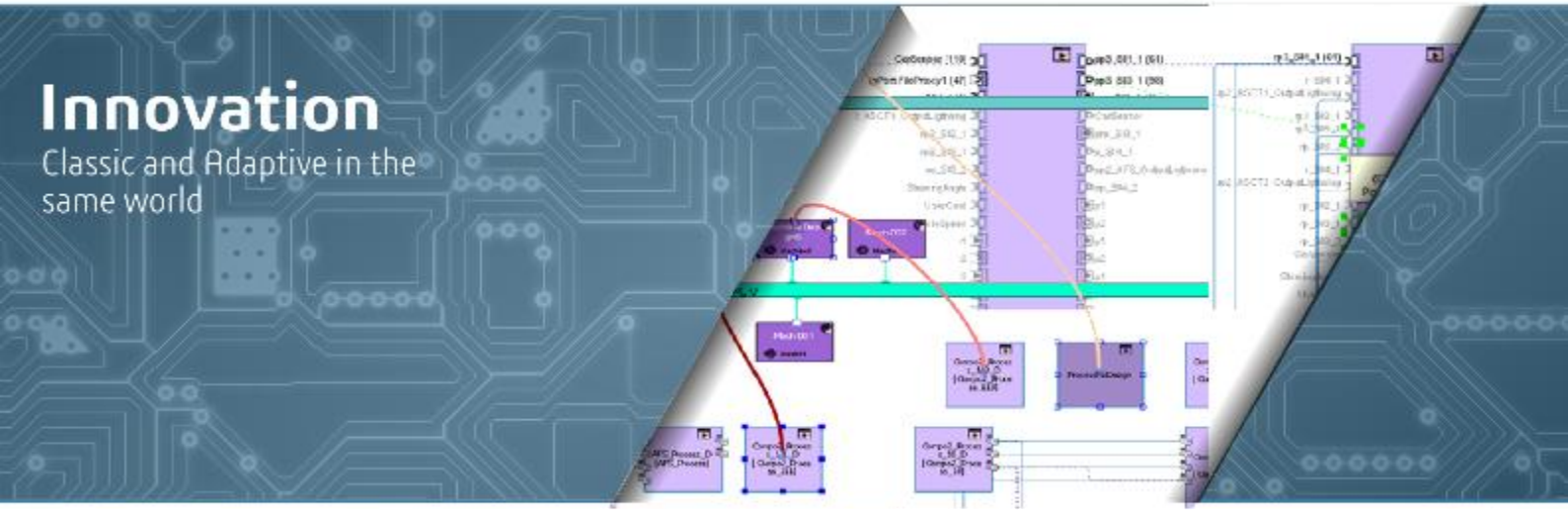
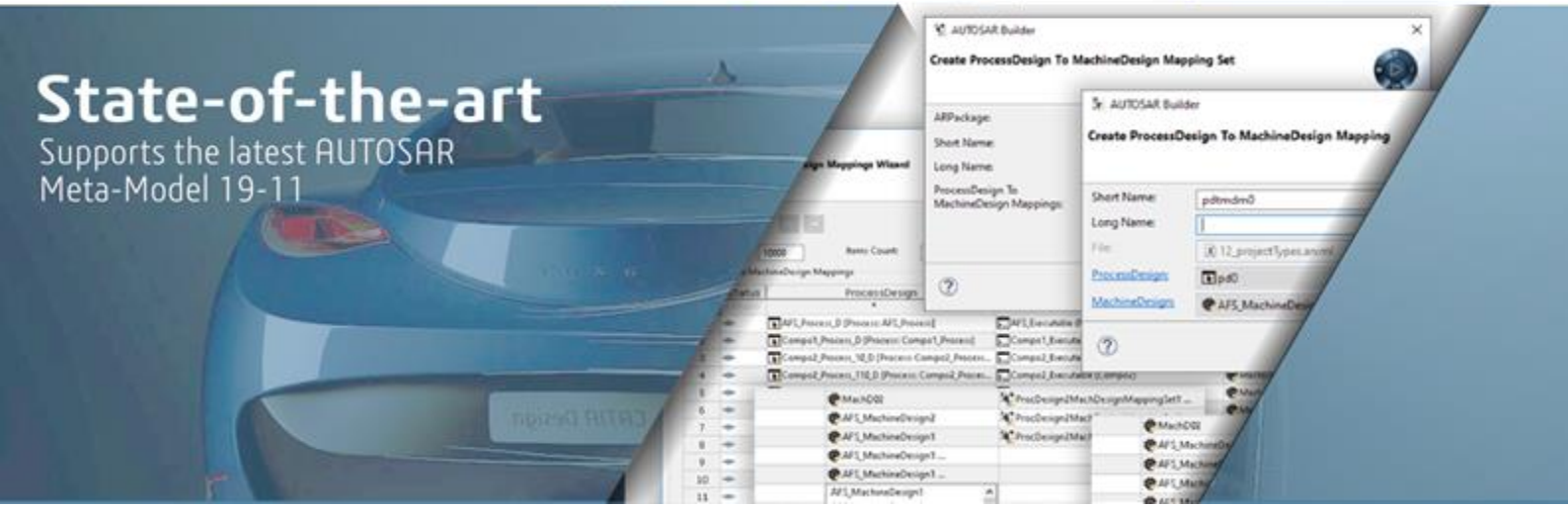
3DEXPERIENCE®

AUTOSAR Builder™

Welcome to AUTOSAR Builder 2020x Refresh1





CATIA

DASSAULT SYSTEMES | The 3DEXPERIENCE® Company

Table of Contents

General Presentation 3
1. System Requirements 3
2. Installation and Licensing 3
New Features and Enhancements 4
1. Versions and AUTOSAR Builder 4
1. AUTOSAR Builder Fundamentals 4
1.1. Requirement Coverage 4
1.2. Customizing Preferences 5
1.2.1. Adaptive Preferences 5
1.2.2. Runnable Generator 5
2. AUTOSAR Builder for Classic 6
2.1. AB Validation for Classic Platform 6
2.2. Table Technology Support 6
2.2.1. Software Component to ECU Mapping Editor 6
2.2.2. Delegation Connections Editor 7
2.3. Enhanced User Interface 7
2.3.1. Assembly Connections Editor 7
2.3.1. Data Mapping Editor 8
2.4. Initial Value of Data Elements 8
3. AUTOSAR Builder Adaptive 9
3.1. Adaptive 19-11 Update 9
3.2. Process Design Integration for Meta Model 19.11 9
3.2.1. Process Design to Machine Design Mapping 9
3.2.2. Process to Machine Mapping Editor 10
3.2.3. Service Instance to Port Prototype Mapping Editor 10
3.2.4. Process Design Diagram 11
3.2.5. Processes Diagram 11
3.2.6. System Mapping Diagram 12
3.2.7. Tree View 12
3.3. Processes Diagram 13
3.4. Service Interface Elements 14
3.5. Communication Specification 14
3.6. AB Validation for Adaptive Platform 15
Legal Notices 16
1. Trademarks 16
2. Third-Party Copyrights Notices 16
3. Restricted Rights 17

3DS.COM © Dassault Systèmes

General Presentation

AUTOSAR Builder is a complete ©AUTOSAR toolchain, starting from authoring to ECU configuration via ECU extract, RTE generation, simulation, and more features. It is a comprehensive tool for system and ECU design. It also enables you to import Model Based Design legacy descriptions and generate AUTOSAR compliant C code, ready to be embedded in target ECUs.

