>Related concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Concept</td>
</tr>
<tr>
<td>Related tasks</td>
</tr>
<tr>
<td>Target Task</td>
</tr>
<tr>
<td>Related information</td>
</tr>
<tr>
<td>Target Topic</td>
</tr>
</tbody>
</table>

Images and Figures

Images are an important part of a publication.

Note:

You can use raster image formats (such as PNG or JPEG), but it is best to use vector images (such as SVG or PDF). They scale very well and produce better results when printed. In addition, the text from these images is searchable and can be selected (if the glyphs have not been converted to shapes) in the PDF viewer.

Images - Built-in CSS

Image properties are defined in `[PLUGIN_DIR]css/print/p-figures-images.css`.

```css
*{class ~*topic/image*} { 
  prince-image-resolution: 96dpi;
  -ah-image-resolution: 96dpi;
  image-resolution: 96dpi;
  max-width: 100%;
}
```

How to Fix Image Bleeding - Control Image Size

Sometimes the images may be too big for the page. The built-in CSS rules specify a maximum size for images, limiting to the width of the parent block. But if the parent block is itself too wide and bleeds out of page, you might consider specifying a length.

In your customization CSS (on page 48), add the following snippet:
Pay attention to images that have an image map (on page 183) associated. The built-in rules set the max-width: auto for them to avoid scaling. Otherwise, it would cause a misalignment between the image and its clickable areas. These images are best to have a @width and @height attribute.

How to Change Image Resolution

How to Change the Resolution for Raster Images

This technique changes the size of all raster images from your documentation. It will not work for vector images, such as PDF or SVG.

The default resolution is 96 dpi (same as in web browsers). You can change it by adding the following in your customization CSS (on page 48):

```
*[class ~="topic/image"] {  
    prince-image-resolution: 300dpi;  
    -ah-image-resolution: 300dpi;  
    image-resolution: 300dpi;  
}
```

Important:
The above selector does not apply to images from the `<imagemap>` element. You can use the following selector for that purpose:

```
*[class ~="ut-d/imagemap"] > *[class ~="topic/image"] {  
    ...  
}
```

Make sure you verify the area shapes to match the new image boundaries. The pixels specified in the image map area coordinates are always 1/96 in. For more details, see: How to Use Image Maps (on page 183).

How to Change the Resolution for Vector Images

This technique will change the size of all vector images (such as PDF or SVG) and will not affect raster images.

Vector images are rendered with a default resolution of 96 dpi. You can change this default value by setting the `image.resolution` transformation parameter (on page 13) to another value (from 72, 120, 300 and 600).
How to Place Big Images on Rotated Pages

Very wide images may bleed out of the page. One solution for this is to use landscape pages for these wide images.

In your customization CSS (on page 48), add:

```css
*{class~="topic/image"}[outputclass='land'] {
  page: landscape-page;
}
```

Setting the attribute `@outputclass = 'land'` on the table element will force the table on a new landscape page. Another solution is to set an `@outputclass` attribute on the image, then create a rule that matches it, and associate a landscape page for it.

How to Place a Text and Image Side by Side

If you need to align text and an image side by side, you can use the following technique:

1. Organize your text and image under a `<div>` element like this:

   ```html
   <div outputclass="side-by-side">
     <p>This will be in the left side, the next figure in the right. </p>
     <fig>
       <image href="cactus.jpeg"/>
     </fig>
   </div>
   ```

   **Note:**
   You can use the `@outputclass` attribute to mark the `<div>` elements that have this special layout.

2. In your customization CSS (on page 48), add:

   ```css
   *[outputclass = "side-by-side"] > *[class = "topic/p"] {
     display:inline-block;
     width: 45%;
   }

   *[outputclass = "side-by-side"] > *[class = "topic/fig"] {
     display:inline-block;
     width: 45%;
   }
   ```

   The image should fill the entire width of the parent `<fig>` element:
By default, the bottom of the image is on the same line as the text baseline. If you want the text and the image to be aligned at the top, add these lines:

```css
*{outputclass ~="side-by-side"} > *{class ~="topic/fig"} > *{class ~="topic/image"} {
   vertical-align:top;
}
```

Note:
The `font-size:0pt` is needed to remove the font ascent and descent around the image rectangle.

How to Control the Image Size in Complex Static Content

It is common to have text and images mixed together in a :before or :after pseudo-element. For example, for notes you may have both artwork and text:

```css
*{class ~="topic/note"}::before {
   content: url('note.png') "Some text";
}
```

If you want to change the size of the image, you have two options:

- **Use the image-resolution CSS property:**

  ```css
  *[class ~="topic/note"] {
   image-resolution:300dpi;
  }
  ```

- **Separate the image from the text and apply the width and height CSS properties only on the image, using the width and height properties. You could use multiple :before pseudo-elements for that, considering that the farthest content presented before the actual content of an element is matched by the :before with the highest number in the brackets:**

  ```css
  *[class ~="topic/note"]:before(2) {
  content: url('note.png') ;
  width:0.5in;
  }
  ```
How to Center Images

DITA defines a `<placement>` attribute for the `<image>` elements. The implicit value is `inline`. Suppose that you need to center the images that have the placement set to `break` (for example, they are not on the same line with other content and the images from the `<fig>` element).

