NGN standardization activities in ITU-T
- Global interoperability for NGN deployment -

Kaoru Kenyoshi
Vice-chairman of ITU-T SG11
NEC Corporation
Contents

1. Introduction
2. Current status on NGN standardization & Future Direction
3. Activities to improve interoperability
4. Conclusion
1. Introduction
2. Current status on NGN standardization & Future Direction
3. Activities to improve interoperability
4. Conclusion
Relationship of NGN Standard Organizations

**Global Standard body**

Final discussion to set global standards

**Regional Standard body**

Adopting IMS into NGN

making consensus in Asian region before ITU-T

Supporting TISPAN in NGN standardization

**De-facto Standard in industry**

Developing IMS for 3G network

Developing IP&SIP

---

FG-NGN (Focus Group on NGN)
ATIS (Alliance for Telecommunications Industry Solutions)
TIA (Telecommunications Industry Association)

ETSI (European Telecommunications Standards Institute)
CJK (China, Japan, Korea)
IETF (The Internet Engineering Task Force)
Vigorous activity to standardize NGN

- Since 2003, a study group dedicated to NGN has been organized in each standards body.
- The 2nd release documents were prepared by ITU-T in 2009.

Invented “SIP” for voice and video communication on the Internet

Supports TISPAN and focuses on filling the gaps and promoting implementation (IP interoperability, triple play)

Is the pioneer in studying all-IP networks, and has completed “IMS” for mobile

TISPAN leads global discussions on NGN, and adopted IMS for fixed

Final discussions to create global standards

Rich experience in VoIP and broadband, which helps generate consensus in Asia

SIP: Session Initiation protocol
IMS: IP Multimedia Subsystem
Timeline of NGN Standardization

- Thirteen ITU-T recommendations about NGN basic concepts were published in Jul. 2006.
- In Jan. 2008, the core part of NGN Release 1 was completed for practical purposes.
- NGN specific services, such as IPTV, FMC, etc., are being discussed now.
NGN capability set 2 (Y.2007)

- At Sept. 2009, in addition to session-based basic communication services which were summarized in Y.2006, **ITU-T Recommendation Y.2007** was established for providing **IPTV basic service** (linear TV and VoD).
- A capability set Recommendation specifies ITU-T Recommendations and standards of other SDOs to realize some specific services.

Scope of Y.2007 (Extracted major documents from 155 docs in Y.2007)

<table>
<thead>
<tr>
<th>Services</th>
<th>Stage 1 (Requirements)</th>
<th>Stage 2 (Architecture)</th>
<th>Stage 3 (Signaling)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic telecommunication services</strong> (Phone, Video phone, Conference, etc)</td>
<td>Y.2201 (NGN Requirements) Y.2262 (PSTN Simulation) Y.2701 (Security) Q.1706 (Nomadism), etc</td>
<td>Y.2012 (NGN architecture) Y.2021 (IMS) Y.2111 (RACF) 282.007°1 (IMS), etc</td>
<td>Q.3300series (RACF) Q.3401 (NNI) Q.3402 (UNI) 283.003°1 (IMS), etc</td>
<td>Y.2006 (NGN capability set 1)</td>
</tr>
<tr>
<td><strong>IPTV basic service (Liner TV and VoD) over NGN</strong></td>
<td>Y.1901 (IPTV requirements) G.1080 (QoE requirements) X.1191 (Content protection) Y.2236 (Multicast), etc</td>
<td>Y.1910 (IPTV architecture) Y.2017 (Multicast) H.622.1 (Home network) H.721 (Basic terminal), etc</td>
<td>H.750 (Metadata) H.762 (LIME) H.770 (Service discovery) RFC2326°2 (RTSP), etc</td>
<td>IPTV-FJ specification shown in underline</td>
</tr>
</tbody>
</table>
New functional architecture (Y.2012)

- ID management functions based on Y.2720
- Upgrading NACF(Y.2014) and RACF(Y.2111) for FMC and IPTV

SNI (Service Network Interface)

Content delivery functions for IPTV

Mobility management and control functions (Y.2018) for FMC
Strategic direction for the future

- Remaining enhanced network related capabilities
  - Transport control capabilities: Mobility, Multicasting and QoS control over interworking
  - Networking capabilities: Ad-Hoc Networks, DSN, Multi-connection and Ubiquitous Networking
  - Security related: Support of IdM and DPI (Deep Packet Inspection)