The AUTOSAR Builder tool suite includes:

- **Authoring Environment** – The AUTOSAR Authoring Tool for software modeling and network design
- **ECU Extractor**
- **ECU Environment** – The Generic ECU Configuration Editor for ECU configuration and BSW code generation
- **Rte Generator**
- **ASim** - AUTOSAR Simulation, covering the VFB level, and soon the ECU and Network levels
- **Adaptive Environment** – The AUTOSAR Adaptive environment for adaptive design

AUTOSAR Builder is based on Eclipse and uses ©Artop. Artop is an open AUTOSAR tool environment that is available for free. It enables you to build your own tools and integrate from other tool vendors.

For more details, see the AUTOSAR Builder Overview document.

1. System Requirements

AUTOSAR Builder is supported on Microsoft Windows 10, 8, 7, VISTA, XP (64 bit platforms).

The required minimum memory is:

- Approximately 600MByte hard-disk space
- 4 GB RAM*

(*)When working with large models in AUTOSAR Builder, it is recommended that at least 8GB of physical memory is allocated to enhance the performance.

2. Installation and Licensing

For more information related to the licensing of AUTOSAR Builder, see AB_Installation_Procedure.pdf.

3DS.COM © Dassault Systèmes

New Features and Enhancements

1. Versions and AUTOSAR Builder

AUTOSAR Builder is based on:

- Eclipse Neon **4.6.3**
- ARTOP **4.6.1**
- CDT **9.2.1**

AUTOSAR Builder supports the AUTOSAR Classic **4.4.0** and AUTOSAR Adaptive **R19-11**. Adaptive code generators are updated to support AUTOSAR Adaptive **R19-11**.

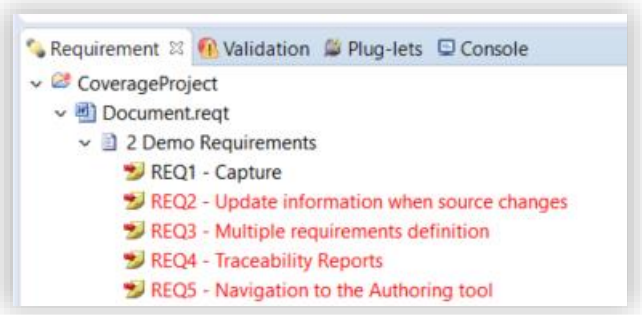
This release note summarizes updated features and new functionalities offered by AUTOSAR Builder 2020x Refresh1.

1. AUTOSAR Builder Fundamentals

1.1. Requirement Coverage

The requirement coverage information is now only stored in the .req file. This avoids modifying the original .arxml file.

Note: Any working model with coverage information which is authored with an older version of AUTOSAR Builder shall work in this version.

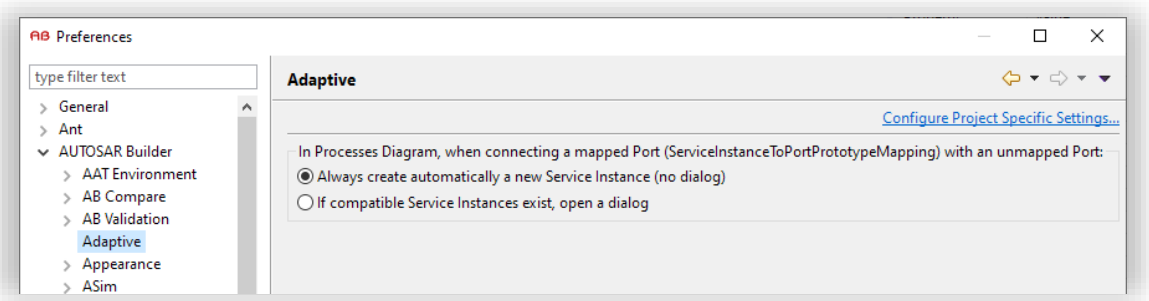


3DS.COM © Dassault Systèmes

1.2. Customizing Preferences

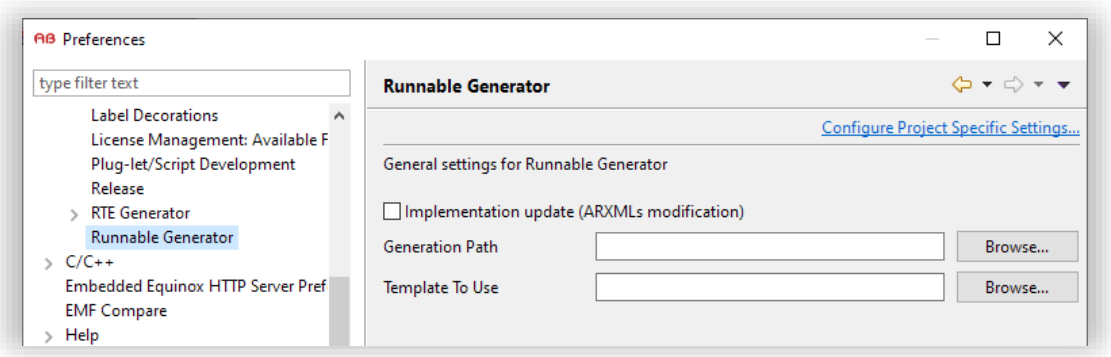
1.2.1. Adaptive Preferences

The Adaptive preferences are introduced to configure settings for generating service instance to port prototype mappings from the processes diagram.



1.2.2. Runnable Generator

You can set the default values for Source folder and Template in Preferences > AUTOSAR Builder > AAT Environment > Runnable Generator.



3DS.COM © Dassault Systèmes

CATIA
DASSAULT SYSTEMES | The 3DEXPERIENCE® Company

2. AUTOSAR Builder for Classic

2.1. AB Validation for Classic Platform

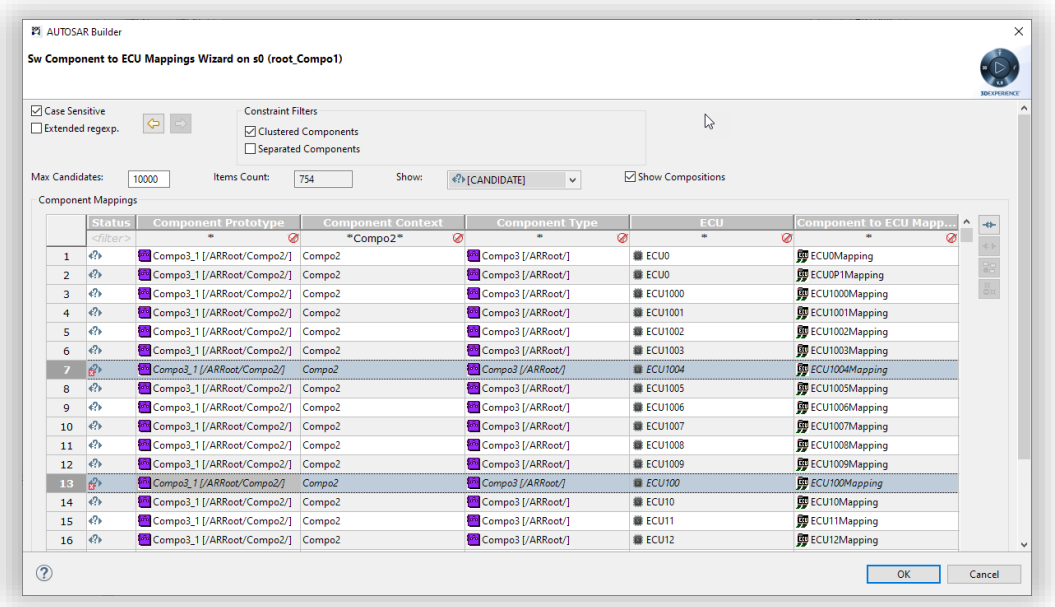
The following new rules are added for AUTOSAR Classic platform:

