



eCoMove Communication Platform eCoMove Final Event, Aachen

Ola Martin Lykkja Q-Free ASA

21.11.2013



www.ecomove-project.eu



Core technologies in eCoMove

- Architecture
- Communication platform
- ecoMessages
- ecoMap and eco Cooperative Horizon
- ecoSituational Model (local view)
- ecoStrategic Model (city view)
- Execution Platform

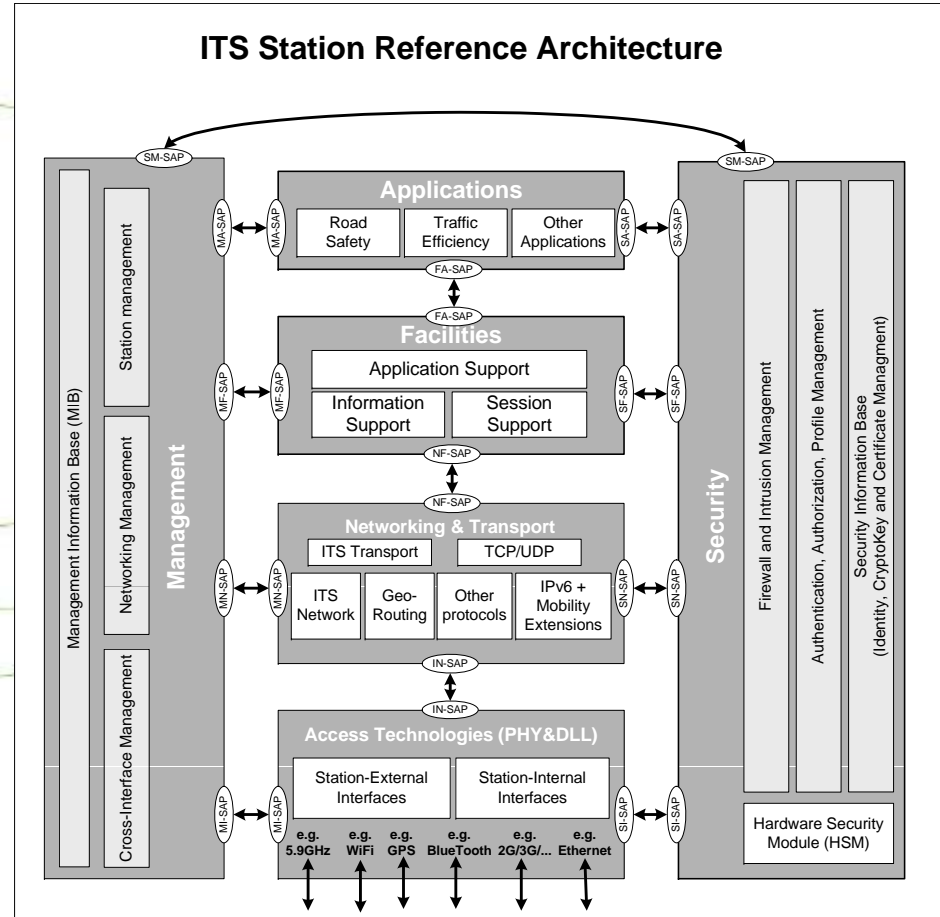
Communications

- Architecture from ISO 21217 and ETSI 302 665
 - Implementation from CVIS
- Network and Transport Protocols from ETSI
 - Compatibility with sim^{TD} and Drive
 - eCoMove Comm. Profile with Single Hop Broadcast
 - Service Announcements enhanced from CVIS
- Communications API from CVIS
 - Factory-based, plug-in architecture
 - Compatible with standard Java API (micro edition)
 - Supports IPv6, GeoNetworking, FNTP, WSMP, etc.

