ILE workshop in IPTV-GSI, Geneva, 12-16 September 2016

Toward ultra-realistic {telework, broadcasting and IPTV}
- High-realistic viewing and Japanese activities -

September 2016

Oki Electric Industry Co., Ltd.

Contact: Hideki Yamamoto
Oki Electric Industry Co., Ltd.
Japan

Tel: +81 48 420 7012
Fax: +81 48 420 7138
Email: yamamoto436@oki.com

Contents

- OKI Corporate overview
- High-realistic viewing and Japanese activities
  - Ultra-realistic telework system
  - Super high-vision **broadcasting** (4K / 8K) and public viewing in Japan
  - **ITU-T IPTV** standardizations toward 8K and OKI's activity
- Conclusions

OKI Corporate overview

OKI at a Glance

135th year since manufacturing the first telephone in Japan.
Now, OKI is a global company operating in over 100 countries world wide.

(The * mark represents data as of March 31, 2016)

- Founded in: 1881 by Kibataro Oki
- President: Shinya Kamagami
- Net sales: 490.3 billion yen (Ended March 31, 2016)
- Capital*: 44.0 billion yen
- Employees*: 20,190 (Japan: 12,048 Overseas: 8,142)
- Number of subsidiaries*: 89 subsidiaries (Overseas: 44)
- Business: Based on its corporate philosophy “enterprising spirit,” OKI provides products, technologies, and solutions of info-telecom systems and printers to meet the diversified needs of communities worldwide

President
Shinya Kamagami

Founder:
Kibataro Oki

OKI offices: 64 footholds in 38 countries and regions

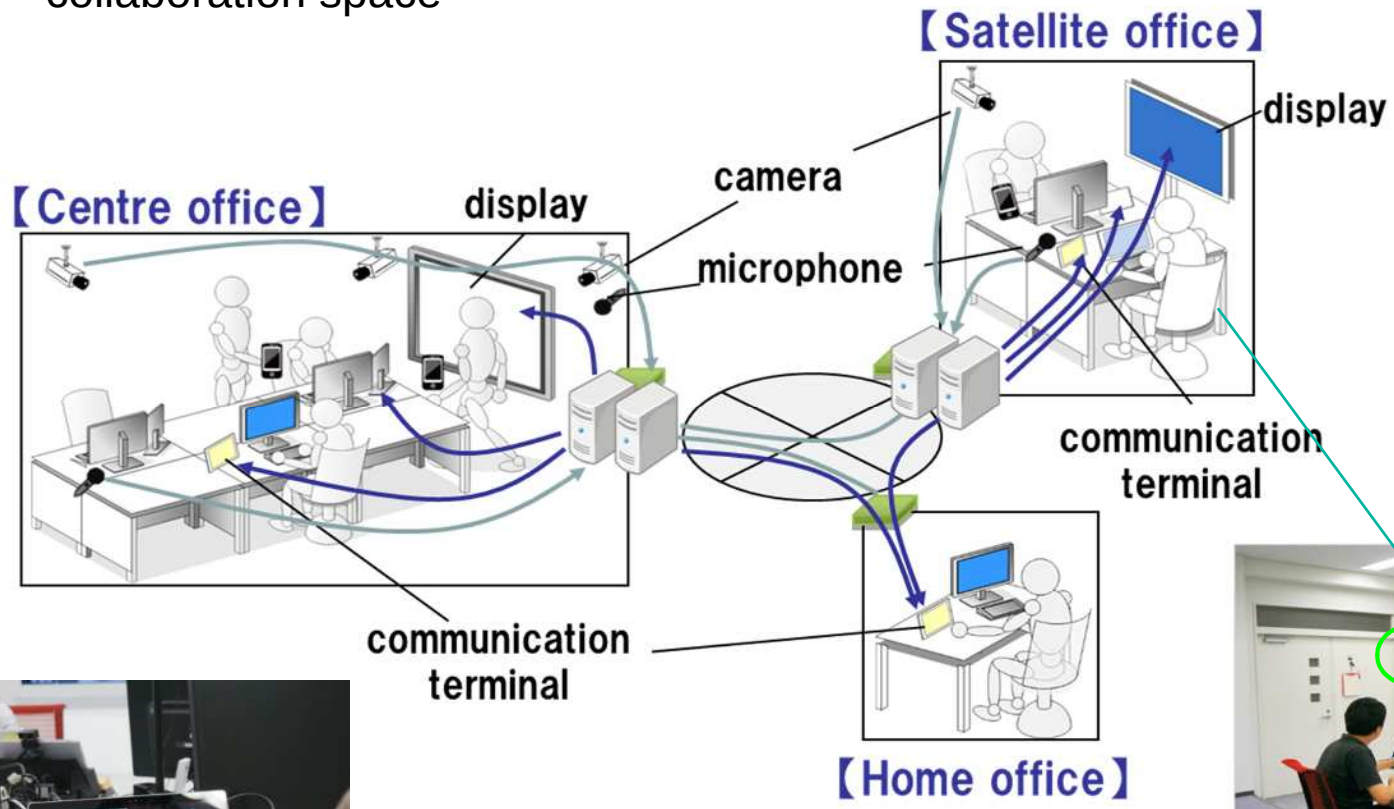
135th Anniversary

- Ultra-realistic telework system

Ultra-realistic telework system

Make office workers feel like working together.