Category	Meta Model	Internal ID	Description
Authoring Environment / RTE Generator	(None)	RTE_R_43019	Missing Data Access Point on PRPortPrototype
Authoring Environment / Other / EB Tresos Studio Compatibility	(None)	EBT_40022	ClientServerOperationToSignalMapping shall reference a DataTransformer
		EBT_40023	ClientServerOperationToSignalMapping with DataTransformer shall be used in AUTOSAR version newer or equal than 4.2.1
		EBT_40024	L' attribute of a Longname is mandatory
		EBT_40025	NetworkRepresentation of an ISignal is mandatory
		EBT_40026	UsesEndToEndProtection shall not be empty
		EBT_40027	EB Tresos Studio reject attributes present in arxml with no value

2.2. Table Technology Support

2.2.1. Software Component to ECU Mapping Editor

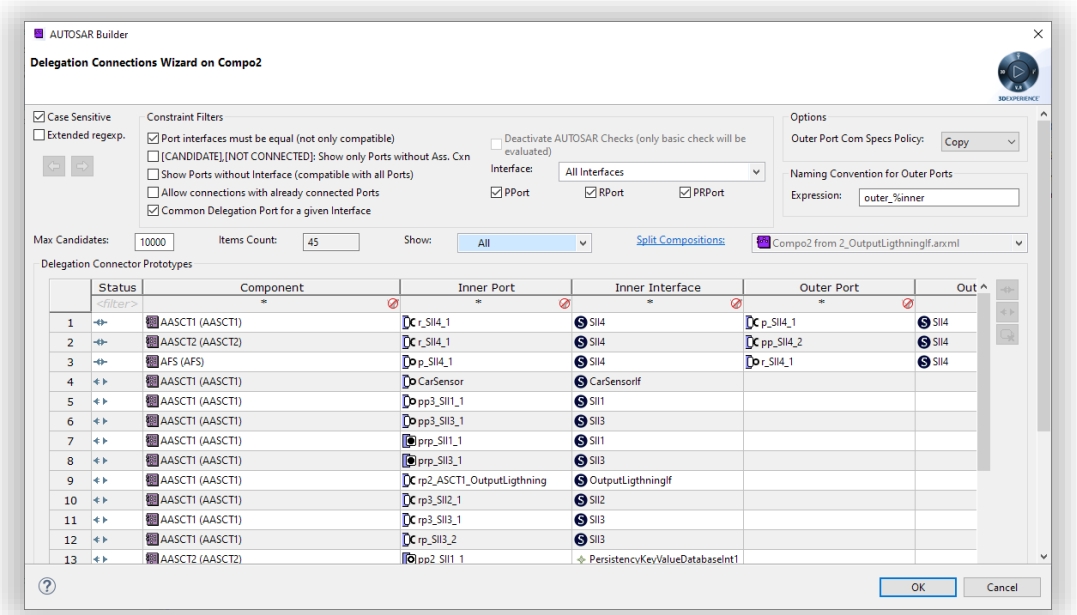
In the standardized user interface, the editor now supports the common functionalities of a mapping editor including constraint filters, advanced regular expressions, and column filtering. It also supports filtering based on clustered components and separated components. New tooltips, status indicators, and commands are introduced for creating valid mappings.



3DS.COM © Dassault Systèmes

2.2.2. Delegation Connections Editor

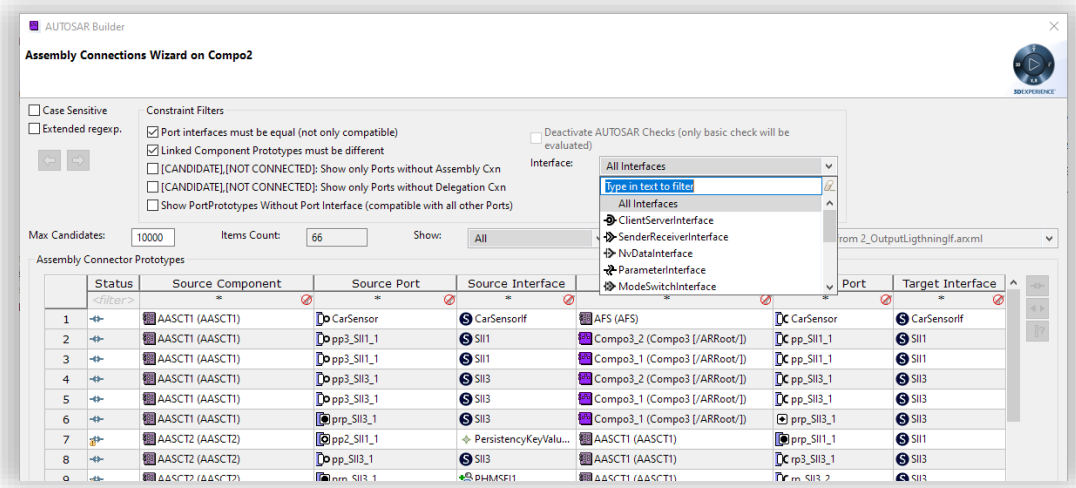
The editor now supports the common functionalities of a mapping editor including constraint filters, advanced regular expressions, and column filtering.



