

AUTOSAR Acceptance Tests

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BMW Group



BOSCH

Continental

DAIMLER



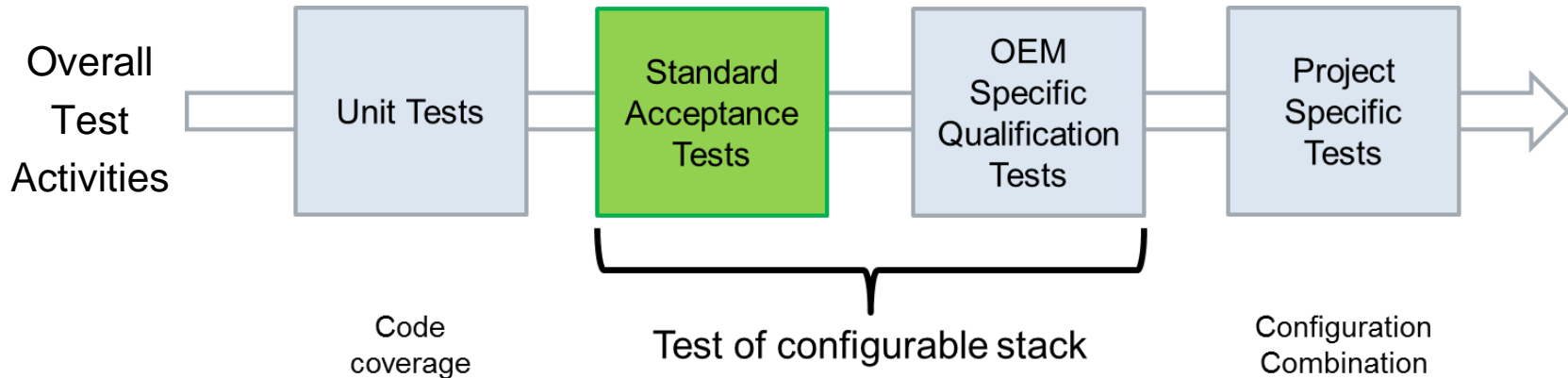
PSA PEUGEOT CITROËN

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AUTOSAR Acceptance Tests



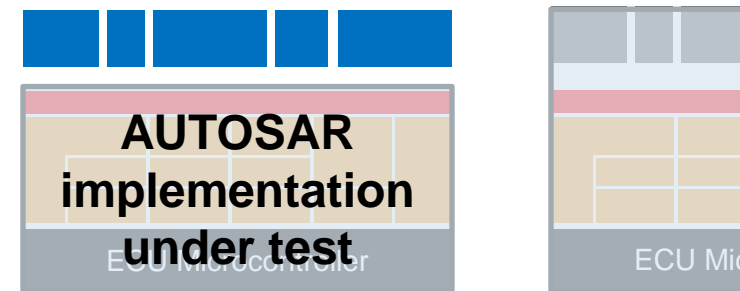
➤ AUTOSAR Acceptance Tests Objective: Minimize test effort

- Common test development and maintenance
- Methodology and extensibility
- Exchange of trustable test execution results