- Office with multiple cameras, microphones, and sensors
- Various communication terminal that presents remote office situation and shared collaboration space



Cooperative work with large display

Experimental satellite office

○ **camera, microphone, sensor**

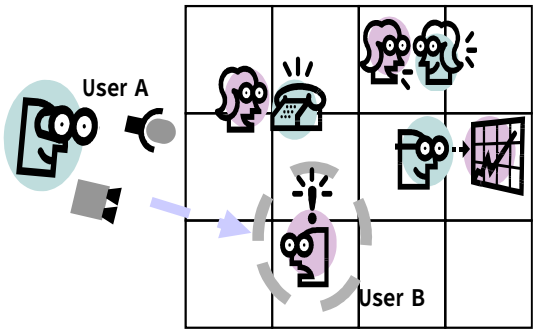
Access to the specified area

Functions of our telework system

F1: Transmit multimedia information of specific areas in another office

Walk-through in another office according to user's position based on multimedia information.

Ultra-realistic interaction (ex. user A approaches → user B notice that → user A notice that).



F2: Time-shift viewing (logging the event and situation in the past)

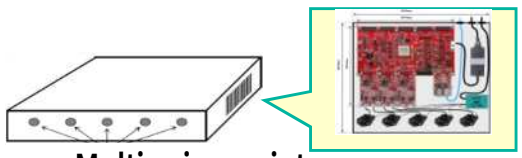
Translate the image / sound events from sensor data (ex. acoustic data or vector data)

Edited video augmented an onomatopoeia in the event and situation.

F3: Support in collaborative F2F communications on large screens

Image engine which can handle depth information for showing data objects.

Use low cost Distributed Video Coding (DVC) method.



Multi-viewpoint sensor

F4: Context-aware based on environmental office information

Methods for estimating a user's status by monitoring PC operation.

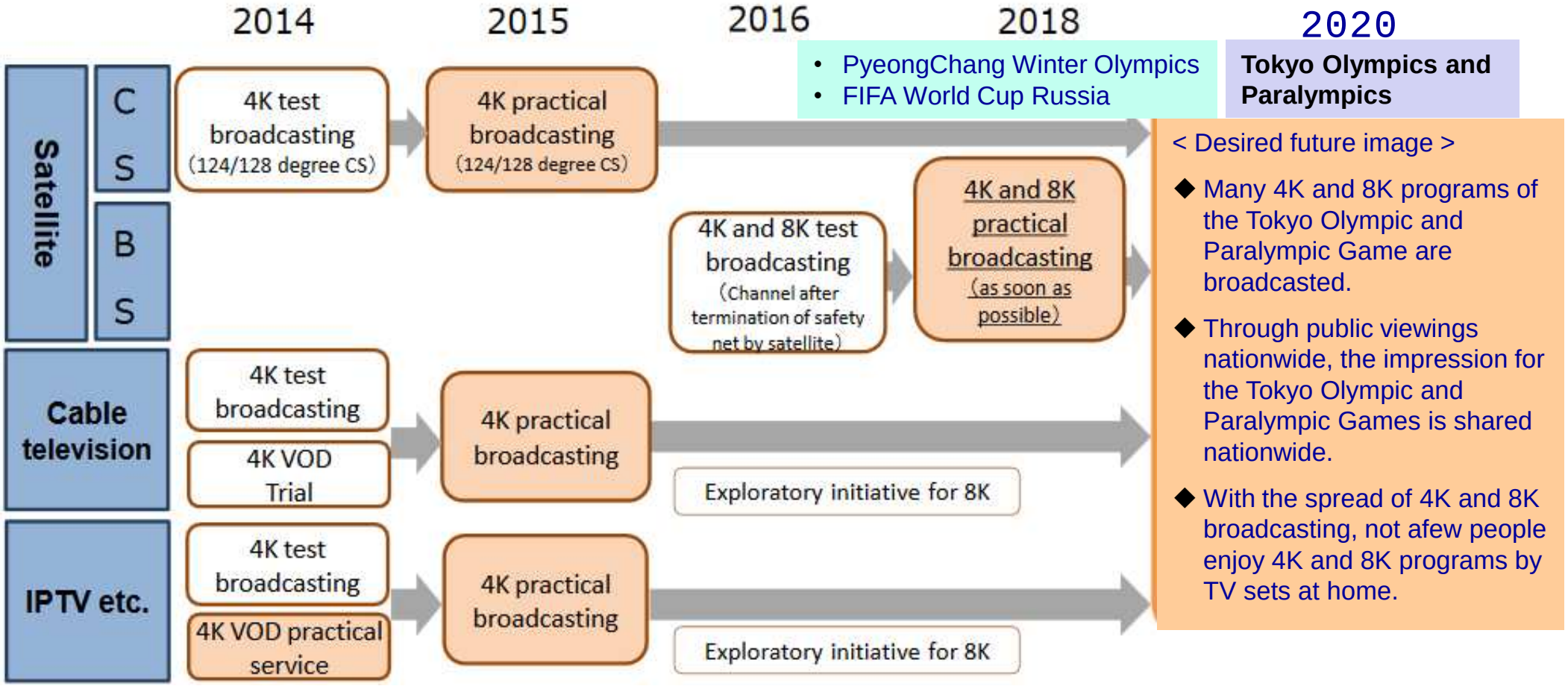
Methods for interruptibility estimation based on environmental information by using multi-sensors.

Acknowledgements: Component technologies contributing to telework system include the research and development of ultra-realistic communications technologies by the innovative 3D imagery, part of an array of development projects entrusted by the National Institute of Information and Communications Technology (NICT).

