

Certification Operating Council Updates

Test Specifications, TCI, Test Tools and more

USDOT Plugfest

May 8, 2017

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Goals & Scope

- Overview of changes in Test Specifications, Test Tools, etc.

USDOT Certification Program

- The USDOT competitively selected three certification service providers (7Layers, Danlaw, and Southwest Research Institute)
- All three work together through the Certification Operating Council (COC) to support certification testing for CV Pilots
- The USDOT project is extended till September 2017 to accommodate V2I testing
- Vision is to help the industry to organize and run a self-sustaining certification program supporting deployment and evolution of DSRC-based services

Listing of Test Specifications

Test Specifications	Title / Scope	Version
WAVE802.11-TSS&TP	Test Suite Structure and Test Purposes for IEEE 802.11 (scope of DSRC)	1.1.0 10/20/2016
WAVEMCO-TSS&TP	Test Suite Structure and Test Purposes for Multi Channel Operation (IEEE 1609.4)	1.2 (20170426)
WAVENS-TSS&TP	Test Suite Structure and Test Purposes for Network Services (IEEE 1609.3)	1.2 (20170426)
WAVESEC-TSS&TP	Test Suite Structure and Test Purposes for Security Services (IEEE 1609.2)	1.2 (20170428)
J2945.1-TSS&TP	Test Suite Structure and Test Purposes for J2945.1	0.5.4 (20170428)
V2I Specs	V2I Test Suite Structure and Test Purposes (based on RSU 4.1 Requirements)	0.2 (20170419)
Interoperability Test Specs	Plug Fest Interoperability Test Cases	1.3 (20170503)
Field Testing	1. V2I Field Test 2. Vehicle Tests for the Test Track	
Test Control Interface	Test Control Interface protocol specification	0.5 (20170417)

COC Test Specifications available on

https://github.com/certificationoperatingcouncil/COC_TestSpecs

Responses to Questionnaire – Thank you!

ALPS
Autotalks
Chemtronics
Cohda Wireless
Danlaw
Delphi
Desno
eSSys
eTransSystems
Hitachi
IT-Telecom
Keysight
Korea Electronics Technology
Institute
Laird
LG electronics
Lite-On

Marben
NORDSYS
Panasonic
Renesas
Savari
Siemens
SiriusXM
Sumitomo
Unex
Valeo Peiker
Vector

28 responses to questionnaire

Scope of changes

- 80211
 - No changes
- 16094
 - TPs testing IPv6 over DSRC reworked to use WSA for IPv6 configuration
- 16093
 - Criteria for validating message Repeat Rate
- 16092
 - “Bug fixes” based on comments
- 29451
 - TPs categorized into Stationary and Moving Vehicle tests
 - Editorial clarifications to many test cases
 - Better delineation of TPs according to 4 test setups:
 - TC1 for testing “default” BSM behavior
 - TC2 for testing BSM in a moving vehicle vs. “ground truth”
 - TC3 for testing data ranges and edge conditions in BSMs using Test System and TCI
 - TC4 for testing BSM reception

Scope of changes (cont'd)

- V2I RSU Test Specification - new
 - Based on RSU4.1, includes OBU tests
 - Testing SNMP management interface
 - Built-in applications: Store & Forward, Immediate Forward
 - GPS positioning, time and notifications when GPS signal is lost
 - Multi-channel operation
 - WSA transmission & reception
 - SPAT/MAP transmission & reception

 - Does not include:
 - Environmental testing
 - Device operational testing (log files, user management)
 - Testing of device security & intrusion detection

Scope of changes (cont'd)

- Interoperability Test cases
 - Further details to the previously defined test cases
 - Additional test cases for SPAT & MAP
- Field Testing
 - Test cases for RSU & OBU
 - Determine PER for OBU and RSU in the driving range 0-300m
 - Vehicle test cases
 - Accuracy for vehicle location, heading
 - BSM Part II – PathHistory, PathPrediction
 - Heading latch/unlatch at low speeds
 - Certificate changes over travel distance

Scope of changes (cont'd) – Test Control Interface

- Changes in TCI
 - 29451 Frame
 - Aligned messages with updates to the 29451 test specification
 - SutControl – new messages
 - SetTestId – inform device about test id – for debugging
 - RequestSutInfo – device hardware/software version – for certification
 - Changes in TCI WEE.asn (shared by TCI and 1609.3)
 - WEE used by TCI changed EDCA/ecwMax (0..~~15~~1023) – changes encoding
 - May affect test cases utilizing WSA

Scope of changes (cont'd) – TCI Tools (on Github)

- Updates in TCI_MessageGenerator (by Danlaw)
 - Supports all updates in the TCI specification

- TCI message sequences
 - Danlaw test system
 - Covers 16093 test cases
 - Spirent test system
 - Posted soon
 - Available on request

Version	Fixes
1.04	<ul style="list-style-type: none">• Re-compile to implement changes to the TCI;• Fixed decoding and encoding BSM;• When sending StartWsmRx, the RxFlags bits were not set when selected.
1.05	<ul style="list-style-type: none">• Minor change.
1.06	<ul style="list-style-type: none">• Minor changes to the 2945.1 tab labels and sub-tabs names to conform to the new 2945.asn file.
1.07	<ul style="list-style-type: none">• Major bug fixes reported by Mangesh Sukthanker from Marben Products, Vamsi K Peddina from Lear Corporation and Thomas Ritter.
1.08	<ul style="list-style-type: none">• Compiled with the latest TCI interface ASN.1 version TCI_20170409-2;• Added Set_Initial_State subtab to the 2945 tab.• Changed CheckDeviceAvailability Message to RequestSutAvaibility.• Added requestSutInfo and setTestId messages
1.09	<ul style="list-style-type: none">• Updated to conform with the latest TCI29451.asn changes.
1.10	<ul style="list-style-type: none">• Changes as a result of the latest 2945.ASN changes, the addition of startBsmRx and stopBsmRx.
1.11	<ul style="list-style-type: none">• eventFlag ComboBox has been replaced by a ListBox.

COC test systems

- Danlaw test system
 - Target scope 802.11, 1609.2, 1609.3, 1609.4, 2945/1 (conformance)
 - V2I tests
- Spirent test system (7layers)
 - Target scope 1609.3, 1609.2, 1609.4, 2945/1 (conformance)
 - V2I tests
- SwRI test system
 - All non-vehicle J2945/1 requirements (conformance, field tests)
 - V2I test & RSU field tests

IUT implementation of TCI Application is required for testing COC Test Specifications

What's after Plugfest

- COC testing
 - COC USDOT project - Task 7 “Conduct Self-sustaining certification testing”
 - June – August, 2017 - COC members will test devices and provide “formal” test reports as a service
 - Test report results expected to be shared with USDOT
- OmniAir certification
 - OmniAir is preparing to launch a certification program for Connected Vehicle devices
 - Certification Release 1 is based on COC test specifications
 - OmniAir presentation will be at 4:30pm

Where to get more information

- **Certification Operating Council:**
certificationoperatingcouncil@gmail.com
- **Certification Test specifications:**
https://github.com/certificationoperatingcouncil/COC_TestSpecs
- **Test Control Interface Specification:**
• https://github.com/certificationoperatingcouncil/TCI_ASN1
- **Test Control Interface Tools:**
• https://github.com/certificationoperatingcouncil/TCI_Tools
- **DSRC Proxy:**
• <https://github.com/certificationoperatingcouncil/DSRCproxy>