

ITS workshop
Berlin
February 2014

*The universal future-
proof ITS station for
Cooperative ITS*



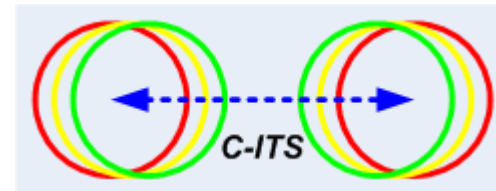
This presentation is related to work done on C-ITS base standards for Release 1 in

- CEN TC278 WG16 / ISO TC204 WG18
 - PT1601 and PT1604
- ISO TC204 WG16 (CALM group)
- IEEE 1609 WG (WAVE)

and test suites / their validation in

- ETSI TC ITS
 - STF 422, STF 455

partly funded by the EC under mandate M/453 on Cooperative ITS, and partly validated in the research project CVIS and others.





Some views:

- ✓ Car-to-car communications in the road safety and traffic efficiency domain is a small part of C-ITS with no business model.
- ✓ C-ITS will be largely infrastructure based. An example of successful C-ITS is the European Electronic Road Tolling Service (EETS).
- ✓ C-ITS beneficially uses several access technologies, as a minimum
 - a single-hop ad-hoc access technology (M5, 63 GHz, ...), and
 - a wide area technology (3G, 4G, ...), but also
 - a bumper-to-bumper communication technology (IR, 76 GHz, ...).These technologies obviously change over time.
- ✓ C-ITS needs null-networking single-hop protocols and IPV6 for end-to-end communication.
- ✓ C-ITS benefits from geo-dissemination of data performed above the traditional communication protocol stack.



Universal future-proof ITS station

What are the requirements for a future-proof ITS station unit?

- ITS-SUs are **trusted devices**, as C-ITS deals with sharing of data between applications (LDM and subscribe/publish mechanisms), and with safety of property and life.
- C-ITS applications are **portable**, i.e. usable on different platforms (ITS-SUs), and **downloadable** into ITS-SUs.
- Applications are **abstracted** from Communications in order to be independent from regional frequency allocations and future access technologies.
- Communication protocol stacks are selected **automatically** by the station management based on abstract requirements from applications.



Universal future-proof ITS station

What are the requirements for a future-proof ITS station unit?

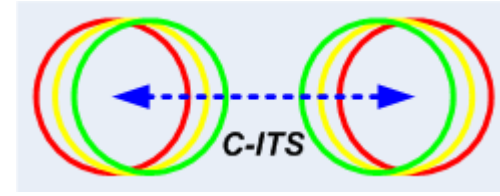
...

- Several **implementation architectures** serve different needs (, and may create new observable, secured, interoperable interfaces inside an ITS-SU).
- **Portable devices** may act as ITS-SUs, but may also become an integral part of another ITS-SU, e.g. in a vehicle.
- Powerful **station management** (local, remote) with the capability to update remotely firmware, software and applications is a prerequisite.



ISO TC204, one of the leading advocates for Intelligent Transport System, developed the Release 1 set of communication protocol standards in the CALM group (WG16):

- ISO 21217: Architecture of the trusted ITS station (BSMD)
- ISO 24102-x: Local and remote station management including FSAP, IICP, path/flow management.
- ISO 21218: Access technology support
- ISO 29281: Efficient single-hop communications (FNTP)
- ISO 21210 and others: End-to-end networking with IPv6
- ISO 25111 and others: Cellular networks in ITS
- ISO 21215: 802.11 5,9 GHz access technology
- ISO 21214: Infrared access technology
- ... *and others*



CEN TC278, a further leading advocate for Intelligent Transport System, together with ISO TC204 developed base standards in the C-ITS group for applications, facilities, management, and message sets / data dictionaries. Examples are:

PT1601:

- CEN/ISO 17419: Management of ITS applications
 - ✓ *Globally unique identifiers – how to achieve trust*
- CEN/ISO 17423: Requirements for paths and flows
 - ✓ *Abstraction of ITS applications from communications*

PT1604:

- CEN/ISO 18750: Local Dynamic Map
 - ✓ *For global applicability (infrastructure and in-vehicle)*

Close cooperation with the CALM working group.



ETSI, the traditional expert for "radio type approval", and for conformance and interoperability testing, on request of the CALM group developed test suites for Release 1 communication standards:
STF 422:

- TTCN-3 conformance test suites for the ISO ITS FAST services
 - ✓ *ISO 24102-5 Fast Service Advertisement Protocol (FSAP)*
 - ✓ *ISO 29281 Fast Networking & Transport Layer Protocol (FNTP)*
 - ✓ *ISO 24102-4 ITS station-Internal management Communications Protocol (IICP)* [also used as standardized test access to SUT – new CEN/ISO TS]

STF 455:

- TTCN-3 conformance test suite for
 - ✓ *ISO 21218 ITS access technology support.*
- Validation of the above test suites





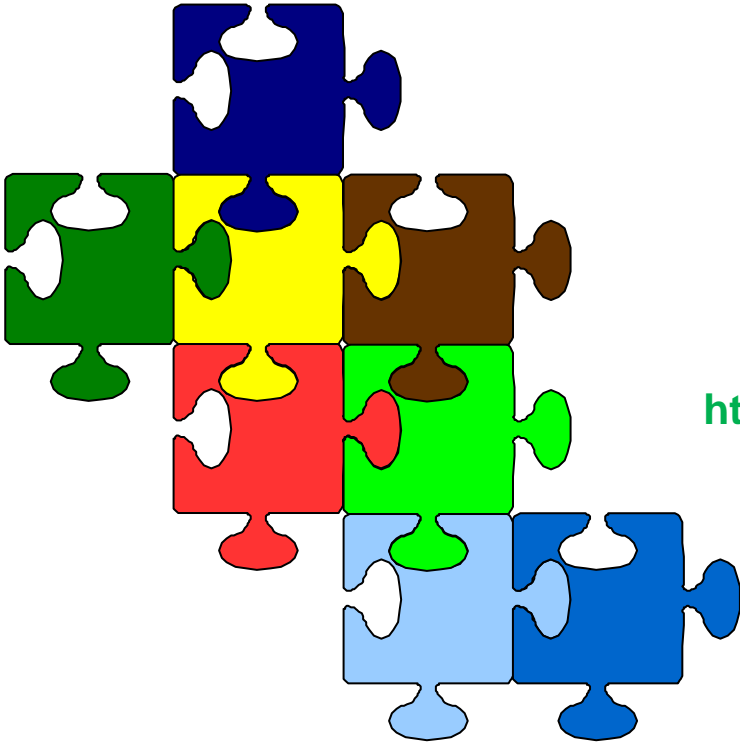
Based on the recommendations from the EU/US harmonization task force for C-ITS ([deliverables from HTG1 and HTG3](#)), IEEE 1609 WG and ISO CALM group work on harmonization of

- IEEE WAVE WSMP with ISO FNTP
 - ✓ THE efficient null-networking single-hop communications protocol for C-ITS
- IEEE WAVE WSA with ISO FSAP
 - ✓ THE service advertisement protocol for single-hop communications "push-advertisement" with "handover" to alternative access technology / service channel / networking protocol for the service session phase.

CEN / ISO / IEEE Release 1 C-ITS standards are future-proof and globally applicable!



Elektrische Signalverarbeitung Dr. Fischer GmbH



ESF GmbH
Hans-Joachim Fischer
Fichtenweg 9
D-89143 Blaubeuren
Germany
HJFischer@fischer-tech.eu

<http://release1.its-standards.info>

phone: +49 7344 175 340