In your customization CSS (on page 48), add:

```css
*.[class ~="topic/fig"]
{
  text-align:center;
}

/* Other images, with break placement. */
*.[class ~="topic/image"] [placement='break']
{
  display:block;
  text-align:center;
}

/*
Scaled images are getting a computed width attribute, so we can use the auto margins.
Auto margins function only if the block they apply to has a width.
*/
*.[class ~="topic/image"] [placement='break'][width]
{
  margin-left:auto;
  margin-right:auto;
  border: 2pt solid red;
}
```

How to Change/Reset the Figure Numbering

**Note:**
This topic is applicable for the `DITA Map PDF - based on HTML5 & CSS` transformation types.

There are cases when you need to change the aspect of the figure counter that is shown before the figure titles. By default, the figure titles are formatted like this:

```
Figure NN. Lore Ipsum Title
```

`NN` is the number of the figure that starts being counted from the beginning of the publication.
One use-case is to have the NN counter be incremented only within one chapter (for example, the first chapter contains "Figure 1" and "Figure 2", and the second chapter starts over with "Figure 1" instead of incrementing to "Figure 3").

You should reset the figure counter on each topic marked as chapter, then hide the label from the figure `<figcaption>` (this is an HTML element generated by the XSL transformation), and create another label using a :before selector on the `<figcaption>`.

```css
/*[class =~ "topic/topic"]{is-chapter} {
    counter-reset: figcount;
}

.fig--title-label{
    display:none;
}

/*[class =~ "topic/fig"] > .figcap:before{
    content: "Figure " counter(figcount) ". ";
    counter-increment: figcount;
}
```

**How to Fix Missing Images**

If your images are not accessible, you may receive an error message in the transformation console like this:

```
Image not found. URI:file:/path/to/my/image
```

This is usually because they are in a folder that is not in the folder subtree of the transformed map or topic. To solve this, you can set the following transformation parameter: `fix.external.refs.com.oxygenxml=true`.

**How to Use Image Maps**

To use the DITA `<imagemap>` element in a PDF transformation, follow this procedure:

1. Start by determining the width and height of your image in **CSS pixels** and specify it on the `<image>` element using the `@width` and `@height` attributes.

**Notes:**

- A **CSS pixel is 1/96 in**, so if the image is created at a 96dpi resolution, one dot from the image is one pixel in the CSS space. If your image is displayed at another resolution (**on page 179**), then it is adjusted accordingly (for example, 192dpi results in two dots from the image being equal to one pixel in the CSS space).
- You can use other CSS units, including percentages. The percentages are solved relative to the image size and represent a way of creating **responsive** image maps.
Warning:
If you publish the content for both PDF and HTML web output, make sure you only use pixels, as some browsers only support these units.

Example:
Suppose you have a very large image that is 6400x4800 dots, but you want to make it fit in a box of 640x480 CSS pixels. In the following snippet, this is done by specifying the width and height attributes. The areas must use coordinates relative to these values.

```html
<imagemap>
  <image href="../images/Gear_pump_exploded.png" id="gear_pump_exploded"
        width="640" height="480">
    <alt>Gear Pump</alt>
  </image>
</imagemap>
```

2. In the map element, add areas (each with a shape and a set of coordinates):

```html
<imagemap>
  <image ...
  > ...
</image>
  <area>
    <shape>circle</shape>
    <coords>172, 265, 14</coords>
    <xref href="parts/bushings.dita#bushings_topic/bushings" format="dita">Bushings</xref>
  </area>

  <area>
    <shape>poly</shape>
    <coords>568, 81, 576, 103, 468, 152, 455, 130</coords>
    <xref href="parts/drive-shaft.dita#drive_shaft_topic/drive_shaft" format="dita">Drive Shaft</xref>
  </area>
...</imagemap>
```

The type of areas are the ones defined in the HTML standard: circle, poly, rect, default. For more details, see: https://html.spec.whatwg.org/multipage/image-maps.html#the-area-element.

