Device Certification

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SIS62: Ensuring global impact and legal value for the certification of c-its systems and services

Prepared by Certification Operating Council
September 22, 2015
Device Certification

What to expect from a Certification Service

Example: RSU 4.0
**Development of Pilot Certification Program**

- USDOT competitively selected three certification service providers – Danlaw, 7Layers and OCS
- All three work through the Certification Operating Council (COC) to develop certification services
- Certification services are to assure basic interoperability of CV Pilot installations
- Certification services will be available during CV Pilots Build and Operation phases on a fee-for-service basis
- Initial award provides an 18-month timeline, which runs though 2016
Certification Service Providers

Danlaw provides connected vehicle telematics solutions and embedded electronics to OEMs and their Tier-1 supply chain.

OmniAir Certification Services (OCS) is a non-profit organization founded by OmniAir to execute independent certification for the intelligent transportation industry.

7Layers is an international group of engineering & test centers having a core competence in wireless technologies.

TOWARDS INTELLIGENT MOBILITY
Better use of space
Goals For Pilot Certifications

Conduct Device Certification to ensure:

- Conformance to the message protocols
  - Ability to transmit & receive messages using specific protocols
  - Use message security and security credentials
- Conformance to performance requirements
  - Use position and timing information
  - Radio behavior characterization
- Device interoperability regarding selected information flows
Focus on Key Interfaces for Pilots

Vehicle Situation Data: All basic safety messages (BSMs) meet performance requirements

Field Situation Data: All MAPs and signal phase and timing (SPaT) created using same interpretation

Application Protocol Data Units

Traveler Situation Data:
- Use common distribution

SCMS:
- Use one system

Information flows for basic system interoperability
How CV Pilots can use Certification Services

1. A Site Operator requests the Certification Operating Council (COC) develop certification testing based on the Device Requirements
2. COC develops Test Specifications based on Device Requirements
   – COC and the Site Operator agree on certification criteria
3. The Site Operator references Test Specification in the procurement guidelines to Vendors
4. Vendors submit products to COC for the Certification Testing
5. COC conducts device testing per Test Specification
6. COC uses 3rd party test results + results from certification testing
7. COC issues certification verdict
8. COC issues Certification Mark on passing
9. Site Operator buys marked devices
What to expect from a certification service

RSU 4.0 Certification Testing

In scope (current)
- Suitability for environment
- Radio behavior testing
- Wired and wireless protocol testing
- Message protocol conformance for
  - DSRC-based: BSM, SPAT, MAP, TIM
  - Vehicle Situation Data Message
  - Traveler Situation Data Message

Not in scope (future development)
- System integration testing
- Field testing
- Application testing
- Installed performance testing
  - Performance may vary depending on RSU specific installation, site selection, length of antenna cable, and etc.
Steps Toward RSU 4.X Testing

- Update requirements document
  - Revise RSU specification toward new revisions of SAE/IEEE standards,
  - Revise RSU to support specified applications (i.e. selected for CV Pilots)
- Agree on the scope of testing
  - Identify individual requirements that will be tested by an independent party
  - Identify individual requirements that will be self-certified
- Prepare for Testing
  - Prepare Master Test Plan (as per IEEE 829 Std.)
  - Prepare test specifications tailored to the RSU requirements
  - Determine certification guidelines and passing criteria
Scope of Development in Current Work

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<th>2 - Communication Protocol Abilities</th>
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<td>3 - Interface Abilities</td>
<td>Applications</td>
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<td>4 - Overall Application Abilities</td>
<td>Basic Device</td>
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</table>

Certification Levels:

1. Environmental Abilities including Physical Security,
2. Communication Protocol Abilities,
3. Interface Abilities (both the syntax and contents of the message payload transmitted over the communications medium), and
4. Overall Application Abilities.
Certification Modules Coverage of RSU 4.0

• Supported by existing test methods and labs: (19%)
  - FCC
  - Environmental
  - Physical

• Supported by COC certification modules under development: (31%)
  - IEEE 1609
  - IEEE 802.11p
  - Radio behavior testing
  - DSRC message structure

• Not supported by COC modules under development: (50%)
  - Logging / Configuration
  - MIB
  - Operating System
Certification Operating Council

Questions to be addressed for CV Pilots

- What applications are planned at each site (NY City, Tampa and Wyoming)?
- What classes of devices will be used (vehicle, aftermarket, carry-on, roadside)?
- What standards versions will each CV Pilot site use?
  - IEEE 1609.3, 1609.4, 1609.2, J2735 (BSM, TIM, SPAT/MAP) are changing
  - What security implementation and certificate management implementation (SCMS) will be supported
  - Interface definition between RSU and traffic controllers, and other devices
  - How DSRC-based messages will be collected/archived
  - How RSU devices will be managed remotely
- What criteria will be used for selecting devices/systems?
Full Deployment Certification

Pilot Deployment Certifications

Danlaw, 7Layers, OCS
- Interoperability for BSM, SPAT, MAP, TIM
- Vehicle Situation Data
- Traveler Situation Data
- Intersection Situation Data

MetLabs, UL, Cetecom, EVC
- System integration
- Regulatory testing
- Environmental testing
- Conformance testing of PHY/MAC
- Lab accreditation
- Security Credential Management
- Field tests
- Applications & data flow
- J2945.1 compliance
- J2945.x requirements
- Installed performance
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