Container Management

Manual

For Container Manager 5.2

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dSPACE

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Important Notice

Contents

About This Document

Contents

This document introduces you to managing SWC containers.

This document is primarily for engineers who want to exchange data related to AUTOSAR software components between SystemDesk and TargetLink.

Symbols

dSPACE user documentation uses the following symbols:

Symbol	Description
DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a hazard that, if not avoided, could result in property damage.
Note	Indicates important information that you should take into account to avoid malfunctions.
Tip	Indicates tips that can make your work easier.
	Indicates a link that refers to a definition in the glossary, which you can find at the end of the document unless stated otherwise.
	Precedes the document title in a link that refers to another document.

Naming conventions

dSPACE user documentation uses the following naming conventions:

%name% Names enclosed in percent signs refer to environment variables for file and path names.

< > Angle brackets contain wildcard characters or placeholders for variable file and path names, etc.

Special folders

Some software products use the following special folders:

Common Program Data folder A standard folder for application-specific configuration data that is used by all users.

`%PROGRAMDATA%\dSPACE\<InstallationGUID>\<ProductName>`

or

`%PROGRAMDATA%\dSPACE\<ProductName>\<VersionNumber>`

Documents folder A standard folder for user-specific documents.

`%USERPROFILE%\Documents\dSPACE\<ProductName>\<VersionNumber>`

Local Program Data folder A standard folder for application-specific configuration data that is used by the current, non-roaming user.

`%USERPROFILE%\AppData\Local\dSPACE\<InstallationGUID>\<ProductName>`

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dSPACE Help (local) You can open your local installation of dSPACE Help:

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To access the Web version, you must have a *mydSPACE* account.

PDF files You can access PDF files via the icon in dSPACE Help. The PDF opens on the first page.

Working with the Container Manager

Where to go from here

Information in this section

Introduction to the Container Manager

Basics

The Container Manager is a tool for managing containers that lets you synchronize the contents of containers and manage files in a container, e.g., by adding textual specifications of a software component. It provides an overview of all the containers in a project and shows differences to containers in another project.

Note

Software components are exchanged by exporting and then importing them. You have to perform the export or import of containers in either SystemDesk or TargetLink.

The Container Manager is not needed for import or export operations. You can use this tool for file operations.

Synchronizing containers using the Container Manager You can synchronize containers with the Container Manager.

It lets you synchronize different containers without opening SystemDesk or TargetLink. Refer to How to Perform Customized Container Synchronization on page 11.

Hierarchical structure

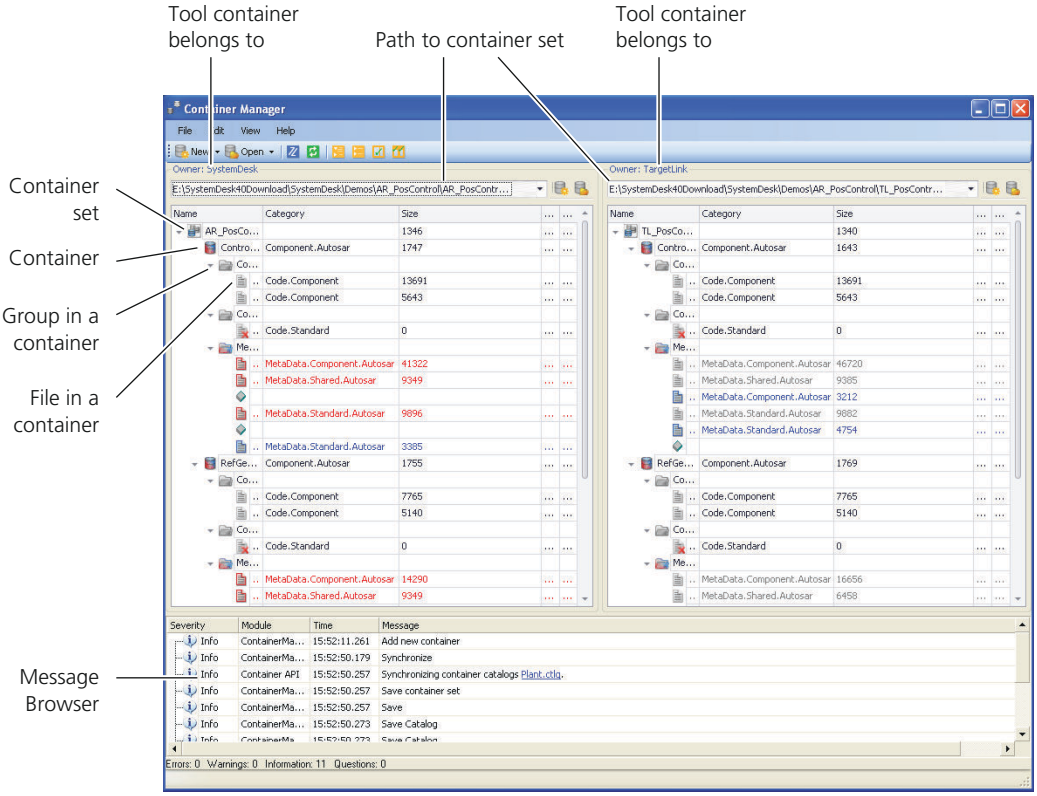
The Container Manager displays the existing containers hierarchy.

Container set A synonym for a container set (CTS) file that contains one or more containers.

Container A synonym for container (CTLG) file that contains one or more groups of files.

Group in a container The hierarchical structure where the files of a software component (container) are categorized. A file's format defines the group it belongs to. The `CodeFiles` group, for example, gathers C and H code files. Groups cannot be nested.

File in a container The lowest structural level in a container.



The Container Manager also contains the following elements:

Tool Container belongs to The name of the tool in which the container set was created.

Path to container set The location of the container set (CTS) file on the hard disk.

Message Browser The Message Browser provides a history of all info, error, and warning messages that occur when you work with the Container Manager.

How to Add Additional Files

Objective

If you want to add files to a container that are not provided by SystemDesk or TargetLink, e.g., specification files or other documents, you can use the Container Manager.

Preconditions

- You have created a software component according to the AUTOSAR standard and exported it to a container.
- You have started the Container Manager.

Method

To add additional files

1 In the Container Manager, expand the group in the container where you want to place the additional files.

Tip

If you want to create a new group for the additional files, select the Add Group command from the context menu of the container.

2 Right-click this group to open its context menu.

The context menu of the group opens.

3 From the context menu, select Add Files.

The Open dialog opens.

4 In the Open dialog, mark the files you want to add to the expanded group, and click Open.

Result

You have added one or more files to the selected group in a container.

Related topics

Basics

Introduction to the Container Manager 7

References

Add Files 37

How to Add a Container From a File

Objective

If you want to use atomic software components of different SystemDesk projects or TargetLink models in one existing container set, you can use the Container Manager.

Preconditions

- You have two container sets that each contain one or more containers.
- You have started the Container Manager.

Method

To add a container from file

1. In the Container Manager, right-click the container set where you want to place the additional container.
   The context menu of this container set opens.
2. From the context menu, select **Add Container from File**.
   The **Select Container Set or Catalog** dialog opens.
3. In the **Select Container Set or Catalog** dialog, click the Browse button in the **Catalog File** field.
   The **Select Catalog** dialog opens.
4. In the **Select Catalog** dialog, mark the CTLG file which represents the container you want to add. Click **Open**.
5. In the **Select Container Set or Catalog** dialog, the CTLG file to be added is checked. Click **OK**.

Result

You have added one container to the selected container set.

Related topics

Basics

Introduction to the Container Manager 7

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Add Container From Container Set 37

How to Perform Customized Container Synchronization

Objective

To synchronize software component containers manually.

Default and customized synchronization

Default synchronization For file synchronization, container management categorizes each file and specifies one of the basic file operations as the default synchronization operation according to the workflow definition file and the built-in rules.

If the default synchronization operations meet your requirements, you can use the **Synchronize Left** and **Synchronize Right** commands.

Customized synchronization If the default synchronization operations do not meet your requirements, you can perform customized container synchronization. The default operations are proposed for you to change as required.

Tip

To avoid frequent customized container synchronization, you should consider changing the workflow definition file to make the required synchronization operations the defaults.