3. Verify how the shapes look in the output. You can make the shapes visible by one of the following methods:
• Using the `show.image.map.area.numbers` and `show.image.map.area.shapes` transformation parameters.
• Adding a CSS snippet to your customization. The shapes have the `image-map-shape` class, the bullet around the image map number (`image-map-number`), and the text inside the bullet (`image-map-number-text`). To make them translucent yellow:

```css
.image-map-shape {
  fill: yellow;
  fill-opacity: 0.5;
  stroke-opacity: 0.5;
}
.image-map-number-text {
  visibility: visible;
}
.image-map-number {
  fill: yellow;
  fill-opacity: 0.4;
  stroke-opacity: 0.7;
}
```

**Tip:**
An SVG with links can be used as an alternative to the DITA `<imagemap>` element. Make sure that each link is a relative URI to an ID inside the publication content.

### How to Hide the Image Map Links List

Below every image map, a list of links that point to the image map targets is displayed. This list can be hidden from the final output by using the following CSS selector:

```css
.imagemap--areas {
  display: none;
}
```

### How to Use SVG Syntax Diagrams

The DITA `<syntaxdiagram>` element is supported by the PDF transformation. To use SVG syntax diagrams, follow this procedure:

1. Download the latest version of the `svg-syntaxdiagrams` plugin, unzip it, and copy all the folders into your `DITA-OT-DIR\plugins` folder (they all start with "com.").
2. Open a command prompt inside `DITA-OT-DIR\bin` and run the `dita install` command.
3. You can now add your custom `<syntaxdiagram>` element in your topic, as in the following example:

```xml
<syntaxdiagram id="syntaxdiagram_ok4_clk_xnb">
  <title>CopyFile</title>
  <groupseq><kw>CopyF</kw></groupseq>
</syntaxdiagram>
```
4. Run the DITA Map PDF - based on HTML5 & CSS (or DITA PDF - based on HTML5 & CSS) transformation.

**Warning:** If you are not publishing the content for the first time, you may need to delete the `out/` and `temp/` folders to see the syntax diagram correctly in the `.merged.html` file.

**Result:** The PDF is generated and the syntax diagram is displayed as a referenced SVG file like this:

```
COPYF input-filename *INFILE output-filename *OUTFILE
```

### Tables

Tables are widely used in technical documentation. This section contains information about the CSS rules that are used to style them and how to fix some problems.

#### Tables - Built-in CSS

There is a combination of CSS files that address tables:

- `[PLUGIN_DIR]/css/core/-table-html-cals.css`
- `[PLUGIN_DIR]/css/print/p-tables.css`

#### How to Handle Wide Tables - Page Rotation

Some of the tables can have a large number of columns. In this case, the table may bleed out of the page. One solution is to use landscape pages for these tables.

Setting the attribute `orient = 'land'` attribute on the table element will force the table to be on a new landscape page.

Another solution is to use automatic detection of wide tables (5 or more columns):

```css
*{class~="topic/table"}[data-cols='5'],
*{class~="topic/table"}[data-cols='6'],
*{class~="topic/table"}[data-cols='7'],
*{class~="topic/table"}[data-cols='8'],
*{class~="topic/table"}[data-cols='9'],
*{class~="topic/table"}[data-cols='10'] {
  page: landscape-page;
}
```
Note:
The landscape-page page layout is defined in the [PLUGIN_DIR]/css/print/p-pages-and-headers.css file.

If you want to rotate the entire topic that contains the big table, use:

```css
* [class~="topic/table"] [data-cols='5'],
* [class~="topic/table"] [data-cols='6'],
* [class~="topic/table"] [data-cols='7'],
* [class~="topic/table"] [data-cols='8'],
* [class~="topic/table"] [data-cols='9'],
* [class~="topic/table"] [data-cols='10'] {
  max-width: 100%;
  table-layout: auto;
}

* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='5']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='6']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='7']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='8']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='9']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='10']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='5']) > *
  [class~="topic/table"] [data-cols='5']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='6']) > *
  [class~="topic/table"] [data-cols='6']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='7']) > *
  [class~="topic/table"] [data-cols='7']),
* [class~="topic/topic"]:has(*:not([class~="topic/topic"]) > *
  [class~="topic/table"] [data-cols='8']) > *
  [class~="topic/table"] [data-cols='8']),
```
Note:
It is also possible to import the [PLUGIN_DIR]/css/print/p-optional-auto-rotate-wide-tables.css stylesheet into your custom CSS.

How to Avoid a Table Exceeding the Page Width

The DITA specification indicates that tables should have a fixed layout. This can be done in two different ways:

1. **Using proportional or relative measures** - It includes percent values and shares values (i.e. "3*" or "12*").

2. **Using fixed measures** - It includes all the values followed by units (i.e. in, pt, px, and others).

**Important:**
Although the specification allows you to combine these values, it is **highly recommend** that you only use one method at a time. Combining both methods could lead to a table exceeding the page width and will make the content unreadable.

How to Fix Text Bleeding From Table Cells

Slim tables or tables that have many columns make the text from the cells be confined to a small horizontal space. Sometimes this causes long words to bleed outside the cell boundaries.

