Features

CAR 2 CAR Communication Consortium

About the C2C-CC

Enhancing road safety and traffic efficiency by means of Cooperative Intelligent Transport Systems and Services (C-ITS) is the dedicated goal of the CAR 2 CAR Communication Consortium. The industrial driven, non-commercial association was founded in 2002 by vehicle manufacturers affiliated with the idea of cooperative road traffic based on Vehicle-to-Vehicle Communications (V2V) and supported by Vehicle-to-Infrastructure Communications (V2I). The Consortium members represent worldwide major vehicle manufactures, equipment suppliers and research organisations.

Over the years, the CAR 2 CAR Communication Consortium has evolved to be one of the key players in preparing the initial deployment of C-ITS in Europe and the subsequent innovation phases. CAR 2 CAR members focus on wireless V2V communication applications based on ITS-G5 and concentrate all efforts on creating standards to ensure the interoperability of cooperative systems, spanning all vehicle classes across borders and brands. As a key contributor, the CAR 2 CAR Communication Consortium and its members work in close cooperation with the European and international standardisation organisations.

Disclaimer

Document information

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Table 1: Document information

Changes since last release

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Table 2: Changes since last release

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1 Introduction

Other (informational) **RS_FEA_147**

Within the open system architecture of Cooperative Intelligent Transport System (C-ITS) four types of participants, called sub-systems, are identified in [EN 302 665]: vehicle, roadside, personal, and central. Each of these sub-systems includes a C-ITS station, but based on their sub-system specific equipment they enable different features. As a result of their feature list and their role in traffic, for each sub-system a set of use cases becomes possible to improve road safety and traffic efficiency.

2 Scope

Other (informational) **RS_FEA_146**

The present document provides all features in scope of a vehicle sub-system from C2C-CC point of view. This set of features is the consolidated and communicated understanding of the core vehicle system features in a vehicle C-ITS station. According to the C2C-CC contract, the present list focuses on specifying the vehicle C-ITS station transmitting side. Moreover, this set is oriented towards enabling the vehicle use cases as included in the current C2C-CC release. Details about the content of the release can be found in [C2CCC RelOv] and are listed in brief in the following:

- emergency vehicle warning
- dangerous situation
- stationary vehicle warning
- traffic condition ahead warning
- collision risk (exchange of IRCs)
- adverse weather conditions

The use cases as part of the current C2C-CC release do not constitute a mandatory set of applications to be implemented as part of a vehicle C-ITS station. Only a subset of them might be supported by a specific implementation of the vehicle C-ITS station.

In terms of C2C-CC a feature defines a service or a major part of the vehicle C-ITS station. They always detail an objective, but – like objectives – without any further specification about its details. As a result, features are not directly testable.

Features itself are detailed by one or more requirements. A feature can be assumed as tested, if all requirements, which detail this feature, are tested.

3 Conventions used

Other (informational) **RS_FEA_152**

Conventions used in this and other C2C-CC specification documents can be found in [C2CCC ConV].

4 Definitions

Definition **RS_FEA_149**

A vehicle C-ITS station is a vehicle ITS station as defined in [EN 302 665] and further specified in this C2C-CC release.

Definition **RS_FEA_427**

'Vehicle states' comprise absolute position, heading and speed at a certain point in time.

Definition **RS_FEA_428**

Information provided with a *'confidence level'* of 95 % means that the true value is inside the confidence interval for at least 95 % of the data points in a given statistical base.

5 Feature specification

Feature **RS_FEA_176**

AT changeovers shall be triggered in such a manner that at least 95 % of all trips are divided into three segments: A start segment in the beginning of a trip, an end segment and a middle segment in between.

Details:

Detailed by:

Feature **RS_FEA_405**

The vehicle C-ITS station shall support services for confidentiality within the communication with the PKI entities.

Details:

Detailed by:

Feature **RS_FEA_189**

The vehicle state estimation (see RS_FEA_427) shall include confidence intervals for the defined confidence level of 95% according to the definition in RS_FEA_428, as a standardized description of the estimation accuracy.

Details:

Detailed by:

Feature **RS_FEA_430**

The vehicle C-ITS station shall provide services for communicating with other C-ITS stations by using ITS-G5, operating in the frequency band 5855 MHz to 5925 MHz.

Details:

Detailed by:

Feature **RS_FEA_431**

The vehicle C-ITS station shall provide services to avoid channel congestion of the shared media.

Details:

Detailed by:

Feature **RS_FEA_432**

The vehicle C-ITS station shall provide mitigation techniques to avoid disturbing other services operating at nearby frequencies (i.e. CEN DSRC).

Details:

Detailed by:

Feature **RS_FEA_433**

The vehicle C-ITS station shall provide services for transmitting, receiving and forwarding messages to multiple, geographically scattered and movable entities.

Details:

Detailed by:

Feature **RS_FEA_434**

The vehicle C-ITS station shall provide services for handling multiple messages of different types on the sender side.

Details:

Detailed by:

Feature **RS_FEA_435**

The vehicle C-ITS station shall provide services for regularly transmitting information about itself and receiving of those information from other C-ITS stations in its vicinity.

Details:

Detailed by:

Feature **RS_FEA_436**

The vehicle C-ITS station shall provide services for transmitting information about events on demand and receiving of those events from other C-ITS stations.

Details:

Detailed by:

Feature **RS_FEA_437**

The vehicle C-ITS station shall use a standardized message format for each message type it exchanges with other C-ITS stations.

Details:

Detailed by:

Feature **RS_FEA_438**

The vehicle C-ITS station shall check relevant host vehicle dynamics data (e.g. position, speed, heading, longitudinal acceleration, yaw rate) for plausibility.

Details:

Detailed by: RS_BSP_431, RS_BSP_514

Feature **RS_FEA_439**

The vehicle C-ITS station shall use certificates (Authorization Tickets) and signatures to ensure authentication of message originator.

Details:

Detailed by: RS_BSP_160

Feature **RS_FEA_440**

A vehicle C-ITS station with access to map data should make use of those map data to share lane specific information and to enable interpretation of received lane information from other

stations.
Note: Vehicle C-ITS stations without access to map data have to consider the unknown road situation if the road layout of the originator and receiver might be different.

Details:

Detailed by: RS_BSP_572, RS_BSP_573, RS_BSP_574, RS_BSP_575, RS_BSP_576, RS_BSP_577