Preconditions

You have started the Container Manager, and opened a source container set as well as a target container set.

Method

To perform customized container synchronization

1. In the Container Manager, press **F9** or select File - Expand All.

   All the structural elements and all the included files of the container set are shown.

2. In the Container Manager, right-click the container set, container or group you want to synchronize with the same structural element on the other side.

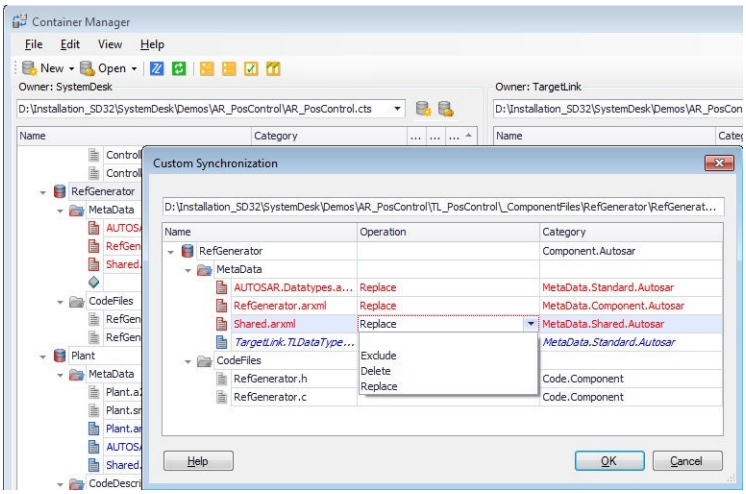
   The context menu of the marked element opens.

3. In the context menu, click Customized Synchronize Right/Left.

   The Custom Synchronization dialog opens. The default synchronization Operation is displayed individually for each file.

4. Click a file operation.

   A drop-down list of possible operations opens.



5. Select the required operation and click OK to close the dialog.

   Custom synchronization is performed according to the selected file operations.

Result

You have synchronized a container set, container, or group in a container using *customized* synchronization file operations.

Related topics

Basics

References

How to Compare Files

Objective

To compare files with the Container Manager.

Preconditions

- You have installed a compare tool and specified it in the Preferences dialog. Refer to Preferences on page 55.
- In the Container Manager, you have opened a container set, which consists of a source and a target container set.

Method

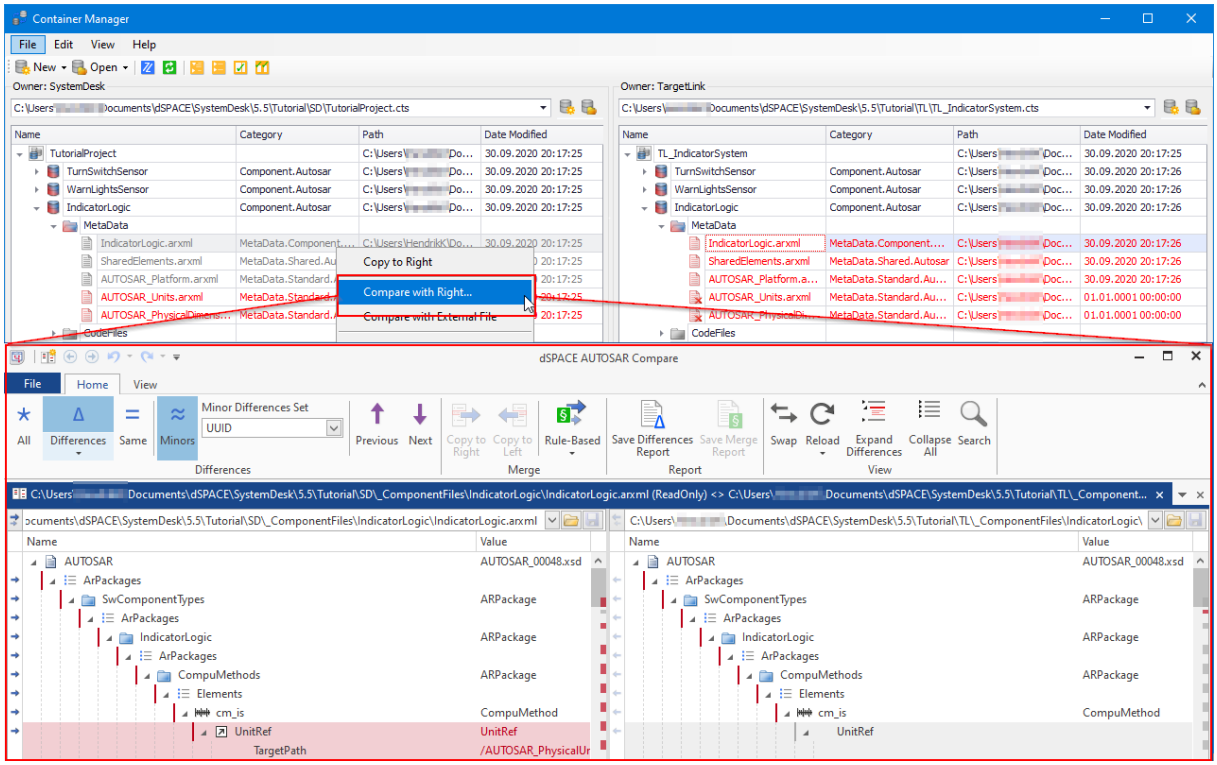
To compare files

1. In the Container Manager, press **F9** or select File - Expand All.
   All the structural elements and all the included files of the container are shown.
2. Right-click a file in a container you want to compare.
   The context menu of the file opens.
3. In the file's context menu, select the Compare External File command.
   The compare tool's dialog opens and highlights the differences of the compared files.

Result

You have compared files by means of the Container Manager.

As an example, the illustration below shows a result of comparing two ARXML files using *dSPACE AUTOSAR Compare*, which is the dSPACE tool for comparing AUTOSAR files:



Related topics

References

Compare External File 40
Preferences 55

How to Create a Container Set File

Objective

You can create a CTS file manually, for example, to archive containers on a network drive.

Basics

CTS file created automatically A container set file is automatically created, when you use the container management export command. This is the usual way to create a CTS file.

CTS file created manually Suppose you want to archive containers created by SystemDesk or TargetLink on a network drive. In this case, you can create a CTS file manually in the network, and synchronize the containers to be archived to that CTS file.

Method

To create a container set file

1. From the Container Manager's File menu, select New — Left or New — Right.

   A File dialog opens.

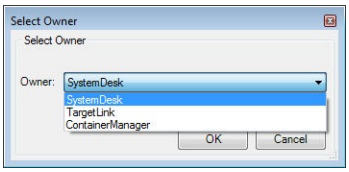
2. In the File dialog, specify the name of the new file and select **`Containerset file`** in the Save as type field.

3. In the File dialog, press Save to create the file and close the dialog.

   The Select Owner dialog opens.

4. In the Select Owner dialog, select the appropriate tool, and click OK to close the dialog.

   A new empty container set file is created and displayed in the left or right area of the Container Manager depending on the command used.



Result

You have created a container set file (CTS).

Related topics

Basics

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References

Export SWC Container (SystemDesk Manual)

Advanced: Configuring Container Handling

Where to go from here

Information in this section

Basics on the Workflow Definition (CTW) File

Introduction

The workflow definition file is the central location for defining rules for container and file synchronization.

The rules specify how the files of a software component (SWC) collected in a container are treated in the workflow and organized in the directory structure. Rules for container and file synchronization are defined centrally in the workflow definition (CTW) file.

You can adjust the CTW file to individual requirements.

Note

It is recommended that only experienced users change the workflow rules. There is a special syntax for defining workflow rules.

Main functions

The most important functions of the workflow rules are the organization of the container structure, the synchronization of files and the storing concept for the files belonging to a software component. The rules are used by SystemDesk and TargetLink when you import a container. They are also used by the Container Manager when you synchronize containers.

File categorization and container partitioning The files in a container are organized in groups. The workflow rules define the clustering inside the container by means of the file name extension and the elements of the workflow definition (CTW) file especially the file categories (refer to File categories on page 20).

Synchronization Container synchronization is based on the rules in the CTW file. For further information, refer to Workflow rule sets on page 21 and Example of Synchronizing Containers on page 25.

File locations The rules also define the organization of the files belonging to a container in the file system.