By default, the built-in CSS automatically activates the hyphenation for the text inside tables as long as your topics have the language specified.
In case the text is still bleeding outside the boundaries, you can also use the `overflow-wrap` property to force the word to break:

```css
*[class ~="topic/table"] { 
    overflow-wrap: break-word;
}
```

Related Information:
- Hyphenation *(on page 150)*
- How to Enable/Disable Hyphenation for Tables *(on page 153)*

### How to Fix Small Images in Table

Tables contained in the output of DITA Map PDF - based on HTML5 & CSS (and DITA PDF - based on HTML5 & CSS) transformations have an automatic layout by default. This means that DITA-OT defines a preferred size on them, optimizing their width/height inside the content to make them as small as possible.

If, for example, you have a two-column table *without defined column widths* and one column contains images while the other column contains text, the table in the generated PDF will have its first column shrunk with smaller images and an enlarged second column (to occupy the least amount of space in the output).

To avoid this, you must `unset` the default image `max-width` so that the original size of the image will be used instead:

```css
*[class ~="topic/image"] { 
    max-width: unset;
}
```

### How to Rotate Content from a Table Cell

In DITA CALS tables, you can rotate the content of a cell by setting the `@rotate` attribute to 1.

In the following example, the `Sport`, `All terrain`, and `Family` header cells are rotated.

```html
<table frame="all" rowsep="1" colsep="1" id="table_d1p_flb_crb">
    <title>Car Features</title>
    <tgroup cols="4">
        <colspec colname="c1" colnum="1" colwidth="14*"/>
        <colspec colname="c2" colnum="2" colwidth="1*" align="center"/>
        <colspec colname="c3" colnum="3" colwidth="1*" align="center"/>
        <colspec colname="c4" colnum="4" colwidth="1*" align="center"/>
    </tgroup>
    <thead>
        <row>
            <entry morerows="1">Car Name</entry>
            <entry namestart="c2" nameend="c4">Features</entry>
        </row>
    </thead>
</table>
```
Table 2. Car Features

<table>
<thead>
<tr>
<th>Car Name</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tesla Model S</td>
<td></td>
</tr>
<tr>
<td>Sport</td>
<td>X</td>
</tr>
<tr>
<td>All terrain</td>
<td>X</td>
</tr>
<tr>
<td>Family</td>
<td>X</td>
</tr>
</tbody>
</table>

The resulting output will be:

```
<entry rotate="1">Sport</entry>
<entry rotate="1">All terrain</entry>
<entry rotate="1">Family</entry>
</row>
</thead>
<tbody>
  <row>
    <entry>Tesla Model S</entry>
    <entry>X</entry>
    <entry/>
    <entry>X</entry>
  </row>
... 
```

The built-in CSS matches the cells with this attribute and applies the following properties:

```css
*{class="topic/entry"}[rotate='1'] { 
  transform: rotate(270deg);

  /* Avoid wrapping, including hyphenation */
  white-space:pre;
  hyphens:manual;
} 
```
To change the vertical alignment of the content (for example, to move it to the middle of the cell), use the following in your CSS customization:

```css
*[class~="topic/entry"][rotate='1'] {
  vertical-align:middle;
}
```

The resulting output will be:

<table>
<thead>
<tr>
<th>Car Name</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sport</td>
</tr>
<tr>
<td>Tesla Model S</td>
<td>X</td>
</tr>
<tr>
<td>Nissan Leaf</td>
<td></td>
</tr>
<tr>
<td>Dacia Duster</td>
<td>X</td>
</tr>
</tbody>
</table>

To make the text wrap (for instance, the "All terrain" could be split on two lines), you need to inhibit the whitespace preservation from the built-in CSS. In this case, all spaces will create a line break in the rotated layout. Thus, you can add this in your customization:

```css
*[class~="topic/entry"][rotate='1'] {
  vertical-align:middle;
  whitespace:normal;
}
```

The resulting output will be:
How to Add Horizontal Lines to a Choice Table

To add horizontal lines that separate the options within a `<choicetable>`, you can use borders set on each of the rows. The following CSS styles the top header and the first column with some background colors. In a choice table, the first column represents the choice labels.

```css
/* [class~="topic/entry"] [rotate='1'] { 
  padding-left: 2em;
}

/* [class~="task/choptionhd"],
/* [class~="task/choptionhd"],
/* [class~="task/chdeschd"],
/* [class~="task/choption"] { 
  background-color: #EEEEEE;
  text-align: left;
}

/* [class~="task/choicetable"] { 
  border: 2pt solid #EEEEEE;
}

/* [class~="task/choicetable"] * [class~="task/chrow"],
/* [class~="task/choicetable"] * [class~="task/chhead"] { 
  border-bottom: 2pt solid #EEEEEE;
}
```
How to Remove the Table NN Label

