

Joint ITU-UNIDO Forum on Sustainable Conformity Assessment for Asia-Pacific Region

(Yangon City, Republic of Union of Myanmar
25-27 November 2013)

ITU IPTV IPv6 Global Testbed and APT/ITU C&I event

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Yangon City, Myanmar, 25 November 2013



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- Introduction to ITU IPTV standards
- ITU IPTV IPv6 Global Testbed (**I3GT**)
- APT/ITU C&I event
- Conclusions





- Introduction to ITU IPTV Standards

ITU global standard



ITU Secretary-General
Hamadoun
Touré

UN Secretary-General
Ban Ki-moon

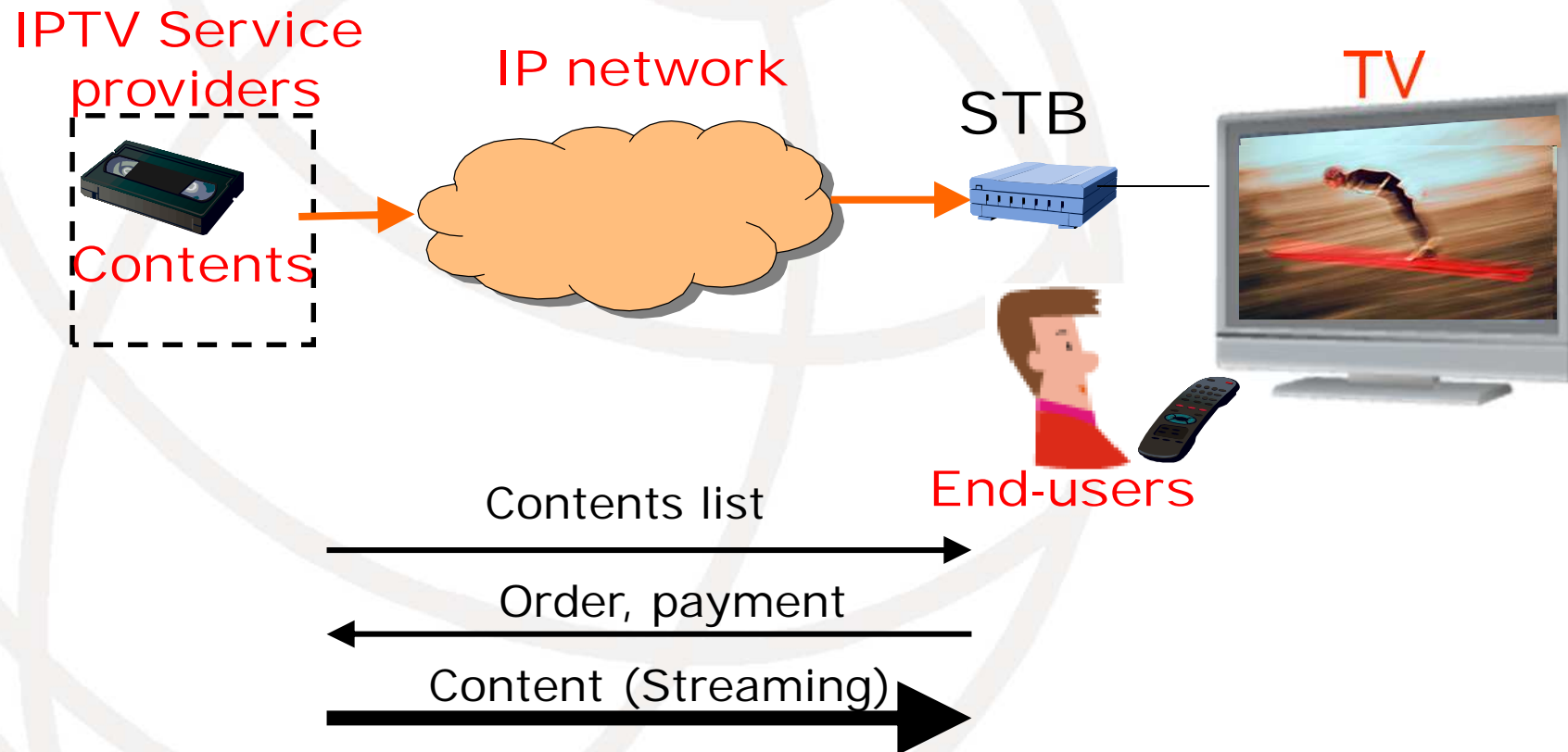
- ITU is United Nations agency for telecommunication and ICTs
- Members:
 - 193 Governments and regulatory bodies
 - 700 Private Sector
 - 20 Academia

IPTV Testbed content for “Sapporo snow festival 2013”
(Malcom Johnson, ITU-T Director)



IPTV introduction (1)

- An IPTV service is provided by IPTV service providers.
- End-users buy contents and consume them provided by IPTV service providers.

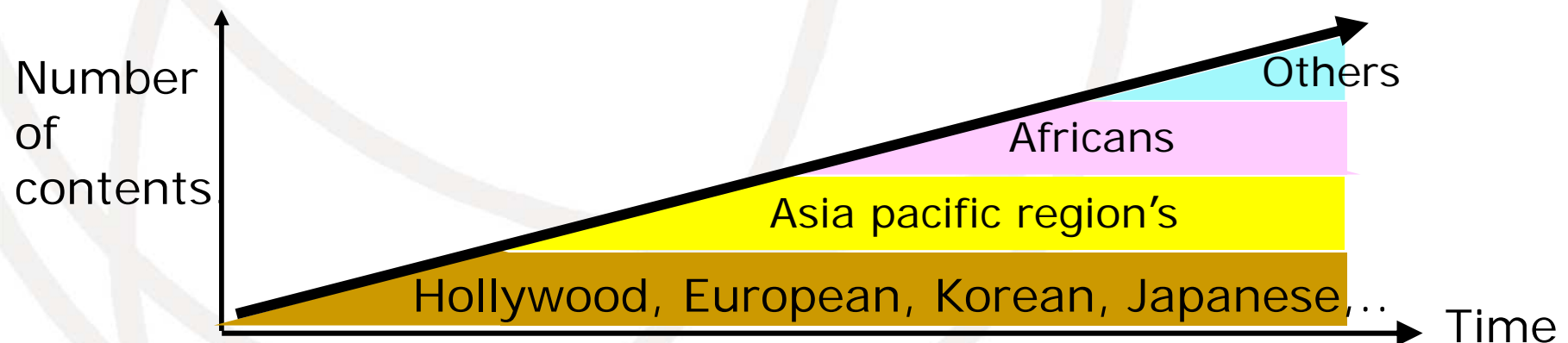


IPTV introduction (2) IPTV market view

- IPTV market is growing in the world.
- Number of interesting contents made by emerging countries will continue to increase.

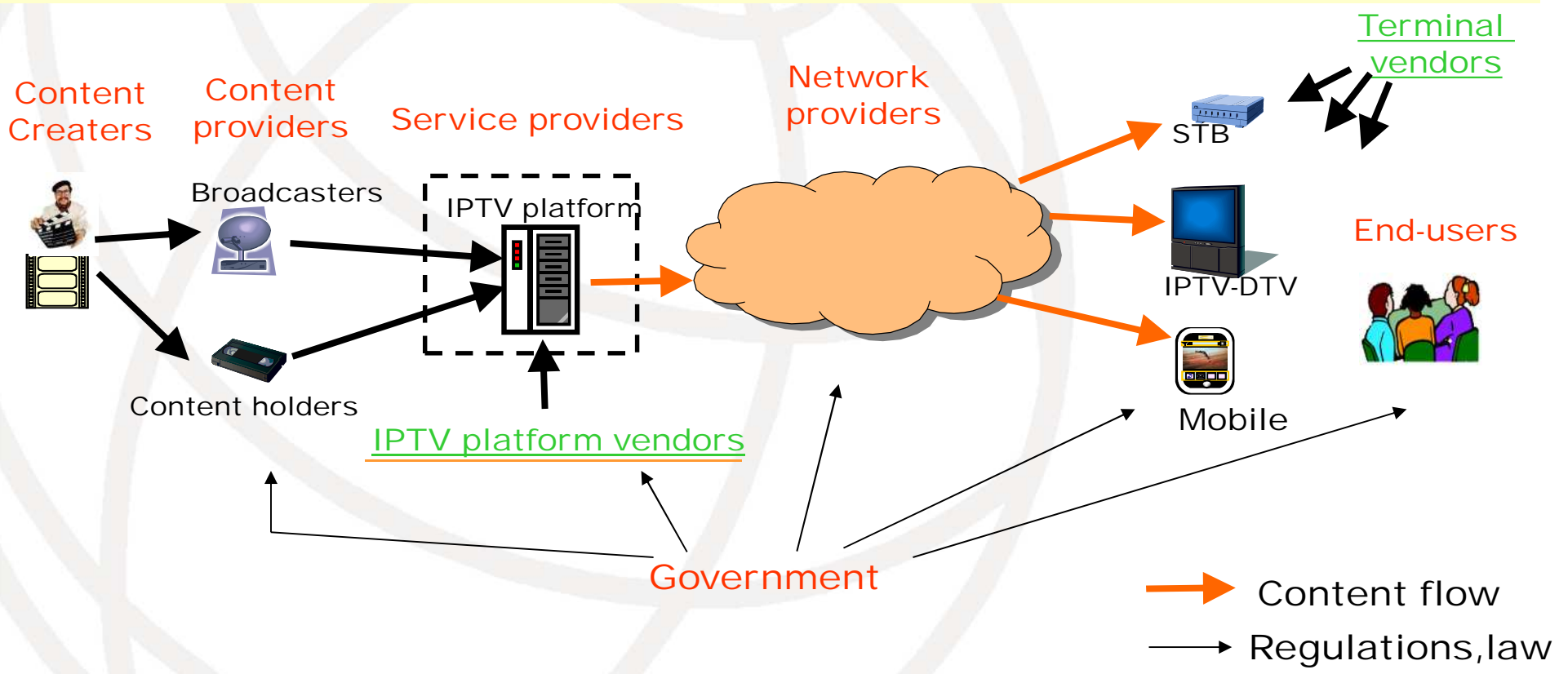
■ Because ...