Adjustment to individual requirements

The rules in the CTW file cover the most common cases in working with containers. There are default rules that cover other cases, such as where nonstandard file formats (i.e., not ARXML, A2L, C, H, etc.) have to be added.

If you need an organizing structure in the container, for example, for text documents in a Word format, the CTW file can be adjusted to this requirement.

Compatibility to other versions A CTW file can also be used in newer versions of SystemDesk and TargetLink.

Location of the workflow definition file

You can define the location of the CTW file in the **General Page** of the Preferences on page 55 dialog.

Related topics

Examples

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Elements of the Workflow Definition (CTW) File

Introduction

The workflow definition file is an XML file which consists of 5 sections containing details on how files are treated when containers are managed.

AUTOSAR versions

The first section lists the AUTOSAR versions. You can select the version when you export a container, for example, from SystemDesk. One of these versions can be set as the default.

```
<!--
#####################################################
# AUTOSAR Versions which are used in the workflow #
#####################################################
-->
<SupportedAutosarVersion IsDefault="true">3.2.1</SupportedAutosarVersion>
<SupportedAutosarVersion>3.1.5</SupportedAutosarVersion>
<SupportedAutosarVersion>3.1.4</SupportedAutosarVersion>
<SupportedAutosarVersion>3.1.2</SupportedAutosarVersion>
```

The AUTOSAR versions defined in the CTW file must match the AUTOSAR versions supported by the related tools (SystemDesk, TargetLink).

Tool definitions

The Tool Definitions section consists of the tool definitions for the tools involved in container management.

Normally you do not need to change the list of tools.

```
<!--
####################
# Tool Definitions #
####################
-->
<ToolDefinition Name="SystemDesk">
  <Description>AUTOSAR system design tool.</Description>
</ToolDefinition>
<ToolDefinition Name="TargetLink">
  <Description>Model based function development tool.</Description>
</ToolDefinition>
<ToolDefinition Name="ContainerManager">
  <Description>Generic tool for container management.</Description>
</ToolDefinition>
```

MIME types

The MIME types section consists of MIME type definitions that are used for V-ECU implementation export. A MIME type defines a file type that is represented by one or more file names extensions, e.g., the `xml/autosar` MIME type stands for ARXML and EPC files.

You do not need to change the MIME types section.

Container categories

To categorize each container in a container set, container categories are defined in the CTW file. The following category definitions exist:

Container Category	Description
Component.Autosar	Software components designed according to the AUTOSAR standard. You can create such components with SystemDesk and the TargetLink AUTOSAR Module.
Component.Simulink	Components designed with Simulink to build a simulation environment, for example, a controller function modeled in Simulink (not AUTOSAR).
Generic	Generic container
Ecu.Autosar	AUTOSAR-specific ECU. This category is used for the V-ECU implementation export.

File categories

To assign the files of a software component to the appropriate file category in a container, file categories are defined in the CTW file. Files are categorized, when you start an import or export in SystemDesk or TargetLink, or a synchronization operation in the Container Manager.

File Category	Description
MetaData.Component.Autosar	Component-specific AUTOSAR file
MetaData.Ecu.Autosar	AUTOSAR basic software module description
MetaData.Shared.Autosar	Shared AUTOSAR file
MetaData.Standard.Autosar	Standard AUTOSAR file

File Category	Description
MetaData.Component.A2l MetaData.Ecu.A2l MetaData.Shared.A2l	Variable description in the ASAM MCD 2MC format (also known as ASAP2)
MetaData.Component.Smi	A file that is generated by the Simulink® Coder™ build process in connection with the dSPACE Target for Offline Simulation. The file contains, for example, the input/output signals and the sample time of a Simulink model. The file is used to integrate a Simulink model in SystemDesk as an atomic software component.
Code.Component	Component-specific code file
Code.Bsw	Basic software module code file
Code.Bsw.Standard	Standard code file delivered with the compiler, or with the specified target platform
Code.Shared	Code file which is shared by several components
Code.Standard	Standard code file delivered with the compiler, or with TargetLink
Code.Generic	Generic code file
Generic.Component	Component-specific generic file
Generic.Ecu	ECU-wide generic file
Generic.Shared	Generic shared file
Generic	Generic file

Workflow rule sets

The workflow rules are grouped together in three workflow rule sets for different purposes, as shown in the following table.

Container management applies these workflow rules, when you use an export, import, or synchronization command.

If the relevant conditions are fulfilled, container management performs the following actions:

Workflow Rule Set	Rules
From TargetLink to SystemDesk	1. Don't copy global metadata files from TargetLink to SystemDesk. 2. Delete obsolete code files generated by TargetLink. 3. In all other cases, container management uses built-in default synchronization operations, which depend on the file dates, i.e., the last modification date, and access rights on operating system level.[1)]
From SystemDesk to TargetLink	1. Copy user-defined code files from SystemDesk to TargetLink. 2. Don't copy generated code files from SystemDesk to TargetLink. 3. In all other cases, container management uses built-in default synchronization operations, which depend on the file dates, i.e., the last modification date, and access rights on operating system level.[1)]
Last fallback	1. Delete obsolete code files generated by TargetLink. 2. In all other cases, container management uses built-in default synchronization operations, which depend on the file dates, i.e., the last modification date, and access rights on operating system level.[1)]

[1)] For example, **`Replace`** is used as the default synchronization operation, if the source file is newer than the target file.

Condition Expressions in the CTW File

Condition semantics

Conditions are boolean expressions containing variables that are evaluated at run time depending on the current context.

In the definitions of file categories and workflow rules, there can be no condition, one condition, or two conditions.

Condition1 has higher priority than Condition2, i.e., in the first stage only Condition1 is evaluated for all elements. The first element where Condition1 is true, is applied. If no matching element is found in stage 1, then Condition2 is evaluated for all elements in the second stage. If no matching element with Condition2 is found, then finally the first element with no specified condition is applied.

File categories and workflow rules are applied only if one of the conditions is true.

Variables in condition expressions for file categories

The table below lists all the variables that you can use in condition expressions for file categories in a CTW file.

Variable	Description
`Directory`	Directory name of the file
`DirectoryLower`	Directory name of the file in lower-case letters
`Extension`	Extension of the file
`ExtensionLower`	Extension of the file in lower-case letters
`FullName`	Full name of the file
`FullNameLower`	Full name of the file in lower-case letters
`Name`	Name of the file (without path)
`NameLower`	Name of the file (without path) in lower-case letters

Variables in condition expressions for default directories, workflow rule sets, container rules and file rules

The table below lists all the variables that you can use in condition expressions for the following elements within a CTW file:

- Default directories (`DefaultDirectory`)
- Workflow rule sets (`WorkflowRuleSet`)
- Container rules (`ContainerRule`)
- File rules (`FileRule`)

Variable	Description
`DefaultSyncOperation`	The synchronization operation which is used when no workflow rule applies ('None', 'Insert', 'Use', 'Delete', 'Exclude', 'Replace')
`DiffStatus`	The difference status of the element depending on its existence, file size and date ('Equal', 'SourceOnly', 'Different', 'TargetOnly', 'DifferentChildren', 'SourceIsNewer', 'TargetIsNewer')

Variable	Description
`FromSDToTL`	True, if element is synchronized from SystemDesk to TargetLink `(($(Source.Owner) == 'SystemDesk') AND ($(Target.Owner) == 'TargetLink'))`
`FromTLToSD`	True, if element is synchronized from TargetLink to SystemDesk `(($(Source.Owner) == 'TargetLink') AND ($(Target.Owner) == 'SystemDesk'))`
`Owner`	Same as Target.Owner if it exists, otherwise Source.Owner.
`Source.Owner`	Owner of the source container set
`Target.Owner`	Owner of the target container set
`ContainerSet.Name`	Same as `Target.ContainerSet.Name` if it exists, otherwise same as `Source.Container.Name`
`Source.ContainerSet.Name`	Name of the source container set
`Target.ContainerSet.Name`	Name of the target container set
`Container.Category`	Same as `Target.Container.Category` if it exists, otherwise same as `Source.Container.Category`
`Source.Container.Category`	Category of the source container
`Target.Container.Category`	Category of the target container
`Container.Name`	Same as `Target.Container.Name` if it exists, otherwise same as `Source.Container.Name`
`Source.Container.Name`	Name of the source container
`Target.Container.Name`	Name of the target container
`File.Category`	Same as `Target.File.Category` if it exists, otherwise same as `Source.File.Category`
`Source.File.Category`	Category of the source file
`Target.File.Catagory`	Category of the target file
`File.Name`	Same as `Target.File.Name` if it exists, otherwise same as `Source.File.Name`
`Source.File.Name`	Name of the source file
`Target.File.Name`	Name of the target file
`File.Creator`	Same as `Target.Creator.Name` if it exists, otherwise same as `Source.Creator.Name`
`Source.File.Creator`	Creator of the source file
`Target.File.Creator`	Creator of the target file
`TLSubsystemName`	Name of the TargetLink subsystem containing the component

Binary operators

The table below lists all the binary operators that you can use in condition expressions within a CTW file.