For the DITA Map PDF - based on HTML5 & CSS transformation scenario, the label for a table's title is wrapped in a span element with the class: table--title-label.

```html
<table ...
...
<caption class="- topic/title title tablecap">
   <span class="table--title-label">Table</span>
   <span class="table--title-label-number">1. </span></span></caption>
</table>
```

To hide it, set its display to none:

```css
.table--title-label {
   display:none;
}
```

For the direct transformation, use:

```css
*[class ~="topic/table"] > *[class ~="topic/title"]:before {
   content: none;
}
```

How to Center Tables

You can center the tables by using margins auto, while the table caption (title) can be centered using the text-align property:

```css
*[class ~="topic/table"] {
   margin-left:auto;
   margin-right:auto;
   width: 50%;
   border: 1pt solid blue;
}
```
How to Add Stripes to a Table

To create a striped look for your tables, you can use the following CSS rules:

```css
/* Header background and foreground */
*[class = "topic/table"]*[outputclass = "stripes"] > *[class = "topic/thead"] > *[class = "topic/row"] { 
  background-color: blue;
  color: white;
}

/* A default background for the entire table body */
*[class = "topic/table"]*[outputclass = "stripes"] > *[class = "topic/tbody"] { 
  background-color: #e4e4e4;
}

/* Color for the stripes */
*[class = "topic/table"]*[outputclass = "stripes"] > *[class = "topic/tbody"] > *[class = "topic/row"]:nth-child(odd) { 
  background-color: cyan;
}

/* Border for the cells */
*[class = "topic/table"]*[outputclass = "stripes"] *[class = "topic/entry"] { 
  border: blue;
}
```

The above rules assume that tables that are to be painted with stripes are marked with an `@outputclass` attribute:

```html
<table outputclass="stripes">...
</table>
```

If you want to make all tables look the same, you can ignore this attribute and remove the `*[outputclass = "stripes"]` simple selector from the above rules.

⚠️ **CAUTION:**

Applying stripes and thin cell borders can cause rendering issues in the PDF renderer on screen display devices. For more information, see How to Fix Disappearing Thin Lines or Cell Borders (on page 207).
**Code Blocks**

Code blocks are used to render section of programming code.

**How to Enable Code Syntax Highlighting**

This topic refers only to the DITA Map PDF - based on HTML5 & CSS transformation type. You can use syntax highlighting to make it easier to read your code snippets by displaying each type of code in different colors and fonts. In the DITA topics, set the `@outputclass` attribute on the `<codeblock>` elements to one of these values:

- language-bourne
- language-c
- language-cpp
- language-csharp
- language-css
- language-ini
- language-java
- language-javascript
- language-json
- language-lua
- language-perl
- language-php
- language-python
- language-ruby
- language-sql
- language-xml
- language-xquery

For example, for a java snippet:

```xml
<codeblock outputclass="language-java">
  for (int i=0; i<100; i++) {
    // do something
  }
</codeblock>
```

The resulting HTML fragment in the merged HTML5 document is:

```html
<pre class="+ topic/pre-d/codeblock pre codeblock language-java" xml:space="preserve">
  <strong class="hl-keyword" style="color:#7f0055">for</strong>
  <span class="hl-number" style="color:#7f0055">i</span>=<span class="hl-number" style="color:#7f0055">0</span>; i<100; i++) {
    // do something
  }
</pre>
```
Changing the Colors for the Syntax Highlighting

As you can see in the above example, the HTML elements `<span>` and `<strong>` are used to color the content. Since they have a `@style` attribute set, the overriding properties need to be marked with `!important`.

Suppose you want to color the keywords in red and the comments in blue. To do so, add the following to your customization CSS (on page 48):

```
.hl-keyword {
    color: red !important;
}
.hl-comment {
    color: blue !important;
}
```

How to Disable Line Wrapping in Code Blocks

By default, code blocks have the content wrapped to avoid the bleeding of long lines out of the page. To avoid wrapping, add the following in your customization CSS (on page 48):

```
*[class~="pr-d/codeblock"] {
    white-space: pre;
}
```

For the DITA Map PDF - based on HTML5 & CSS transformation type, the best solution to distinguish between lines is to leave them wrapped, but color each line with a different background (zebra coloring). An example is provided here: XSLT Extensions for PDF Transformations (on page 33).

How to Deal with Unwanted Returns in Code Blocks

There are cases where the source file contains long lines of code that need to continue onto the next line in the rendered PDF (to wrap visually).

When the user copies the block from the PDF reader, they get two separated lines. This means that the command fails when users copy it from the PDF to the command-line terminal (because it comes in as two commands).

For example, the command:

```
$gist = ls -l * | count -n | some more
```
May be rendered in the PDF on two lines:

```
$gist = ls -l * | count -n
| some more
```

And this is invalid when used in the terminal.