- Korean TV programs and movies are currently very popular in the world.
- In Festival de Cannes May 2008, a Singapore movie, “My Magic” directed by Eric Khoo, was selected in Competition group.
- In Festival de Cannes 12-13 May 2010, Thai movie, “Lung Boonmee Raluek Chat” directed by Apichatpong Weerasethakul, won Palme d'Or award for the first time .



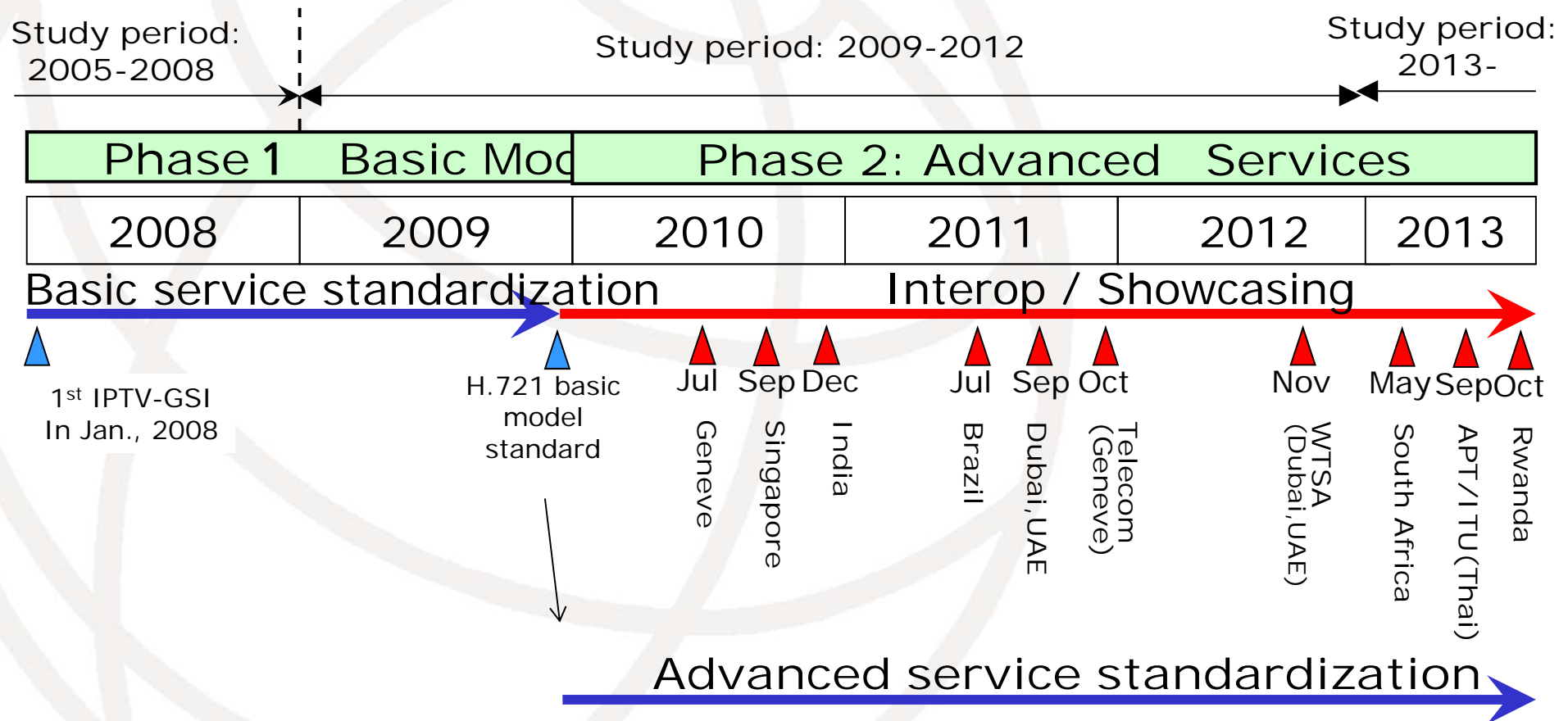
Stake holders for IPTV services and vendor rolls

- In order to provide IPTV service, not only IPTV service providers but also lots of other stake holders are concerning with IPTV services.
- Vendors are parties to provide IPTV service platforms and IPTV terminals.



IPTV defined in ITU IPTV standards

- IPTV \neq Internet Video
- Defined as “multimedia services, such as Television; Video; Audio; Text; Graphics; Data, delivered over IP based networks managed to provide the required level of QoS/QoE, security, interactivity and reliability”.



IPTV Services overall

- IPTV is a killer service of broadband infrastructure.
- By using of IP, IPTV provides interactive TV services.
- IPTV can be used as a platform of lots of TV base services.

■ Basic entertainment services

- ▶ Linear (Channel Service) Broadcast TV
- ▶ Video On Demand (VoD)
- ▶ Accessibility: captioning, descriptive audio
- ▶ Audio services
- ▶ Karaoke, gaming

■ Public Services

- ▶ Billboards, disaster alerts, traffic news, etc

■ E-*

- E-government
- E-publishing (e-Books, Newspaper)
- E-commerce (banking, etc.)
- E-learning (distance learning)
- E-health (telemedicine, tele-healthcare)

■ Private and Community Broadcasting (sharing videos)

■ Photo albums (sharing photos with your friends)

■ TV yellow pages

... and much more



Entertainment



E-learning



[ITU-T Y..Sup.5]

Server

Overview of ITU-T Recommendations for IPTV

- There are lots of draft Recommendations and Technical papers under discussion.
- End-user functions and Application functions are hot topics now.

Home networking

H.622.1: Req & Arch for IPTV Home networks

Applications and end-systems

H.750: Metadata for IPTV Services

H.721: IPTV Terminal (Basic)