- Super high-vision broadcasting (4K / 8K) and public viewing in Japan

New Roadmap for Promotion of 4K and 8K（Published in September, 2014)

- The roadmap was formulated in the Study Group on Upgrading of the Broadcasting Services(June, 2013).
- “Follow-up Meeting on 4K and 8K Roadmap“ has been held since February 2014, and how to accelerate implementation of the roadmap has been discussed. The interim report was formulated and published in September 2014.
- In order to promote the further spread of 4K and 8K, issues will continue to be investigated in the follow-up meetings.



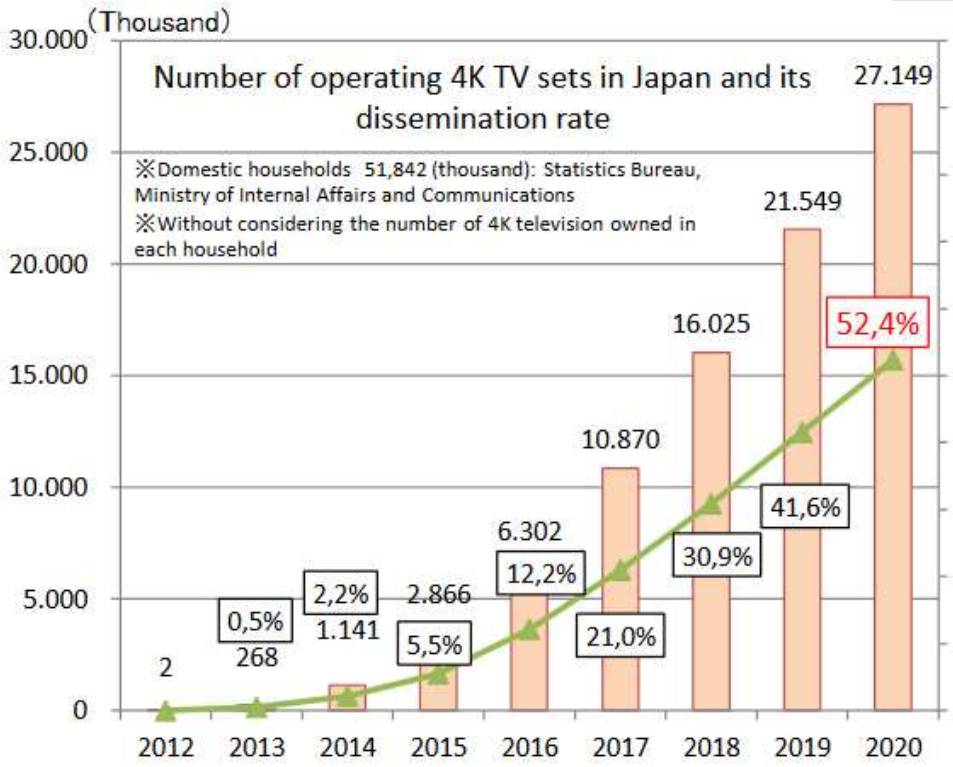
Based on an iterim report from the study group for 4K8K roadcasting at the Minstry of Inernal Affairs and Communication (MIC)

Dissemination Rate of 4K Television (Estimation) and Economic Effects of 4K and 8K

- Estimation of the dissemination rate of 4K television and economic effects of 4K and 8K as well as embodiment of the roadmap were published in “Interim Report from the Follow-up Meeting on 4K and 8K Roadmap” (September, 2014).

- The number of 4K TV sets is estimated to be about 27 million in 2020 and its domestic dissemination rate to be about 52%

- Potential domestic market size of 4K and 8K is estimated to be about 4.4 trillion yen (direct effect around 2020).
- Effect on the domestic economy is about 9 trillion yen (direct and indirect effects calculated based on the input-output table).
- Effect on the domestic economy is estimated to be about 36 trillion yen in total from 2013 to 2020.



Source: JEITA ”World demand trend of AV and IT devices: Prospect until 2018”
Data of 2019 to 2020 are estimation data by Mitsubishi Research Institute, Inc. obtained by extrapolating the data until 2018.

