Device Certification

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BORDEAUX 2015
22nd ITS World Congress
Bordeaux, France
5 to 9 October
2015

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Device Certification

What to expect from a Certification Service

Example: RSU 4.0

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

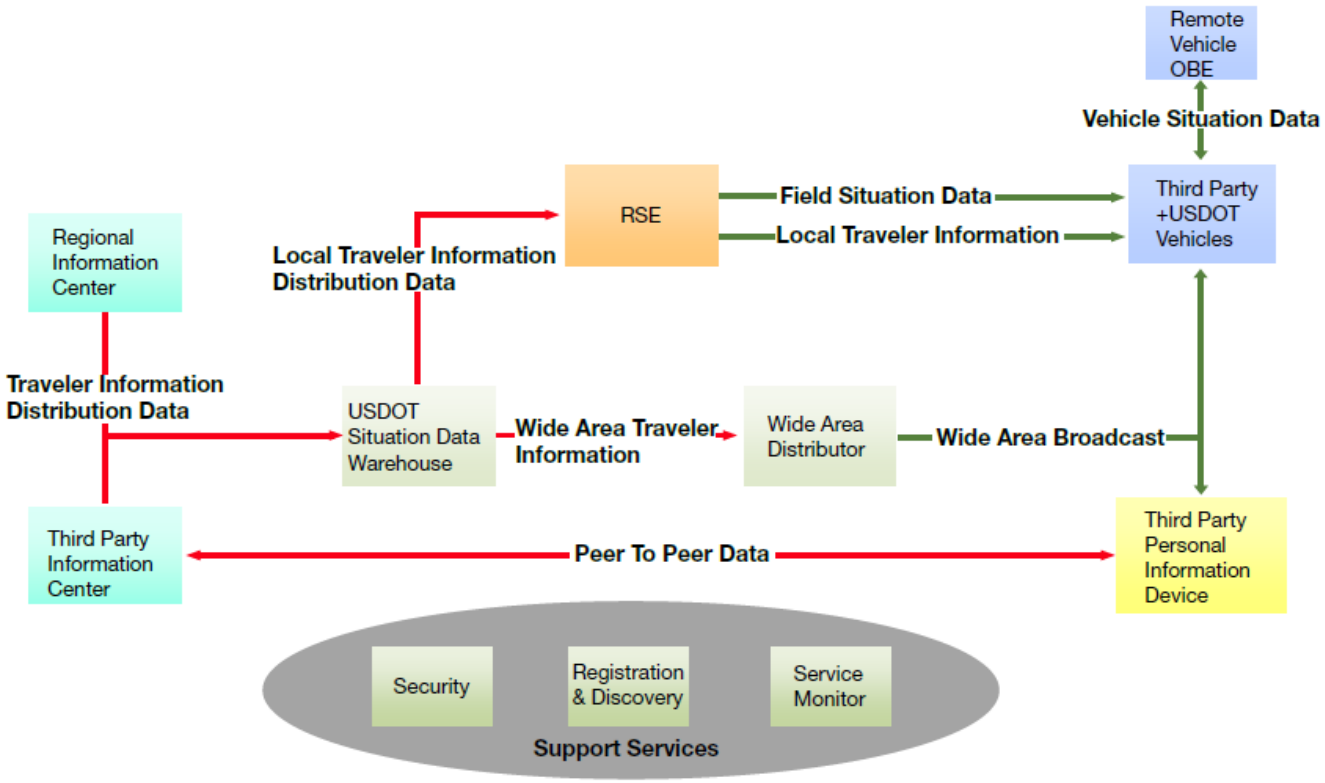
7Layers is an international group of engineering & test centers having a core competence in wireless technologies.