2.3. Enhanced User Interface

2.3.1. Assembly Connections Editor

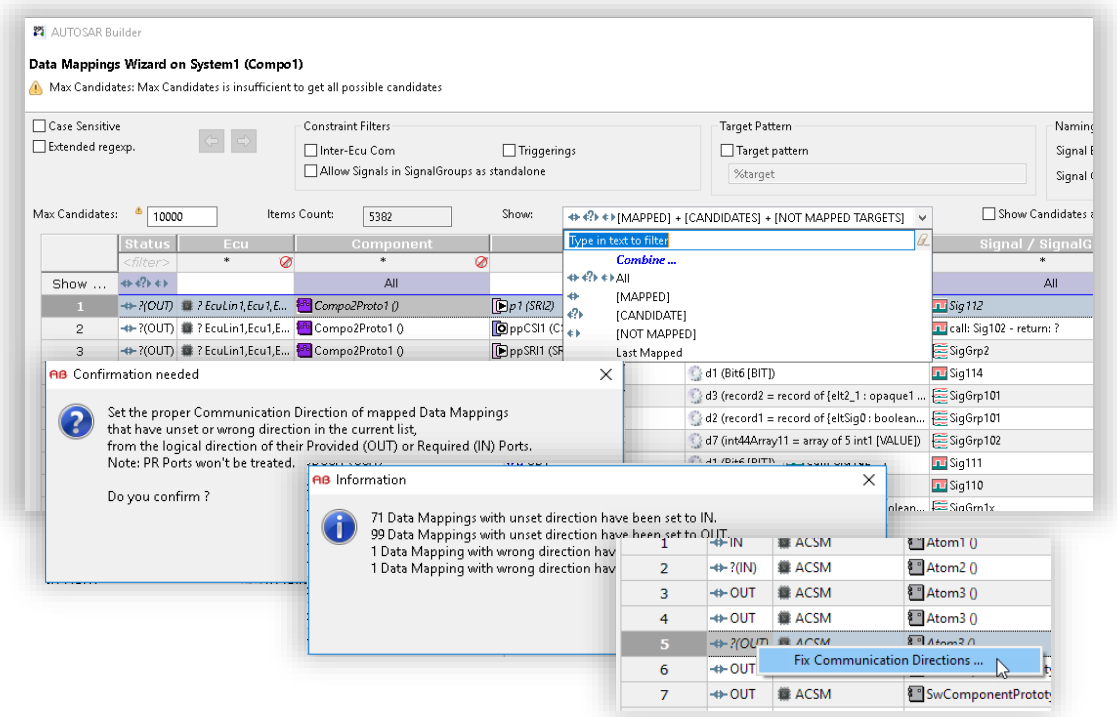
The top portion of the editor, which contains advanced filtering options and editor specific options, is reorganized. The interface list is enhanced to enable filtering based on specific interfaces. The status icons, warnings, and tooltips are also enhanced.



3DS.COM © Dassault Systèmes

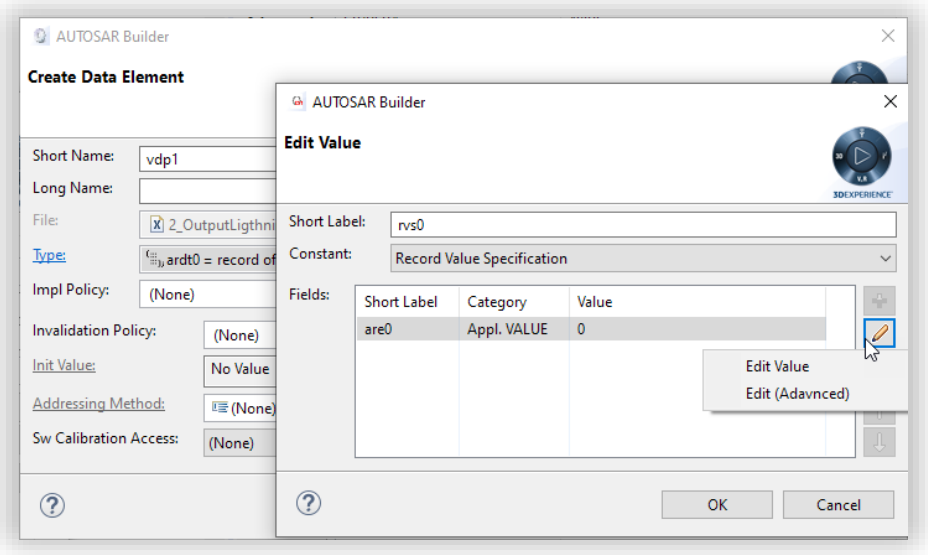
2.3.1. Data Mapping Editor

The Data Mapping Editor interface is unified with other mapping editors. The editor proposes candidate mappings for the sub prototypes, in case of composition prototypes, displays the detailed information on communication direction, and displays new tooltips, warnings, and information dialog boxes.



2.4. Initial Value of Data Elements

When defining the initial value using value specification of type array or record, you can edit the initial value directly or through its value specification.



3DS.COM © Dassault Systèmes

3. AUTOSAR Builder Adaptive

3.1. Adaptive 19-11 Update

AUTOSAR Builder 2020x Refresh1 integrates Adaptive 19-11 meta-model and already delivers the updated interfaces for new concepts implemented in this meta-model.

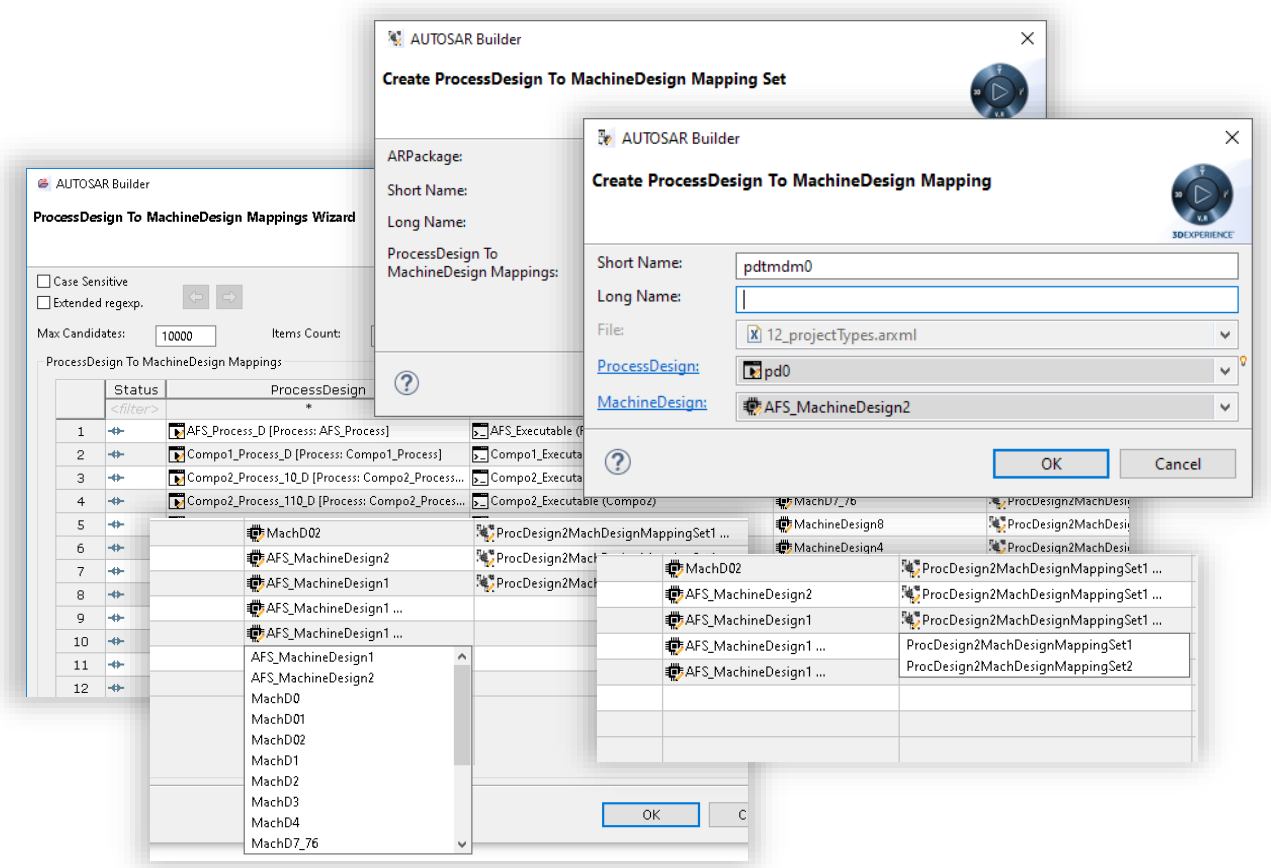
3.2. Process Design Integration for Meta Model 19.11