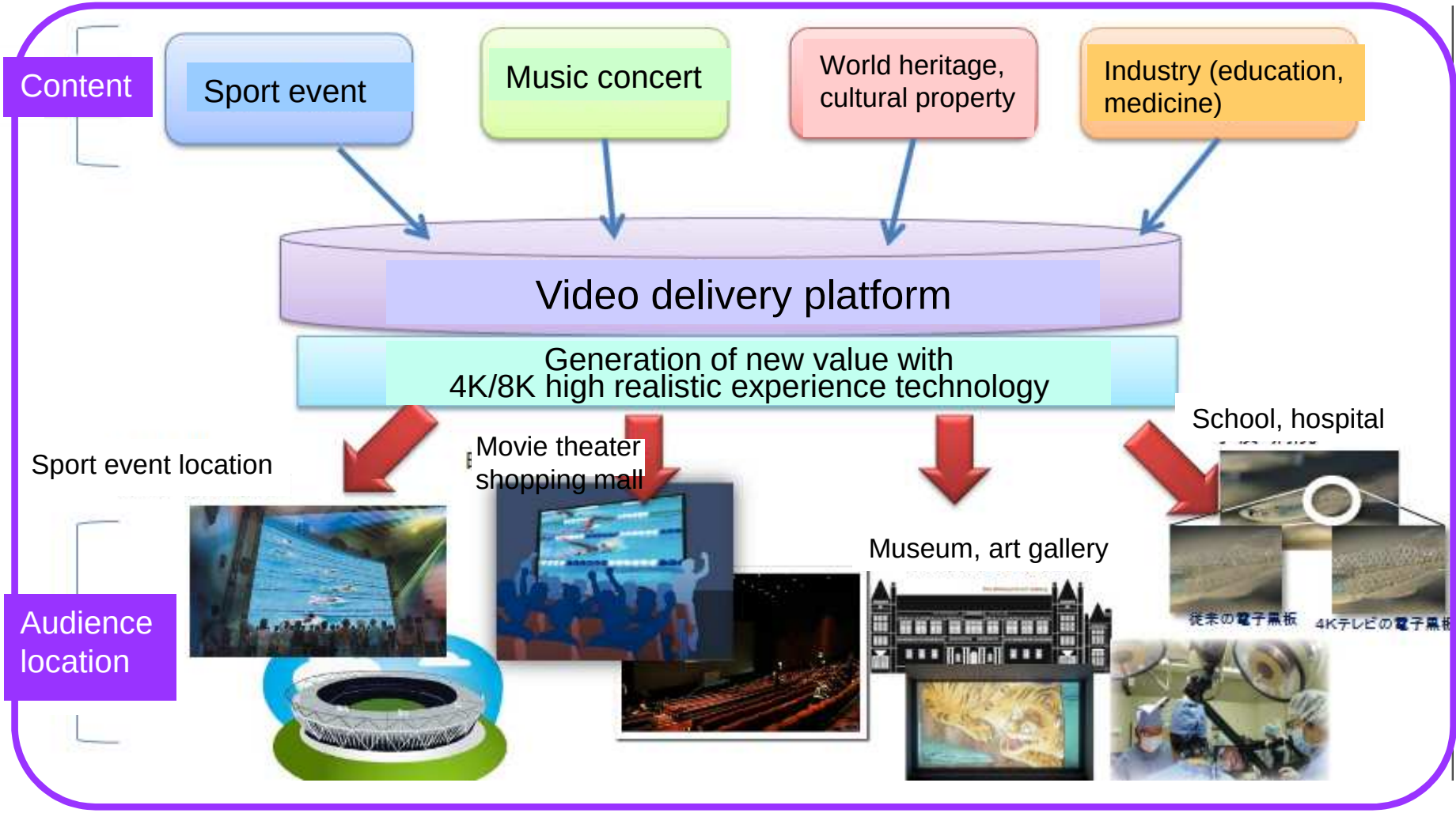
[Estimation by Mitsubishi Research Institute, Inc.

Vision of High realistic video services

- It is expected that new big market will be generated by 4K/8K digital signage, immersive live experience through new video delivery platform
- New organization for this purpose was established in July, 2016 in Japan.

Desired future image in 2020

Through public viewings nationwide, the impression for the Tokyo Olympic and Paralympic Games is shared nationwide.



Based on the meeting document for the promotion of ICT to social applications toward 2020 (MIC Japan, 2015.7.27)

ITU-T IPTV standardizations toward 8K and OKI’s activity

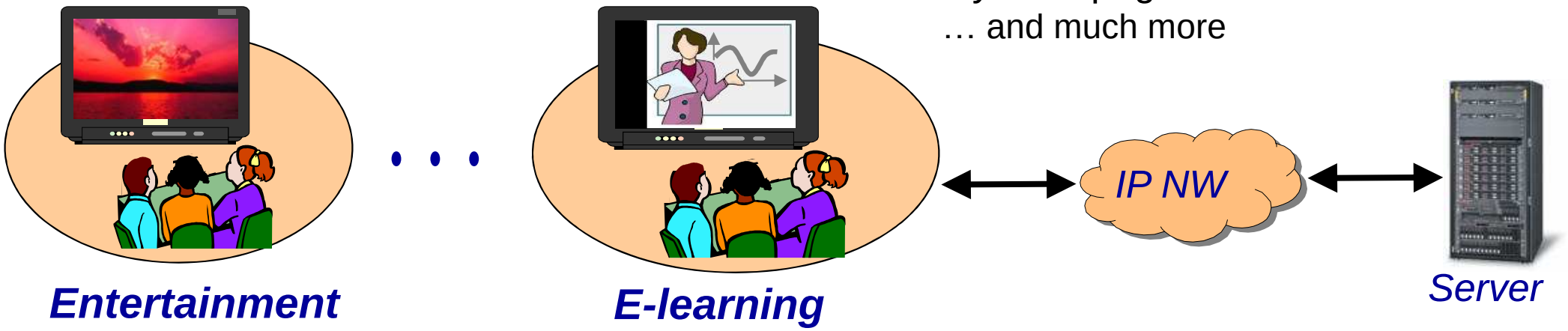
IPTV service overall

- IPTV is a killer service of broardband infrastructure.
- IPTV provides interactive TV services.
- IPTV can be a platform of lots of video services .(Y.sup.5) as well as entertainment

- **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



Overview of IPTV standards in ITU-T and high quality video

- ITU-T standards covers from video codec to IPTV applications.
- New H.721(2018?) will cover high realistic video streaming with 8K,HDR,and MMT.