ITS Station Architecture

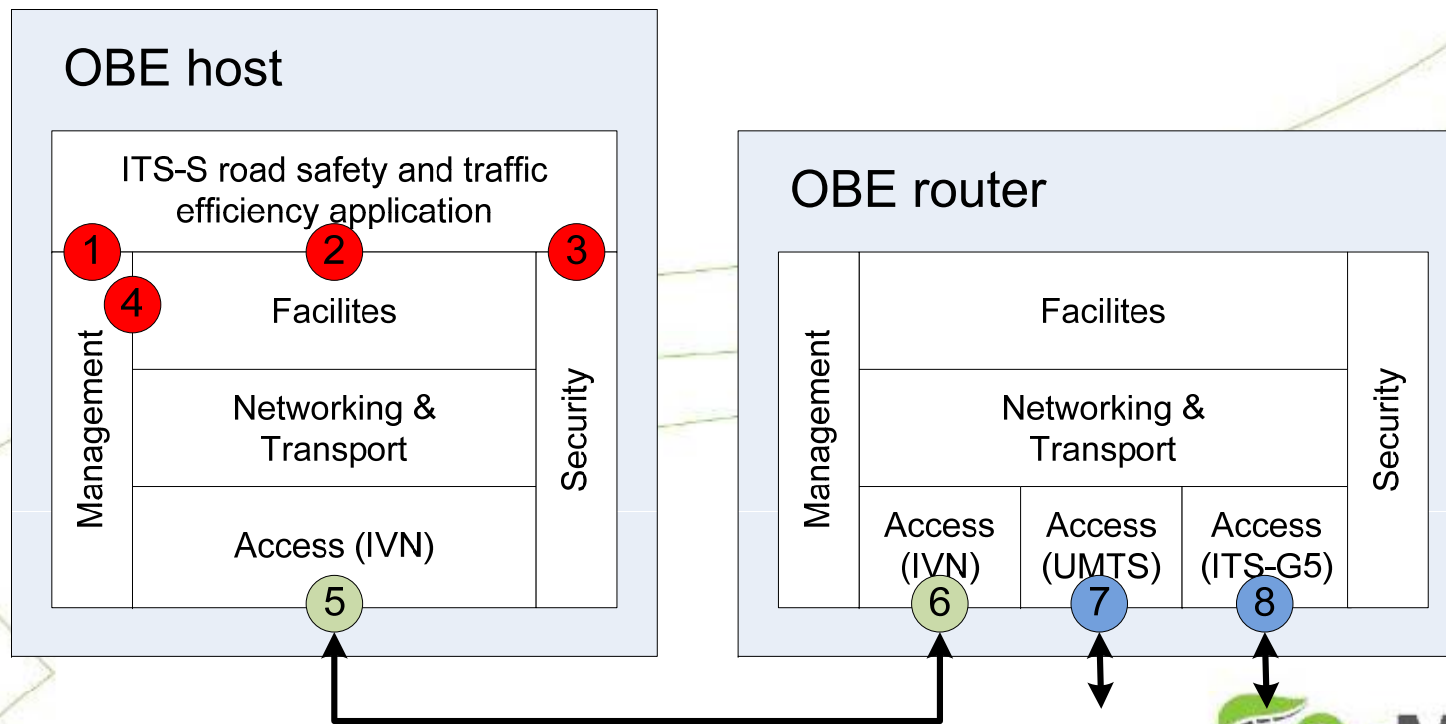
- ISO 21217
- ETSI 302 665
- COMeSafety

- eCoMove
 - D2.3
 - No security
 - Fully aligned with ISO

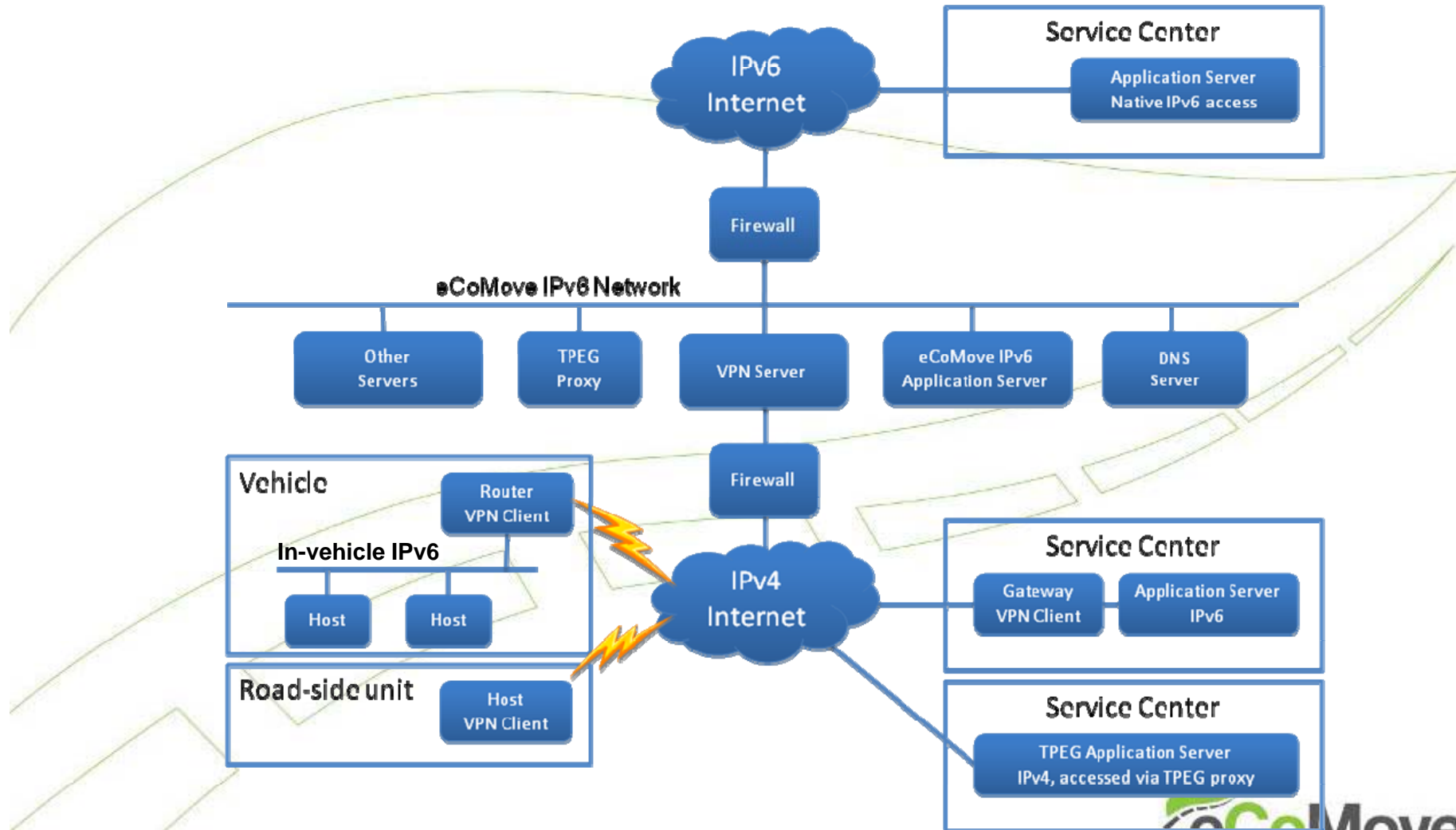


