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Wind River
September 2002

Recommendations for IPv6 in Third Generation Partnership Project (3GPP) Standards

Status of this Memo

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Abstract

This document contains recommendations from the Internet Engineering Task Force (IETF) IPv6 Working Group to the Third Generation Partnership Project (3GPP) community regarding the use of IPv6 in the 3GPP standards. Specifically, this document recommends that the 3GPP specify that multiple prefixes may be assigned to each primary PDP context, require that a given prefix must not be assigned to more than one primary PDP context, and allow 3GPP nodes to use multiple identifiers within those prefixes, including randomly generated identifiers.

The IPv6 Working Group supports the use of IPv6 within 3GPP and offers these recommendations in a spirit of open cooperation between the IPv6 Working Group and the 3GPP community. Since the original publication of this document as an Internet-Draft, the 3GPP has adopted the primary recommendations of this document.

Conventions Used In This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119 [KEYWORD].

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1. Introduction

In May 2001, the IPv6 Working Group (WG) held an interim meeting in Redmond, WA to discuss the use of IPv6 within the 3GPP standards. The first day of the meeting was a joint discussion with 3GPP, during which an architectural overview of 3GPP's usage of IPv6 was presented, and there was much discussion regarding particular aspects of IPv6 usage within 3GPP. At that meeting, a decision was made to form a design team to write a document offering advice from the IPv6 WG to the 3GPP community, regarding their use of IPv6. This document is the result of that effort.

This document offers recommendations to the 3GPP community from the IETF IPv6 Working Group. It is organized into three main sections:

1. An introduction (this section) that provides background information regarding the IETF IPv6 WG and the 3GPP and includes a high-level overview of the technologies discussed in

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2. Recommendations from the IPv6 WG to the 3GPP community. These can be found in section 2.
3. Further work items that should be considered by the IPv6 WG. These items are discussed in section 3.

It is the purpose of this document to provide advice from the IPv6 Working Group to the 3GPP community. We have limited the contents of this document to items that are directly related to the use of IPv6 within 3GPP. This document defines no standards, and it is not a definitive source of information regarding IPv6 or 3GPP. We have not chosen to explore 3GPP-related issues with other IETF protocols (i.e., SIP, IPv4, etc.), as they are outside the scope of the IPv6 Working Group.

The IPv6 Working Group fully supports the use of IPv6 within 3GPP, and we encourage 3GPP implementers and operators to participate in the IETF process. We are offering these suggestions in a spirit of open cooperation between the IPv6 Working Group and the 3GPP community, and we hope that our ongoing cooperation will help to strengthen both sets of standards.

The 3GPP address allocation information in this document is based on the 3GPP document TS 23.060 version 4.1.0 [OLD-TS23060]. At the 3GPP plenary meeting TSG #15 in March 2002, the 3GPP adopted the two primary recommendations contained in this document, allocating a unique prefix to each primary PDP context when IPv6 stateless address autoconfiguration is used, and allowing the terminals to use multiple interface identifiers. These changes were retroactively applied from 3GPP release 99 onwards, in TS23.060 versions 3.11.0, 4.4.0 and 5.1.0 [NEW-TS23060].

1.1 What is the 3GPP?

The Third Generation Partnership Project (3GPP) is a global standardization partnership founded in late 1998. Its Organizational Partners have agreed to co-operate in the production of technical specifications for a Third Generation Mobile System, based on the evolved GSM core networks.

The 3GPP Organizational Partners consist of several different standardization organizations: ETSI from Europe, Standards Committee T1 Telecommunications (T1) in the USA, China Wireless Telecommunication Standard Group (CWTS), Korean Telecommunications Technology Association (TTA), the Association of Radio Industries and Businesses (ARIB), and the Telecommunication Technology Committee(TTC) in Japan.

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The work is coordinated by a Project Co-ordination Group (PCG), and structured into Technical Specification Groups (TSGs). There are five TSGs: Core Network (TSG CN), Radio Access Networks (TSG RAN), Services and System Aspects (TSG SA), GSM/EDGE Radio Access Network (GERAN), and the Terminals (TSG T). The TSGs are further divided into Working Groups (WGs). The technical work is done in the working groups, and later approved in the TSGs.

3GPP working methods are different from IETF working methods. The major difference is where the majority of the work is done. In 3GPP, the work is done in face-to-face meetings, and the mailing list is used mainly for distributing contributions, and for handling documents that were not handled in the meeting, due to lack of time. Decisions are usually made by consensus, though voting does exist. However, it is rather rare to vote. 3GPP documents are public and can be accessed via the 3GPP web site [3GPP-URL].

1.2 What is the IETF?

The Internet Engineering Task Force (IETF) is a large, open, international community of network designers, operators, vendors, and researchers, concerned with the evolution of the Internet architecture and the smooth operation of the Internet. The IETF is also the primary standards body developing Internet protocols and standards. It is open to any interested individual. More information about the IETF can be found at the IETF web site [IETF-URL].

The actual technical work of the IETF is done in working groups, organized by topic into several areas (e.g., routing, transport, security, etc.). The IPv6 Working Group is chartered within the Internet area of the IETF. Much of the work is handled via mailing lists, and the IETF holds meetings three times per year.

1.3 Terminology

This section defines the 3GPP and IETF terminology used in this document. The 3GPP terms and their meanings have been taken from [TR21905].

1.3.1 3GPP Terminology

APN	Access Point Name. The APN is a logical name referring to a GGSN and an external network.
CS	Circuit Switched
GERAN	GSM/EDGE Radio Access Network

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GGSN	Gateway GPRS Support Node. A router between the GPRS network and an external network (i.e., the Internet).
GPRS	General Packet Radio Services
GTP-U	General Tunneling Protocol - User Plane
MT	Mobile Termination. For example, a mobile phone handset.
PDP	Packet Data Protocol
PDP Context	A PDP connection between the UE and the GGSN.
PS	Packet Switched
SGSN	Serving GPRS Support Node
TE	Terminal Equipment. For example, a laptop attached through a 3GPP handset.
UE	User Equipment (TE + MT + USIM). An example would be a mobile handset with a USIM card inserted and a laptop attached.
UMTS	Universal Mobile Telecommunications System
USIM	Universal Subscriber Identity Module. Typically, a card that is inserted into a mobile phone handset.
UTRAN	Universal Terrestrial Radio Access Network

1.3.2 IETF Terminology

IPv6	Internet Protocol version 6 [RFC 2460]
NAS	Network Access Server
NAT	Network Address Translator
NAT-PT	Network Address Translation with Protocol Translation. An IPv6 transition mechanism. [NAT-PT]
PPP	Point-to-Point Protocol [PPP]
SIIT	Stateless IP/ICMP Transition Mechanism [SIIT]

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