3.2.1. Process Design to Machine Design Mapping

New interfaces are introduced to create:

- Process Design to Machine Design Mappings
- Process Design to Machine Design Mapping Sets

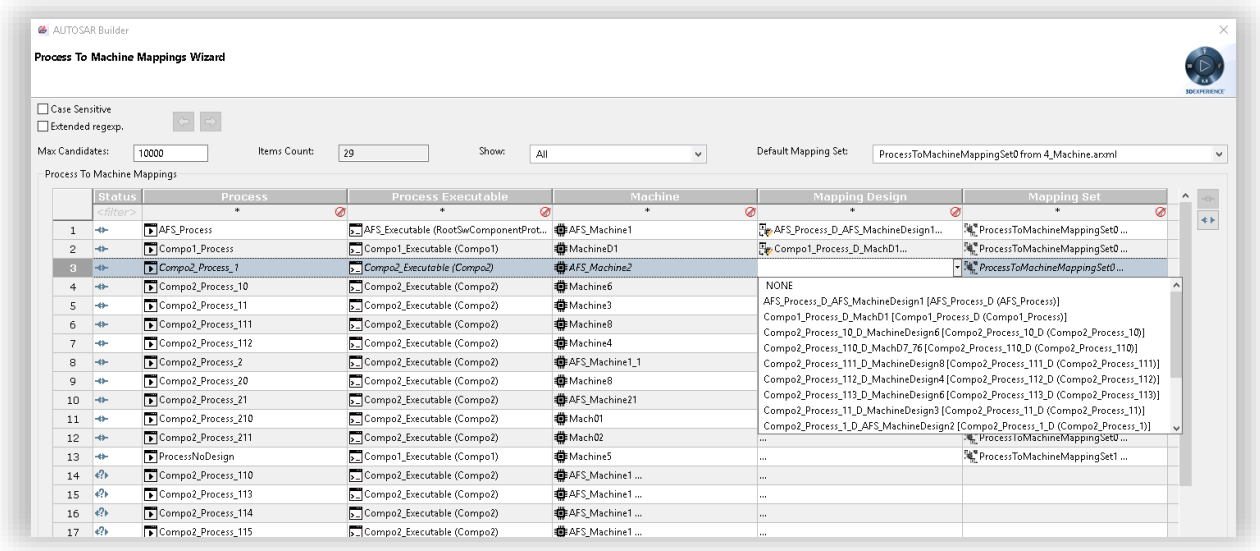
A mapping editor is also introduced to create and edit mappings easily.



3DS.COM © Dassault Systèmes

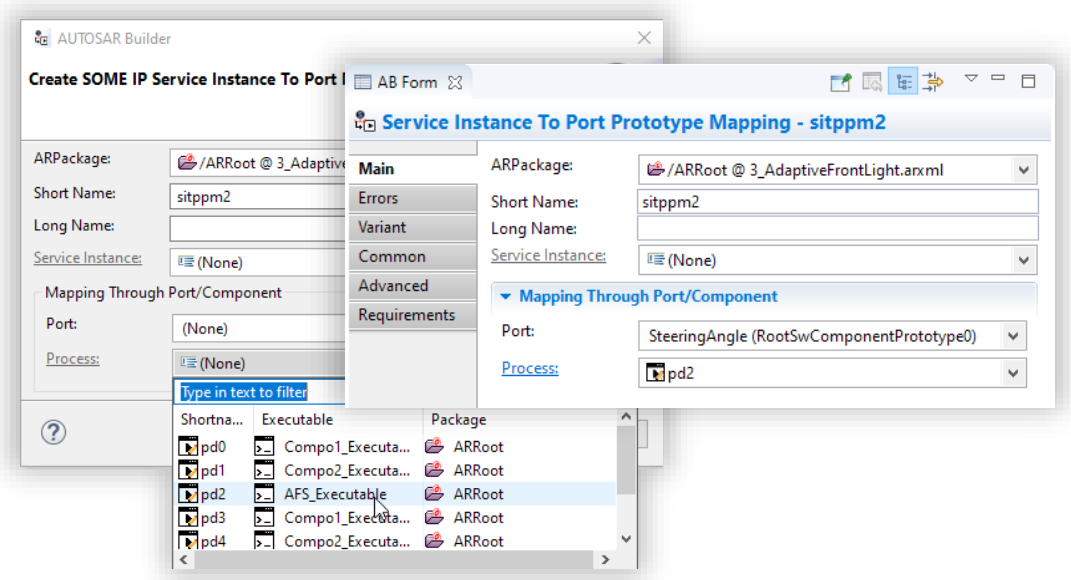
3.2.2. Process to Machine Mapping Editor

As the process to machine mapping can now reference a process design to machine design mapping, the Mapping Design and Mapping Set columns are added in the mapping editor.



3.2.3. Service Instance to Port Prototype Mapping Editor

Service instance to port prototype mappings now reference a process design instead of a process.