➤ Limited to test behavior available to applications or on the bus

- Limit maintenance effort for users and AUTOSAR

2. Compatibility with applications?



1. Compatibility with EE architecture?

Acceptance Test Specifications

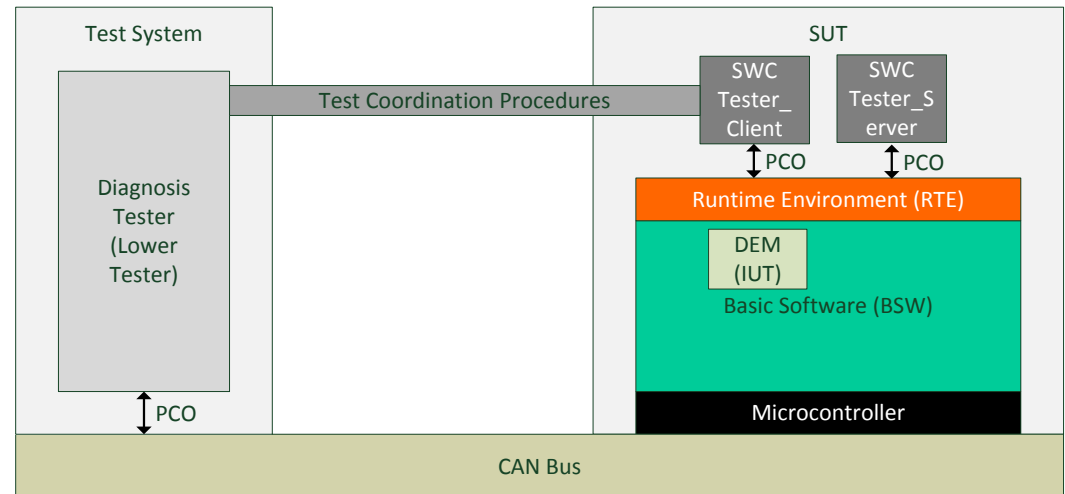
➤ Organized per Test Suite

- General Test Objective and Approach

- Test System
- Test Configuration
- Test Case Design

- Re-usable Test Steps

- Complex set of test steps that can be later reused in test cases



- Test Cases

- Set of test cases, each described using the same template. See next slides.

Test Case Example (1/2)

Short description of the test objective.
also used as title of test case

List of CP releases for which this test case
specification is applicable

Traceability to
AUTOSAR_ATR_Requirements

Traceability to SWS items relevant for the
tested functionality

Requirements on configuration

- Focus on key parameters
- Upstream template parameters if possible

Description how the test case works

Hints on the adaptations needed to adapt
the test case to other CP releases

Test Objective	Test Intra-ECU C/S argument rescaling - ClientServerInterfaceMapping Linear Scaling		
ID	ATS_RTE_00145	AUTOSAR Releases	4.0.3 4.1.1
Affected Modules	RTE	State	reviewed
Trace to Requirement on Acceptance Test Document	ATR: ATR_ATR_00028		
Trace to R4.1.1 Item	RTE: SWS_Rte_03818 RTE: SWS_Rte_03819 RTE: SWS_Rte_03829		
Requirements / Reference to Test Environment	Use Case 03.01 : Intra-ECU C/S Communication		
Configuration Parameters	1 SWC Client The Operation uses parameter with ClientType LowerLimit = 0, UpperLimit = 100 ComputationMethod : PhyToInt : identical 1 SWC Server The Operation uses parameter with ServerType LowerLimit = 200, UpperLimit = 1200 Computation Method: PhyToInt : Linear (10*x+200) Both are using uint32 types 1 ClientServerInterfaceMapping maps the client to the server		
Summary	The Test Manager starts the Client, which calls the server The Test Manager checks that server was invoked with the converted values.		
Needed Adaptation to other Releases	Needed Adaptation for Release [3.2.2]		
	Configuration: [n/a]	Client-server argument rescaling does not exist in R3.2.2.	
	Test Steps: [n/a]	The test case shall be removed	

Test Case Example (2/2)

Pre-conditions mandatory to execute the test case

Sequence of test steps that shall be executed.

Steps are organized as an action and a pass criteria.

When one of the pass criteria fails, the test case fails.

Point of control & observation
The actions and pass criteria can be preceded by an indication on where the action has to be performed (resp. where the pass criteria has to be observed).

Pre-conditions	None	
Main Test Execution		
	Test Steps	Pass Criteria
Step 1	[CP] start Tester_Client_1	
Step 2	[SWC<Tester_Client_1>] invoke the operation (Rte_call) with argument value 0	[SWC<Tester_Server>] server has been invoked with converted argument value 200
Step 3	[SWC<Tester_Client_1>] invoke the operation (Rte_call) with argument value 100	[SWC<Tester_Server>] server has been invoked with converted argument value 1200
Step 5	[CP] terminate Tester_Client_1	
Post-conditions	None	