Operator	Description
`AND, &&`	Boolean "and"
`OR, ||`	Boolean "or"
`==`	Identity equality

Operator	Description
!=	Identity inequality
~~	Regular expression match. Right operand is a regular expression.
+	Add
-	Substract
*	Multiply
/	Divide

Example The following expression is true, if the file extension in lower-case letters is `.arxml` or `.epc` *and* if the file scope is `Component` or `Undefined`:

```
($(ExtensionLower) ~~ '\.(arxml|epc)') AND ($(Scope) ~~ '(Component|Undefined)')
```

Scope classifies files as follows:

- Component
- ECU
- Shared
- Global

The default scope of a file is `Component`.

Tip

The expression you stated is a regular expression. For basic information about regular expressions, refer to:

- http://www.regular-expressions.info/reference.html
- http://en.wikipedia.org/wiki/Regular_expression

Example of Categorizing Files

Introduction

The following example shows how container management uses the rules in the CTW file to categorize a file that you add to a container.

Basics

For every file to be added to a container, container management checks all the file categories one after the other. Every category is checked for against the file's parameters. The file name and the extension are also checked.

To add a file to a container, refer to How to Add Additional Files on page 9.

In the following example, the file you add must be named *Interfaces.arxml*.

Rules applied when adding a file to a container

When you add this file to a container, only the following file category of the workflow definition (CTW) file is used:

MetaData.Shared.Autosar When you add the *Interfaces.arxml* file, container management gives it this category, because it matches the rules in the following lines of the CTW file.

```
<FileCategory Name="MetaData.Shared.Autosar">
  <Description>Shared AUTOSAR file.</Description>
```

The declaration of the file category name contains this category name for *Interfaces.arxml*.

```
  <Condition1>$(NameLower) ~~ '(.*shared.*|interfaces|datatypes|scalings)\.(arxml|epc)'</Condition1
```

The name of the added file matches the naming conventions:

- The name in lower cases is *interfaces*.
- The file extension is.*arxml*.

```
  <Condition2>($(ExtensionLower) ~~ '\.(arxml|epc)') AND ($(Scope) ~~ '(Shared|Undefined)')</Condition2>
```

Condition2 is not evaluated, because Condition1 has matched.

```
  <Scope>Component</Scope>
  <DefaultDirectory Condition1="$(Owner) == 'SystemDesk'">..\..\_SharedFiles</DefaultDirectory>
  <DefaultDirectory Condition1="$(Owner) == 'TargetLink'">.</DefaultDirectory>
```

Container management does not evaluate these lines when categorizing the Interfaces.arxml file.

```
</FileCategory>
```

The end tag closes the file rule.

Result

The file has been added to a container with the **`MetaData.Shared.Autosar`** category information.

Example of Synchronizing Containers

Introduction

The following example shows how the CTW file is evaluated during the synchronization of a group in a container.

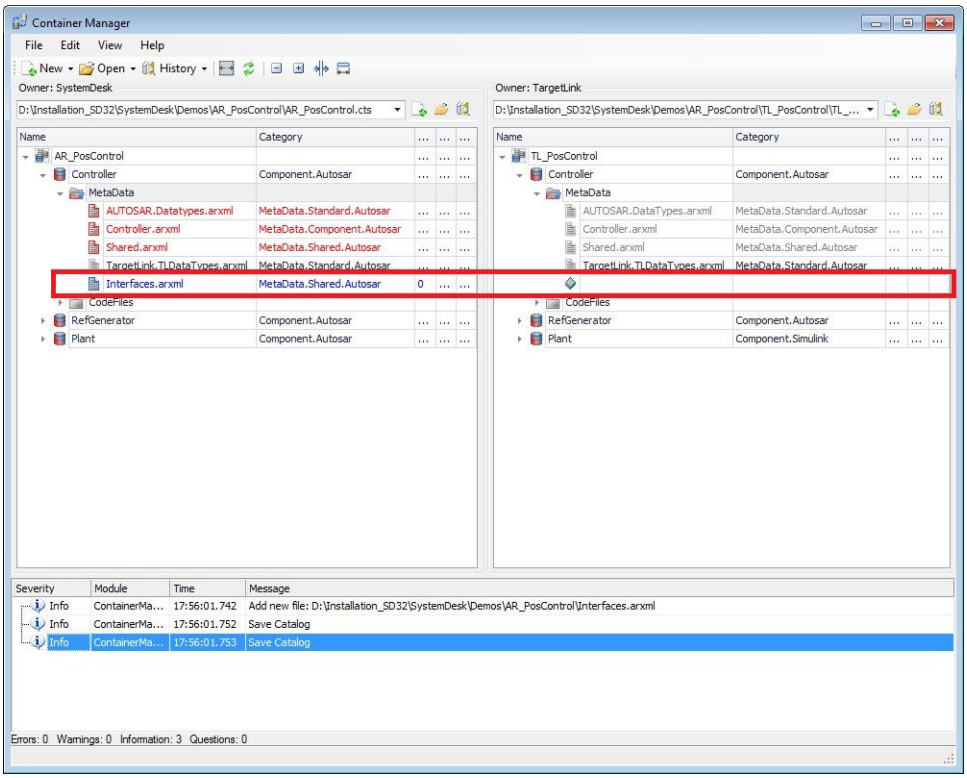
The following example is based on these marginal conditions:

- The container owned by SystemDesk contains a file **`Interfaces.arxml.`** This file is not included in the TargetLink-owned container. It is the only difference between the two containers.
- In the synchronization operation, SystemDesk is the source and TargetLink is the owner.

Basics

For every file to be synchronized, the workflow rule definition file is evaluated row by row. Every rule is checked for a match with the file's parameters.

Files are synchronized between two containers.



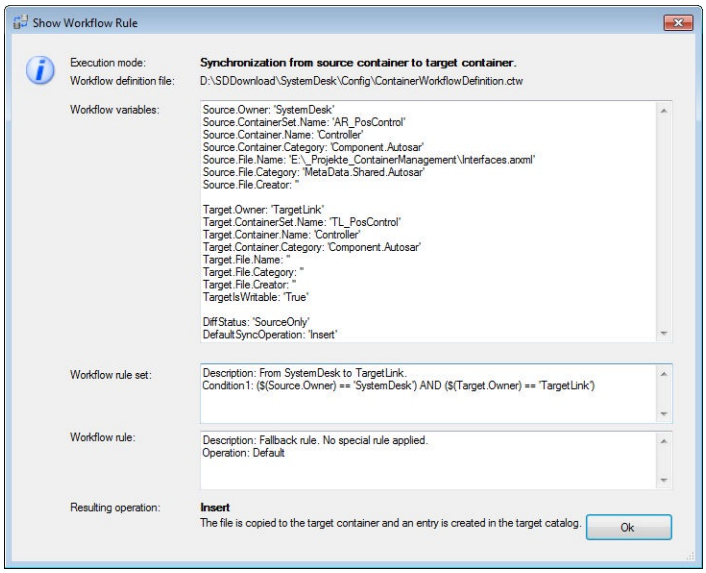
Workflow rule for synchronizing a group in a container

The `MetaData` group is to be synchronized with the TargetLink-owned container set on the right.

The color of the added `Interfaces.arxml` file indicates container differences.

The default file operation is `Insert`.

If you right-click the added file, and select the **Show Workflow Rule** command, you get the following dialog:



If you select the **Synchronize Right** command on the **MetaData** group's context menu, the synchronization starts.

