



**SIP FORUM**

ATIS-1000062 – SIP Forum TWG-6

**JOINT ATIS/SIP FORUM TECHNICAL REPORT – IP INTERCONNECTION  
ROUTING**

**JOINT TECHNICAL REPORT**



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#### ATIS-1000062, SIP Forum TWG-6, *Joint ATIS/SIP Forum Technical Report – IP Interconnection Routing*

Is an ATIS & SIP Forum Joint Technical Report developed by the **ATIS/SIP Forum IP-NNI Task Force** under the **ATIS Packet Technologies and Systems Committee (PTSC)** and the **Technical Working Group (TWG)** under the **SIP Forum**.

Published by

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

**SIP Forum LLC**  
733 Turnpike Street, Suite 192  
North Andover, MA 01845

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Printed in the United States of America.

# IP Interconnection Routing

**Alliance for Telecommunications Industry Solutions**

Approved May, 2015

**Abstract:**

As Service Providers introduce and expand IP-based service offerings, there is increasing interest in identifying the opportunities for the industry to facilitate IP routing of Voice over IP (VoIP) traffic using E.164 addresses. The ATIS/SIP Forum IP-Network-to-Network (NNI) Task Force took on the initiative to develop a Technical Document and is publishing a report to describe the candidate proposals for circulation and comment. Recognizing that IP traffic exchange is developing as an overlay to existing Time-Division Multiplexing (TDM) interconnection and will be implemented by different service providers with varying timelines, the purpose of this draft report is to:

1. Provide an overview of in-use and proposed architectures with the provisioning processes and calls flows to facilitate the exchange of VoIP traffic associated with IP-based services using E.164 addresses.
2. Present comparative characteristics that may be useful in understanding the approaches.
3. Consider how such in-use and proposed solution(s) may be adopted and/or coexist, and evolve for transition to a future integrated registry envisioned at the FCC Numbering Testbed Workshop.

## Foreword

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The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Packet Technologies and Systems Committee (PTSC) develops and recommends standards and technical reports related to services, architectures, and signaling, in addition to related subjects under consideration in other North American and international standards bodies. PTSC coordinates and develops standards and technical reports relevant to telecommunications networks in the U.S., reviews and prepares contributions on such matters for submission to U.S. ITU-T and U.S. ITU-R Study Groups or other standards organizations, and reviews for acceptability or per contra the positions of other countries in related standards development and takes or recommends appropriate actions.

The SIP Forum is an IP communications industry association that engages in numerous activities that promote and advance SIP-based technology, such as the development of industry recommendations, the SIPit, SIPconnect-IT and RTCWeb-it interoperability testing events, special workshops, educational seminars, and general promotion of SIP in the industry. The SIP Forum is also the producer of the annual SIPNOC conferences (for SIP Network Operators Conference), focused on the technical requirements of the service provider community. One of the Forum's notable technical activities is the development of the SIPconnect Technical Recommendation – a standards-based SIP trunking recommendation for direct IP peering and interoperability between IP PBXs and SIP-based service provider networks. Other important Forum initiatives include work in VRS interoperability, security, NNI, and SIP and IPv6.

Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, PTSC, 1200 G Street NW, Suite 500, Washington, DC 20005, and/or to the SIP Forum, 733 Turnpike Street, Suite 192, North Andover, MA, 01845.

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 a optional capability that could augment the standard. The standard is fully functional without the incorporation of this optional capability.

The **ATIS/SIP Forum IP-NNI Task Force** under the **ATIS Packet Technologies and Systems Committee (PTSC)** and under the **SIP Forum Technical Working Group (TWG)** were responsible for the development of this document.

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Technical Report on –

# IP Interconnection Routing

## 1 Scope, Purpose, & Application

### 1.1 Scope

This document was developed under a joint ATIS/ Session Initiation Protocol (SIP) Forum collaboration. The document discusses existing in-use and proposed routing solutions to facilitate the exchange of traffic associated with Internet Protocol (IP)-based services between North American service providers.

Many options and issues were previously investigated by an ATIS Inter-Carrier VoIP Call Routing Focus Group (IVCR-FG), which issued its final report in February 2008. At that time, the IVCR-FG report noted that a number of vendor proposals have been made, but no initiative exists to develop the necessary standards needed to enable VoIP call interconnectivity [1].

The initial objectives of the ATIS/SIP Forum IP-NNI Task Force as memorialized in the agreement between ATIS and the SIP Forum included defining “the architecture and requirements for a shared ‘Thin’ registry of NNI interconnection data.” The Task Force was unable to reach consensus on a single registry architecture. Accordingly, this report summarizes the various proposals for IP interconnection routing that have been discussed by the Task Force, both registry and non-registry based, and how they may interoperate.

Subsequent to the formation of the ATIS/SIP Forum IP-NNI Task Force, the Federal Communications Commission authorized the creation of a Numbering Testbed to “spur the research and development of the next generation standards and protocols for number allocation, verification, and call routing.”[2] The Commission also held a workshop to initiate a Numbering Testbed on March 25, 2014. Discussion at the Workshop focused on ideas for a “future integrated registry” that would support number allocation, verification, and call routing across all types of North American Numbering Plan (NANP) numbers in a post TDM environment.

It should be noted that this initial report of the ATIS/SIP Forum IP-NNI Task Force report does not address the development of such an integrated registry, but instead focuses on the identification of existing in-use and proposed solutions to facilitate call routing across IP interconnections between now and the deployment of the future integrated registry envisioned at the Workshop.

### 1.2 Purpose

As Service Providers introduce and expand IP-based service offerings, there is increasing interest in identifying the opportunities for the industry to facilitate IP routing of VoIP traffic using E.164 addresses. The ATIS/SIP Forum IP-NNI Task Force has taken on the initiative to develop a Technical Report and is publishing a draft report to describe the candidate proposals for circulation and comment. Recognizing that IP traffic exchange is developing as an overlay to existing TDM interconnection and will be implemented by different service providers with varying timelines, the purpose of this draft report is to:

1. Provide an overview of in-use and proposed architectures with the provisioning processes and calls flows to facilitate the exchange of VoIP traffic associated with IP-based services using E.164 addresses.
2. Present comparative characteristics that may be useful in understanding the approaches.
3. Consider how such in-use and proposed solution(s) may be adopted and/or coexist, and evolve for transition to a future integrated registry envisioned at the FCC Workshop.

Based upon the output and feedback on this draft report, further analysis will be required including but not limited to:

1. Refine solution(s) that includes consideration of feedback obtained from the draft report.