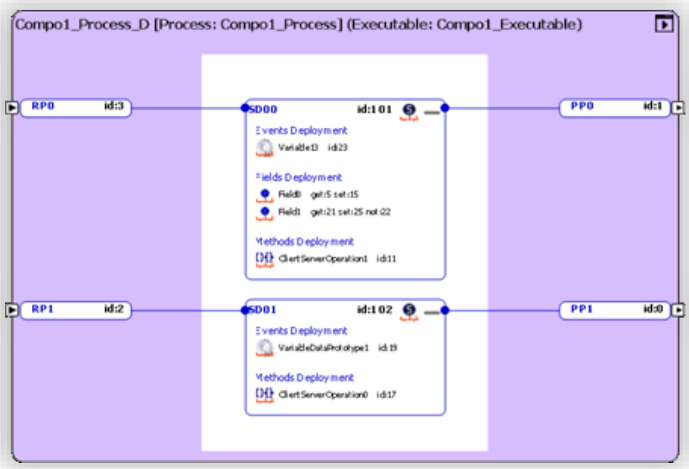


3DS.COM © Dassault Systèmes

DS CATIA
DASSAULT SYSTEMES | The 3DEXPERIENCE® Company

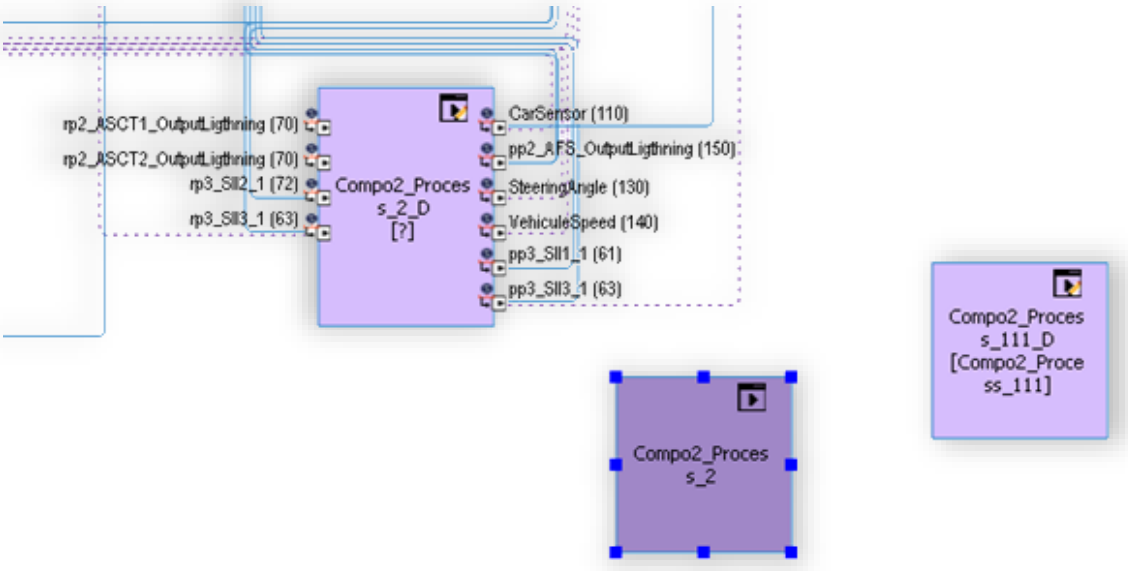
3.2.4. Process Design Diagram

Process Diagram is renamed to Process Design Diagram and now shows the details of the process design.



3.2.5. Processes Diagram

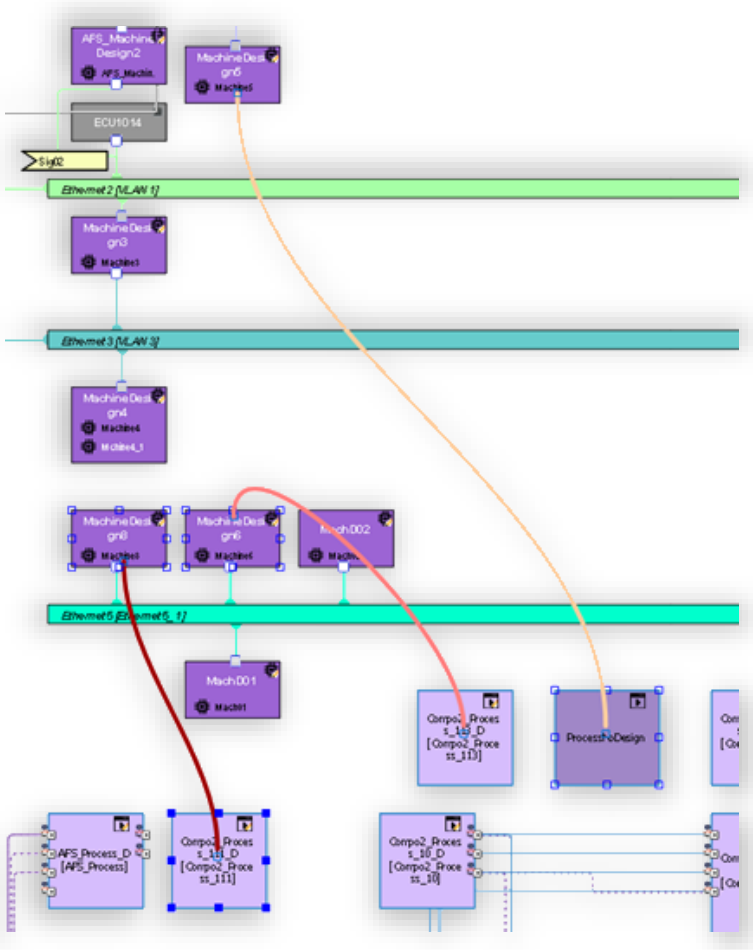
The processes diagram now shows process designs and the processes which do not reference a process design.



3DS.COM © Dassault Systèmes

3.2.6. System Mapping Diagram

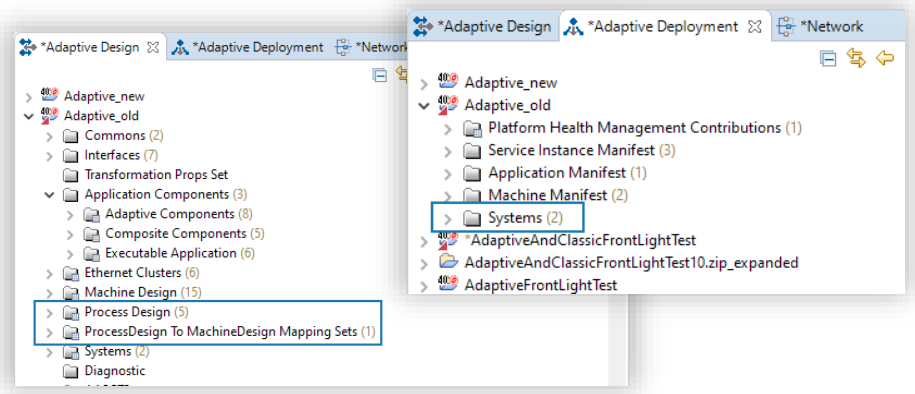
The display of the mappings between adaptive components of the topology is enhanced.



3.2.7. Tree View

The following modifications are done in the Tree view:

- Process Design node is moved from Adaptive Deployment view to Adaptive Design view.
- Process Design to Machine Design Mapping Sets node is added in Adaptive Design view.
- Systems node is added in Adaptive Deployment view

