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Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 3: Network Architecture

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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EUROPEAN STANDARD

**Intelligent Transport Systems (ITS);
Vehicular Communications;
GeoNetworking;
Part 3: Network Architecture**

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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 3 of a multi-part deliverable. Full details of the entire series can be found in part 1 [7].

National transposition dates	
Date of adoption of this EN:	8 December 2014
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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**may not**", "**need**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Introduction

The present document specifies the network architecture for communication-based Intelligent Transport Systems (ITS) using different ITS access technologies, such as ITS-G5. The network architecture provides - in combination with the description of scenarios - a basis for the technical specification of the networking and transport protocols, in particular for GeoNetworking and its related protocols.

The present document first introduces a generic, high-level system view of the network architecture and defines four basic deployment scenarios. Based on the system view, it identifies and describes the main network components and specifies network reference points among them. Central component of the architecture is the ITS station. For this component, an overview of its protocol architecture is given and different options of using the GeoNetworking protocol in combination with transport protocols and protocols of the IP suite are described. Finally, the present document defines frameworks for different aspects of networking and data transport, such as ad hoc communication, addressing, resource management and data congestion control, integration with protocols of the IP suite and others.

The network architecture is based on the ITS architecture specified in ETSI EN 302 665 [1] and represents the networking viewpoint of the overall architecture.

1 Scope

The present document specifies a network architecture of communications in Intelligent Transportation Systems (ITSC). The network architecture is focused on, but not limited to, vehicular communication. The architecture enables a wide range of ITS applications for road safety, traffic efficiency as well as for infotainment and business.

The present document defines the framework for network and data transport protocols that provide data exchange among ITS stations. A particular aspect is the GeoNetworking protocol that provides ad hoc and multi-hop communication over short-range wireless technologies utilizing geographical positions.

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.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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] ISO/IEC 7498-1: "Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model".

[3] ETSI TS 102 637-1: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 1: Functional Requirements".

[4] ETSI TS 102 637-2: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service".

[5] ETSI TS 102 637-3: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service".

[6] ETSI EN 302 663: "Intelligent Transport Systems (ITS); Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band".

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

[8] ETSI EN 302 636-2: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 2: Scenarios".

[9] ETSI TS 102 636-4-1: "Intelligent Transport System (ITS); Vehicular communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality".

[10] ETSI TS 102 636-5-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 5: Transport Protocols; Sub-part 1: Basic Transport Protocol".

[11] ETSI TS 102 636-6-1: "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking Protocols".

[12]   ETSI TS 102 723 (all parts): "Intelligent Transport Systems (ITS); OSI cross-layer topics".

[13]   ETSI TS 102 731: "Intelligent Transport Systems (ITS); Security; Security Services and Architecture".

[14]   ETSI TS 102 940: "Intelligent Transport Systems (ITS); Security; ITS communications security architecture and security management".

[15]   ISO/IEC 8802-2: "Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements; Part 2: Logical Link Control".

[16]   IETF RFC 791: "Internet Protocol".

[17]   IETF RFC 2460: "Internet Protocol, Version 6 (IPv6) Specification".

[18]   IETF RFC 3775: "Mobility Support in IPv6".

[19]   IETF RFC 768: "User Datagram Protocol".

[20]   IETF RFC 793: "Transmission Control Protocol".

[21]   IETF RFC 3963: "Network Mobility (NEMO) Basic Support Protocol".

[22]   IETF RFC 5213: "Proxy Mobile IPv6".

[23]   IETF RFC 5648: "Multiple Care-of Addresses Registration".

2.2   Informative references

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]   Recommendation ITU-R M.687-2: "International Mobile Telecommunications 2000 (IMT-2000)".

[i.2]   IETF RFC 3753: "Mobility Related Terminology".

[i.3]   3GPP: "UMTS Standard, Release 08 Specification".

NOTE: Available at: http://www.3gpp.org.

[i.4]   IETF RFC 4213: "Basic Transition Mechanisms for IPv6 Hosts and Routers".

[i.5]   IETF RFC 2185: "Routing Aspects of IPv6 Transition".

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