ITS Station Implementation

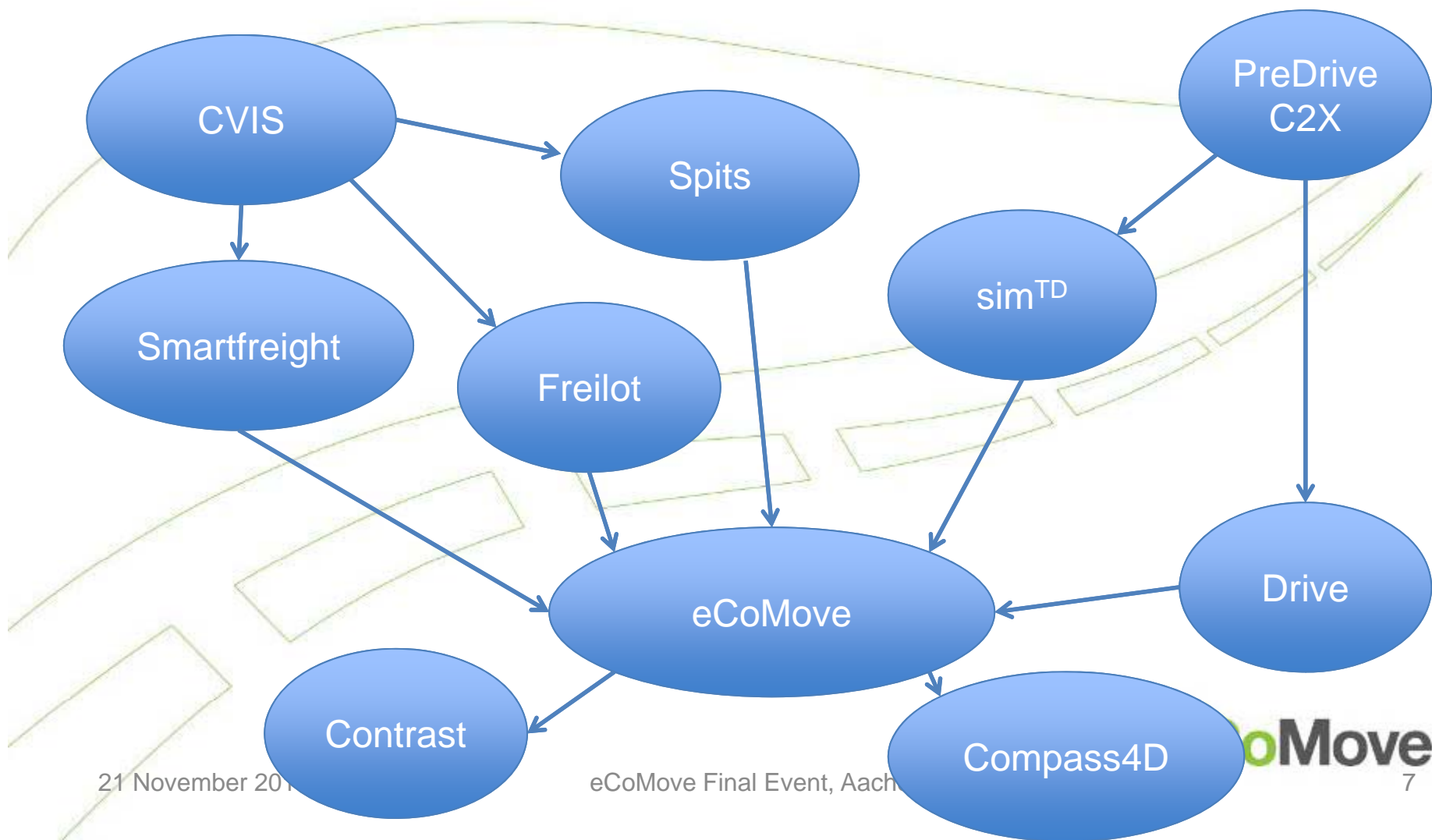
- Red dots are published API
- Blue is standardized interfaces over 3G and 802.11p
- Green is not published



