

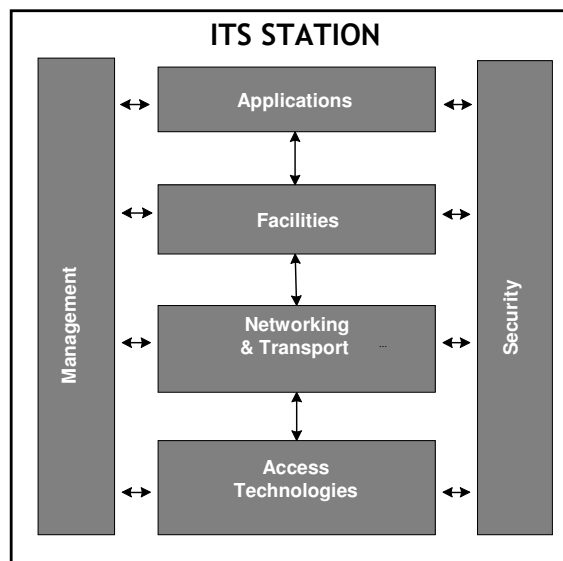


Research in ICT for Mobility and Transport: Co-operative Systems

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COMeSafety

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Q-Free ASA
Chief Architect CVIS

[Globally accepted ITS Communications Architecture



[5.9 GHz Challenge

There are three organisations developing standards for 5.9GHz ITS band

- USA: IEEE 802.11p + P1609 + SAE (WAVE)
- Europe: ETSI TC ITS (C2C GeoNet)
- Global: ISO TC204 WG16 (CALM)

Focus is different

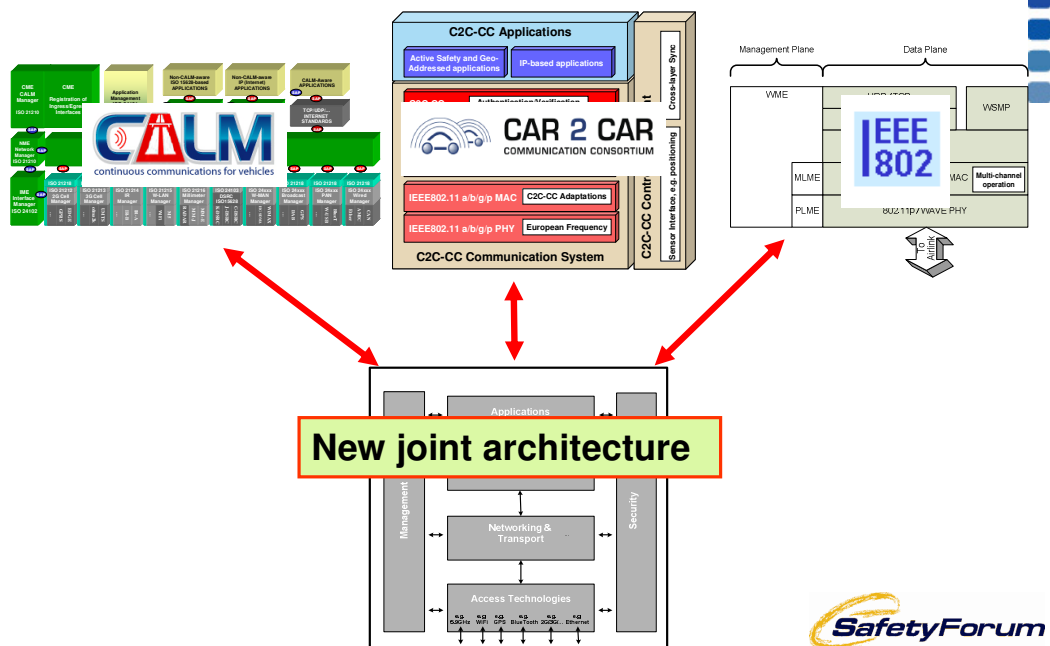
- ISO focus on multiple media management and tries to be umbrella for all activities
- IEEE focus on lower layers (802.11) and a “simplified” architecture
- ETSI focus is car-to-car multihopping.