H.770 : IPTV Service discovery

H.761: Ginga-NCL

H.741.x: Audience Measurement

H.762: LIME

H.763.1: Cascading style sheets for IPTV services

H.264: video

Architecture, requirements, network

Y.2007: NGN Capability Set 2

Y.Sup 5: IPTV Service use cases

Y.Sup 7: NGN Release 2 Scope

Y.1910: IPTV Functional Architecture

Y.1901: IPTV Service Requirements

Q.3010: Authentication protocol

Quality of Experience

H.701: Content Error-Recovery

G.1080: IPTV QoE

G.1081: Performance Monitoring

G.1082: Improving robustness of IPTV performance

Security and Content Protection

X.1191: Req & arch for IPTV security

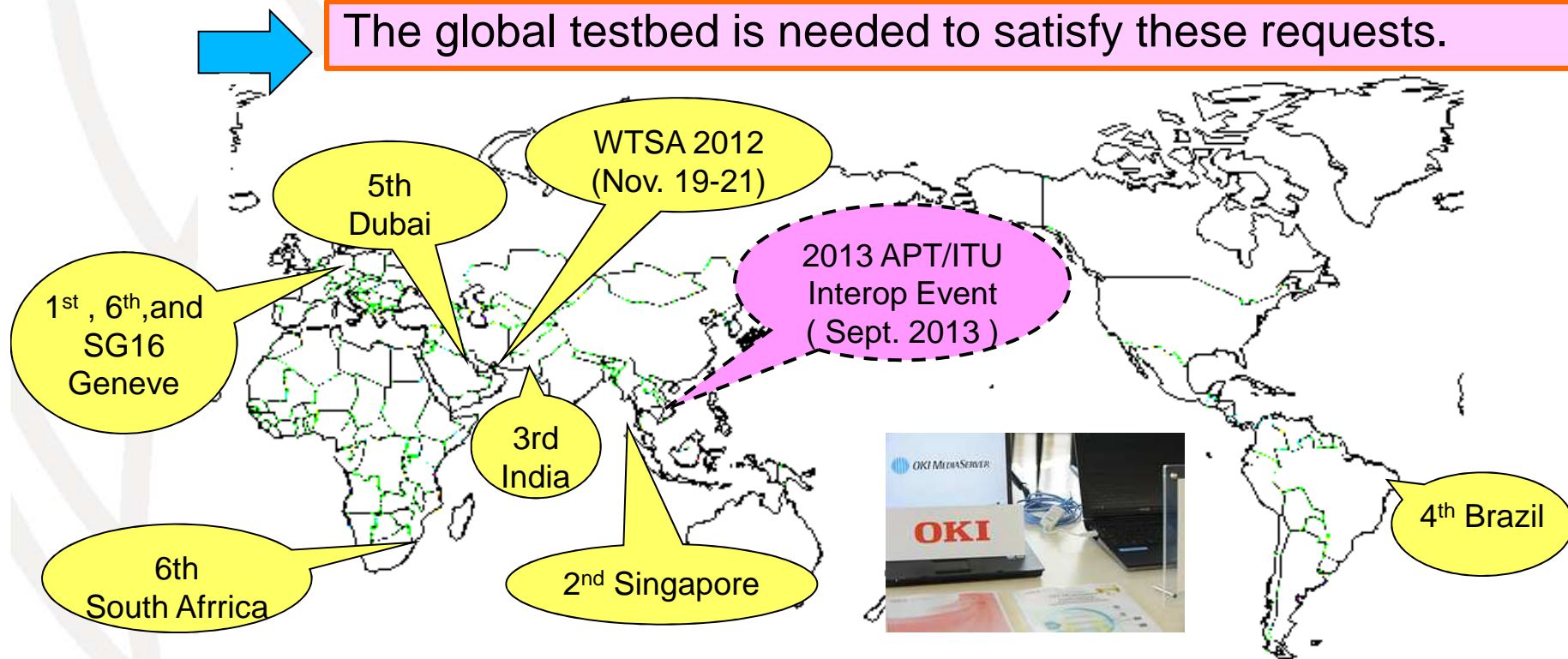


- ITU IPTV IPv6 Global Testbed

Why IPTV global testbed is necessary?

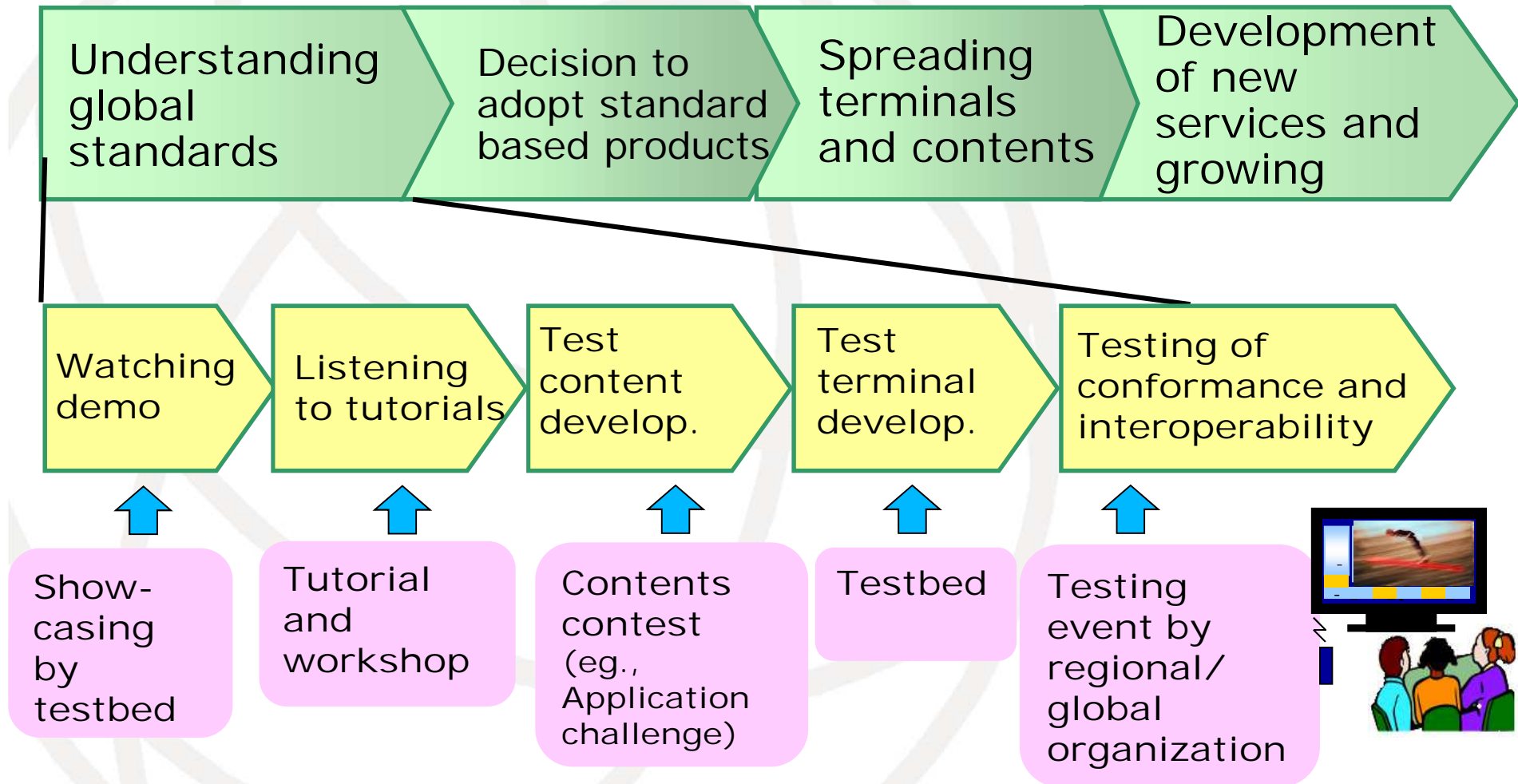
- ITU IPTV standards are expected to remove vendor locks because they are open standard.
- After ITU output IPTV standards, interoperability events and showcaing events were started to promote ITU IPTV standards in the world from 2010.
- Visitors became interested in IPTV standards, but these events were too short to understand details and test them to know whether these can be used or not.

The global testbed is needed to satisfy these requests.



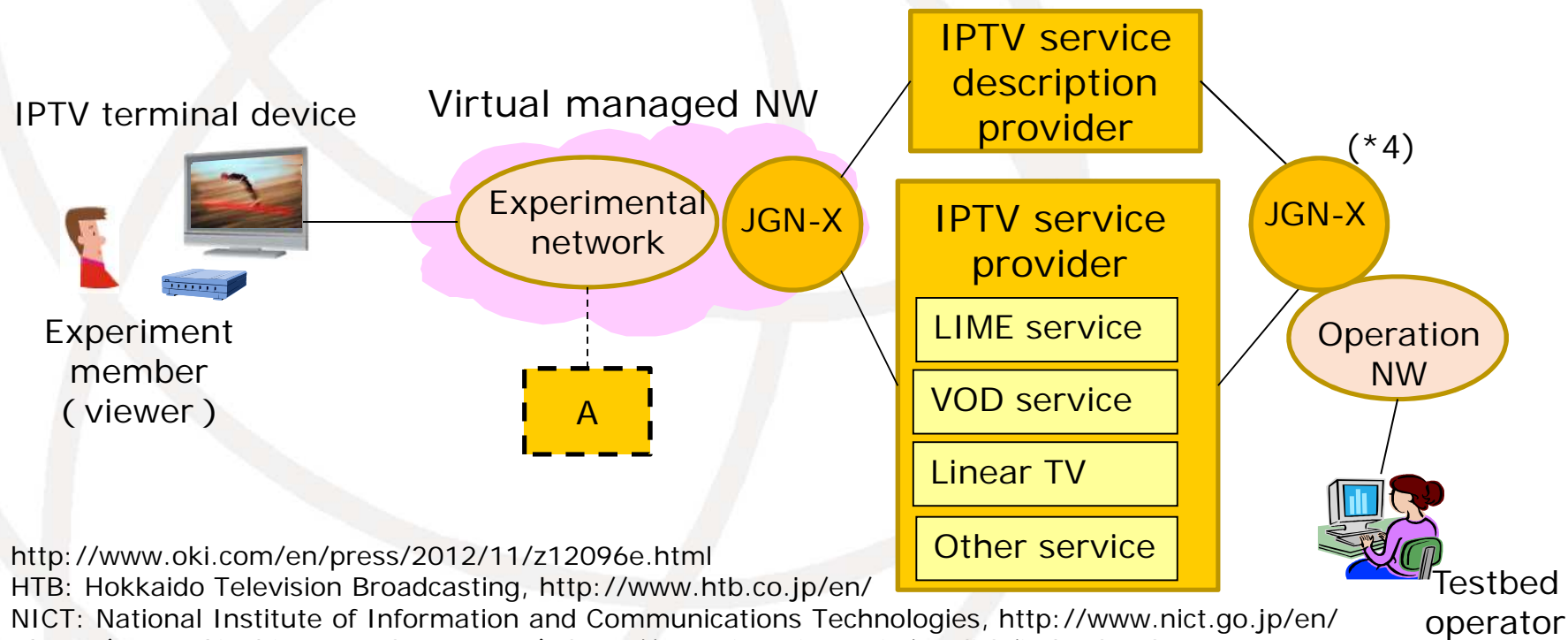
Steps from understanding standards to real services