IPv6 Communications



Modules and ideas from other projects



Execution Platform

- Not originally part of eCoMove DoW
 - However a common execution environment is crucial to enable module sharing
- Java and OSGi selected
 - Already used by many projects
 - Knopflerfish from Makewave used by most partners
- Positioning
 - Vital to ITS applications
 - POMA API (but not implementation) reused from CVIS
 - Implementation and tools reused from Smartfreight
- Common HMI model was considered but rejected
 - Later wished for during integration tests
- D2.16 Developers Handbook
 - Hints, tips and lessons learned from previous projects

Messages

- Delivery architecture from CVIS
 - No longer a one-to-one relationship between message and application
 - Publish and subscribe pattern
- Messages from ETSI, sim^{TD} (SAE), TPEG, and in-project
 - CAM from ETSI 302-637-2
 - TSPDM derived from sim^{TD}, derived from J2735 SPaT
 - ITS derived from sim^{TD}, derived from J2735 MAP/TOPO
 - TPEGM – TPEG container from ISO 18234
 - ecoCam – Fuel consumption, weight, engine, etc...
 - VPM – Vehicle Path Message
 - SLAM – Speed and Lane Advice

Open Source – Used and produced

- OSGi – Knopflerfish
 - Positioning
 - Message Facility Layer
 - Communications Facility Layer
 - Communications Network&Transport Layer
 - Misc tools and utility applications
-
- Available on eCoMove SVN or upon request.

International Cooperation

- Standardization
 - ETSI: Messages and Geonetworking
 - ISO and SAE: TSPDM and MAP
- EU-US Taskforce
 - Identify interoperability issues between EU and US in IEEE 802.11p communication
- ETSI Plugtests
 - Helmond 2011
 - Paris 2012
 - Essen, next week

Input from eCoMove to ETSI

- Time – Proper definition and use of time
 - Interaction with ETSI ITS (WG1, WG3, and WG5)
 - CAM has TAI
 - DENM has TAI
 - Geonetworking has TAI
 - Security was already using TAI (was aligned with IEEE 1609)
 - TAI – International Atomic Time
 - Linear timescale
 - Monotonic increasing
 - Unambiguous
 - TAI may be challenging to implement, but is needed

Input from eCoMove to ETSI (2)

- Messages

- ecoCAM

- eCoMove proposal rejected based on privacy concerns
 - However: Open for new discussions after success is proven in eCoMove

- VPM

- Historical path added to CAM (aligned with SAE BSM)
 - Future probable path not included

EU-US Taskgroup

- HTG1: Security
- HTG2: Messages (no eCoMove participation)
- HTG3: Communication protocols

- Main conclusions
 - Security has the biggest gaps and less mature standards
 - Transport protocols are different

ETSI Plugtests – November 2011

- Testing of GeoNetworking, CAM and DENM
- More than 10 implementations
- All 3 platform partners from eCoMove: NEC, Peek and Q-Free
- Projects: eCoMove, Freilot, Drive, Score@F
- Proved interoperability between eCoMove and ‘the rest of the world’
 - At Physical, Network and Transport Layers
 - At Facilities (messages) layers (CAM + DENM)
- First step on eCoMove integration testing

Next steps in ITS

- API
- Platforms
- Messages

API - Next steps in standardization?

- Standard API will bring costs down for integrators and developers
- Look at POSIX created by US government in 1990's
- Now used in: Linux, Android, OS X, iOS, Windows, ...
- Java and OSGi is de facto standard today

Border Crossing Message?

- Vehicle crossing a border driving from one regulatory and juridical region to another
 - IEEE 802.11p channel usage
 - Power levels
 - Privacy laws
 - Lawful interception
 - Protocols (Geonet, ISO or IEEE)
 - Certificate authority
 - Message authenticity
- A new message describing these options may be needed



Thank you for your attention!

Questions?

Please visit the Core Technology stand!

Ola Martin Lykkja
Q-Free ASA
ola.lykkja@q-free.com