BUT

- All three are developing a full set of standards covering all aspects
- There are big overlaps and wasted effort
- Worst: no interoperability in current specifications



[What is being done?

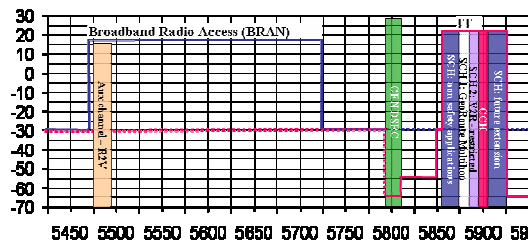


• Access Technologies: 5.9 GHz Spectrum

Good news: We now have spectrum allocation

But: We got about half the spectrum of USA.

- The usage rules can likely not be transferred directly
- European basic research is urgently needed



Common Control Channel: Broadband data, 10MHz@5900 (ch180) (Used by all)
 Service Channel: GeoRoute multihopping, 10MHz@5800 (ch176) (SAFESpot/C2C-CC)
 Aux Channel: for roadside unattended data, 20MHz@5480 (ch296) (CVIS/COOPERIS)
 Vehicle-Roadside data, 10MHz@5800 (ch178) (SAFESpot/C2C-CC, not used initially)
 Blue line represent European spectrum mask for HRAN (conditional use for ITS)
 Red line represents European spectrum mask for ITS 5.9



[Conclusion

Global standardisation interoperability is on the right track

- Still needs direct support and **required use in FOTs!**

Technical testing of 5.9GHz is a challenge

- Currently part of applications testing
- Progress very dependent on US programmes - may hide fundamental problems for Europe
- Technical validation is needed before large scale FOTs are deployed
- Could be done as focused extension of cooperative projects (CVIS and SAFESPOT)



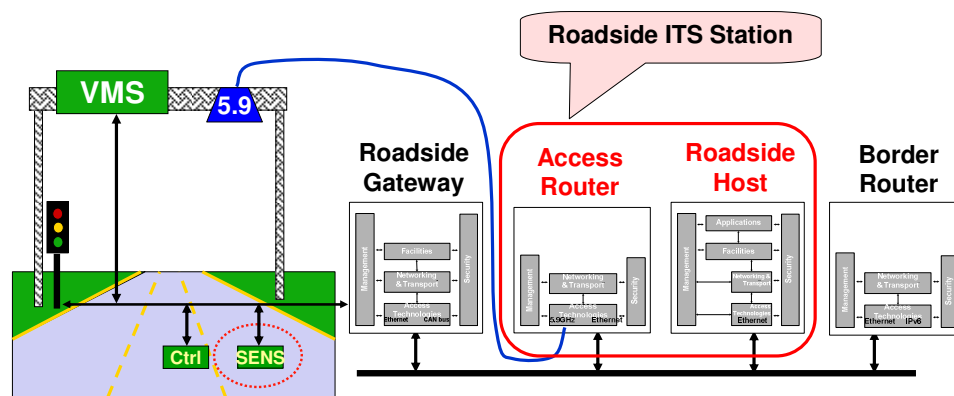


Thank You!