- In order to spread real commercial services based on standards, testbed is useful



What is ITU IPTV IPv6 Global Testbed? (1)

- ITU IPTV IPv6 Global Testbed (I3GT) (*1) is a testbed for the parties that are interested in ITU IPTV standards and IPv6 network.
- I3GT was developed by OKI and HTB(*2) in October, 2012 in the cloud environment of NICT(*3).
- I3GT was demonstrated in WTSA-12 and Sapporo Snow Festival experiment 2013 by NICT.



(*1) <http://www.oki.com/en/press/2012/11/z12096e.html>

(*2) HTB: Hokkaido Television Broadcasting, <http://www.htb.co.jp/en/>

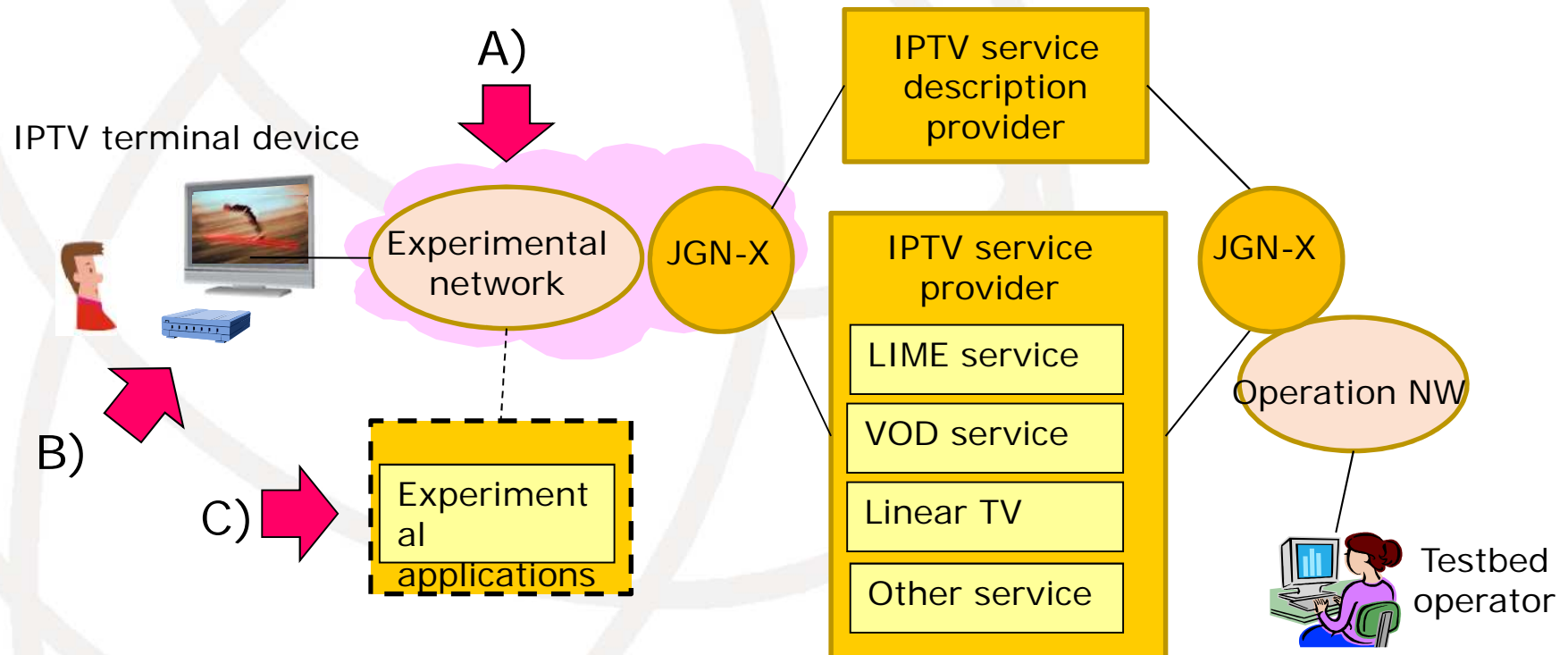
(*3) NICT: National Institute of Information and Communications Technologies, <http://www.nict.go.jp/en/>

(*4) JGN-X (Japan Gigabit Network -eXtreme), <http://www.jgn.nict.go.jp/english/index.html>

What is ITU IPTV IPv6 Global Testbed? (2)

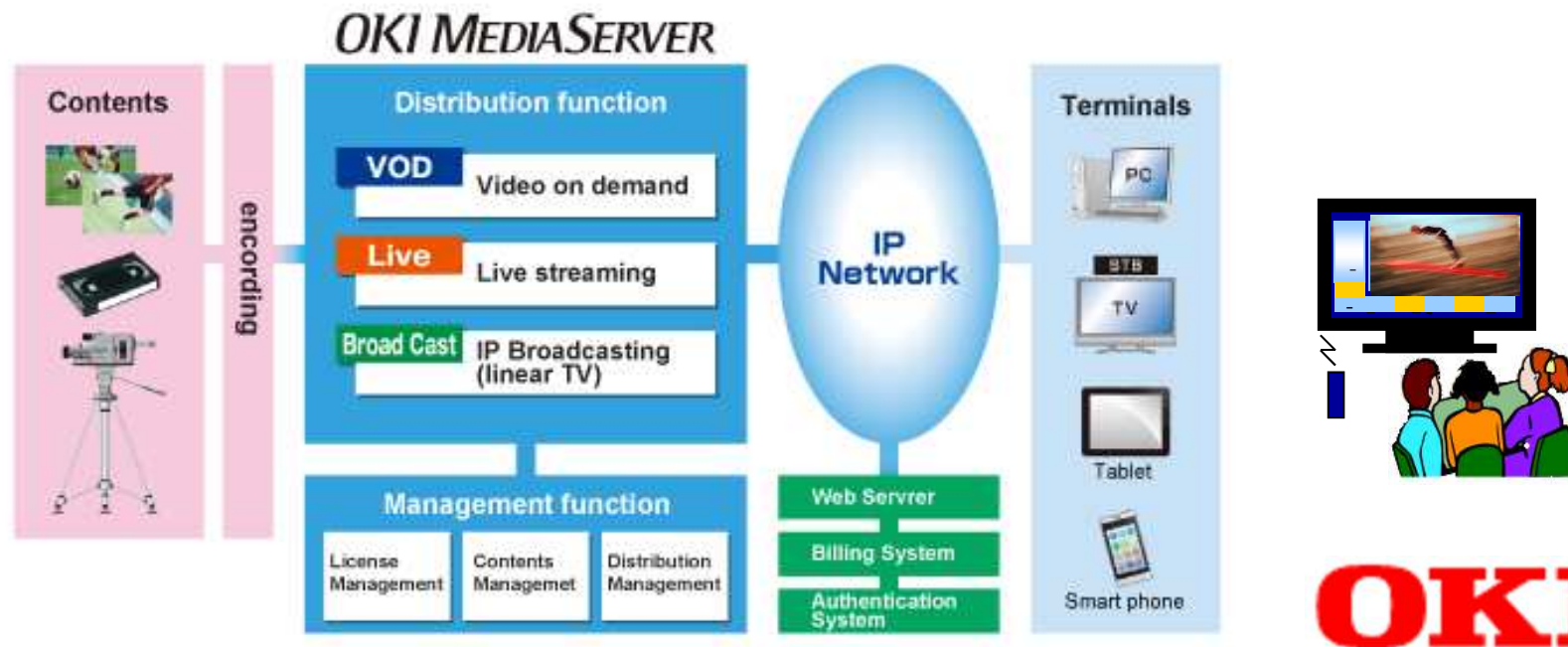
■ Test items (for examples, not limited)

- A) Network bandwidth and quality (delay, loss) suitable for IPTV
- B) IPTV applications based on LIME standard specifications and so on.
- C) Prototype of your own terminals and /or IPTV applications for future commercial services.



