Global Standardization Activities

Report on the ITU-T/IETF NGN Workshop

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Abstract

The joint ITU-T and IETF NGN Workshop was held in Geneva, Switzerland, on May 1st – 2nd 2005. It was scheduled to fall on the weekend during the meetings of ITU-T SG13 from April 25th to May 6th. These two standards bodies are playing key roles in the standardization of the Next Generation Network (NGN). The goal of the weekend conference was to bring these groups together as the first step in establishing a cooperative relationship and to define the issues on which they should work together. The fact that approximately 250 people attended the workshop is indicative of the high level of attention this work is receiving. This article presents a report of the workshop.

1. Background

ITU-T (International Telecommunication Union Telecommunication Sector), which has over a hundred years of history in the area of telecommunications standardization, and IETF (Internet Engineering Task Force), which is becoming increasingly important following the spread of the Internet since the mid 1990s, have cooperated in mutually related areas over the years. Thanks to communication between IETF and Houlin Zhao, the director of ITU-T's Telecommunication Standardization Bureau (TSB) at the end of 2004, the two standards organizations held a joint workshop as a forum for comprehensively integrating the recent work in Next Generation Network (NGN) technology standardization. Cisco's support of the IETF/ITU-T alliance, including their hosting of the lunch, deserves special mention.

2. Workshop program

The joint ITU-T and IETF NGN Workshop was held in Geneva, Switzerland, on May 1st – 2nd 2005. It coincided with the weekend during the meetings of ITU-T SG13 from April 25th to May 6th. Approximately 250 people attended the workshop, indicating the high level of attention that this work is receiving. The workshop program is summarized in **Table 1**. A more detailed version is given online [2]. The major issues of the NGN were divided into six technical areas with a session focusing on each area. Each session had a co-chair and two presenters designated by ITU-T and IETF. The first portion of each session began with introductory overviews. Then, the second portion consisted of presentations on major issues. To prevent the 90-minute sessions from being one-sided presentations, the presentation portions were limited to one hour and the remaining time was opened up for discussions. Presentation materials are available online [2].

3. Discussions in the technical sessions

Session 1: Requirements and functional architecture

The discussions in this session focused on deployment methods for the functionality required by the NGN. A statement in one presentation on the end-to-end principle: "Nothing should be done in the network that can be efficiently done in an end system" led to a lively discussion concerning the end-to-end principle and the achievability of IMS[*1]. Differences in the ways of thinking for the original requirements and the new requirements are shown in **Table 2**. The

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*1   IMS: IP (Internet protocol) multimedia subsystem

Table 1.   Program for ITU-T Workshop on NGN in collaboration with IETF, Geneva.

1 May 2005, Day 1	
09:15 – 09:30 Opening Session	
Mr. Houlin ZHAO, Director of Telecommunication Standardization Bureau, ITU Mr. Brian MOORE, Chairman of ITU-T SG 13 (NGN) Mr. Brian CARPENTER, Chairman of IETF	
09:30 – 11:00 Session 1: Requirements and Functional Architecture	
Co-chairmen:	Presentations:
(ITU-T) Mr. Dick KNIGHT, BT (IETF) Mr. Dave MEYER, Cisco Systems	(ITU-T) Mr. Keith KNIGHTSON, Industry Canada (IETF) Mr. Dave MEYER, Cisco Systems
11:30 – 13:00 Session 2: Nomadicity & Mobility	
Co-chairmen:	Presentations:
(ITU-T) Mr. Naotaka MORITA, NTT (IETF) Mr. Scott BRADNER, Harvard University	(ITU-T) Mr. Kirit LATHIA, Siemens (IETF) Mr. Ted HARDIE, Qualcomm (ITU-T) Mr. Bao Feng ZHANG, Huawei Technologies (IETF) Mr. Hannes TSCHOFENIG, Siemens
13:00 Presentation by the sponsor:	
Mr. Jeffrey SPAGNOLA, Vice President of Worldwide Service Provider Marketing, Cisco Systems	
14:30 – 16:00 Session 3: QoS, Control & Signaling Capabilities	
Co-chairmen:	Presentations:
(ITU-T) Mr. Neal SEITZ, Institute for Telecommunication Sciences (ITS) (IETF) Ms. Allison MANKIN, Shinkuro Inc.	(ITU-T) Ms. Hui-Lan LU, Lucent Technologies (IETF) Ms. Allison MANKIN, Shinkuro Inc. (ITU-T) Mr. Keith MAINWARING, Cisco Systems (IETF) Mr. Hannes TSCHOFENIG, Siemens
16:30 – 18:00 Session 4: Network Management	
Co-chairmen:	Presentations:
(ITU-T) Mr. Dave SIDOR, Nortel Networks (IETF) Mr. Bert WIJNEN, Lucent Technologies	(ITU-T) Mr. Dave SIDOR, Nortel Networks (IETF) Mr. Bert WIJNEN, Lucent Technologies (ITU-T) Mr. Leen MAK, Lucent Technologies
2 May 2005, Day 2	
09:00 – 10:30 Session 5: Security Capabilities	
Co-chairmen:	Presentations:
(ITU-T) Mr. Igor FAYNBERG, Lucent Technologies (IETF) Mr. Jon PETERSON, Neustar	(ITU-T) Mr. Zachary Zelstan, Lucent Technologies (IETF) Mr. Russ HOUSLEY, Vigil Security (ITU-T) Mr. Jiashun TU, ZTE (IETF) Mr. Jon PETERSON, Neustar
11:00 – 12:30 Session 6: Evolution	
Co-chairmen:	Presentations:
(ITU-T) Mr. Keith DICKERSON, BT (IETF) Ms. Leslie DAIGLE, Verisign	(ITU-T) Mr. Ghassem KOLEYNI (IETF) Ms. Leslie DAIGLE, Verisign (ITU-T) Mr. Keith DICKERSON, BT (IETF) Mr. Gonzalo CAMARILLO, Ericsson
12:30 – 13:00 Wrap-up	
Co-chairmen: (ITU-T) Mr. Chae-Sub LEE, ETRI (IETF) Mr. Brian CARPENTER, IBM	