Home network

H.622.1: Req & Arch for IPTV Home networks

Application and terminal devices

- H.701: Content Error Recovery
- H.721: IPTV Terminal (Basic)
- H.750: Metadata for IPTV Services
- H.770 : IPTV Service discovery
- H.761: Ginga-NCL
- H.741: Audience Measurement
- H.762: LIME
- H.722: IPTV Terminal (full fledged)
- H.763.1: Cascading style sheets for IPTV
- H.264: video
- H.703: Enhanced UI framework for IPTV services
- H.265: video

Architecture, network, and requirement.

- 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 service and 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

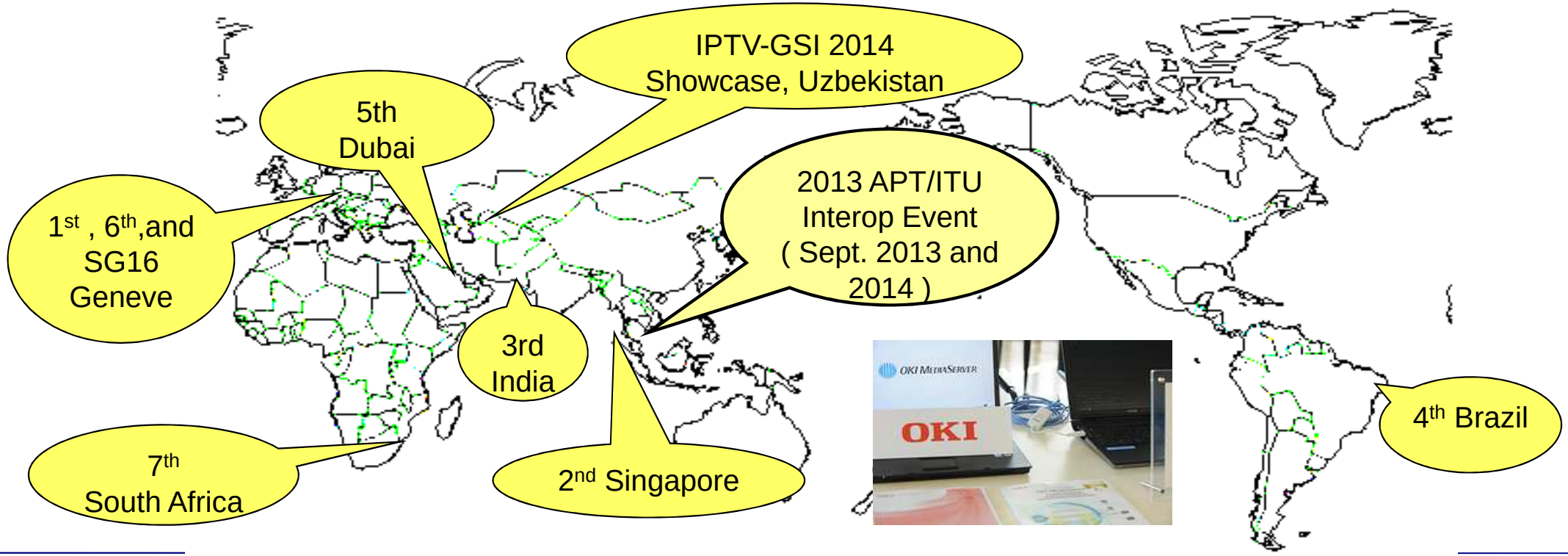
- X.1191: Req & arch for IPTV security

Digital signage

- H.780 : Digital Signage
- H.785.0: Digital signage: Requirements of disaster information services

ITU IPTV standards showcasing

- After ITU standardized basic IPTV specifications in 2010, interoperability events and showcasing events were started to promote ITU IPTV standards in the world.
- In parallel, extended specifications have been discussed in IPTV-GSI.
- **ITU IPTV standards are expected to remove vendor locks by developing countries.**