What is ITU IPTV IPv6 Global Testbed? (3)

- I3GT is a testbed based on the ITU IPTV reference server, *OKI MEDIASERVER*^(*1)
- Integrated IPTV Platform
 - VOD, live streaming, IP broadcasting (linear TV) and their combined services
- Standard based system
 - ITU-T IPTV standards and de-facto standard, IETF HLS, compliant
- Large scale system
 - It supports distributed VOD system for large scale system



(*1) <http://www.oki.com/en/streaming/>

What is ITU IPTV IPv6 Global Testbed? (4)

■ IPTV STB by Mitsubishi Electric



- ◆ Multiple services (currently deployed STB)
 - ◆ Terrestrial and satellite TV broadcast
 - ◆ Premium channel TV broadcast
 - ◆ VoD, Revenue-generating interactive services: Karaoke, portal services
- ◆ Personal video recorder, Remote scheduled recording

ITU-T Recommendations supported

- H.721 IPTV Terminal devices – Basic model
- H.762 Lightweight interactive multimedia environment (LIME) for IPTV services
- H.770 Mechanisms for service discovery and selection



Specifications

- Full-HD H.264, MPEG2
- LAN 10/100 Base-TX x1
- USB 2.0 x2 ports for HDD PVR
- HDMI digital Audio/Video
- Stereo audio
- Composite/Component video
- Digital audio
- IR interface (for remote controller)

IPTV showcasing at WTSA-12 in Dubai

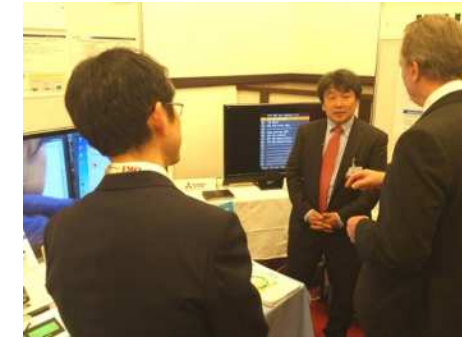
- ITU Secretary-General Hamadoun Touré visited IPTV showcasing and watched the live streaming from Geneva.



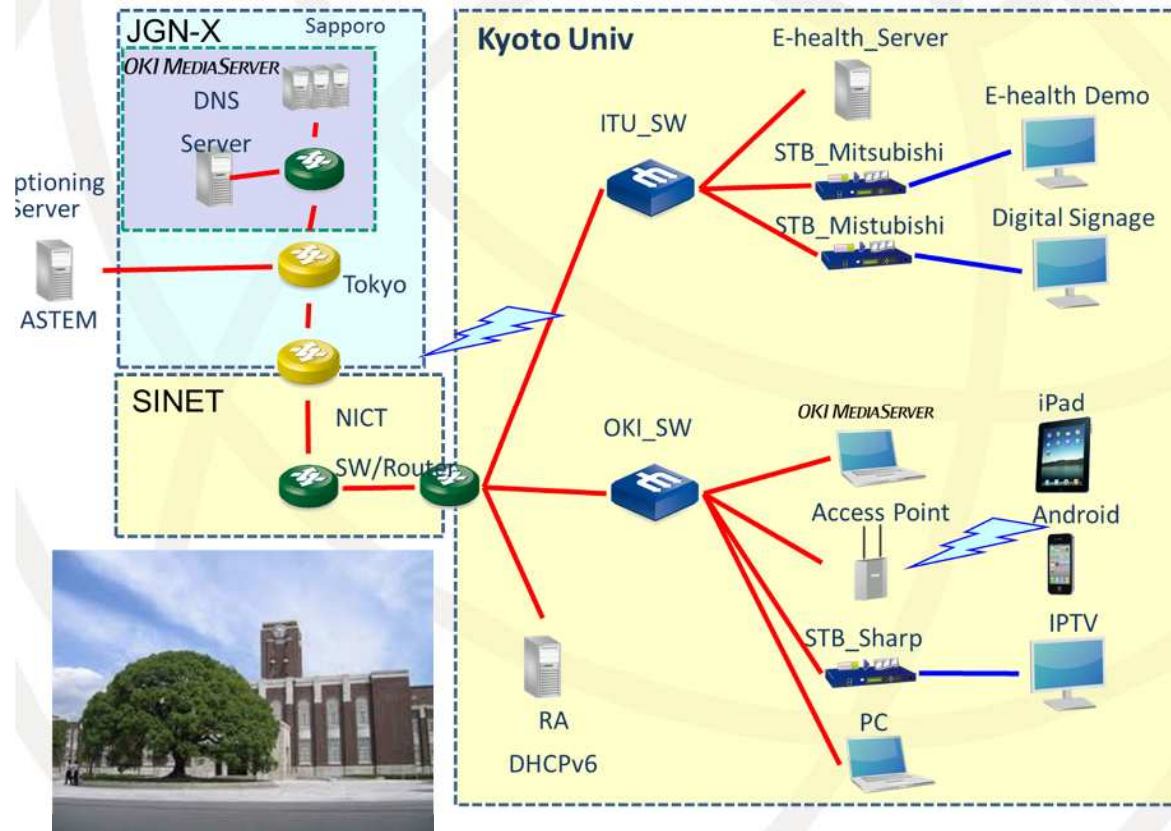
Flags
in UN.

What are the outputs of I3GT? (5)

- Kaleidoscope event was held in Kyoto, Japan.
- New services below are tested inter research NWs.
 - linear TV (IP multicasting)
 - time-shift service (start over)
 - session-shift service (multiscreen)



Director of Telecommunication Standardization Bureau (TSB) of the International , Malcom Johnson visited IPTV showcasing.

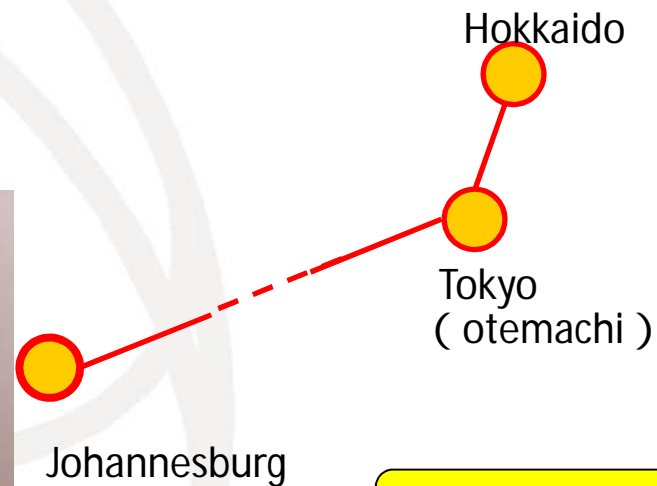
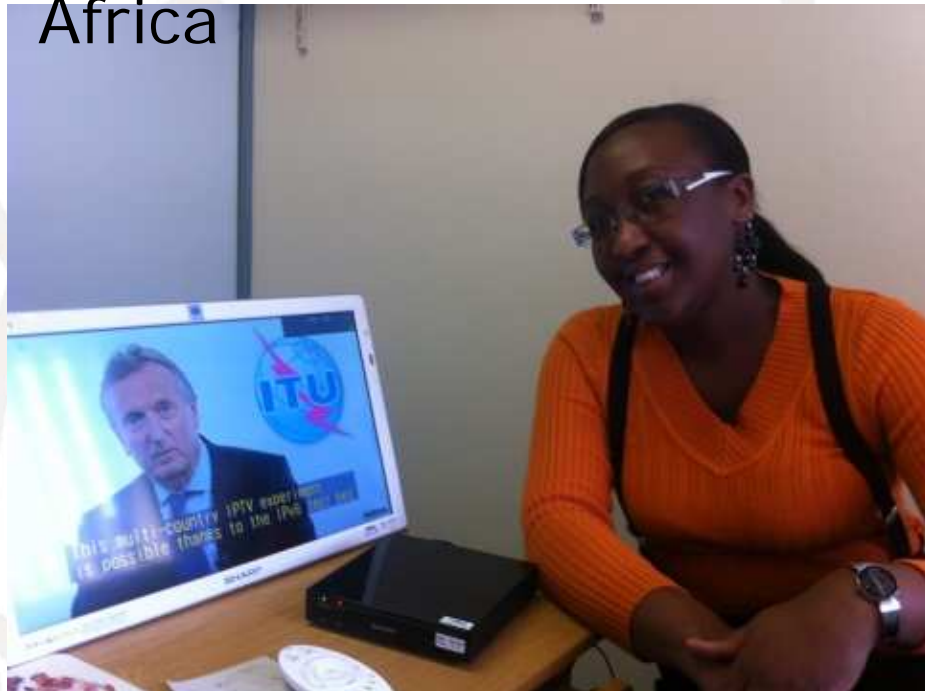


The biggest screen showed linear TV (IP multicasting). The second one showed VOD. The smallest one was a tablet PC for VOD.