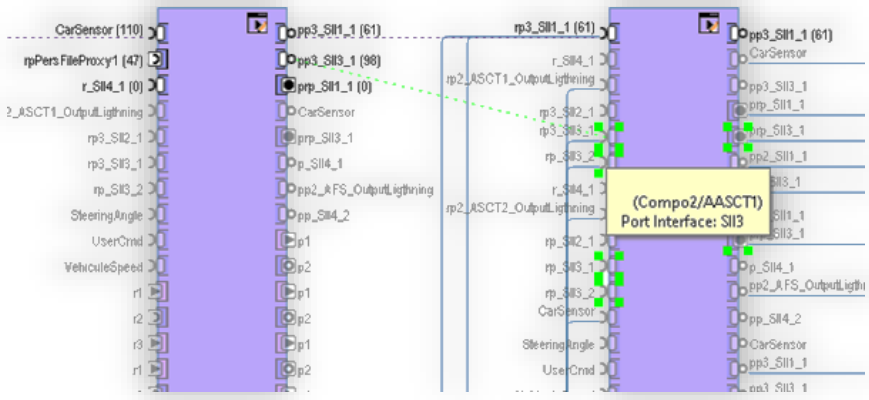


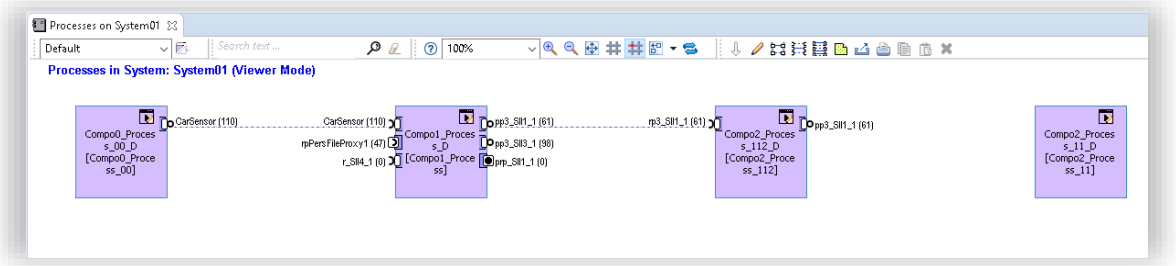
3DS.COM © Dassault Systèmes

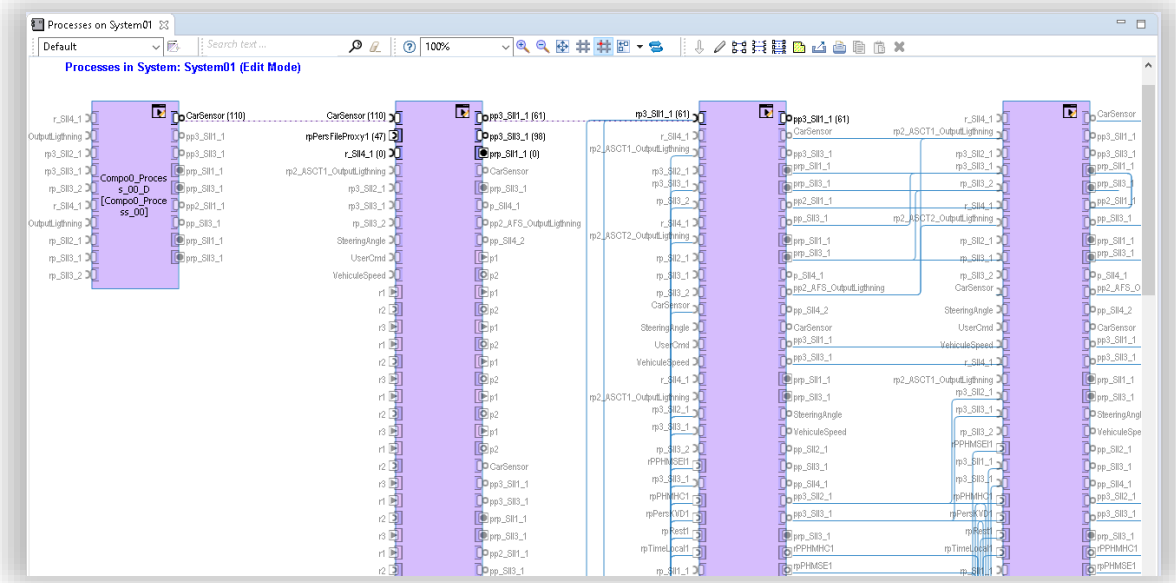
.

3.3. Processes Diagram

You can now create consistent mappings between service instances and port prototypes from processes diagram. The diagram supports Edit Mode and Viewer Mode.



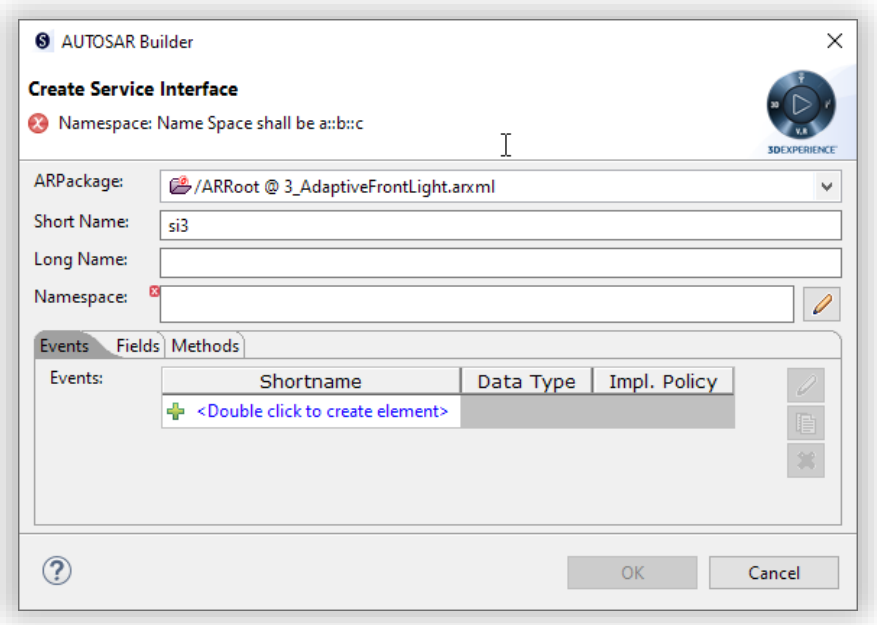




3DS.COM © Dassault Systèmes

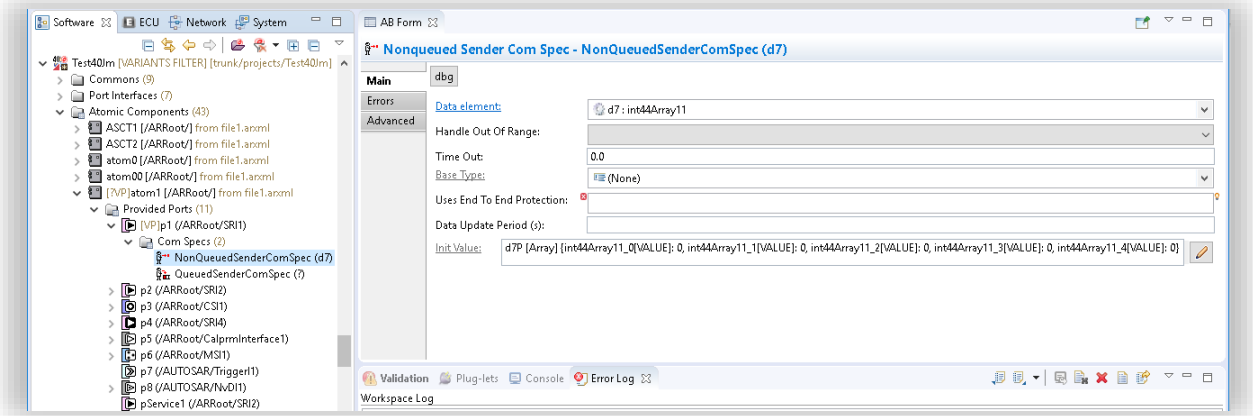
3.4. Service Interface Elements

The elements of the service interface are now listed and configurable from the service interface creation dialog box.



3.5. Communication Specification

You can create communication specifications for the ports using a context menu command. Some new attributes are introduced in the AB Form of the specifications.