Post-conditions mandatory to restore a working environment

Usage of Acceptance Tests

- AUTOSAR provides acceptance test specifications
 - Activities remain on user side

- Different business models
 - Not enforced by AUTOSAR

Test case selection

Test setup

Configurations

Implementation

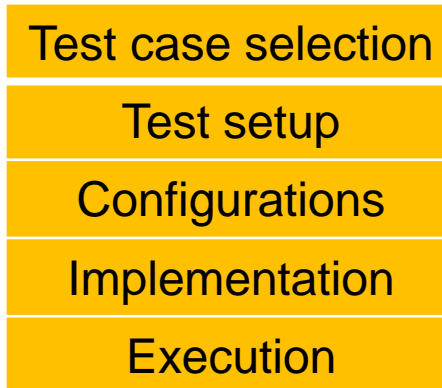
Execution

Usage of Acceptance Tests

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- Different business models
 - Not enforced by AUTOSAR
 - For example
 - Execution by OEM

OEM



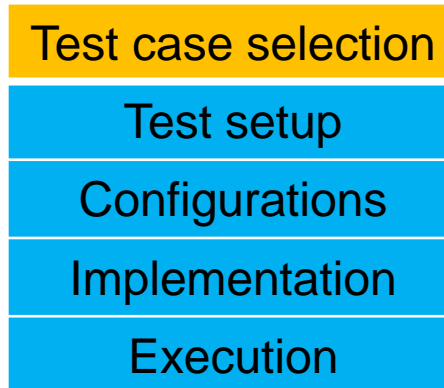
Stack vendor

Usage of Acceptance Tests

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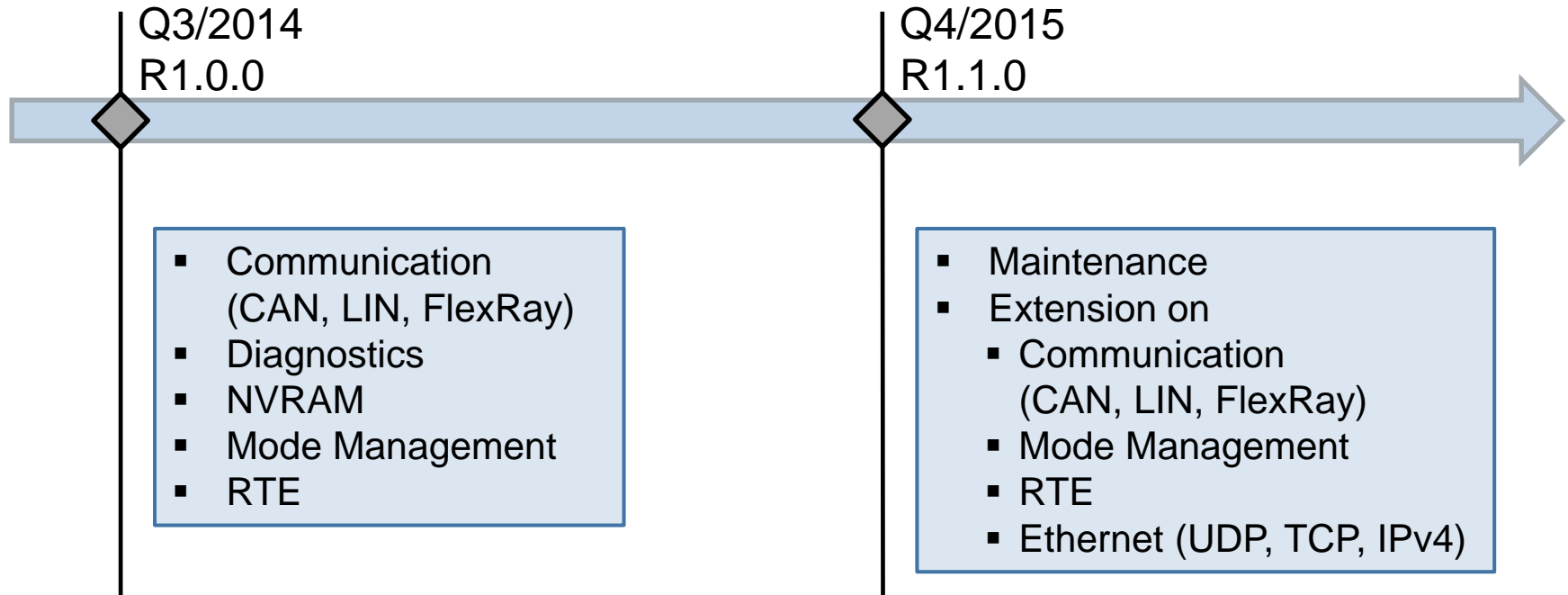
- Different business models
 - Not enforced by AUTOSAR
 - For example
 - Execution by OEM
 - Execution by stack vendor