NGN functional architecture under study by ITU-T emphasizes support for end-to-end services by the network. In contrast, IETF's Internet protocols emphasize placing functions in end-systems to handle disruptions in the network.

Session 2: Nomadicity and mobility

An ITU-T presenter noted that traditional mobile networks have been required to provide extremely high reliability and support for emergency communications, and he suggested that these requirements

Table 2.   Changing environment.

Original requirements	New requirements
End-to-end transparency	Packet inspection, NATs
Peer-to-peer	NATs, firewalls, servers
Connectionless	MPLS
Best-effort	Realtime demands
User back-off	QoS "guarantee"
Network empowerment	User empowerment
No flow state	Flow state
Trust	Hackers everywhere
Static addresses	DHCP, mobility
Fairness	QoS (implies deliberate unfairness)
Terminal-to-host, best-effort	Mass public residential services, multi-terminal multi-QoS
Flat network	Access and Core domains
Layer independence	Inter-layer coupling?
Simple protocol layering	Protocol maze
Research/defense use	Commercialization, competition, consumer choice

NAT: network address translation
MPLS: multiprotocol label switching
DHCP: dynamic host configuration protocol

should be considered for inclusion in NGN standards. The same presenter emphasized the advantages of ISIM[*2] subscriber authentication, which is widely deployed in current mobile networks.

An IETF presenter stressed the importance of flexible design: even assuming that an application is being designed for mobility, it is best not to design for a specific architecture. Specifically, he introduced some IPv4 and IPv6 mobile technologies: SCTP, HIP, multi-homing in IPv6, and Shim6.

Another ITU-T presenter described four aspects of fixed-mobile convergence: centralization of customer support, common service provisioning, network unification, and terminal device convergence. He also discussed technical topics such as user identification, user authentication, network interconnectivity, and numbering schemes. He pointed out that fixed-mobile convergence requires cooperation with multiple standards organizations in addition to ITU-T and IETF.

Finally, IETF presented its work on geopriv (geolocation & privacy) methods for providing geographic location information. As an example of a fundamental difference between the roles of terminal and network functions, it was noted that location information

could be provided not only by the terminal device but also by the network.

Session 3: QoS control and signaling

This session discussed three issues: user requirements, network mechanisms, and the signaling methods to relate these requirements and mechanisms.

Regarding user requirements, it was explained that ITU-T has standardized QoS classes defined in Recommendation Y.1541. Meanwhile, IETF is currently working on how to map user requirements to the DiffServ Basic Service Classes. IETF has developed multiple methods for the network mechanism including RSVP-TE, MPLS-DSTE, Diffserv PHBs, and PDB.

Signaling mechanisms for IP QoS (Internet protocol quality of service) are being developed by both ITU-T and IETF. Signaling types are path-coupled, path-decoupled, end-to-end, and hop-by-hop. Both organizations are placing priority on standardization in the areas of resource control, admission control, QoS measurement, and management.