3DS.COM © Dassault Systèmes

3.6. AB Validation for Adaptive Platform

The following new rules are added for AUTOSAR Adaptive platform:

Category	Meta Model	internal ID	description
Application Design	19-11	ADTV_40245	Combination of CppImplementationDataTypeElement.isOptional and CppImplementationDataTypeElementQualifier.inplace
		ADTV_40246	Applicability of attribute PersistencyRedundancyEnum.redundantPerKey
		ADTV_40249	Qualified combinations of PortPrototypes and PhmSupervisedEntityInterface on application software level
		ADTV_40250	Qualified combinations of PortPrototypes and PhmRecoveryActionInterface on application software level
		ADTV_40251	Restriction regarding the modeling of the PhmRecoveryActionInterface.recovery
Application Manifest	19-11	ADTV_40247	Consistency of values of attributes PersistencyInterface.redundancy and PersistencyRedundancyHandling.scope
		ADTV_40252	Value of UcmDescription.identifier in the scope of a VehiclePackage
		ADTV_40253	Existence of attribute activationSwitch set to True in the context of the enclosing UcmStep
		ADTV_40254	Simultaneous existence of SoftwarePackageStep.preActivate and SoftwarePackageStep.verify
		ADTV_40255	Restriction for attribute SoftwarePackageStep.activationSwitch
		ADTV_40256	Multiplicity of reference LogicalSupervision.initialCheckpoint
		ADTV_40257	Multiplicity of reference LogicalSupervision.finalCheckpoint
		ADTV_40258	Multiplicity of reference LogicalSupervision.transition
		ADTV_40259	Multiplicity of reference GlobalSupervision.localSupervision
		ADTV_40260	Multiplicity of reference SupervisionCheckpoint.phmCheckpoint
		ADTV_40261	Multiplicity of aggregation LocalSupervision.transition
Machine Manifest	19-11	ADTV_40244	Eligible subclasses of HeapUsage in the context of StateDependentStartupConfig.resourceConsumption
Service Instance Manifest	19-11	ADTV_40248	ProvidedSomeipServiceInstance shall be unique in respect of serviceInstanceId, serviceInterfaceId and majorVersion
System Design	19-11	ADTV_40243	Target of reference SoftwareActivationDependencyCompareCondition.softwareActivationDependency

3.7. Adaptive Software Component Code

As a prototype, AUTOSAR Builder 2020x Refresh1 supports advanced capabilities for code design, application generation, and execution. A suite of tools allows you to:

- Generate application code skeleton
- Generate the ARA Layer
- Compile the application as a linux application
- Execute the linux application on Qemu

For more information about this prototype and getting an access to it, please contact Arthur GAUTHIER: arthur.gauthier@3ds.com

3DS.COM © Dassault Systèmes

Legal Notices

AUTOSAR Builder 2020x Refresh1 is © 2005 – 2020 Dassault Systèmes.

This chapter specifies the patents, trademarks, copyrights, and restricted rights for the AUTOSAR Builder Release 2020x Refresh1:

1. Trademarks

AUTOSAR Builder, 3DEXPERIENCE, the Compass icon, the 3DS logo, CATIA, SOLIDWORKS, ENOVIA, DELMIA, SIMULIA, GEOVIA, EXALEAD, 3D VIA, BIOVIA, NETVIBES, IFWE and 3DEXCITE are commercial trademarks or registered trademarks of Dassault Systèmes, a French "société européenne" (Versailles Commercial Register # B 322 306 440), or its subsidiaries in the United States and/or other countries. **All other trademarks are owned by their respective owners.** Use of any Dassault Systèmes or its subsidiaries trademarks is subject to their express written approval.

DS Offerings and services names may be trademarks or service marks of Dassault Systèmes or its subsidiaries.

2. Third-Party Copyrights Notices

Certain portions of the AUTOSAR Builder® Release 2020x Refresh1 contain elements subject to copyright owned by the following entities:

Copyright © 2015, 2016, Oracle and/or its affiliates. All rights reserved.
Copyright © Artop User Group. All rights reserved.
The AUTOSAR Builder® Release 2020x Refresh1 may include open source software components. Source code for these components is available upon request. The original licensors of said open source software components provide them on an "as is" basis and without any liability whatsoever to customer (or licensee).

IP Asset Name	IP Asset Version	Copyright notice
Under Other License Terms		
InnoSetup	5.5.9	Copyright © 1997-2013 Jordan Russell. All rights reserved. Portions Copyright © 2000-2013 Martijn Laan. All rights reserved.

The following components are distributed and licensed under the terms of their original licenses:

IP Asset Name	IP Asset Version	Copyright notice
Under GNU GPL 2.0		
MinGW (delivered for convenience in a separate package)	4.9.2	Copyright © 2016 - MinGW.org

3DS.COM © Dassault Systèmes

Under Eclipse Public License 1.0		
Eclipse components	4.5.1	Copyright © 2016 The Eclipse Foundation. All Rights Reserved.

Other license terms:

InnoSetup :

Except where otherwise noted, all of the documentation and software included in the Inno Setup package is copyrighted by Jordan Russell.
Copyright © 1997-2018 Jordan Russell. All rights reserved.
Portions Copyright © 2000-2018 Martijn Laan. All rights reserved.
This software is provided "as-is," without any express or implied warranty. In no event shall the author be held liable for any damages arising from the use of this software.
Permission is granted to anyone to use this software for any purpose, including commercial applications, and to alter and redistribute it, provided that the following conditions are met:
1. All redistributions of source code files must retain all copyright notices that are currently in place, and this list of conditions without modification.
2. All redistributions in binary form must retain all occurrences of the above copyright notice and web site addresses that are currently in place (for example, in the About boxes).
3. The origin of this software must not be misrepresented; you must not claim that you wrote the original software. If you use this software to distribute a product, an acknowledgment in the product documentation would be appreciated but is not required.
4. Modified versions in source or binary form must be plainly marked as such, and must not be misrepresented as being the original software.
Jordan Russell
jr-2010 AT jrsoftware.org
http://www.jrsoftware.org/

3DS.COM © Dassault Systèmes

3. Restricted Rights

This clause applies to all acquisitions of Dassault Systèmes Offerings by or for the United States federal government, or by any prime contractor or subcontractor (at any tier) under any contract, grant, cooperative agreement or other activity with the federal government. The software, documentation and any other technical data provided hereunder is commercial in nature and developed solely at private expense. The Software is delivered as "Commercial Computer Software" as defined in DFARS 252.227-7014 (June 1995) or as a "Commercial Item" as defined in FAR 2.101(a) and as such is provided with only such rights as are provided in Dassault Systèmes standard commercial end user license agreement. Technical data is provided with limited rights only as provided in DFAR 252.227-7015 (Nov. 1995) or FAR 52.227-14 (June 1987), whichever is applicable. The terms and conditions of the Dassault Systèmes standard commercial end user license agreement shall pertain to the United States government's use and disclosure of this software, and shall supersede any conflicting contractual terms and conditions. If the DS standard commercial license fails to meet the United States government's needs or is inconsistent in any respect with United States Federal law, the United States government agrees to return this software, unused, to DS. The following additional statement applies only to acquisitions governed by DFARS Subpart 227.4 (October 1988): "Restricted Rights - use, duplication and disclosure by the Government is subject to restrictions as set forth in subparagraph (c)(l)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252-227-7013 (Oct. 1988)

AUTOSAR Builder 2020x Refresh1 is © 2005 – 2020 Dassault Systèmes.

3DS.COM © Dassault Systèmes