During synchronization, the following rows and areas of the CTW file are used:

FileCategory Name="MetaData.Shared.Autosar" The same file rule is used as in the example of categorizing files (refer to Example of Categorizing Files on page 24), with the difference that the *Interfaces.arxml* file is transferred to the *TargetLink* container.

```
<DefaultDirectory Condition1="$(Owner) == 'TargetLink'">.</DefaultDirectory>
```

This line is checked in order to add *Interfaces.arxml* to the TargetLink container.

Because **Condition1** has matched, the file is stored in the same directory (.) as the catalog file of the atomic software component.

WorkflowRuleSet From SystemDesk to TargetLink The rule set **From SystemDesk to TargetLink** is chosen because **Condition1** has matched.

```
<WorkflowRuleSet>
  <Description>[R.2] From SystemDesk to TargetLink.</Description>
  <Condition1>($(Source.Owner) == 'SystemDesk') AND ($(Target.Owner) == 'TargetLink')</Condition1>
```

The next file rule is not used. Here **Condition1** is not fulfilled. The file category does not match the regular expression, which selects all file categories beginning with **Code.Generic** followed by any name.

```
  <FileRule>
    <Description>[R.2.1] Copy user-defined code files from SystemDesk to TargetLink.</Description>
    <Condition1>$(Source.File.Category) ~~ 'Code\.Generic\..*'</Condition1>
    <Operation>Default</Operation>
  </FileRule>
```

The next file rule is also not used. It does not match the condition.

```
<FileRule>
  <Description>[R.2.2] Don't copy generated code files from SystemDesk to TargetLink.</Description>
  <Condition1>
    ($(Source.File.Category) ~~ 'Code\..*') AND
    ($(Source.File.Creator) == 'TargetLink')
  </Condition1>

  <Operation>None</Operation>
</FileRule>
```

FileRule: Fallback rule / Operation Default This rule is applied. It is the fallback rule, because no other condition has matched. Hence the `Default` operation is performed.

```
<FileRule>
  <Description>[R.2.9] Use default operation for synchronization from SystemDesk to TargetLink.</Description>
  <Operation>Default</Operation>
</FileRule>
```

Resulting synchronization operation: Insert No condition matched the file rules in the previous steps. Thus the default file operation is performed.

The Show Workflow Rule dialog displays the resulting operation in the current context.

Result

The `MetaData` group is synchronized with the corresponding group in the TargetLink owned container set on the right. Synchronization is performed according to the workflow rule in the CTW file.

Related topics

References

Customized Synchronize Right/Left..... 45

Example of Configuring a CTW File to Individual Requirements

Introduction

To adjust the file categorization in container management to your requirements, you can configure the CTW file.

Example for defining a new file category and default directory

To categorize file formats to be added to a container, you can define a file category in the CTW file.

Suppose you have to add documents with the DOC file name extension to the atomic software component. These documents must be put in a separate container management category and stored in a specific directory for SystemDesk.

A possible new file category is specified in the listing below. Here all DOC files with the scope `Component` or `Undefined` are categorized in `MetaData.Component.Specifications`. Also these files are stored in the `..\..\_Specifications` directory for the SystemDesk container.

Tip

The file directories are located relative to the location of the catalog file (*.ctlg). Container directories are located relative to the container set file (*.cts).

For the TargetLink container, the files are stored in the same directory as the CTLG file.

```
<FileCategory Name="MetaData.Component.Specifications">
  <Description>Component-specific document files.</Description>
  <Condition1>($(ExtensionLower) ~~ '\.doc') AND ($(Scope) ~~ '(Component|Undefined)')</Condition2>
  <Scope>Component</Scope>
  <DefaultDirectory Condition1="$(Owner) == 'SystemDesk'">..\..\_Specifications</DefaultDirectory>
  <DefaultDirectory Condition1="$(Owner) == 'TargetLink'">.</DefaultDirectory>
</FileCategory>
```

Result

The default workflow definition file is changed to individual requirements.

When you add a DOC file to a container, it will be categorized to the `MetaData.Component.Specifications` file category.

For storing the file on disk two cases are possible:

- You add the file to the SystemDesk-owned container and synchronize it to the TargetLink-owned container: the file is stored in the same directory as the TargetLink catalog file.
- You add the file to the TargetLink-owned container and synchronize it to the SystemDesk-owned container: the file is stored in the `..\..\_Specifications` directory that is located in a relative path to the SystemDesk catalog file.

Related topics

HowTos

How to Create and Specify a Custom Workflow Definition 29
How to Reset to Default Workflow Definition 31

How to Create and Specify a Custom Workflow Definition

Objective

To create a custom workflow definition and set it as the default, you have to use a special feature of the Container Manager.

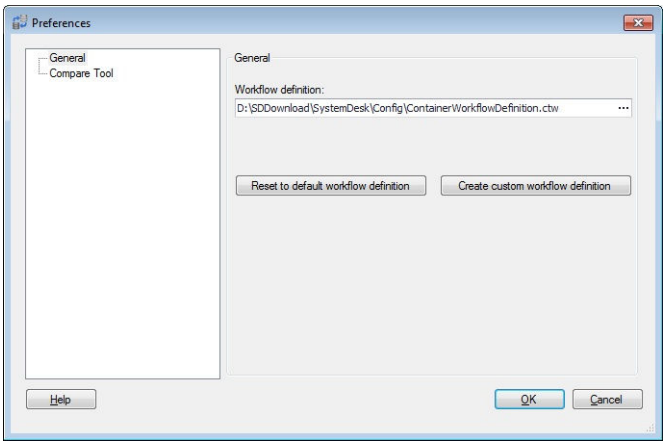
Method

To create and specify a custom workflow definition

1 In the Container Manager, select Preferences from the File menu.

The Preferences dialog opens.

2 On the General page of the Preferences dialog, click Create Custom Workflow Definition.



A file dialog opens with the default name of the workflow definition (CTW) file.

3 In the file dialog, select the directory for the CTW file, and rename it according to your preferences.

Click Save to store the file to disk.

4 On the General page of the Preferences dialog, click the Browse button beside the Workflow Definition to search for your customized CTW file.

A file dialog opens.

5 In the file dialog, search for your customized CTW file.

When you have found your CTW file, mark it, and click Open to transfer the whole path to the Workflow Definition field in the General page of the Preferences dialog.

6 Click OK to save the new definitions for the customized workflow definition file.

Result

You have created a customized version of the CTW file and set it as the central Workflow Definition file for container management.

Related topics

Basics

Basics on the Workflow Definition (CTW) File 18

References

Preferences 55

How to Reset to Default Workflow Definition

Objective

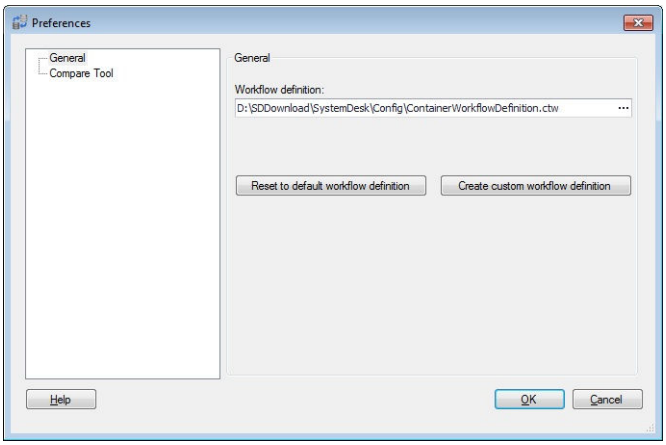
If you are working with a customized workflow definition file, you can reset to the default workflow definition.

Method

To reset to default workflow definition

1 In the Container Manager, select Preferences from the File menu.
The Preferences dialog opens.

2 On the General page of the Preferences dialog, click Reset to Default Workflow Definition.



3 Click OK to close the dialog.

Result

The workflow definition is reset to the default workflow definition file.

Related topics

References

Preferences 55

Reference Information

Where to go from here

Information in this section

About the Container Manager

Access

You can access this command via:

Menu bar	Help
Context menu of	None
Shortcut key	None
Toolbar icon	None

Purpose

To display version information.

Result

The version information is displayed.