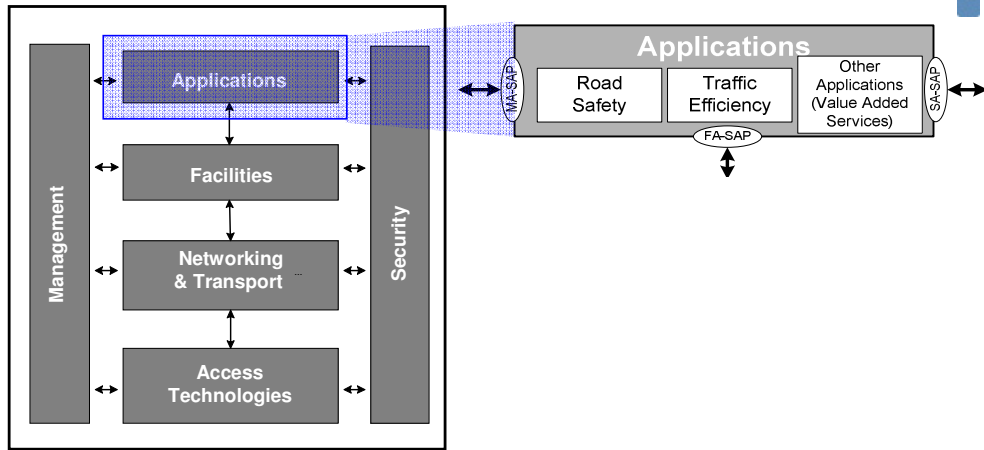
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European ITS Communication Architecture - Components

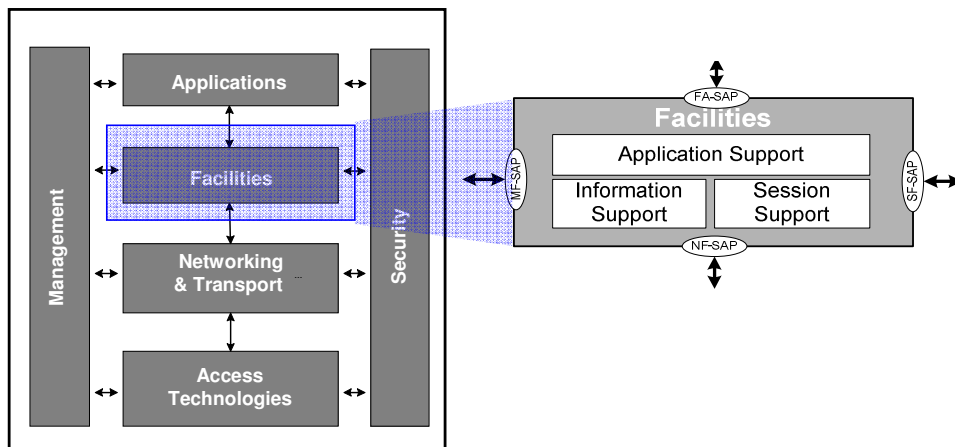


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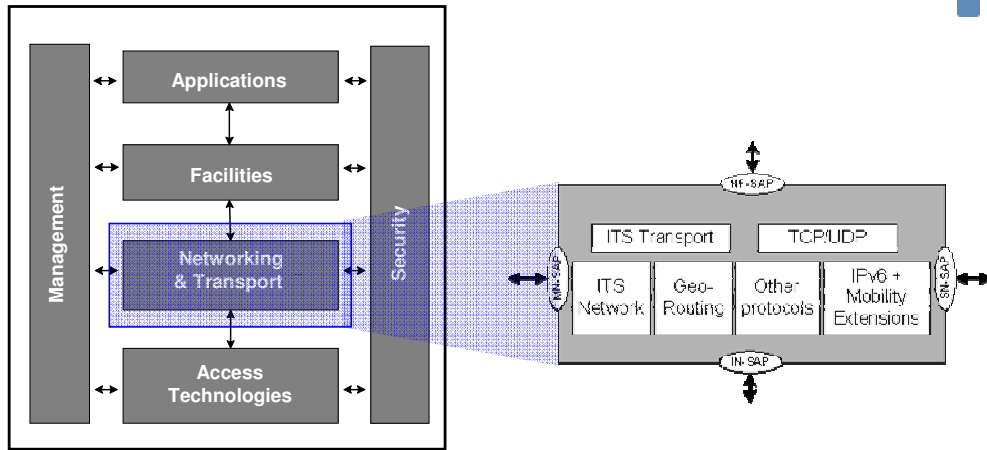
ITS Station Reference Architecture: Applications



