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Technical Specification

Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 6: Internet Integration; Sub-part 1: Transmission of IPv6 Packets over GeoNetworking Protocols

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport System (ITS).

The present document is part 6, sub-part 1 of a multi-part deliverable covering GeoNetworking and Transport, as identified below:

- Part 1: "Requirements for GeoNetworking and Data Transport Protocol";
- Part 2: "Scenarios for GeoNetworking";
- Part 3: "Network architecture";
- Part 4: "Geographical addressing and forwarding for point-to-point and point-to-multipoint communications";
- Part 5: "Transport protocols";
- Part 6: "Internet integration";**

Sub-part 1: "Transmission of IPv6 Packets over GeoNetworking Protocols";

- Part 7: "Network management";

Introduction

The ETSI GeoNetworking protocol [i.25] and [i.26] is a non-IP network-layer protocol that provides geographic addressing and forwarding. Applications and facilities specifically designed for GeoNetworking exploit these functionalities, for example to disseminate warning or generic information messages to geographically scoped areas. This approach satisfies the requirements of several ITS services, whose application domain is limited to networks that are disconnected from large existing network infrastructures. However, several ITS applications require the integration of ITS stations with larger networks like private transport networks or the Internet.

In order to connect networks based on GeoNetworking to networks running the Internet Protocol (IP), which represent the majority of currently deployed large networks, it is necessary to allow GeoNetworking stations to act like Internet hosts or routers. ETSI Technical Committee ITS recognizes IP version 6 (IPv6,[7]) as the primary and only version of IP to be necessarily supported by ITS stations.

The present document introduces a set of mechanisms that allow GeoNetworking to transport IPv6 packets without introducing modifications to existing IPv6 protocol implementations. By deploying these mechanisms, the following two main advantages are achieved:

- 1) coverage offered by point-of-attachment to the Internet like road-side ITS stations is extended by means of sub-IP geographic routing; and
- 2) IPv6 multicast traffic can be geocasted, i.e. addressed and delivered to all ITS stations currently located within a geographic area.