There is no CSS workaround for this, but to manually format the command line, add a line continuation character like this:

```
$gist = ls -l * | count -n \ 
| some more
```

Note:
For Linux/macOSX, the continuation character is the backslash \\. For Windows, this is the shift character ^.

The command-line processor will now recognize that the first line is continuing on to the next one.

**Notes**

Notes contain an additional piece of information that calls attention to particular content. They may have various types (tip, caution, danger, restriction, important, warning).

For information on how to add and manage mixed content before the note icons and labels, see How to Control the Image Size in Complex Static Content (on page 181).

**How to Change Note Icons**

The recommended icon format is SVG.

To change the default icons for notes that do not have a `@type` attribute, add the following rule to your customization CSS (on page 48):

```css
div.note {
  background-image:url('../img/note.svg');
}
```

For a note with a `@type` attribute set to `warning`, `caution`, or `trouble`, add the following corresponding CSS rule:

```css
div.warning {
  background-image:url('../img/warning.svg');
}
div.caution {
  background-image:url('../img/caution.svg');
}
div.trouble {
  background-image:url('../img/troubleshooting.svg');
}
```
Abbreviated Forms

When using the `<abbreviated-form>` element in your content, it is possible to style the subsequent occurrences differently than the first occurrence. To achieve this, add something similar to the following rule in your customization CSS (on page 48):

```css
a:has(dfn[class ~="abbreviated-form"]) {
  color: oxy_xpath("let $cdf:= dfn return if (preceding::dfn[@keyref = $cdf/@keyref]) then 'black' else 'red'");
  text-decoration: oxy_xpath("let $cdf:= dfn return if (preceding::dfn[@keyref = $cdf/@keyref]) then 'none' else 'underline'");
}
```

This example would render the first occurrence with a red color and an underline, while the subsequent occurrences would be rendered with a black color and no underline.

Trademarks

Trademarks are used to specify legally registered words and they are often used in technical documentation. To specify a trademark, your DITA content could use a structure similar to this:

```xml
<tm tmtype="tm">My Product Name</tm>
```

Depending on the value of the `tmtype` attribute, a different symbol is appended to the text: (®, ™, or ℠).

The structure of the merged HTML document the CSS will apply to is:

```html
<span class="- topic/tm tm" tmtype="tm">My Product Name</span><span class="- topic/tmmark tmmark ">™</span></span>
```

How to Style the Trademark Element Text

To change the style of the entire trademark text, you can match the `topic/tm` class like this:

```css
*[class ~="topic/tm"] {
  font-weight:bold;
}
```

How to Style the Trademark Symbol

To change the aspect of the trademark symbol, you can use the `topic/tmmark` class. Usually, common fonts already render these symbols smaller and with superscript by default. The following example does it from the CSS:

```css
*[class ~="topic/tmmark"] {
  vertical-align: super;
  font-size: smaller;
}
```
Styling Through Custom Parameters

You can activate parts of your CSS by using custom transformation parameters that start with the `args.css.param` prefix.

These parameters are recognized by the publishing pipeline and are forwarded as synthetic attributes on the root element of the merged map. The last part of the parameter name will become the attribute name, while the value of the parameter will become the attribute value. The namespace of these synthetic attributes is: `http://www.oxygenxml.com/extensions/publishing/dita/css/params`.

When using the DITA Map PDF - based on HTML5 & CSS or the DITA PDF - based on HTML5 & CSS transformations, the generated attribute will be in no namespace.

**Notes:**

- Make sure the name of your custom parameter does not conflict with an attribute name that may already exist on the root element.
- Use only Latin alphanumeric characters for parameter names.
- You can set multiple styling parameters at the same time.

How to Limit the Depth of the TOC Using a Parameter

In the following example, a custom parameter is used to switch from a full depth table of contents to a flat one that shows only the titles of the first-level topics (such as chapters, notices, or the preface).

The custom parameter is:

```
args.css.param.only-chapters-in-toc="yes"
```

The CSS that hides the `topicrefs` at level 2 or more:

```
:root[only-chapters-in-toc='yes'] *[class =~ "toc/toc"]
 > *[class =~ "map/topicref"]*[class =~ "map/topicref"] {
     display: none;
 }
```

The `:root[only-chapters-in-toc='yes']` selector makes the rule activate only when the attribute is set.

