



ATIS-0300118

ATIS Standard on -

**Next Generation Interconnection Interoperability Forum
NGN Reference Document**

NGN Interconnection



As a leading technology and solutions development organization, the Alliance for Telecommunications Industry Solutions (ATIS) brings together the top global ICT companies to advance the industry's most pressing business priorities. ATIS' nearly 200 member companies are currently working to address the All-IP transition, 5G, network functions virtualization, big data analytics, cloud services, device solutions, emergency services, M2M, cyber security, network evolution, quality of service, billing support, operations, and much more. These priorities follow a fast-track development lifecycle — from design and innovation through standards, specifications, requirements, business use cases, software toolkits, open source solutions, and interoperability testing.

ATIS is accredited by the American National Standards Institute (ANSI). The organization is the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP), a founding Partner of the oneM2M global initiative, a member of the International Telecommunication Union (ITU), as well as a member of the Inter-American Telecommunication Commission (CITEL). For more information, visit www.atis.org.

Notice of Disclaimer & Limitation of Liability

The information provided in this document is directed solely to professionals who have the appropriate degree of experience to understand and interpret its contents in accordance with generally accepted engineering or other professional standards and applicable regulations. No recommendation as to products or vendors is made or should be implied.

NO REPRESENTATION OR WARRANTY IS MADE THAT THE INFORMATION IS TECHNICALLY ACCURATE OR SUFFICIENT OR CONFORMS TO ANY STATUTE, GOVERNMENTAL RULE OR REGULATION, AND FURTHER, NO REPRESENTATION OR WARRANTY IS MADE OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS. ATIS SHALL NOT BE LIABLE, BEYOND THE AMOUNT OF ANY SUM RECEIVED IN PAYMENT BY ATIS FOR THIS DOCUMENT, AND IN NO EVENT SHALL ATIS BE LIABLE FOR LOST PROFITS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. ATIS EXPRESSLY ADVISES THAT ANY AND ALL USE OF OR RELIANCE UPON THE INFORMATION PROVIDED IN THIS DOCUMENT IS AT THE RISK OF THE USER.

NOTE - The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights. By publication of this standard, no position is taken with respect to whether use of an invention covered by patent rights will be required, and if any such use is required no position is taken regarding the validity of this claim or any patent rights in connection therewith. Please refer to [<http://www.atis.org/legal/patentinfo.asp>] to determine if any statement has been filed by a patent holder indicating a willingness to grant a license either without compensation or on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain a license.

Published by

**Alliance for Telecommunications Industry Solutions
1200 G Street, NW, Suite 500
Washington, DC 20005**

Copyright © 2018 by Alliance for Telecommunications Industry Solutions
All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher. For information contact ATIS at 202.628.6380. ATIS is online at < <http://www.atis.org> >.

**Next Generation Interconnection Interoperability Forum
(NGIIF)
NGN Reference Document**

NGN Interconnection

Alliance for Telecommunications Industry Solutions

Approved December 11, 2017

Abstract

This document focuses on providing information for connecting service provider (SP) networks using next generation connections, including internetwork routing.

Foreword

The Alliance for Telecommunications Industry Solutions (ATIS) serves the public through improved understanding between carriers, customers, and manufacturers. The Next Generation Interconnection Interoperability Forum (NGIIF) addresses next generation network interconnection and interoperability topics associated with emerging technologies. Specifically, it develops operational procedures that involve the network aspects of architecture, disaster preparedness, installation, maintenance, management, reliability, routing, security, and testing between network operators. In addition, NGIIF addresses issues that impact the interconnection of existing and next generation networks and facilitate the transition to emerging technologies.

The mandatory requirements are designated by the word *shall*, and recommendations by the word *should*. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages. The word *may* denotes an optional capability that could augment the standard. The standard is fully functional without the incorporation of this optional capability.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, NGIIF, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time of consensus on this document, NGIIF, which was responsible for its development, had the following leadership:

R. Ryan, NGIIF Co-Chair (Comcast)

K. Riepenkroger, NGIIF Co-Chair (Sprint)

Trademark Acknowledgements

iconectiv®, Telcordia®, and Common Language® are registered trademarks and CLCI™, CLLI™, LERG™ Routing Guide and TPM™ Data Source are trademarks and the Intellectual Property of Telcordia® Technologies, Inc. dba as iconectiv®.