This session touched on the difference between the two organizations' underlying philosophies for the NGN. ITU-T assumes that QoS control and session control are critical prerequisites for the NGN. On the other hand, IETF stresses that for the Internet, these types of control should be optional additions and that basic services should be provided on a best-effort basis without signaling.

Session 4: Network management

The NGNMFG (NGN Management Focus Group) is the central body working on NGN management specifications, including those that originate both inside and outside ITU-T. The NGN Management Roadmap is planned to be completed in September 2005. Management specifications depend largely on the functional and physical entities that they are to manage. It was pointed out that the current NGN architecture is still slightly too abstract and that such management-related issues require more work. It was also observed that IETF work is focusing on management related to equipment operations, while ITU-T has a wider scope including network management, service management, and business management.

Session 5: Security

While ITU-T work in the areas of security is based on the guidelines of X.805, IETF is working to improve security from a number of angles.

Session 6: Network evolution

ITU-T presented the results of work undertaken by its FGNGN (Focus Group on NGN) on migration from the existing telephone networks to IP-based networks. The differences between emulation and simu-

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*2   ISIM: IMS subscriber module

lation were explained and concrete migration scenarios were introduced. Emulation means that existing interfaces and network capabilities are maintained. Simulation, on the other hand, uses IP interfaces while simulating existing network capabilities. IETF presented their views on the conceptualization of network evolution. This conceptualization extended beyond the specific migration from the phone network. IETF representatives also made a presentation about session-based services using SIP (session initiation protocol).

4. Overview of joint management meeting

After the workshop sessions, twenty IETF administrative directors and chairs from all the ITU-T Study Groups exchanged views concerning how to establish an alliance between the two standards bodies.

TSB Director Houlin Zhou led a discussion between the top officials of both organizations. The IETF side included IAB Chair Leslie Daigle, several IAB members, IETF Chair Brian Carpenter, and a majority of the area directors (IAB: Internet Architecture Board). The ITU-T side included chairs/vice-chairs from all study groups. This was the third time since 2001 that a joint management meeting between ITU-T and IETF had been held.

It was agreed that, now that the original goal of information exchange and human interaction between the two groups had been accomplished, discussions have widened and diverged into many paths, and the next step is to define the topics on which the alliance will focus.

A presentation was made concerning the electronic tools for project management being introduced at ITU-T to track the status of ITU-T's NGN standardization progress.

A question was raised concerning how ITU-T should ask IETF for changes to protocols. In response, IETF described the RFCs (Requests For Comments), which define guidelines for modifying specific protocols such as SIP, RSVP, and MPLS/GMPLS. IETF protocols are meant to be flexible and serve a wide range of applications; therefore, if an ITU-T requirement is for a specific application it will be necessary to evaluate the effect on sustaining interoperability.

IETF also pointed out that when a modification to an IETF protocol is desired, the requirements should be presented and not the solution to those requirements. IETF's normal approach is to scrutinize the requirements when a certain issue is raised.

IETF proposed using an electronic tracking system to monitor the status of discussions because there had been instances of issues slipping through the cracks in ITU-T's liaison to IETF. The two organizations are working towards improving the information flows for this liaison.

5. Direction for the future

This trial joint meeting provided a suitable forum for surveying the direction of development for core NGN technologies. It was decided that discussion on specific issues will be held in the future. During the meeting, comments were made regarding the differences in working styles between the organizations. 1) In IETF, work is continuously conducted through mailing list discussions, while ITU-T's style concentrates efforts on participation and deliberation at conferences. An actual case where this difference in working styles caused friction was mentioned: in a joint area of study there was a sudden change at ITU-T meetings that could not be accepted by participants on the IETF mailing list. 2) Another difference is related to document distribution: in IETF, documents (including works in progress) can be freely accessed by anyone, while ITU-T documents under study are limited to members and the distribution of completed recommendations is fee-based. It was mentioned that these procedural differences between the two organizations make it even more important to foster exchange through an overlap of participants who are active in both groups.

References

[1] http://www.itu.int/ITU-T/worksem/ngn/200505/
[2] http://www.itu.int/ITU-T/worksem/ngn/200505/program.html

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He received the B.E. and M.E. degrees from Nagoya University, Nagoya, Aichi in 1985 and 1987, respectively. In 1987, he joined NTT Research and Development Center, where he engaged in research on ATM systems. From 2000, he has been studying VoIP and interactive multimedia technology. Since October 2004, he has been a Vice Chair of SG13 in ITU-T. He is a member of the Institute of Electronics, Information and Communication Engineers of Japan.