How to Change the Page Size Using a Parameter

In the following example, a custom parameter is used to modify the page size. The parameter is defined in the transformation scenario as:

```
args.css.param.page-size="A4"
```

Then in the CSS, the attribute value is extracted and used as follows:

```
@page {
    size: oxy_xpath('/@*[local-name()="page-size"][1]');
}
```
How to Change the Cover Page Using a Parameter

In the following example, a custom parameter is used to set the path of the cover page. The parameter points to an image by using its URL and is defined in the transformation scenario as:

```
args.css.param.cover-page="file:/path/to/cover-page.svg"
```

Then in the CSS, the attribute value is extracted and used as follows:

```
@page front-page {
    background-image: url(oxy_xpath('./@*[local-name()="cover-page"]')[1]);
}
```
Controlling the Publication Content

Using a plain DITA map, the transformation will produce a publication with a front page, a table of contents, chapters with content, and an index at the end. This is appropriate for most cases, but there are use cases where some adjustments are necessary. For example, if you want to do one of the following:

- Remove the TOC or index.
- Add a glossary.
- Change the position of the TOC or the index relative to the sibling topics.
- Add a *preface, frontmatter, or backmatter* with copyright notices, abstracts, list of tables, list of figures, etc.

All of these can be achieved using a DITA `<bookmap>` element.

A bookmap has a more elaborate structure than a regular map. You should start by defining the title structure, with a main title and alternative title:

```
<!DOCTYPE bookmap PUBLIC "-//OASIS//DTD DITA BookMap//EN" "bookmap.dtd">
<bookmap id="taskbook">
  <booktitle>
    <mainbooktitle>Publication Title</mainbooktitle>
    <booktitlealt>A very short description of the publication</booktitlealt>
  </booktitle>
</bookmap>
```

Then you may define a *frontmatter*. For this, you can link the topics that need to appear before the main content. You can also define the location where the table of contents will be placed. In the example below, it appears between the *abstract.dita* and *foreword.dita* topics:

```
<frontmatter>
  <topicref href="topics/abstract.dita"/>
  <booklists>
    <toc/>
  </booklists>
  <topicref href="topics/foreword.dita"/>
</frontmatter>
```

**Note:**

To remove the TOC from the publication, just omit the `<toc>` element from the `<booklists>` element.

Next, the topics are grouped into chapters:
At the end, you could define the structure of the backmatter. Just like for the frontmatter, you can include some topics and some generated content (such as the index). In the example below, the glossary is defined to come after the index, followed by a list of figures and list of tables. At the very end, there is a topic with some thank you notes.

```xml
<backmatter>
  <topicref href="topics/conclusion.dita"/>
  <booklists>
    <indexlist/>
    <glossarylist>
      <topicref href="topics/xp.dita" keys="xp" print="yes"/>
      <topicref href="topics/anti_lock_braking_system.dita" keys="abs" print="yes"/>
    </glossarylist>
    <figurelist/>
    <tablelist/>
  </booklists>
  <topicref href="topics/thanks.dita"/>
</backmatter>
```

As you can see, the bookmap offers much better control over the final content of the publication. It also offers more options in controlling the metadata that will go into the PDF (see the Metadata (on page 95) topic).

**How to Omit the Front Page, TOC, Glossary, Index for a Plain DITA Map**

For a plain DITA map, there are no elements that allow you to control if and where to place the generated content such as the title page, table of contents, list of tables, glossary, or index. For the most common use-case, when you want to hide them all and just keep the content, you can use the transformation parameter `hide.frontpage.toc.index.glossary`. See: Transformation Parameters (on page 13).

**Related Information:**
- How to Remove Entries from the TOC (on page 126)
- How to Hide the TOC (on page 126)

**How to Make Chapters Look Like Individual Publications**

*Note:
This topic is only applicable for the DITA Map PDF - based on HTML5 & CSS transformation scenario.*
Sometimes you want to make each chapter independent (i.e. it can be read separately, as a separate part of your publication). For this, you need the page counter, figure, and table counters to restart at each chapter. You can control this by using the `args.css.param.numbering (on page 109)` command-line parameter.

In addition to numbering, you can force the creation of a chapter TOC (on page 127).
6. Troubleshooting

This section contains information about fixing various change tracking, highlights and comments publishing problems.

Failed to Run Pipeline: The Entity Cannot BeResolved Through Catalogs

Problem

You can get a Failed to run pipeline error message that looks something like this:

```
Failed to run pipeline: The entity SOME_ENTITY cannot be resolved through catalogs.
For security reasons files that are not listed in the DITA-OT catalogs and are not
located in the DITA-OT directory are not read
```

Cause

This happens when the security checks that are implemented in the default transformation have blocked the reading of files that are not part of the DITA-OT (Oxygen Publishing Engine) installation directory and not part of the transformed DITA map.

Solution

If the origin of the transformed content is known and trusted, you can disable these checks by setting the `args.disable.security.checks` transformation parameter to `yes`.

The format-date() XPath Function Does not Respect the Specified Locale

Problem

Formatting a date using another language code, as in this example:

```
title:before {
    content: oxy_xpath('format-date(current-date(), "[Mn] [Y]", "ru", (), ())');
}
```

results in an output like: [Language: en]september 2019, with the date being formatted in English.