Expanded I 3GT network

- National Advanced IPv6 Center of Excellence in Universiti Sains Malaysia in Malaysia was connected in March 2013
- CSIR (Council for Scientific and Industrial Research) in South Africa was connected in June 2013

South
Africa



Malaysia



ITU IPTV IPv6 Global testbed

■ Official Web(1)

<http://www.itu.int/en/ITU-T/C-I/interop/I3GT/Pages/default.aspx>

The screenshot shows a Windows Internet Explorer browser window displaying the ITU IPTV IPv6 Global Testbed Project (I3GT) website. The browser's address bar shows the URL: <http://www.itu.int/en/ITU-T/C-I/interop/I3GT/Pages/default.aspx>. The website features the ITU logo and the tagline "Committed to connecting the world". A navigation menu includes "ITU", "General Secretariat", "Radiocommunication", "Standardization", "Development", "ITU Telecom", and "Membership". Below the menu, there are links for "About ITU-T", "Study Groups", "Events", "All Groups", "Join ITU-T", "Publications", "Resources", "Workshops", and "Regional Presence". The main heading is "ITU IPTV IPv6 Global Testbed Project (I3GT)". A breadcrumb trail reads: "YOU ARE HERE HOME > ITU-T > ITU CONFORMITY AND INTEROPERABILITY > ITU INTEROP EVENTS > ITU IPTV IPv6 GLOBAL TESTBED". There are social media share buttons for Facebook, Twitter, LinkedIn, and Email. A banner image shows a globe with a laptop, tablet, and smartphone, with the text "ITU IPTV IPv6 Global Testbed". To the right, there are tabs for "Related activities", "News", and "Contact". The "Related activities" tab is active, showing a list of links: "ITU-T IPTV Global Standards Initiative", "Joint Coordination Activity on IPTV", "Study Group 16 - Multimedia coding, systems and applications", "ITU Interoperability events", and "Performance and Interoperability (C&I)". The browser's status bar at the bottom indicates "インターネット | 保護モード: 有効" and "110%".

ITU Global IPTV Testbed

■ Official Web(2) Testing sites

SITES

- A. Hokkaido Television Broadcasting Co., Ltd. (HTB), Hokkaido, Japan
- B. National Institute of Information and Communications Technology (NICT), Tokyo, Japan
- C. International Telecommunication Union (ITU), Geneva, Switzerland
- D. Institute for Infocomm Research (I2R), Singapore
- E. Dubai Convention Centre (during WTSA-12) hosted by the government of United Arab Emirates, Dubai, UAE
- F. Chulalongkorn University, Bangkok, Thailand
- G. University of Ateneo de Manila, Manila, Philippines
- H. Universiti Sains Malaysia, Penang, Malaysia
- I. Council for Scientific and Industrial Research (CSIR), Johannesburg, South Africa



[View Larger Map](#)

Where will I 3GT go? (1)

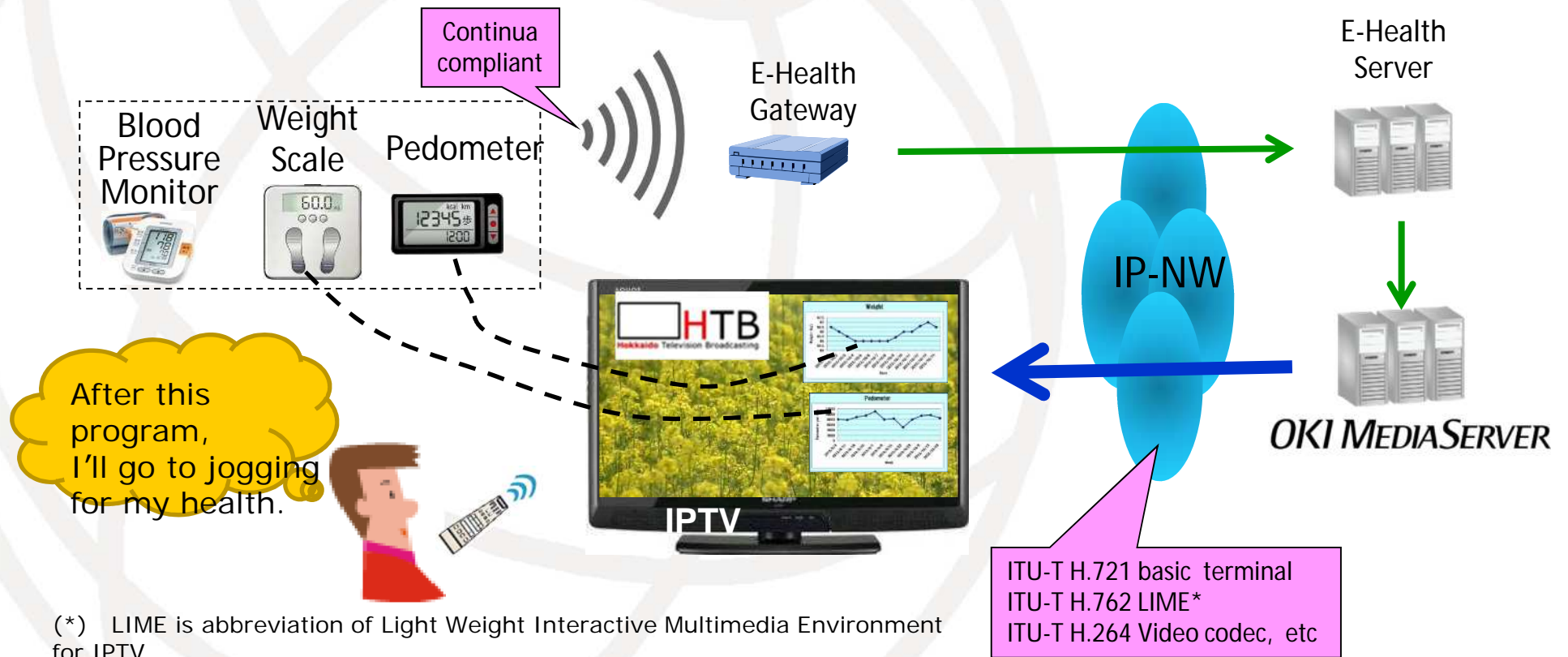
- It is planned to connect with more and more countries that are interested in ITU IPTV standards (universities, research laboratories, SDOs, carriers,..)
- In order to catch up state-of-the-art technologies and potential user needs, it is planned to support new standards and services, such as:
 - **E-health, e-learning**
 - Mobile (HLS, DASH, Multiple terminal control standards, ..)
 - New codec (ITU-T H.265), new resolution 4K
 - Audience measurement (ITU-T H.741.0-4, ...)
 - Digital signage (ITU-T H.780,...)

Where will I 3GT go? (2) - "a Better Quality of Life by IPTV"-

E-Health

Visualization of your health condition on IPTV

- ◆ Audience can see their personal health data such as weight, blood pressure and distance walked on their IPTV screen.
- ◆ Visualization of health condition will encourage audience to control their health condition.
- ◆ Global standard technologies such as ITU IPTV (LIME*) and Continua** are used to extend services more cost effectively and easily.



