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Inteligentni transportni sistemi - Komunikacija med vozili - Geomreženje - 2. del: Scenariji

Intelligent Transport Systems (ITS) - Vehicular Communications - GeoNetworking - Part 2: Scenarios

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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.1].

National transposition dates	
Date of adoption of this EN:	31 October 2013
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1   Scope

The present document classifies and specifies all communication scenarios that are supported by GeoNetworking.

2   References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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2.1   Normative references

The following referenced documents are necessary for the application of the present document.

[1]   ETSI EN 302 665: "Intelligent Transport Systems (ITS); Communications Architecture".

2.2   Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1]   ETSI EN 302 636-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 1: Requirements".

[i.2]   ETSI TS 102 636-3: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 3: Network Architecture".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in [1] and [i.2] apply.

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

    R2R   Roadside-to-Roadside
    R2V   Roadside-to-Vehicle
    V2R   Vehicle-to-Roadside
    V2V   Vehicle-to-Vehicle

4   Classification of communication scenarios

This clause specifies the basic communication scenarios for GeoNetworking. The communication scenarios for GeoNetworking can be classified in two ways:

- by connection multiplicity and addressing mode (address or location);

- by direct or indirect usage of the GeoNetworking protocol.

The GeoNetworking standard series is focused on, but not limited to the communication between vehicle ITS stations and vehicle ITS stations (V2V) and between vehicle ITS station and roadside ITS stations (V2R/R2V). The number of hops is not considered in the classification of the scenarios, therefore a GeoNetworking packet may travel over multiple ITS stations before reaching its communication endpoint(s). Roadside-to-Roadside (R2R) communication via GeoNetworking is possible but not explicitly specified.

GeoNetworking shall support the following communication scenarios classified by connection multiplicity and addressing mode (address or location):

- Point-to-point: communication from an ITS station to another.

- Point-to-multipoint: communication from an ITS station to multiple ITS stations.

- GeoAnycast: communication from an ITS station to an arbitrary ITS station within a geographical target area.

- GeoBroadcast: communication from an ITS station to all ITS stations within a geographical target area.

  NOTE: Point-to-point and point-to-multipoint communication are legacy communication scenarios. GeoAnycast and GeoBroadcast are special scenarios in GeoNetworking.

GeoNetworking shall support the following communication scenarios classified according to the way how to access the ITS network and transport layer:

- Direct mode: applications directly access the ITS network and transport layer, e.g. safety and traffic efficiency applications.

- Indirect mode: applications indirectly access the ITS network and transport layer, i.e. applications access the ITS network and transport layer via an intermediate layer such as IPv6.

5   Communication scenarios

5.1   General

Clauses 5.2 to 5.5 specify communication scenarios for GeoNetworking. The scenarios may be combined with each other in order to create more advanced communication scenarios. An example of such a communication scenario is illustrated in annex A.

  NOTE: The example of the advanced communication scenario does not limit the implementation and is here for clarification.

5.2   Point-to-Point

Communication starts at a single ITS station and ends at one ITS station. This scenario is applicable to V2V, V2R and R2V communication. Figure 1 illustrates the point-to-point communication scenario for V2V.
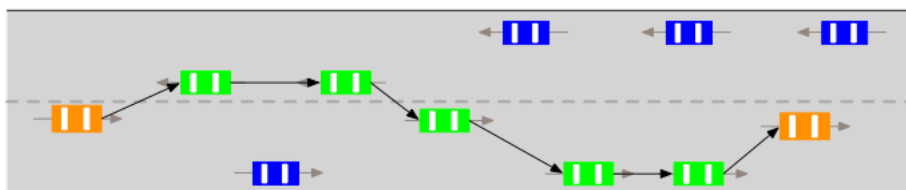

Figure 1: An example of V2V only point-to-point communication

5.3   Point-to-Multipoint

Communication starts at a single ITS station and ends at multiple ITS stations. This scenario is applicable to V2V, V2R and R2V communication. Figure 2 illustrates the point-to-multipoint communication scenario for V2V.

NOTE: This scenario is also applicable to combinations of V2V, V2R and R2V e.g. V2R/V and R2R/V.
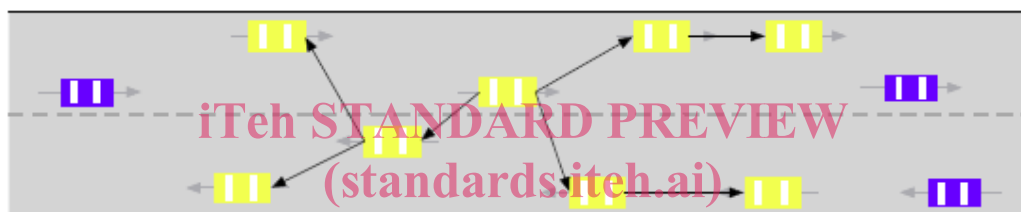
Figure 2: An example of V2V point-to-multipoint communication

5.4   GeoAnycast

Communication starts from a single ITS station and ends at an arbitrary vehicle ITS station within a geographical area. This scenario is applicable to V2V, V2R and R2V communication. Figure 3 illustrates the GeoAnycast communication scenario for V2V, where the source of the GeoNetworking packet is located outside of the geographical area.

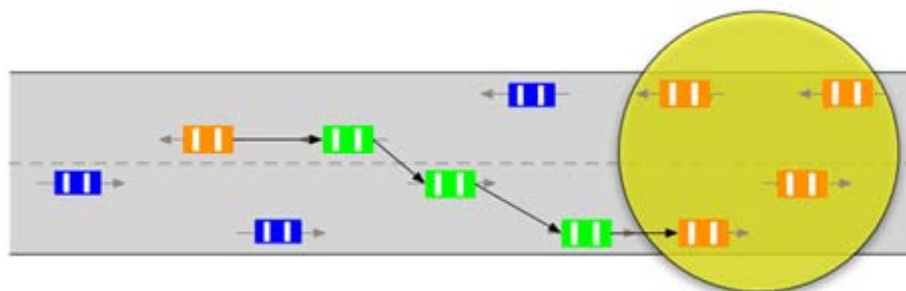NOTE: This scenario is also applicable to combinations of V2V, V2R and R2V e.g. V2R/V and R2R/V.

Figure 3: An example of V2V GeoAnycast communication