



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Final Report

ITU-T Workshop on Opportunities and Challenges in Home Networking

(ITU Headquarters, Geneva, 13-14 October 2005)

Table of Contents

Executive Summary	2
Highlights of Technical Sessions	3
SESSION 1: WORLDWIDE STATUS OF HOME NETWORKING.....	3
SESSION 2: HOME NETWORK ARCHITECTURE AND TECHNOLOGIES	3
SESSION 3: HOME NETWORKING SERVICES AND BUSINESS MODELS	3
SESSION 4: SECURITY AND DIGITAL RIGHTS MANAGEMENT	3
SESSION 5: QUALITY OF SERVICE IN THE HOME NETWORK	3
SESSION 6: ELECTROMAGNETIC INTERFERENCE IN THE HOME ENVIRONMENT.....	4
SESSION 7: THE HOME NETWORKING FUTURE: EFFORTS AND CHALLENGES	4
SESSION 8: PANEL – WRAP-UP	4
Workshop Conclusions and Recommendations	5
ANNEX	6
WORKSHOP EVALUATION.....	6

Executive Summary

Prior to the meeting of ITU-T [Study Group 9](#), the Lead Study Group on integrated broadband cable and television networks, ITU-T hosted a workshop, Opportunities and Challenges on Home Networking at ITU headquarters in Geneva, Switzerland, 13 - 14 October 2005. There were 118 participants from 22 countries. The event followed a similar workshop in Tokyo in 2004. .

Home networking is the linking of all types of electronic devices for applications such as entertainment, telecommunication, information technology, home automation systems and telemetry (remote control and monitoring systems). Given the wide range of previously unrelated technologies involved, standards that allow for interoperability are seen as key to the successful marketing of the concept.

ITU-T Study Group 9 has been working on standardization in home networking systems for more than four years. The workshop was organized by a Steering Group consisting of representatives of Study Group 9 and several other ITU-T study groups and various organizations outside of ITU, to bring together experts from all over the world. Besides an overview of the technology as well as an examination of the standards that address access, services, performance, quality of service (QoS), electromagnetic interference and security issues, this workshop focused on reviewing current standardization progress and an international standardization framework to move forward standardization work in this fast-developing field.

A key conclusion of the workshop is that there needs to be better collaboration between the various groups involved in the work. It is critical for ITU to facilitate working relationships beyond those with ISO and IEC and to open the door to referencing other specifications. The formation of an ITU-T Focus Group, perhaps using the JCA-HN as a basis initially was suggested by some as a way to meet the standardization needs of home networking quickly and with the minimum of red-tape.

A small exhibition was hosted during this event in the Salle des Pas Perdus in the second basement of the ITU Tower building. Korea Electronics Technology Institute (KETI) demonstrated interoperability between different devices and applications with their mini-HomeNetwork system based on the Common Communication Protocol of Korea. Rose Vision (Spain) distributed documents relating to the Avista Project funded by the European Commission.

Highlights of Technical Sessions

Session 1: Worldwide Status of Home Networking

Mr. Charles Sandbank Chairman of the Workshop's Steering Committee in his introductory remarks drew attention to the fact that event's website contains a wealth of material, which due to time constraints, could not all be presented at the workshop. He also emphasised that ITU wanted to use the event to look for ideas on what we should be doing in this emerging field, what standards are needed, what liaisons should be formed and how should the work be organized.

Mr. Houlin Zhao, Director of ITU's Telecommunication Standardization Bureau formally opened the workshop on behalf of the ITU by welcoming experts from various Study Groups, ISO and IEC, representatives from industry forums, and delegates from both developing countries and developed countries, and stating his wish to strengthen ITU-T's impact in this important field.

Following the opening remarks, home networking development worldwide in Japan, the US and Europe and standardization work in ISO/IEC JTC1/SC25 were presented. Speakers noted that home networking opens new business opportunities to many entities including network operators. It was further noted that many of the conclusions of the Tokyo workshop were still relevant and identified QoS and digital rights management (DRM) as critical for home networking. While multiple specifications including international and regional standards already exist, cooperation and exploitation of publications and work outside the ITU-T was advocated as an efficient way toward a common architecture of home networking standards

Session 2: Home Network Architecture and Technologies

Issues related to access and home network architectures and protocols, in-home transport technology, in-home device integration and control and media formatting were discussed in this session. In his summary, session chair Yoichi Maeda (SG15 Chairman, NTT) pointed out that a common network architecture and service requirements, with the transport media and service layers separated in a similar way to the next generation network (NGN) concept should be further studied.

Session 3: Home Networking Services and Business Models

Speakers from the broadcasting, telecommunication and e-health industries shared their experience in home network service provisioning in this session, followed by a panorama analysis of the current home networking business landscape and an example of supporting technology used to implement services across different media and devices. This session consented that quick evolution of customer needs and supporting technologies requires a flexible and evolutionary service provisioning approach. Due to specific characteristics and limitations, wired and wireless access technologies are complementary and will coexist. This session also noted the urgent need to allocate new frequencies for WiFi systems (e.g. in UHF-Band) for the home environment.

Session 4: Security and Digital Rights Management

This session comprised of presentations on security framework for remote access, protection of TV content and digital rights management (DRM) standardization development. The harmonization and continuation of ITU work on DRM was identified as a very important factor and a big challenge.