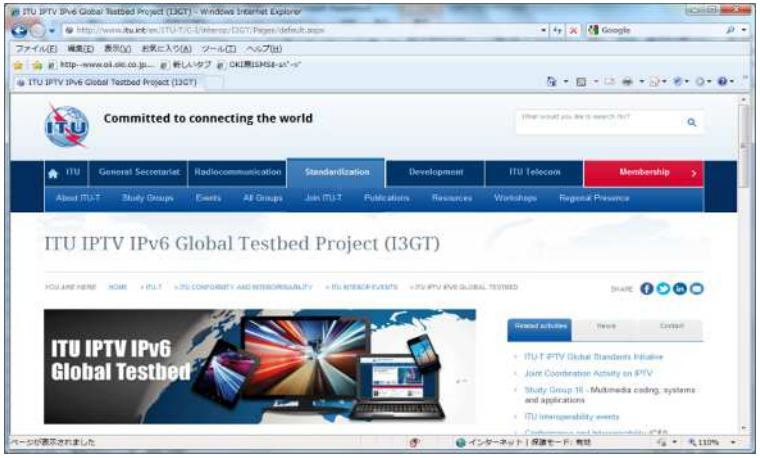


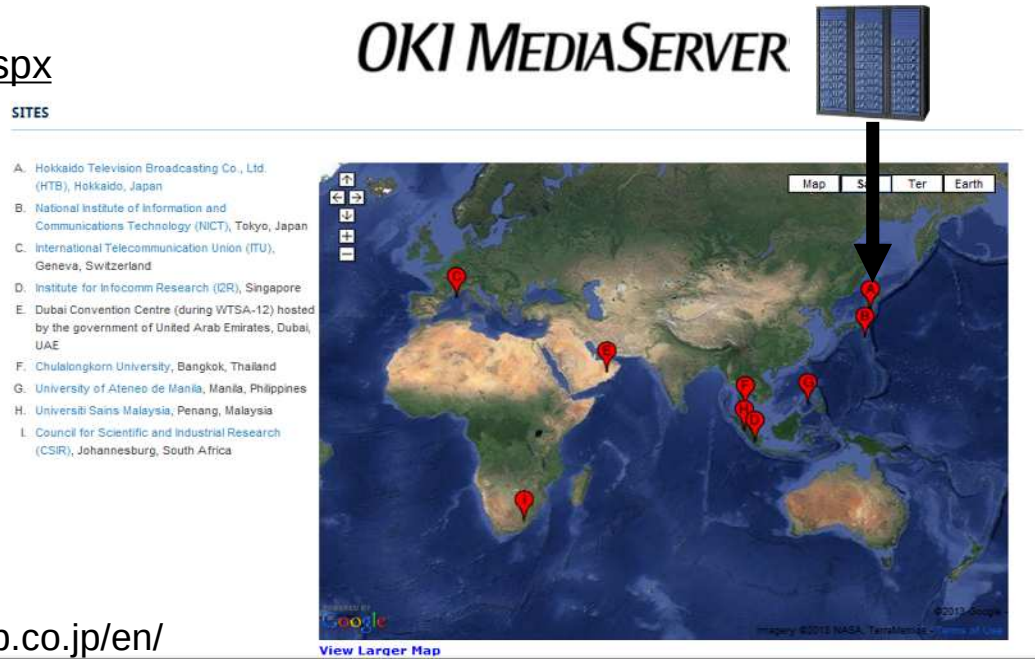
Spreading ITU-T IPTV standards

- 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 Sappro Snow Festival experiment 2013
- **At SG16 in 2015, 4K video streaming was exhibited.**
- **It will be extended to support 8K in near future.**