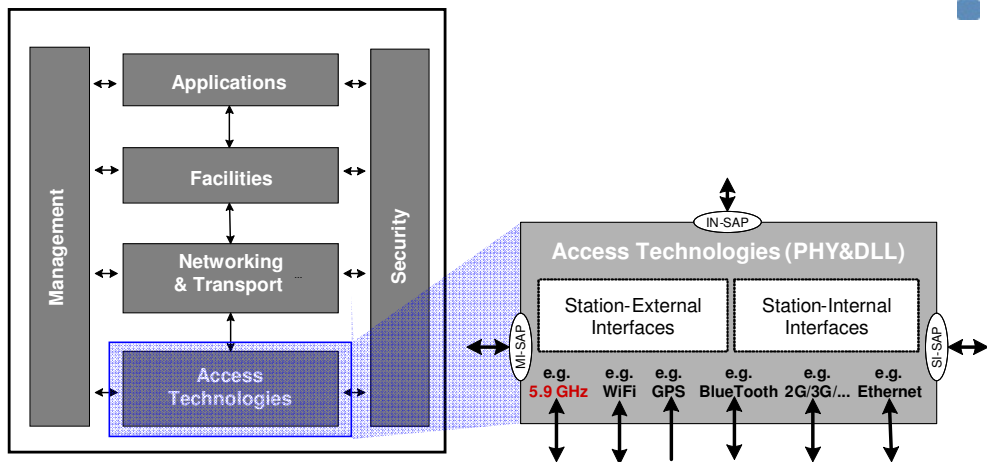
ITS Station Reference Architecture: Facilities



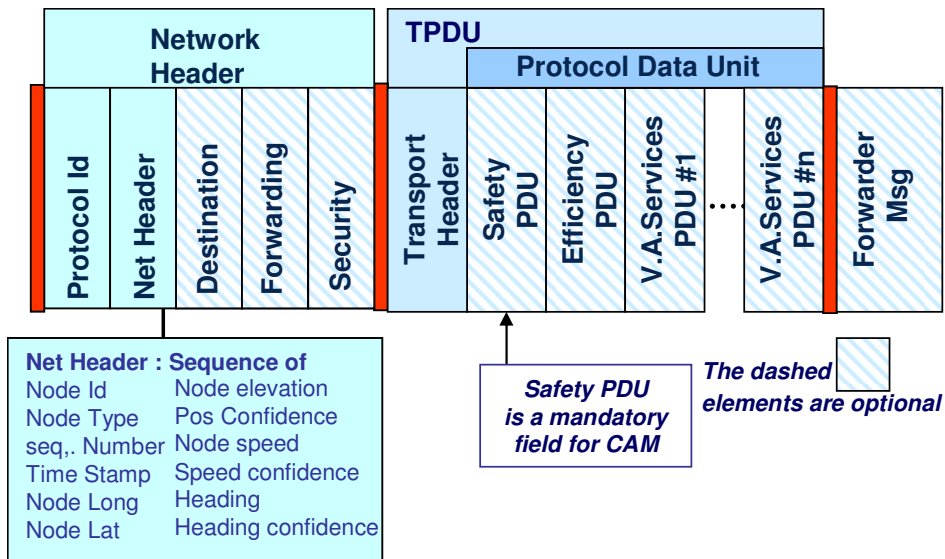
ITS Station Reference Architecture: **Networking and Transport**