Add Container From Catalog File

Access

You can access this command via:

Menu bar	None
Context menu of	Container set
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container set is writable.

Purpose

To add a container with the contents of the selected container catalog file (CTLG) to a container set.

Result

A dialog opens for you to select the location and name of the container catalog file.

A container with the contents of the selected container catalog file (CTLG) is added to the container set.

Add Container From Container Set

Access

You can access this command via:

Menu bar	None
Context menu of	Container set
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container set is writable.

Purpose

To add a container with the contents of the selected container catalog file (CTLG) to a container set.

Result

The **Select catalog** dialog opens for you to select the catalog file. When you confirm your selection by clicking **OK**, a container with the contents of the selected container catalog file (CTLG) is added to the container set.

Add Files

Access

You can access this command via:

Menu bar	None
Context menu of	Group
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container is writable.

Purpose

To add a file to a group in a container.

Result

A file is added to the selected group in the container.

Description

The names of all the files in a group must be unique, even if they reside in different directories.

Add Groups

Access

You can access this command via:

Menu bar	None
Context menu of	Container
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container is writable.

Purpose

To add a file to a group in a container.

Result

A group is added to the container.

Description

The names of all the groups in a container must be unique.

Add New Container

Access

You can access this command via:

Menu bar	None
Context menu of	Container set
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container set is writable.

Purpose

To add a container to a container set file.

Result

A dialog opens for you to select the location and name of the container catalog file.

Description

When you have selected the location and name of the container catalog file, the Container Manager creates a new catalog file (CTLG).

The names of all the containers in a container set must be unique.

Change Owner

Access

You can access this command via:

Menu bar	None
Context menu of	Container set
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container set is writable.

Purpose

To select the tool which owns the selected container set.

Result

Container management opens the **Select Owner** dialog for you to specify the owner of the selected container set.

Description

Lets you select the tool which owns the selected container set:

- SystemDesk
- TargetLink
- Container Manager

Collapse All

Access

You can access this command via:

Menu bar	Edit
Context menu of	None
Shortcut key	**F10**
Toolbar icon	

Purpose

To collapse all the elements in the container grid view.

Result

All the elements in the container grid view are collapsed.

Compare External File

Access

You can access this command via:

Menu bar	None
Context menu of	File in a container
Shortcut key	None
Toolbar icon	None

This command is available only if a compare tool is specified in the **Preferences** dialog. Refer to Preferences on page 55.

Purpose

To compare the selected AUTOSAR file with an external AUTOSAR file.

Description

Lets you compare the selected AUTOSAR file with an external AUTOSAR file.

Result

The Container Manager opens the specified compare tool to inspect the comparison.

Related topics

HowTos

How to Compare Files..... 13

Compare with Right/Left

Access

You can access this command via:

Menu bar	None
Context menu of	File in a container
Shortcut key	None
Toolbar icon	None

This command is available only if you have specified a compare tool in the **Preferences** dialog. Refer to Preferences on page 55.

Purpose

To compare the selected file in the specified compare tool.

Result

The Container Manager opens the compare tool for you to inspect differences.

Description

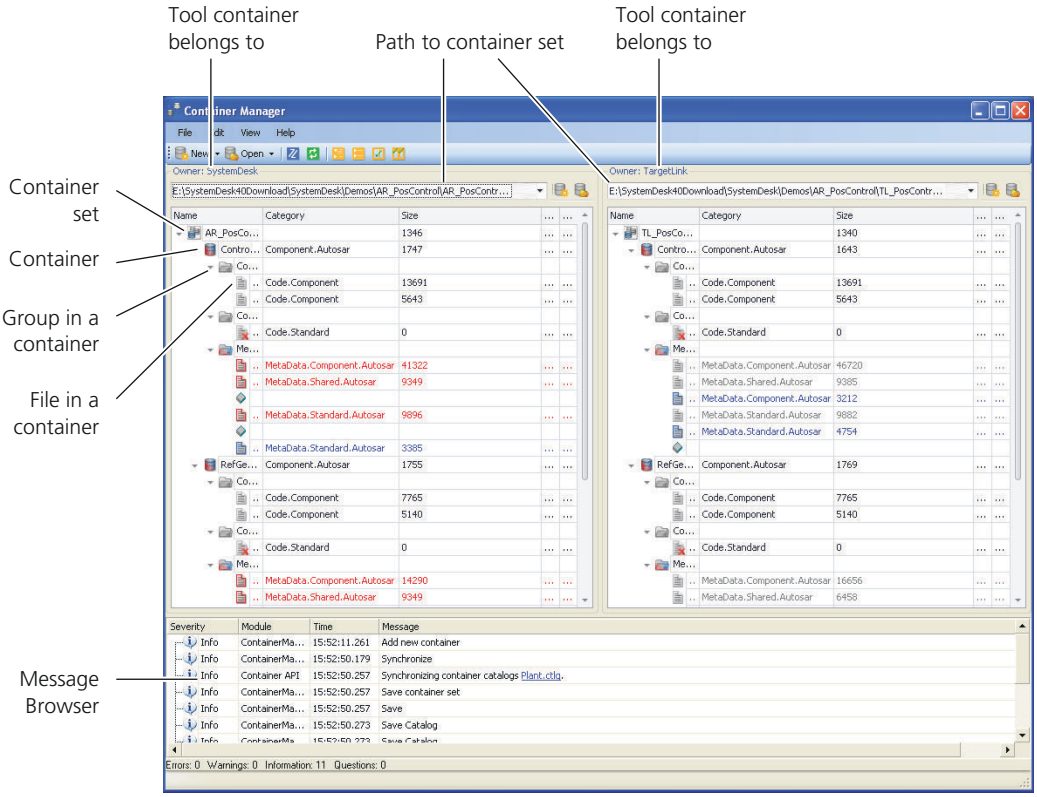
Lets you compare the selected file in the compare tool specified in the Preferences dialog.

Container Manager User Interface

Description

The Container Manager is a tool for managing containers. It allows you to organize the files in a container (for example, remove them from the container), show the workflow rule for each file and synchronize container files.

The Container Manager also lets you add files to a container such as the textual specifications of a software component.



The Container Manager has the following columns for each file:

- Name: The file name
- Category: Lets you select the file category, such as `Metadata.Component.Autosar`, `Code.Component`.
- Date: When the file was last modified

- Path: The file location
- Size: The file size

The labels in the figure show important details of the Container Manager display:

Tool Container belongs to The name of the tool in which the container set was created.

Path to container set The location of the container set (CTS) file on the hard disk.

File in a container The lowest structural level in a container.

Group in a container The hierarchical structure where the files of a software component (container) are categorized. A file's format defines the group it belongs to. The `CodeFiles` group, for example, gathers C and H code files. Groups cannot be nested.

Container A synonym for container (CTLG) file that contains one or more groups of files.

Container set A synonym for a container set (CTS) file that contains one or more containers.

The following table shows the container files statuses indicated by the colors.

File Color	Description
Black	Source and target files are the same.
Red	Source file is newer than target file.
Gray	Target file is newer than source file.
Blue	File is available only in the *source* container.
Blue (italic)	File is available only in the *target* container.

The following table shows the meanings of the symbols.

File Symbol	Description
	Target file is read-only.
	Target file does not exist.

Message Browser

Description The Message Browser provides a history of all info, error, and warning messages that occur when you work with the Container Manager.

Severity, module, time, and text of a message The provides the following information for each message:

Information	Description
Severity	There are different types of messages according to severity level. Each message has a symbol that indicates the message type: ▪ errors ▪ warnings ▪ infos ▪ questions
Module	Module that the message comes from.
Time	The time when the message occurred.
Message	The content of the message.

The following additional message parts are also available:

- Error Code
- Main Module Number
- Submodule Number

You can customize the display of messages via the column chooser (available from the context menu of column headers).

Sort Ascending (also available from the context menu of column headers) Lets you sort the grid alphabetically in ascending order according to the selected column.

Sort Descending (also available from the context menu of column headers) Lets you sort the grid alphabetically in descending order according to the selected column.

Column Chooser / View Column Chooser (available from the context menu of column headers) Lets you add a column to the grid and opens a dialog displaying the columns that can be added to the grid. To add a column, drag it from the dialog to the grid header. To remove a column from the grid, drag its header below the grid.

