# Scope, Purpose, & Application

## Scope

This document was developed under a joint ATIS and SIP Forum collaboration. The document defines an IP NNI Standard with an emphasis on VoIP. Other Multimedia services will be addressed in subsequent releases. The document identifies a baseline set of features that should be common to all IP-NNI's, defining a common NNI profile of 3GPP Specifications and IETF RFC's. The exception is the wireless specific GSMA profiles for mobile to mobile communications.

The objective of this document is to:

1. Define a reference architecture that sets forth the common functional entities necessary for Carrier to Carrier Interconnection. This reference architecture will be from the perspective of the interconnection points between carriers and will not deal with implementation details inside the networks on either side of the IP-NNI.
2. Specify the exact specifications (including IETF RFCs, 3GPP, and other existing standards) associated with these protocols that must or should be supported by each element of the reference architecture. Where required, the options that MUST or SHOULD be supported within a given standard will also be specified.
3. Specify customary methods for negotiating protocols, protocol extensions, and exchanging capability information between carriers. Specify consensus methods of formulating SIP protocol messages where multiple options exist in standards.
4. Specify the exact presentations of Fully Qualified Domain Names in “From:” and “To:” fields including use of TEL URI format, including P-Asserted Identity (PAI).
5. For IP originated Calls, specify the preferred header [SHOULD] for Calling Name data [CNAM], and specify how that data is presented to the terminating proxy including format, syntax and processing of such data. Note: The expectation is that the signaling of CNAM would not survive interworking to SS7.
6. Define mandated support for underlying transport [e.g. UDP, TCP, SCTP].
7. Specify an audio codec selection strategy that minimizes the need for transcoding and a transcoding strategy that balances the workload between originating and terminating carrier.
8. Define strategies for DTMF and Fax support.
9. Specify call loop detection and avoidance methods.
10. Define common Quality of Service objectives including network overload and congestion notification and processing mechanisms.
11. Investigate issues surrounding known interoperability problems (e.g. PRACK [RFC 3262], early media, ptime, etc.).

## Purpose

IP Interconnection among service providers is significantly increasing as the transition of the PSTN from SS7/TDM to SIP/IP networks progresses. Current deployments of SIP/IP in the core carrier networks have exposed operational and implementation differences on how IP for SIP traffic works ‘on the wire’. These differences complicate interconnection, and in some cases require ‘protocol normalization’ to achieve full interoperability. The call control protocol SIP [RFC 3261] is defined in the IETF and further refined in profiles developed by 3GPP or ATIS that reflect regional and/or national differences in implementation. There are hundreds of IETF SIP and 3GPP specifications that are open to interpretation, creating ambiguity in the detailed options that are implemented. This often requires Session Border Controllers or I-CSCF proxies reconcile the signaling between service providers and resolving those ambiguities. Time and effort is also required to document the differences and configure the SBC or I-CSCF proxy to implement the necessary changes to the on the wire protocol.

The purpose of this effort is to identify a baseline set of features that should be common to all IP-NNI implementations for voice service, and where gaps or ambiguities are identified in existing standards, request that those gaps be addressed by the responsible Standards Development Organizations [SDOs].

This specification defines which standards and options must be supported. They will provide carriers with a precise description of the IP-NNI in the areas where the standards leave multiple options, or where the existing specifications are ambiguous.

In addition, this specification will increase requirements [i.e. MAY, SHOULD, MUST] where operational experience indicates that such enhancements are necessary to support full interoperability.

## Application

This standard is defined for North America deployments, but may be applicable for deployments outside North America.

Section 5.6

In section 5.6 where the DSCP & IP precedence table appears,

I see the packet markings are SHOULD-level requirements.

I think it would be more complete to add a requirement

for Service providers who use different markings within their networks.

For example, it \*should\* be the non-standard SP's responsibility

to re-mark packets to the standard values, both on and off the

interconnecting link. This would be consistent with ITU-T

Recommendation Y.1566, QoS and Mapping and Interconnection ...

http://www.itu.int/rec/T-REC-Y.1566-201207-I

and encourage adoption of the packet marking requirements

in the interconnection spec (support of the spec means offering

a single set of class markings to all interconnecting parties,

regardless of their internal network markings).