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



Information flows for basic system interoperability

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

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

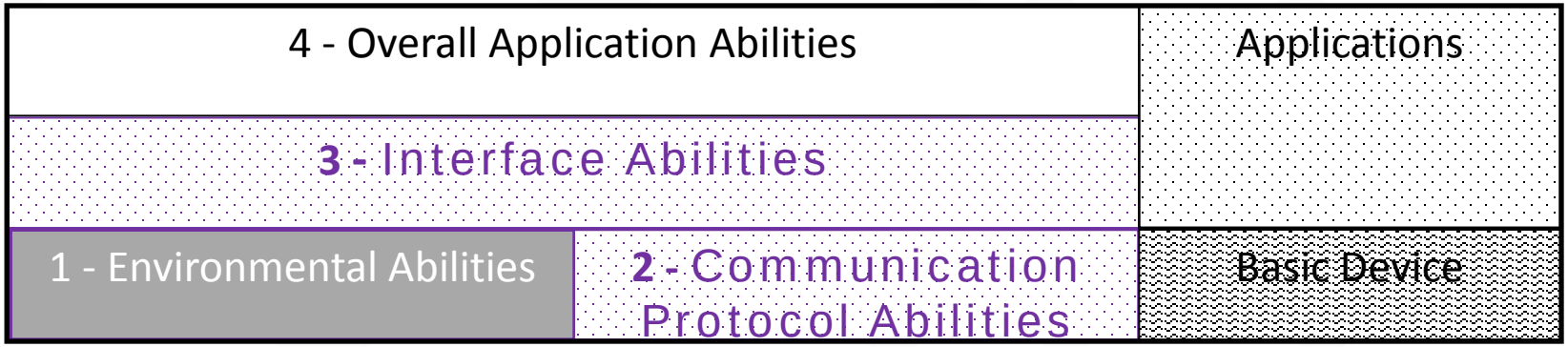
Not in scope (future development)

- 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

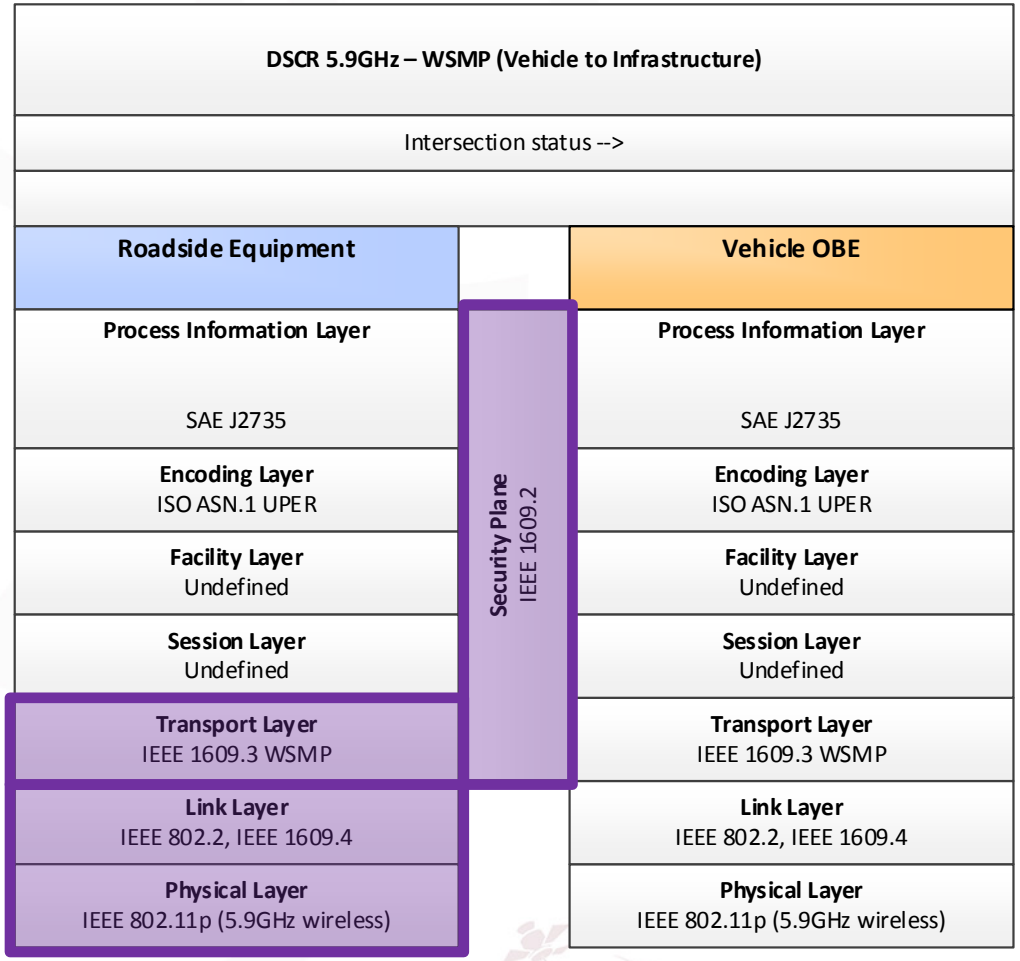


Certification Levels:

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



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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