OEM



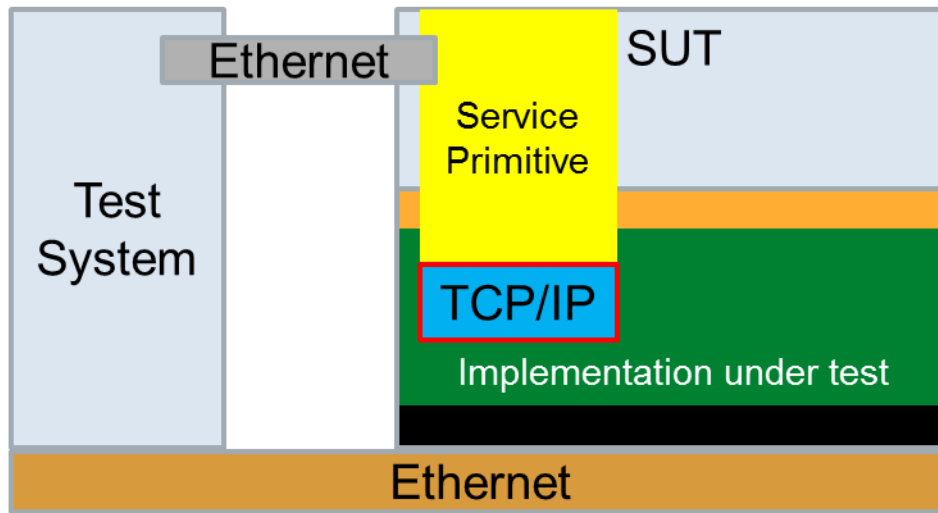
Stack vendor

Available Test Suites



Ethernet Test Suites

- New test suites for UDP, TCP, and IPv4 in R1.1.0
 - Limited to features supported by AUTOSAR
 - Test method limited to features available in AUTOSAR
- Test cases are traceable toward AUTOSAR specification and toward IETF RFCs
- Test cases design



- Protocol and Service Primitive
 - Close Socket
 - Create and Bind
 - Send Data
 - Receive and Forward
 - ...

Next Steps

- Further extension of the test suites

- You can contribute by
 - Providing some of your test cases for standardization
 - Supporting WP-T in reviews
 - Providing feedback as users of existing test suites

- Acceptance Tests will be considered in concept handling process
 - Reduce time to provide test cases for new features

Thank you for your attention!

More Information about
AUTOSAR:

<http://www.autosar.org>

The screenshot shows the AUTOSAR website interface. At the top, the logo 'AUTOSAR Enabling Innovation' is visible. Below it is a navigation menu with 'About', 'Partners', 'Specifications', and 'Documents'. A search bar is located on the right. The main content area features a large image of a car with technical overlays. Below the image, there is a section titled 'Specifications' with a list of releases: Release 4.2, Release 4.1, Release 4.0, Release 3.2, Release 3.1, Release 3.0, Release 2.0, and 'Acceptance Tests Release 1.0'. The 'Acceptance Tests Release 1.0' item is highlighted with a red box. To the right of this list, there is a detailed section for 'Acceptance Tests Release 1.0' with a 'read more' link. A text overlay in the bottom left corner, also highlighted with a red box, reads: 'For information only (see disclaimer) Published Releases'.