Session 5: Quality of Service in the Home Network

Speakers from major telecommunication companies (KDDI, France Telecom and Telecom Italia) and cable industry (CableLabs) shared their experience in managing QoS in the home networking environment. Home networking service providers consider QoS and performance issues as fundamental for commercial applications. Advanced QoS functionalities on customer premise equipment (classification, policing, queuing), dynamic QoS control (interaction between CPE and home network, between CPE and operator's network, and based on flow recognition and QoS signaling specific protocols) and remote management of QoS configuration were viewed as possible

components of end-to-end QoS solutions. ITU-T Study Group 12 already has work underway in this area and plans to organize a QoS workshop in June 2006.

This session noticed that one issue to be addressed was the different terminology used by the numerous players in the field to describe the same thing. Harmonization of terminology use and concept definition would avoid confusion, save time and facilitate better understanding and cooperation.

Session 6: Electromagnetic Interference in the Home Environment

The increased use of broadband services has led to the development of a number of different wireless (e.g. WLAN and DECT) and wireline technologies (e.g. LAN as well as technologies designed to exploit existing telephone extension and power distribution wiring) to interconnect a variety of in-home electronic and electrical equipment. These techniques introduce many new electromagnetic compatibility (EMC) issues. This session comprised of presentations on ITU-T SG5 work on EMC issues encountered in the home environment and a coexisting framework proposed by Sony to manage power line cable (PLC) networks. According to Chairman Roberto Pomponi information and requirements on safety, protection and EMC are already available in various ITU-T Recommendations and other international standards, but the home environment might necessitate improvement of the EMC, resistibility and safety requirements to ensure problem-free operation, in particular for PLC.

Session 7: The Home Networking Future: Efforts and Challenges

In this forward-looking session, speakers shared their vision on home networking's future development with presentations on the evolvement of the Common Communication Protocol in Korea, requirements from a video service provider's perspective, experience of connecting AV devices with home apparatus in Japan and the introduction of EU sponsored home networking projects.

This session noted that interoperability of many application types (data, voice, A/V, home control, appliance) between such a diverse set of technologies and requirements is critical and will lead to many more innovative applications. AV distribution is seen to be a key application driving home networking and it demands interoperable QoS and DRM solutions. Regional regulatory issues will impact AV distribution and must be taken into consideration when creating world wide standards. The importance of international cooperation and ITU's unique role in this regard were reemphasized. It was advised that ITU should vertically act together with related regional standards bodies to endorse and entrust output specifications from industry forums and horizontally coordinating strong and close harmonization among international standardization bodies.

A summit of the forums and SDOs working in the area was suggested by some as one way forward to facilitate relationship building and multi-region regulatory study between regional industry forums and international standards bodies,.

Session 8: Panel – Wrap-up

At the end of the workshop, a wrap-up panel session chaired by Charles Sandbank with chairmen from previous sessions reviewed the outcome of the workshop and discussed how to focus effort on standardization for home networking. Key conclusions from this and all the other sessions are identified below.

Workshop Conclusions and Recommendations

- A clear key conclusion of the workshop is that there needs to be better collaboration between the various groups involved in the work. It was agreed that it is critical for ITU to widen working relationships and further open the door to referencing normatively the specifications of organizations other than ISO, IEC and the other recognised organisations in its recommendations.
- Following a presentation by Reinhard Scholl, Deputy to the Director of ITU's Telecommunication Standardization Bureau in which he outlined the various ways that ITU can accommodate the work of other bodies, participants welcomed the degree of flexibility offered by ITU.
- One option outlined and agreed by some as a useful next step could be the formation of an ITU-T Focus Group to work on some of the technical issues. The Focus Group concept allows urgent standardization needs that are not addressed within existing ITU-T structure to be addressed quickly and with the minimum of red-tape.
- Home networking standardization needs to lead to a common reference architecture which is network independent and service independent.
- Home networking standardization bodies need to develop a common terminology.
- The home environment might necessitate improvement of the EMC, resistibility and safety requirements to ensure problem-free operation, in particular for PLC.
- The harmonization and continuation of ITU work on DRM was identified as a very important factor, and a big challenge.
- There is a need for action by interested parties to obtain an allocation of additional radio spectrum for WiFi systems for use in home networking.
- There was also a need identified to identify how the current home networking work fits in with NGN work, particularly for architecture, QoS and protocols.

To assist in many of the above aims the use of a currently existing group could help. The Joint Co-ordination Activity on Home Networking, (JCA-HN) was created by the ITU Telecommunications Standardization Advisory Group (TSAG) to harmonize work going on across ITU-T Study Groups but its mandate does not extend to technical work. JCA-HN could act as a mailbox for communicating between Fora and the appropriate Study Groups, who can start the co-operative technical work while the TSB works to solve the legal aspects. It is understood that its scope could be expanded (with the endorsement of TSAG), to include co-operation with external bodies involved in the field of home networking, acting as a basis for the possible formation of an ITU-T Focus Group on Home Networking. JCA-HN will seek to identify what exactly needs to be standardized in the field and aims to produce a roadmap outlining this activity.

ANNEX

WORKSHOP EVALUATION

Of 118 participants, 30 returned the filled evaluation form. From the respondents, 33% indicated an overall ranking for the Workshop as “very satisfied”, 53 % as “satisfied and 10% as “neutral”.

1= very dissatisfied, 2= dissatisfied, 3= neutral, 4= satisfied, 5= very satisfied

The average overall ranking of the Workshop was: 4.2

66 % of respondents would welcome another ITU_T workshop on the same subject in the next 1-2 years