Table of Contents

1	Scope, Purpose, & Application	1
1.1	Scope.....	1
1.2	Purpose	1
1.3	Application	1
2	Informative References	1
3	Definitions, Acronyms, & Abbreviations	3
3.1	Definitions	3
3.2	Acronyms & Abbreviations.....	3
4	Responsibilities	5
5	Interconnection Design Considerations	5
5.1	IP Interconnection Design.....	5
5.1.1	<i>Traffic Forecasts</i>	5
5.1.2	<i>Traffic Monitoring</i>	5
5.1.3	<i>Network Management</i>	5
5.2	IP Interconnection Interoperability Parameters.....	6
5.3	IP Interconnection Routing	7
6	Interconnection Agreement Consideration	8
7	IP Interconnection Routing	9
7.1	The IP NNI Reference Model.....	9
7.1.1	<i>Points of Interconnections (POIs) & SIP Interconnection Facilities</i>	9
7.1.2	<i>Traffic Types</i>	10
7.1.3	<i>Traffic Exchange</i>	10
8	National Security & Emergency Preparedness (NS/EP) Priority Support on the IP Network-to-Network Interface	11
8.1	Signaling.....	11
8.2	Transport/Media.....	11
8.3	ETS Packet Priority for IP NNI Interfaces - Use of Existing Differentiated Services Per Hop Behaviors.....	12
8.4	ETS Packet Priority for IP NNI Interfaces – Requirements for a Separate Expedited Forwarding Mechanism	12
8.4.1	<i>NNI Traffic Classes</i>	12
8.4.2	<i>Distinguishing Traffic Classes</i>	12
8.4.3	<i>IP Marking Table</i>	13
9	Regulatory Environment	13

Table of Tables

Table 8.1: NNI Traffic Classes	12
Table 8.2: Packet Marking Schemes	13

ATIS Standard on –

NGN Reference Document- NGN Interconnection

1 Scope, Purpose, & Application

1.1 Scope

Next generation technology [i.e., Internet Protocol (IP)] reflects the ongoing evolution of the Public Switched Telephone Network (PSTN). Historically, the PSTN has been based on Time Division Multiplexing (TDM) equipment and processes as the backbone of the network. As the industry transitions, IP technology provides an alternative means for voice and data transmission and the potential for many new services and processes. However, the transition, and ultimately IP technology, presents a need to address its impact on telephony functions and processes that have been developed over time in order for calls to be reliably completed. These are related to such functions as network reliability, operational efficiencies, intercompany interconnectivity, network/call troubleshooting, and many other areas that permit networks to interwork with each other consistently and effectively.

Within the wide scope of IP related impacts, this document focuses on providing information for connecting service provider (SP) networks using next generation connections, including internetwork routing.

As industry standards, best practices, and regulatory decisions relative to IP become further defined, this document will be modified as applicable.

1.2 Purpose

This document serves as a guide to provide an industry understanding of the operational needs for next generation interconnection and interoperability.

1.3 Application

The intended use of this document is for assistance in deployment of next generation interconnection by SPs, but should not replace technical discussions and/or agreements between interconnecting parties. This document is expected to be updated as pertinent regulatory decisions are made and as industry standards evolve; therefore, the reader should ensure the latest version of this document is being referenced. This document does not replace industry standards or regulatory decisions recently made that may not have yet been reflected in this document.

2 Informative References

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

ATIS-1000010, *Support of Emergency Telecommunications Service ETS in IP Network*.¹

ATIS-1000011, *ETS Packet Priority for IP NNI Interfaces - Use of Existing DiffServ Per Hop Behaviors*.²

¹ This document is available from the Alliance for Telecommunications Industry Solutions (ATIS) at < <https://www.atis.org/docstore/product.aspx?id=25485> >.

² This document is available from ATIS at < <https://www.atis.org/docstore/product.aspx?id=22765> >.