- Official Web

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

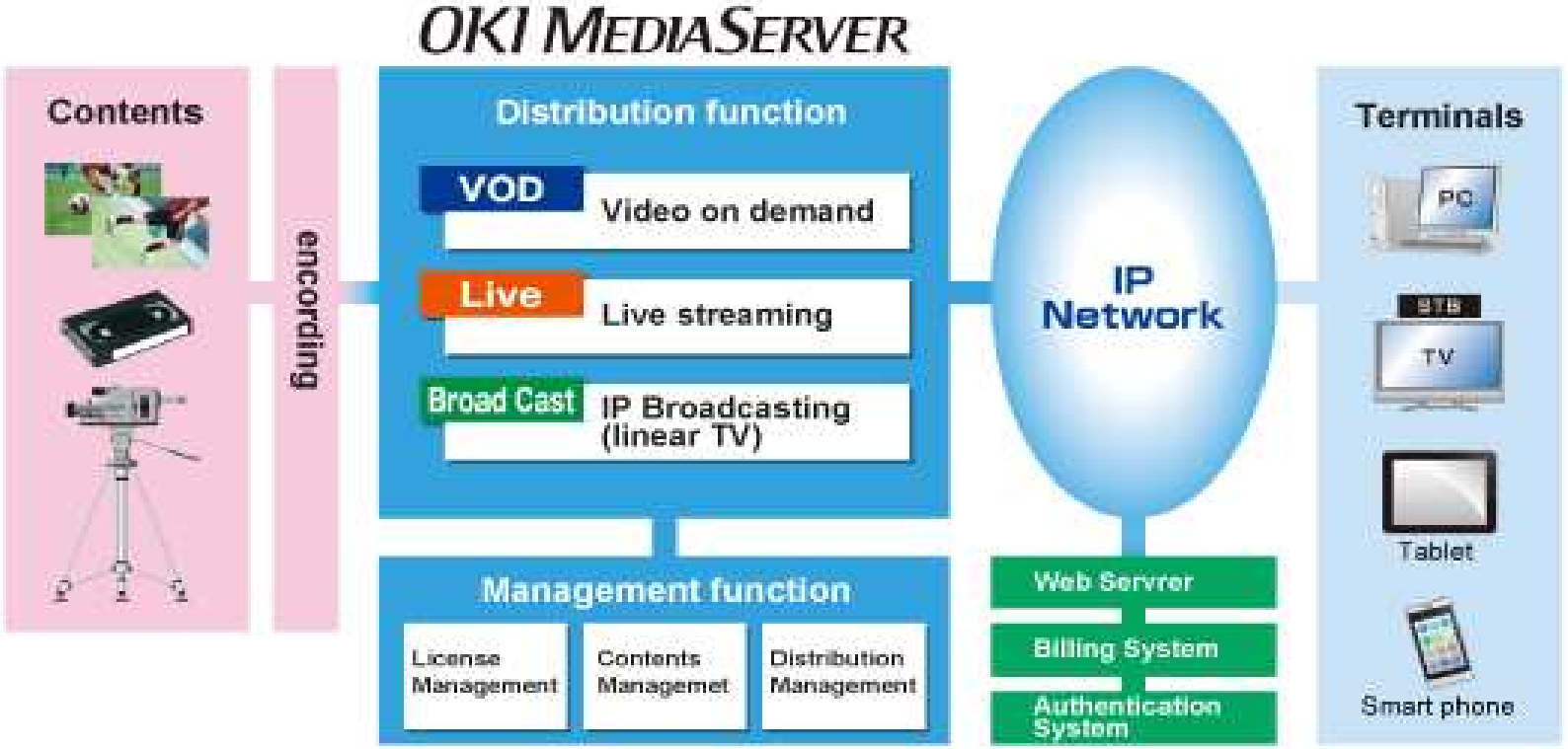


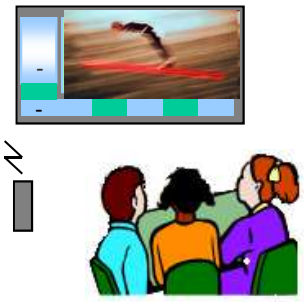


(*1) http://www.oki.com/en/press/2012/11/z12096e.html
(*2) HTB: Hokkaido Television Broadcasting Co., Ltd., http://www.htb.co.jp/en/
(*3) NICT: National Institute of Information and Communications Technologies, http://www.nict.go.jp/en/
(*4) JGN-X (Japan Gigabit Network -eXtreme), http://www.jgn.nict.go.jp/english/index.html

