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 version

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Table 2: Changes since last version

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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 jam 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