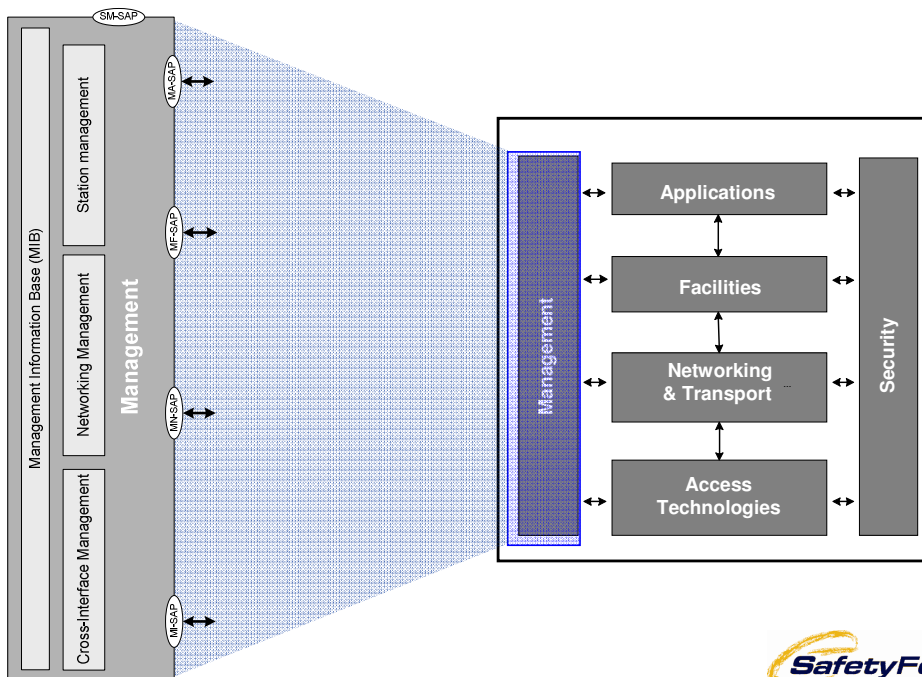
ITS Station Reference Architecture: **Access Technologies**



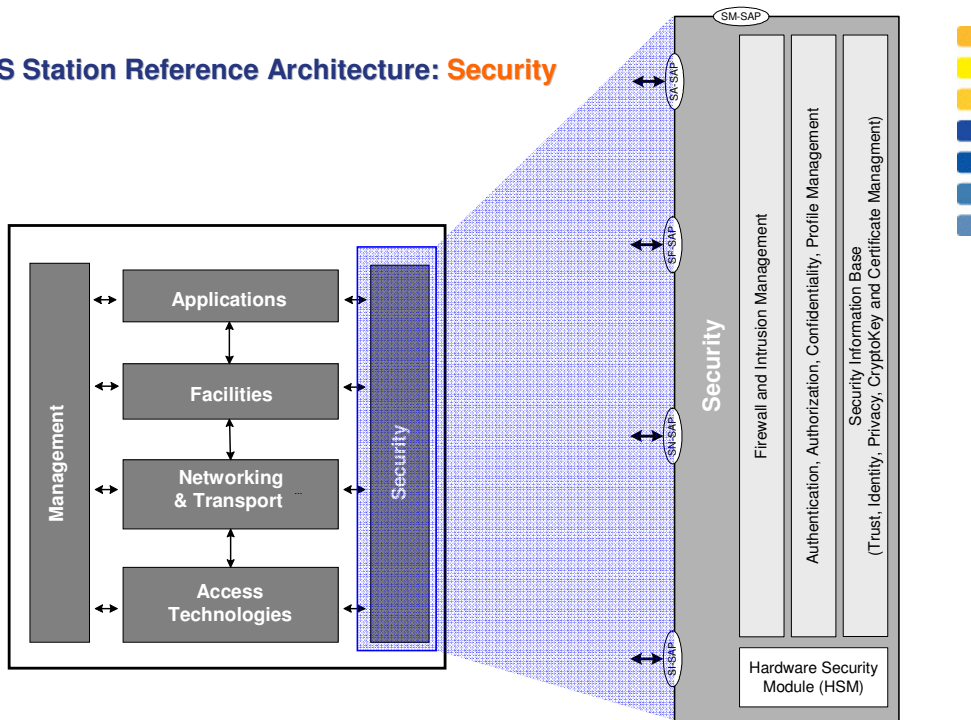
Networking and Transport: Message Structure