Optimum Column Width/Best Fit (available from the context menu of column headers) Lets you optimize the width of the selected column.

Optimum Arrangement of Columns/Best Fit (all columns) (available from the context menu of column headers) Lets you optimize the widths of all columns to fit the width of the editor or browser.

Contents

Access

You can access this command via:

Menu bar	Help
Context menu of	None
Shortcut key	**F1**
Toolbar icon	None

Purpose

To open the documentation of the Container Manager.

Result

The documentation of the Container Manager opens.

Copy to Left/Right

Access

You can access this command via:

Menu bar	None
Context menu of	▪ Container ▪ Group in a container ▪ File in a container
Shortcut key	None
Toolbar icon	None

This command is available only if the target file is writable.

Purpose

To copy the selected element to the other container.

Result

The selected element is copied to the other container.

Description

If the target file does not exist, then the workflow rules determine the directory that the file is copied to on the target side.

Customized Synchronize Right/Left

Access

You can access this command via:

Menu bar	None
Context menu of	▪ Container set ▪ Container ▪ Group in a container
Shortcut key	None
Toolbar icon	None

This command is available only if the corresponding target element is writable.

Purpose

To modify the default synchronization options for the container elements.

Result

Opens the Custom Synchronization dialog for you to modify the default synchronization options for the container elements.

Description

Use custom synchronization to perform special operations such as replacing a code file in situations where you usually would keep it.

Custom Synchronization dialog

Lets you specify an operation to be performed for each container, and each group and file in each container, during synchronization. The default operations are displayed when you open the dialog. You can change the default operations via drop-down lists.

The dialog has the following columns for each file:

- Name: The file name
- Operation: Lets you select the file operation for synchronizing containers (Insert, Delete, Exclude, Replace).
- Category: Lets you select the file category, such as `Metadata.Component.Autosar`, `Code.Component`

The following table shows the container files' statuses indicated by the colors.

File Color	Description
Black	Source and target files are the same.
Red	Source file is newer than target file.
Gray	Target file is newer than source file.
Blue	File is available only in the *source* container.
Blue (italic)	File is available only in the *target* container.

The following table shows the meanings of the symbols.

File Symbol	Description
	Target file is read-only.
	Target file does not exist.

The following basic file operations are available for synchronizing container files.

Basic File Operation	Description
Insert	File is inserted in the target container, i.e., the file is copied to the target container and its name is registered in the catalog file.
Use	An existing file is registered in the catalog file, i.e., the file is reused.
Delete	File is deleted from the target container, i.e., the file is deleted from the catalog file and from the file system.
Exclude	File is deleted from the target container, i.e., the entry is removed from the catalog file, but the file remains in the file system.
Replace	File is replaced in the target container by the file version in the source container. If necessary, the name is changed in the same operation.
None	File remains unchanged.

Delete From Disk

Access

You can access this command via:

Menu bar	None
Context menu of	▪ Container ▪ Group in a container ▪ File in a container
Shortcut key	None
Toolbar icon	None

This command is available only if the file is writable and if the container is writable.

Purpose

To exclude the selected element from catalog and to delete the file from disk.

Result The selected element is deleted from disk without request.

Description Lets you delete the selected element from disk without a confirmation prompt.

Exclude From Catalog

Access You can access this command via:

Menu bar	None
Context menu of	▪ Group in a container ▪ File in a container
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container is writable.

Purpose To exclude the selected element from the selected container set.

Result The Container Manager excludes the selected element from the catalog.

Description The file is not deleted from disk.

Exclude From Container Set

Access You can access this command via:

Menu bar	None
Context menu of	Container
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container is writable.

Purpose To exclude the selected element from the selected container set.

Result The Container Manager excludes the selected element from the selected container set.

Description The file is not deleted from disk.

Exit

Access You can access this command via:

Menu bar	None
Context menu of	File in a container
Shortcut key	**Ctrl+Q**
Toolbar icon	None

Purpose To exit the Container Manager.

Result The Container Manager is closed.

Expand All

Access You can access this command via:

Menu bar	Edit
Context menu of	None
Shortcut key	**F9**
Toolbar icon	

Purpose To expand all the elements in the container grid view.

Result All the elements in the container grid view are expanded.

Fit Column Size

Access

You can access this command via:

Menu bar	View
Context menu of	None
Shortcut key	**Alt+C**
Toolbar icon	

Purpose

To optimize the widths of all columns in each of the two container sets displayed.

Result

The Container Manager optimizes the column width according to the width of the Container Manager window.

Fit Container Set Size

Access

You can access this command via:

Menu bar	View
Context menu of	None
Shortcut key	**Alt+S**
Toolbar icon	

Purpose

To fit the two container sets into the Container Manager with the same size.

Result

The Container Manager displays the left and the right container set with the same size.

History Left

Access

You can access this command via:

Menu bar	File
Context menu of	None

Shortcut key	**Ctrl+H**
Toolbar icon	None

Purpose

To load one of the most recently opened container sets.

Result

The Container Manager opens the Select Catalog dialog for you to select one of the most recently opened container sets. The selected container set is displayed on the left.

Description

The container set history contains the five most recently opened container sets.

The history is saved when the Container Manager is closed. Thus, it is still available after the next program start.

History Right

Access

You can access this command via:

Menu bar	File
Context menu of	None
Shortcut key	**Ctrl+Shift+H**
Toolbar icon	None

Purpose

To load one of the most recently opened container sets.

Result

The Container Manager opens the Select Catalog dialog for you to select one of the most recently opened container sets. The Container Manager displays the selected container set in the right area.

Description

The container set history contains the five most recently opened container sets.

The history is saved when the Container Manager is closed. Thus, it is still available after the next program start.

Make ReadOnly

Access

You can access this command via:

Menu bar	None
Context menu of	▪ Container ▪ Container set ▪ File in a container
Shortcut key	None
Toolbar icon	None

If a container set, a container, a group or a file in a container is set to read-only the element symbol is marked by an additional symbol.

Purpose

To protect the container set, the container or its files from changes.

Result

The container set, container or its files is protected from changes.

Make Writeable

Access

You can access this command via:

Menu bar	None
Context menu of	▪ Container set ▪ Container ▪ File in a container
Shortcut key	None
Toolbar icon	None

Purpose

To allow changes to the container set, the container or its files.

Result

Changes are allowed to the container set, the container or its files.

Move File

Access

You can access this command via:

Menu bar	None
Context menu of	File in a container
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container is writable.

Purpose

To change the selected element's location in the file system.

Result

The selected element's location is change.

New — Left

Access

You can access this command via:

Menu bar	File
Context menu of	None
Shortcut key	`Ctrl+N`
Toolbar icon	

Purpose

To create a container set or catalog file and display it in the corresponding area of the Container Manager.

Result

The Container Manager opens a file dialog for you to specify a name for the new container set or catalog file.

Tip

If you specified a container set file name in the file dialog, the Container Manager additionally opens the Select Owner dialog for you to specify the owner of the new container set file.

Finally the Container Manager displays the new file in the corresponding area of its user interface.

New — Right

Access

You can access this command via:

Menu bar	File
Context menu of	None
Shortcut key	**Ctrl+Shift+N**
Toolbar icon	

Purpose

To create a container set or catalog file and display it in the corresponding area of the Container Manager.

Result

The Container Manager opens a file dialog for you to specify a name for the new container set or catalog file.

Tip

If you specified a container set file name in the file dialog, the Container Manager additionally opens the Select Owner dialog for you to specify the owner of the new container set file.

Finally the Container Manager displays the new file in the corresponding area of its user interface.

Open — Left

Access

You can access this command via:

Menu bar	File
Context menu of	None
Shortcut key	**Ctrl+O**
Toolbar icon	

Purpose

To open an existing container set or catalog file in the Container Manager.

Result

The Container Manager opens a file dialog for you to enter the name of an existing container set or catalog file. The Container Manager displays the specified file.

Open — Right

Access

You can access this command via:

Menu bar	File
Context menu of	None
Shortcut key	`Ctrl+Shift+O`
Toolbar icon	

Purpose

To open an existing container set or catalog file in the Container Manager.

Result

The Container Manager opens a file dialog for you to enter the name of an existing container set or catalog file. The Container Manager displays the specified file.