- Service related capabilities
  - Service support: SIDE (Service Integration and Delivery Environments)
  - Provider support: OSE (Open Service Environment), Mobile IPTV and Web based IPTV

- Continue to develop Testing Specification:
  - From methodology, testing model, architecture to detailed service testing such as VOIP service.
  - Monitoring parameters set becomes the important part for NGN testing and interoperability.
Contents

1. Introduction
2. Current status on NGN standardization & Future Direction
3. Activities to improve interoperability
4. Conclusion
Resolution 76 approved in WTSA08

Studies related to conformance and interoperability testing, assistance to developing countries[1], and a possible future ITU Mark programme (Johannesburg, 2008)

The World Telecommunication Standardization Assembly (Johannesburg, 2008),

[1] These include the least developed countries, small island developing states and countries with economies in transition.
Testing methodology

**Conformance testing**

*Conformance testing comes first.* This type of testing strives to determine if the implementation of a standard does what the standard says it is supposed to do. Each implementation is tested against the same conformance test suite developed for that standard. The basic test configuration is shown in Figure 1.

![Diagram: Product connected to Test Suite](image)

Figure 1 - Conformance testing using a standardized conformance test suite.

**Interoperability testing**

*Interoperability testing follows next.* This type of testing checks two implementations at a time, to determine if the pair is capable of communicating by exchanging useful data at the functional level.

**Conformance testing or Interoperability testing**

The ultimate objective of conformance testing is to achieve interoperability, given that interoperability has been written into the standards. The objective of interoperability testing is to check if interoperability has been achieved through conformance. Conformance and interoperability testing are complementary, and should be done in that order.
Conformance Testing

Definition of conformance
- compliance with requirements specified in applicable series Recommendations. [ITU-T X.290]

Scope of Conformance testing
- Test subject is connected to the tester or reference machine and examines the conformity with reference recommendations.
- Certifications or type of approval may be given to the products passed by the testing authority. This is not a mandatory function of conformance testing.

The documents which describe test specifications for the conformance testing are specified in the test specification language such as PICS, PIXIT etc.

General configuration for Conformance testing

13 September 2010
Interoperability Testing

**Definition of interoperability testing**
- testing to assess the ability of two or more systems to exchange information and to make mutual use of the information that has been exchanged. [ITU-T Z.450]

**Scope of Interoperability testing**
- Multiple products of multiple vendors are connected and tested for interoperability at the service level and/or transport level.

**Interoperability testing will be conducted in the following steps,**
- Define service scenario (service use case).
- Define configuration, products and interfaces to be tested.
- Define implementation agreements for each test interface.
- Examine interoperability tests according to the test scenario and implementation agreement and analyze the test output.

The documents for Interoperability testing are service scenario (service use case) and implementation agreements for each test interfaces.

Interoperability testing (e.g. IOT configuration for IMS based IPTV)
Proposal in accordance of Japan experience on VoIP service testing

- TTC developed Technical Reports to specify the detailed protocol specifications at NGN UNI and NNI for interoperability between Japanese operators.
- TTC developed TTC standards JT-Q3401 and JT-Q3402 which consist of the translation part of ITU-T Recommendations and TTC original specifications as Annex and Appendix.

13 September 2010
ITU Interop Event on IPTV

The first event took place in ITU in Geneva from 20 to 23 July 2010
- Interoperability testing: 20-21, showcasing:22-23

Participations
- NEC, NTT, Mitsubishi Electric, OKI, Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Sumitomo Electric Industries
- Cisco: showcase only
- Observers: Institute for Inforcomm Research (I2R, Singapore), Global ICT Standardization Forum of India (GSIFi)

Certificates of participation were awarded to all participating organizations.

Target Recommendations
- H.721 (IPTV basic terminal), H.750 (metadata), H.762 (lightweight interactive multimedia), H.770 (service discovery)

Next Events
- Singapore, September 2010; India, December 2010
Conclusion

- This presentation introduces the current status and future direction of the standardization in the ITU-T NGN-GSI meeting.
- NGN interoperability became serious problems because SIP protocol has many options. And assuring interoperability based on the global standard is strong desire from the developing countries.
- ITU-T NGN-GSI continues to develop enhanced services and functions and improve NGN interoperability.
Thank you!

Kaoru Kenyoshi
NEC Corporation
Email k-kenyoshi@cb.jp.nec.com
Phone +81-90-2217-8288