ITS Station Reference Architecture: Management



ITS Station Reference Architecture: Security



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[Standardisation Motivation

Standardisation proliferation is bad

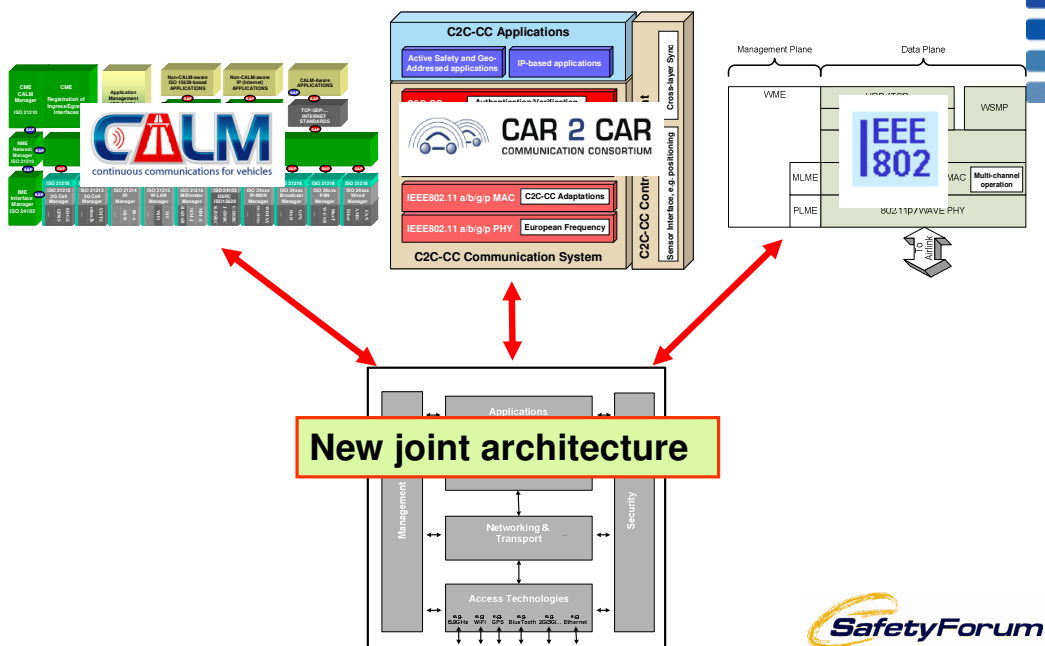
- Increases cost and gives delays
- But worst: will not give safety and efficiency

Global cooperation is needed

- Between standardisation organisations
- Between R&D projects



[What is being done?



[Joint Workshop on 5.9 GHz Vehicular Communications (extract)

2-4 September 2008 in Chicago

Scope and purpose:

- to disseminate information from current standardization efforts around the world, experience gained in prototyping of equipment and software, initial results from real-world tests being conducted by various programs, projects and collaborations around the world
- to decide how best to incorporate lessons learned into a set of global harmonized standards as openly and as efficiently as possible

Results:

- Agreement to use new architecture
- Agreement to avoid overlapping standards and to partition remaining work between actors



[ETSI TC ITS 16 Oct 2008 - extract ETSI TC ITS recognizes and affirms the results of the Chicago workshop

The following are invited to lead process:

- Geonetworking related areas - Andreas Festag
- IPv6 Networking and Mobility areas - Thierry Ernst
- ITS Networking related areas - John Moring
- Management areas - Dick Roy
- Security areas - Scott Cadzow
- 5GHz MAC&PHY areas - Hans-Joachim Fischer
- Architecture area - Knut Evensen

ETSI TC ITS support the activities

- requests ETSI Secretariat to provide any necessary practical support
- ISO, IEEE, IETF and ETSI will appoint official points of contact