Open Container Set

Access

You can access this command via:

Menu bar	None
Context menu of	Container set
Shortcut key	None
Toolbar icon	None

Purpose

To open an existing container set or catalog file in the Container Manager.

Result

The Container Manager opens a file dialog for you to enter the name of an existing container set or catalog file. The Container Manager displays the specified file.

Preferences

Access

You can access this command via:

Menu bar	File in a container
Context menu of	None
Shortcut key	`Ctrl+P`
Toolbar icon	None

Purpose

To view and change global configurations of the Container Manager.

Result

The Container Manager opens the Preferences dialog which allows you to change the settings.

Preferences dialog

The Preferences dialog allows you to specify settings to be applied by the Container Manager.

The Preferences dialog consists of the following pages:

- Compare Tool page
- General page

Compare Tool page

Lets you specify a compare tool for importing, exporting and managing containers. With a compare tool you can also compare an AUTOSAR file with the elements in an external AUTOSAR file.

The Container Manager has an integrated compare command and uses a compare tool to display file differences. You can specify compare tools such as *dSPACE AUTOSAR Compare* for more detailed compare results.

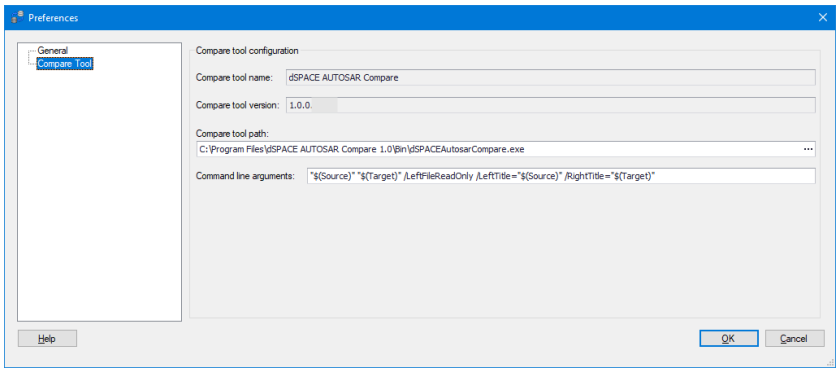
Compare Tool Name Displays the name of the selected compare tool.

Compare Tool Version Displays version information on the selected compare tool.

Compare Tool Path Lets you select the executable of a compare tool.

Command Line Arguments Lets you specify command line arguments for opening files with the selected compare tool.

The following illustration shows the **Compare Tool** page with specifications for dSPACE AUTOSAR Compare as an example:



General page

Workflow definition Lets you select the workflow definition file.

Reset to default workflow definition Lets you reset to the default workflow definition, if you have created and specified an individual one.

Create custom workflow definition Lets you create an individual workflow definition.

Refresh

Access

You can access this command via:

Menu bar	Edit
Context menu of	None
Shortcut key	**F5**
Toolbar icon	

Purpose

To refresh the container grid view.

Result

The container grid view is refreshed.

Rename

Access

You can access this command via:

Menu bar	None
Context menu of	▪ Container set ▪ Container ▪ Group in a container ▪ File in a container
Shortcut key	None
Toolbar icon	None

This command is available only if the container is writable, and if the selected element is writable.

Purpose

To rename the selected element.

Result

The selected element is renamed.

Description

Lets you edit the selected element's name. When you confirm with carriage return the element is renamed.

Select Catalog Dialog

Access

You can access this dialog via the container selection browse button.

Purpose

To select a catalog.

Result

The Select Catalog dialog is displayed.

Select Catalog dialog

The dialog displays a tree view with recently used container set and catalog files. You can either select one of the displayed catalog files, or you can browse for new container set files on disk.

The dialog has the following columns for each file:

- Name: The file name
- Path: The file location

Container set Lets you select a container set file (CTS).

- Click the Browse button to open an existing file.
- (Not available when you import a container or when you use the History command) Click the button to create a new file.

Note

After creating a new file, use the Select Owner dialog to specify the tool that owns the file.

Select File

Access

You can access this command via:

Menu bar	None
Context menu of	File in a container
Shortcut key	None
Toolbar icon	None

The command is enabled only if the container is writable.

Purpose

To select a file for an existing file element in the container.

Result

The selected file on disk is integrated in the current container.

Description

Lets you select a file for an existing file element in the container. This is useful if a file does not exist at the location specified in the catalog file. A file dialog opens.

Show Both Sides

Access

You can access this command via:

Menu bar	View
Context menu of	None
Shortcut key	**Alt+B**
Toolbar icon	None

Purpose	To show both container sets in the Container Manager.
Result	The Container Manager displays both container sets.

Show Left Side

Access

You can access this command via:

Menu bar	View
Context menu of	None
Shortcut key	**Alt+L**
Toolbar icon	None

Purpose	To spread the left-hand container set across the entire width of the Container Manager.
Result	The Container Manager spreads the left-hand container set across the entire width of the Container Manager.

Show Right Side

Access

You can access this command via:

Menu bar	View
Context menu of	None
Shortcut key	**Alt+R**
Toolbar icon	None

Purpose	To spread the right-hand container set across the entire width of the Container Manager.
Result	The Container Manager spreads the right-hand container set across the entire width of the Container Manager.

Show Workflow Rule

Access

You can access this command via:

Menu bar	None
Context menu of	File in container
Shortcut key	None
Toolbar icon	None

Purpose

To display the workflow rule which is to be used for the selected file.

Result

The Show Workflow Rule dialog opens.

Description

Lets you display the Show Workflow Rule dialog containing the workflow rules which are to be used with the Copy to Left/Right on page 44 command for the selected file and Synchronize Right/Left on page 61 command for the files in the whole container set, container or group in a container. Also refer to Advanced: Configuring Container Handling on page 17.

Swap Sides

Access

You can access this command via:

Menu bar	None
Context menu of	None
Shortcut key	**F6**
Toolbar icon	

Purpose

To move the left container set or catalog to the right side of the Container Manager and vice versa.

Result

The Container Manager moves the left container set or catalog to the right side of the Container Manager and vice versa.

Synchronize Right/Left

Access

You can access this command via:

Menu bar	None
Context menu of	▪ Container set ▪ Container ▪ Group in a container
Shortcut key	None
Toolbar icon	None

This command is enabled only if the target container is writable.

Purpose

To synchronize container files with the corresponding files in the other container.

Description

Lets you synchronize the container set, container or group in a container with the corresponding elements in the other container. The Container Manager performs the operation resulting from the workflow rules for each file (default file operation).

Result

The Container Manager synchronizes the container files with the corresponding files in the other container.

Glossary

B

Basic file operations A set of file operations such as Replace or Delete. During file synchronization or container export, you can select one of the basic synchronzation operations for each file to be synchronized. Container management specifies one of the basic file operations as the default file operation depending on the file category.

C

Catalog A file that represents a container for all files related to a software component. It contains file references and file category information such as source code files (H/C) or AUTOSAR files (ARXML/EPC). A (catalog file) container is structured in groups.

Container A bundle of files that are described in a catalog file. The files of a container can be spread over your file system. File paths are relative to the catalog file.

Container set A set of containers. A separate container set file (CTS) is created for each SystemDesk project/TargetLink data dictionary. The paths of catalog files in a container set are relative to the container set file.

D

Default file operation A basic file operation that is determined by container management during file synchronization depending on the file category.

E

External container A container that is owned by the other tool, i.e., not the invoking tool

This container is used when you import files of a software component which were created or changed by the other tool.

F

File categories The various parts of a software component must be stored in different files, i.e., when you export the software component to a container. Container management uses file categories as criteria for organizing these files.

G

Group in a container The hierarchical structure where the files of a software component (container) are categorized. A file's format defines the group it belongs to. The `CodeFiles` group, for example, gathers C and H code files. Groups cannot be nested.

L

Local container A container that is owned by the invoking tool, i.e., SystemDesk or TargetLink

The invoking tool transfers the files of a software component to this container when you export a software component. The external container is not involved.

S

Software component (SWC) A component that logically groups and encapsulates a single functionality.

SWC container A container for files of one software component.

W

Workflow rule A rule defining how files stored in a container are treated when being exchanged between tools (e.g. SystemDesk and TargetLink)