(*) LIME is abbreviation of Light Weight Interactive Multimedia Environment for IPTV
 (**) Continua health alliance :

Showcase in “Engagement of Rwandan Academia in ITU Activities”

- Visualization of your health condition on IPTV was demonstrated in the workshop, “Engagement of Rwandan Academia in ITU Activities”[*] and this SG16



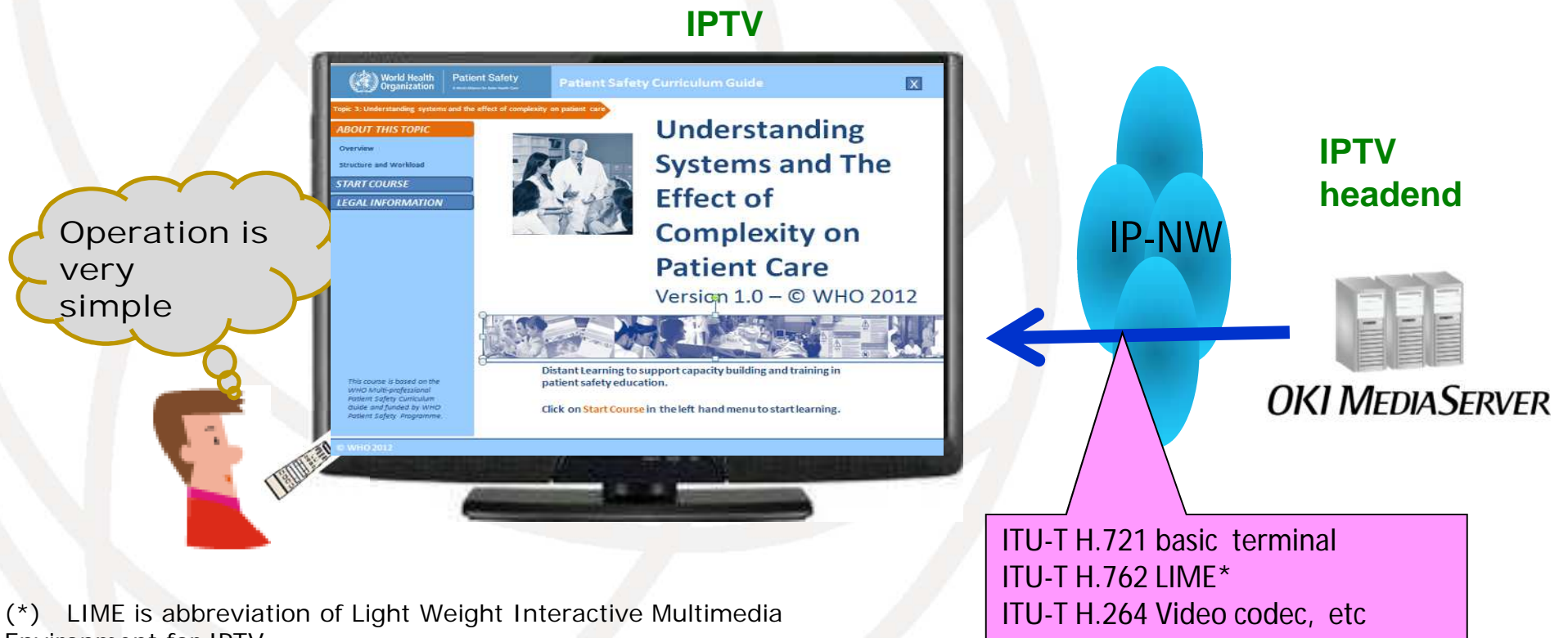
[*] Report of participation in the ITU Workshop "Engagement of Rwandan Academia in ITU Activities" (Kigali, Rwanda, 25 October 2013), ITU-T TD92 (WP2/16)

Where will I 3GT go? (3) - "a Better Quality of Life by IPTV"-

Simple e-learning by IPTV

E-Learning

- ◆ E-learning by IPTV uses remote controller as input devices.
- ◆ Students can study interactive multimedia courseware provided by LIME
- ◆ Patient care" courseware is considered to be developed as a first example.



(*) LIME is abbreviation of Light Weight Interactive Multimedia Environment for IPTV



■ APT/ITU C&I Event

Objectives of C&I event

- The objective of the interop event is to foster understanding and promote activities on Conformance and Interoperability (C&I) in the APT region.
- And it also contributes directly to build the capability and find the resolution for interoperability issues of APT member countries.
- This event will be organized by APT and supported by ITU.

Outline of the event

1. Date:

- 9th and 10th September 2013 followed by ASTAP-22

2. Venue:

- Centara Grand Hotel in Bangkok

3. Contents

1) Workshop (Afternoon on 9th and 10th September)

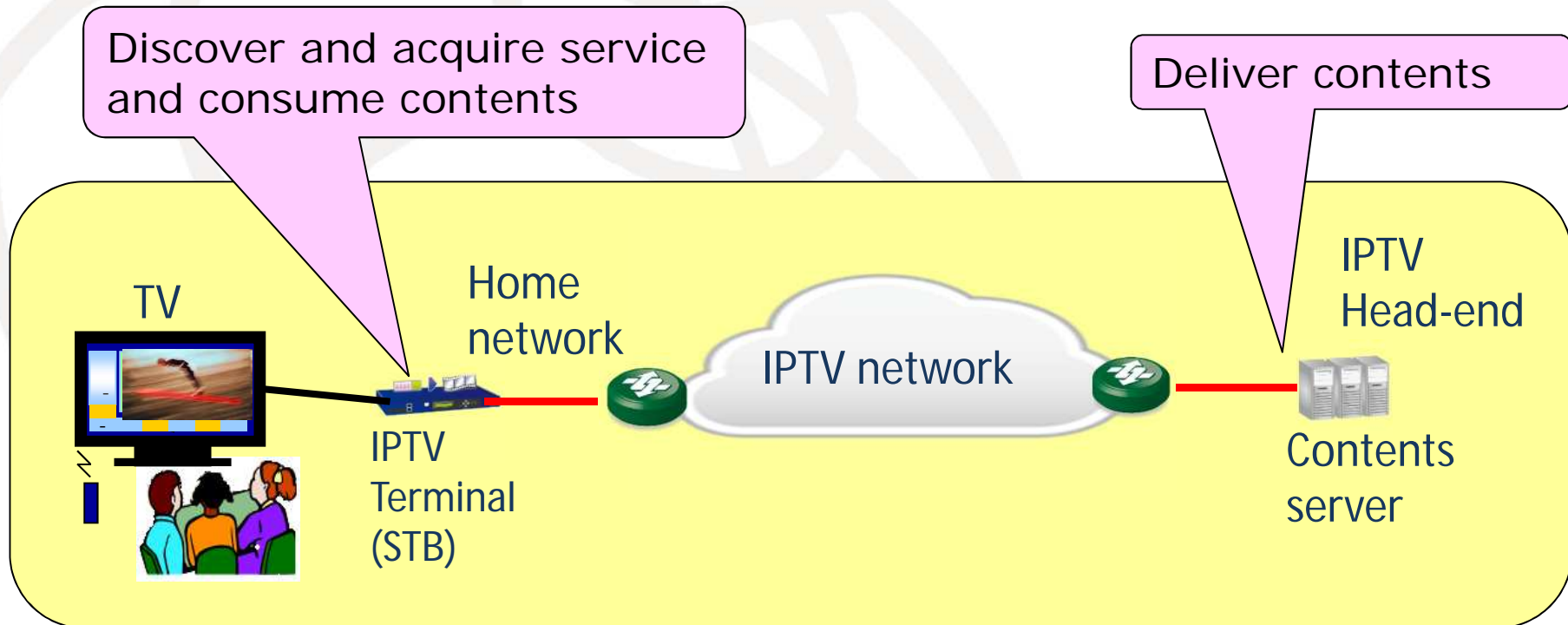
2) Interoperability testing (9th AM September)

- NGN (VoIP, Video conference)
- IPTV(including IPTV-MAFR (Multimedia Application Framework))

3) Showcasing (from 9th PM to 12th September)