Cause

The XPath expressions are evaluated using the Saxon HE processor. This processor does not support languages other than English (https://sourceforge.net/p/saxon/mailman/message/26849522/).
Solution

As a solution, you can either switch to a more language-neutral format that avoids the months names:

```xml
<title:before{
    content: oxy_xpath('format-date( current-date(), "[M] [Y]", "en", (), ())');
}
```

or you can use a more complex XPath expression like this:

```xml
<title:before{
    content: oxy_xpath("let $cm:= format-date(current-date(), '[MNn]') \n
return concat( \n
if ($cm= 'January') then 'JAN' else \nif ($cm= 'February') then 'FEB' else \nif ($cm= 'March') then 'MAR' else \nif ($cm= 'April') then 'APR' else \nif ($cm= 'May') then 'MAY' else \nif ($cm= 'June') then 'JUNE' else \nif ($cm= 'July') then 'JUL' else \nif ($cm= 'August') then 'AUG' else \nif ($cm= 'September') then 'SEPT' else \nif ($cm= 'October') then 'OCT' else \nif ($cm= 'November') then 'NOV' else '' \n,
', \n' ', \nformat-date(current-date(), '[Y0001]') \n)");
```
Make sure the entire expression is rendered blue in the CSS editor. Replace the capitalized month names with the translation in the desired language.

**Error Parsing CSS File - Caused by a Networking Problem**

**Problem**
My custom styles are not applied and in the transformation results console, I get an error containing one of the following: *I/O exception, Unknown host, Error parsing*.

**Cause**
One of the CSS files contains references to resources from another website that is currently inaccessible. These resources may include:

- Fonts
- Images
- Other CSS files

**Note:**
If you exported one of the built-in publishing templates from the transformation scenario dialog, it is possible that the associated CSS files use an imported Google Font.

**Remedy**

1. Check your proxy settings (ask the system administrator for help).
2. If the server is still inaccessible from the transformation process, download the remote resources using a web browser, save them in the customization CSS file folder, and refer them directly from your CSS.

**Note:**
If the problem is caused by a remote font, see Using Local Fonts.

**Glossary Entries Referenced Using 'glossref' are not Displayed**

**Problem**
I have a `<glossgroup>` that contains multiple `<glossentry>` elements and all the entries are referenced using `<glossref>` elements inside my map. When I add an `<abbreviated-form>` element linked to one of my `<glossentry>` elements (using a `<keyref>`), the entry is not resolved in the PDF output.

**Solution**
Make sure every `<glossentry>` has an `@id`. Then, for each `<glossentry>`, declare a `<glossref>` element like this:
Important:
For bookmaps, the `glossref` elements should be declared in a separate ditamap.

How to Fix Disappearing Thin Lines or Cell Borders

Problem
There are cases where thin lines disappear from the PDF viewer at certain zoom levels.

Cause
This is caused by the limited resolution of the display, while a printer has a superior resolution and there should be no problem printing thin lines on paper.

Solution
If the primary PDF target is the display, then you have to use thicker lines in your CSS customization (for example, avoid using 1px and use 1pt or larger instead).

If you are using Adobe Acrobat Reader, then you can enhance the display of thin lines. This behavior can be changed by going to Edit > Preferences > Page Display > Enhance Thin Lines. Deselecting this option makes thin lines displayed as a row of gray pixels (through antialiasing) and they do not disappear. You can experiment by selecting and deselecting the option.
7.

Glossary

Bookmap

A bookmap is a specialized DITA map used for creating books. A bookmap supports book divisions such as chapters and book lists such as indexes.

DITA Map

A DITA map is a component of the DITA framework (on page 208) that provides the means for a hierarchical collection of DITA topics that can be processed to form an output. Maps do not contain the content of topics, but only references to them. These are known as topic references. Usually, the maps are saved on disk or in a CMS with the extension .ditamap.

Maps can also contain relationship tables that establish relationships between the topics contained within the map. Relationship tables are also used to generate links in your published document.

You can use your map or bookmap (on page 208) to generate a deliverable using an output type such as XHTML, PDF, HTML Help, or Eclipse Help.

DITA-OT-DIR

DITA_OT_DIR refers to the default directory for your DITA Open Toolkit distribution.

Framework

A framework refers to a package that contains resources and configuration information to provide ready-to-use support for an XML vocabulary or document type. A framework is associated to an XML document type according to a set of rules. It also includes a variety of settings that improve editing capabilities for its particular file type.

Oxygen Publishing Template

Oxygen Publishing Template defines all the aspects related with the look and feel(layout and styles) for the WebHelp Responsive output.

The template is self-contained and packed as a ZIP archive making it easy to share with others. It represents the main method for customizing the WebHelp Responsive output.
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Oxygen DITA-OT CSS-based PDF Publishing plugin
User Manual
Syncro Soft SRL.

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Documentation: For the most current versions of documentation, see the Oxygen DITA-OT CSS-based PDF Publishing plugin User Manual.

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