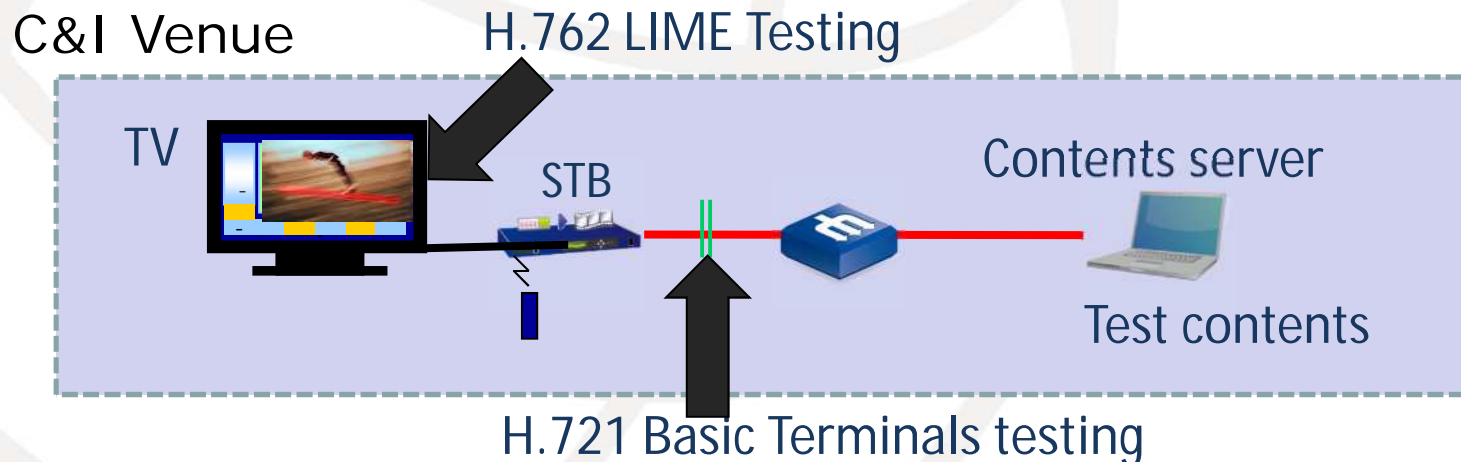
- NGN (VoIP, Video conference)
- IPTV(including IPTV-MAFR (Multimedia Application Framework))
- Optical access

IPTV Testing & Showcasing Conceptual Configuration(1)



C&I Testing outline(1)

- C&I testing for IPTV are based on ITU-T conformance documents.
 - ▶ ITU-T HSTP.IPTV-H721 (Basic Terminal)
 - ▶ ITU-T HSTP.IPTV-H762 (LIME)
- Basic IPTV services (VOD and Linear TV) operations are tested based on HSTP.IPTV-H721.
- Display images and remote controller operations over LIME contents are tested based on HSTP.IPTV-H.762



C&I Testing outline(2)

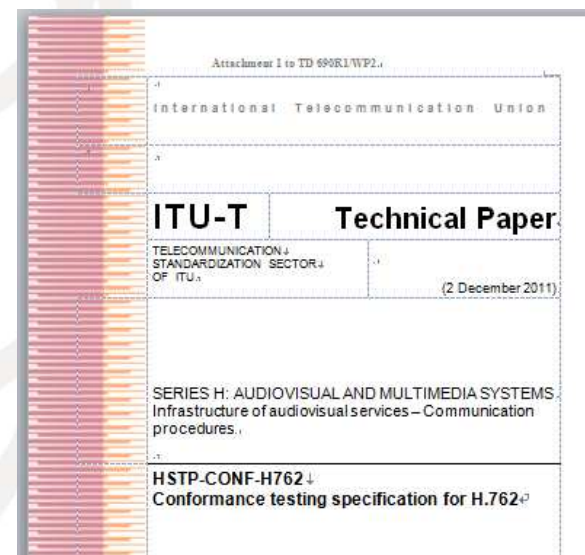
- HSTP.IPTV-H762 (LIME) describes basic element test, object element test items and et.al.
- HSTP.IPTV-H721 (Basic terminal) was used to test interoperability between a server and a terminal.

Basic element test

No.	File name	Description
1	docstr0.lime	TBD
2	body-element-test.lime	TBD
3	body-element-test0.lime	TBD
4	body-element-test1.lime	TBD
5	p-element-test.lime	TBD
6	p-element-test0.lime	TBD
7	br-element-test0.lime	TBD
8	div-element-test.lime	TBD
9	div-element-test1.lime	TBD
10	Span-element-test0.lime	TBD
11	Span-element-test1.lime	TBD
12	a-element-test0.lime	TBD
13	a-element-test1.lime	TBD
14	Input-element-test.lime	TBD
15	Input-element-test1.lime	TBD
16	link-css.lime	TBD

Object element test

No.	File name	Description
1	object-element-test.lime	TBD
2	object-element-test1.lime	TBD
3	object-element-test2.lime	TBD

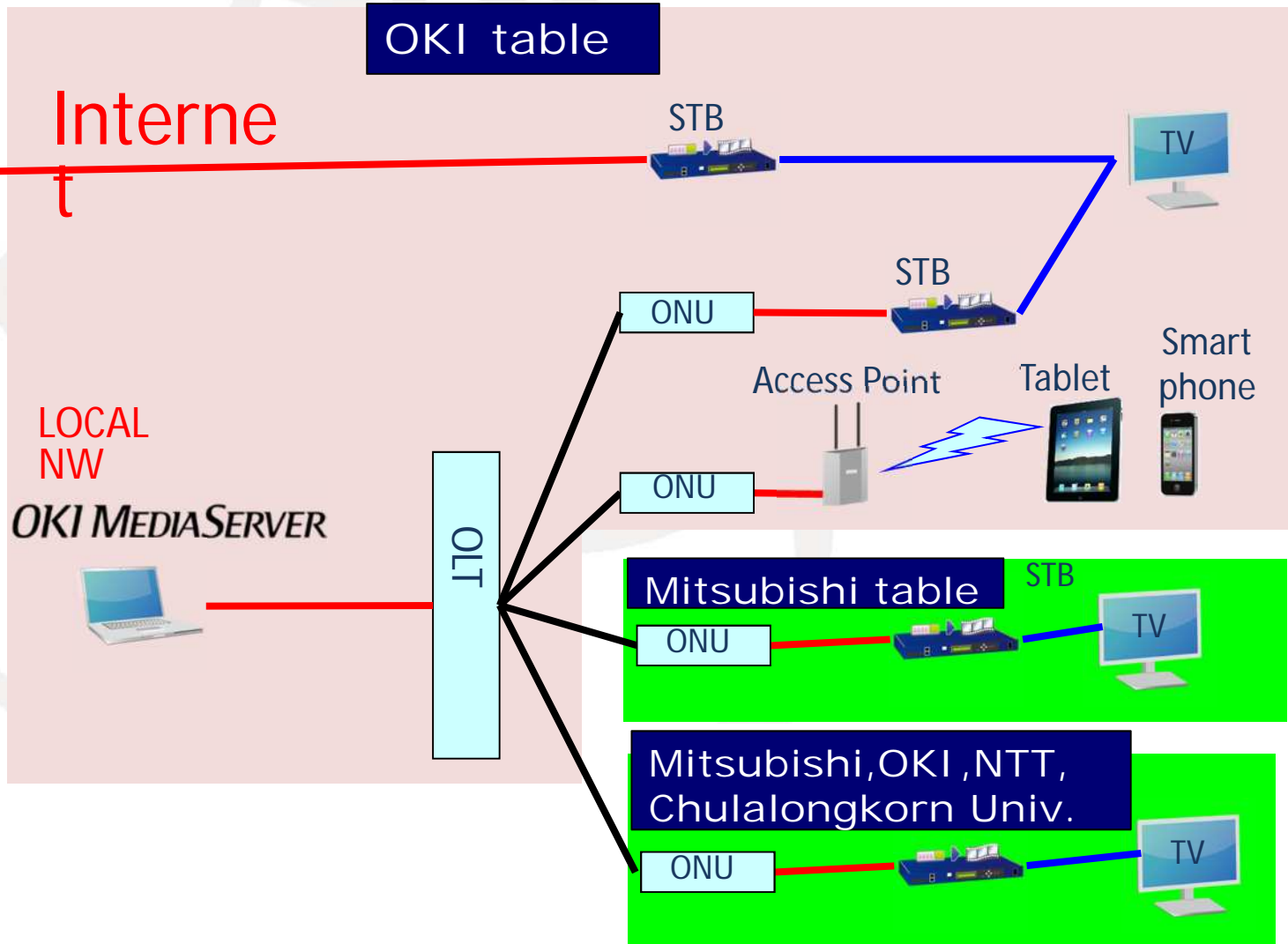


Physical architecture for IPTV showcasing

ITU IPTV IPv6
global testbed
(I3GT)

JGN-X/
Internet

Hotel
SW/Router



Showcasing



IPTV Applications from ITU

IPTV Application challenge



- The purpose is to provide a method to direct translation between Thai language and Thai finger spelling of Thai Sign language to bridge communication.
- The application is written in LIME (H.762).

Sign language video

Thai language alphabet selected

Thai language alphabet group

Selected character in the group

Alphabets in selected group

Conclusions

- ITU IPTV IPv6 Global testbed (I3GT) was developed to test ITU IPTV standards easily.
- I3GT will be enhanced to support state-of-the-art standards, including mobile and e-health, and to connect with more parties who are interested in IPTV.
- Several vendors are providing IPTV platform.
- In APT/ITU C&I event in Sept. 2013 in Bangkok, IPTV testing and showcasing were successfully done. APT and ITU are considering the next relevant event near future.

Thank you for your attention



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