ITU IPTV Streaming server by OKI

- **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

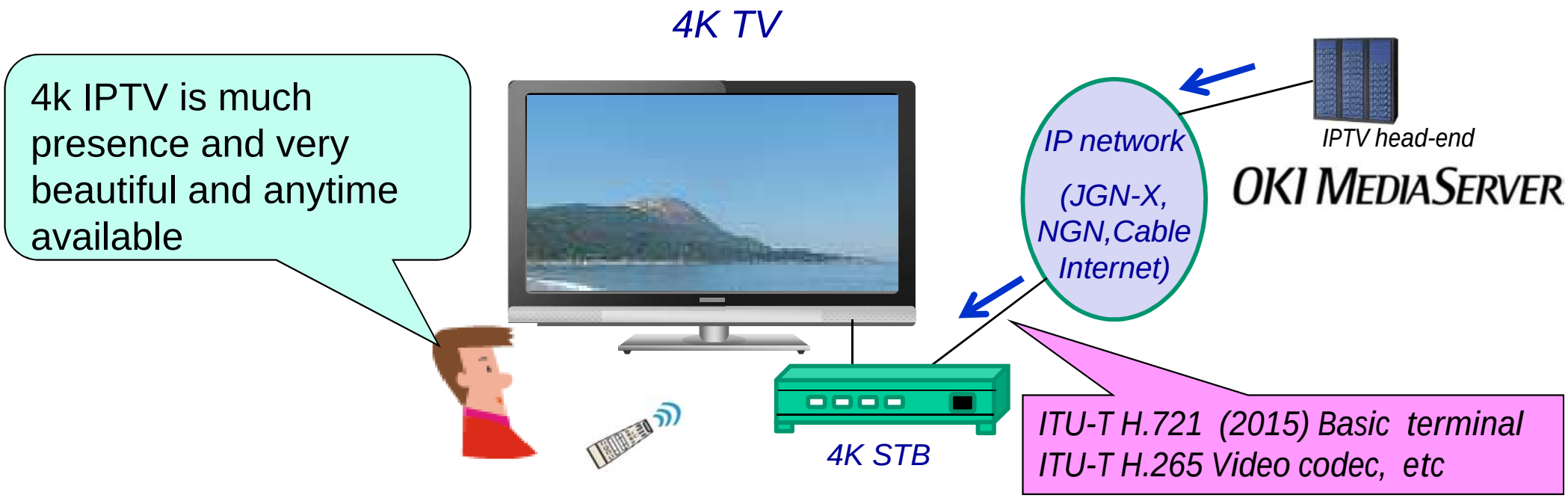




(*1) http://www.oki.com/en/streaming/

4K IPTV services

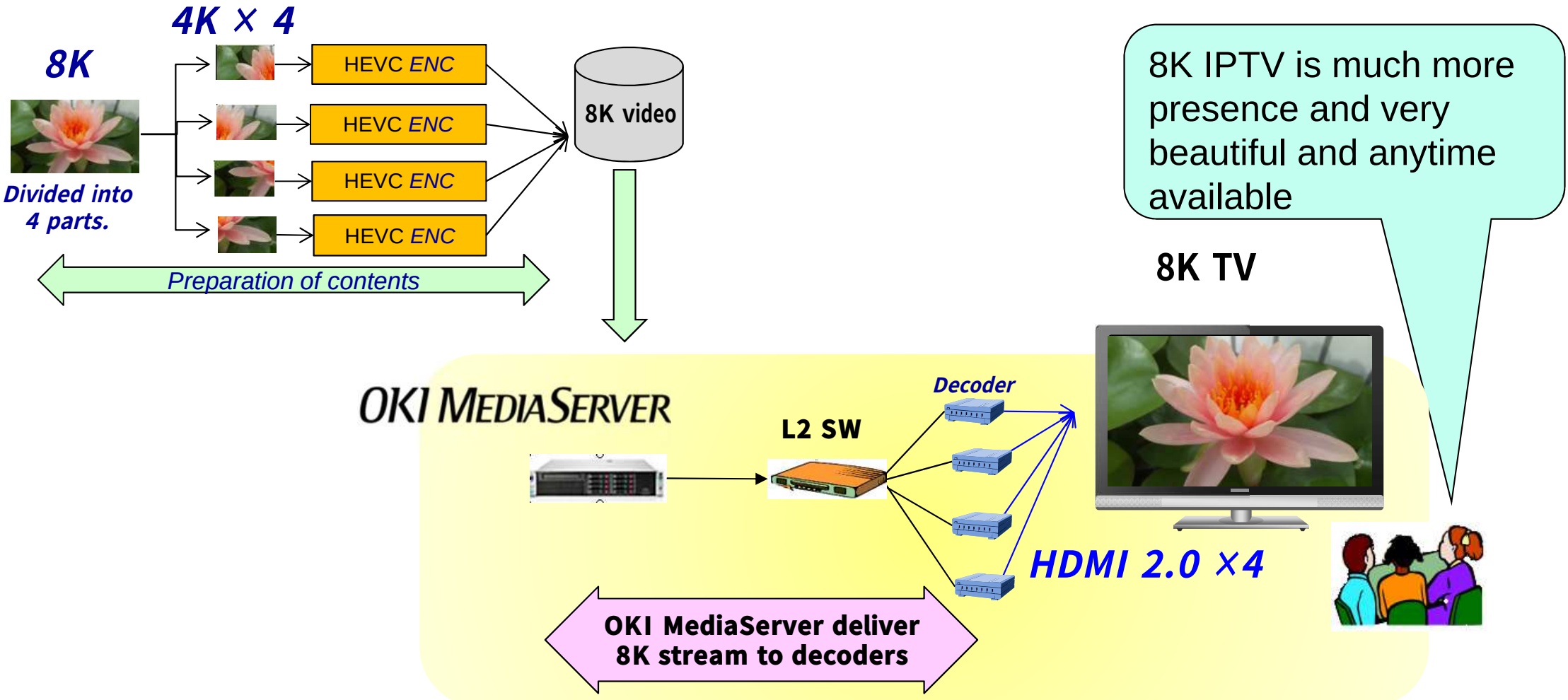
- IPTV head-end system, OKI MediaServer, provides high quality 4k video.
- It is adopted in real services in Japan.
- It was exhibited in the APT/ITU C&I event in Bangkok and so on.



(*) 4K IPTV was exhibited in “Next-generation TV and Ultra-high-speed Network Seminar” in Bangkok on February 6th, 2015

8K IPTV experiment in 2015

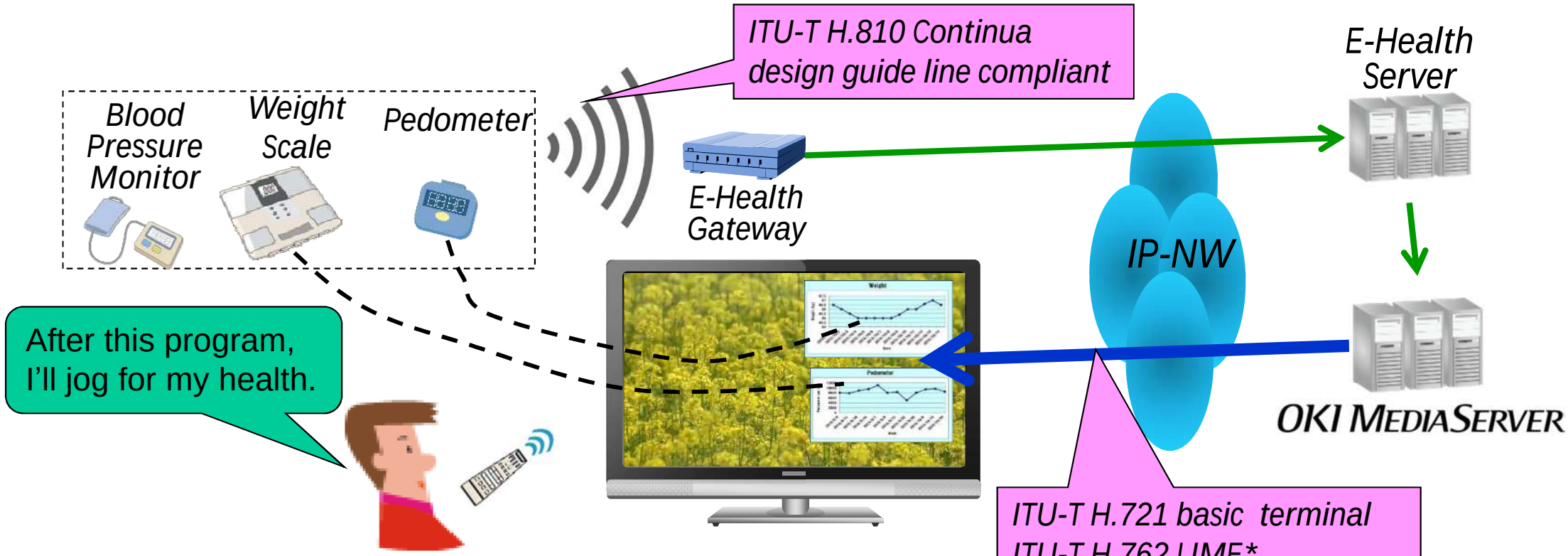
- IPTV head-end system, OKI MediaServer, provides high quality 8K video in the laboratory.
- The latest technologies, such as MMT, MPEG-ALS, and so on, are under development
- OKI leads to standardize IPTV for 8K as a main editor of new ITU-T H.721 and other applications such as digital signage, audience measurement, and accessible services.



Visualization of your health condition on IPTV

E-Health

- 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 E-health (personal health systems**) are used to extend services more cost effectively and easily.

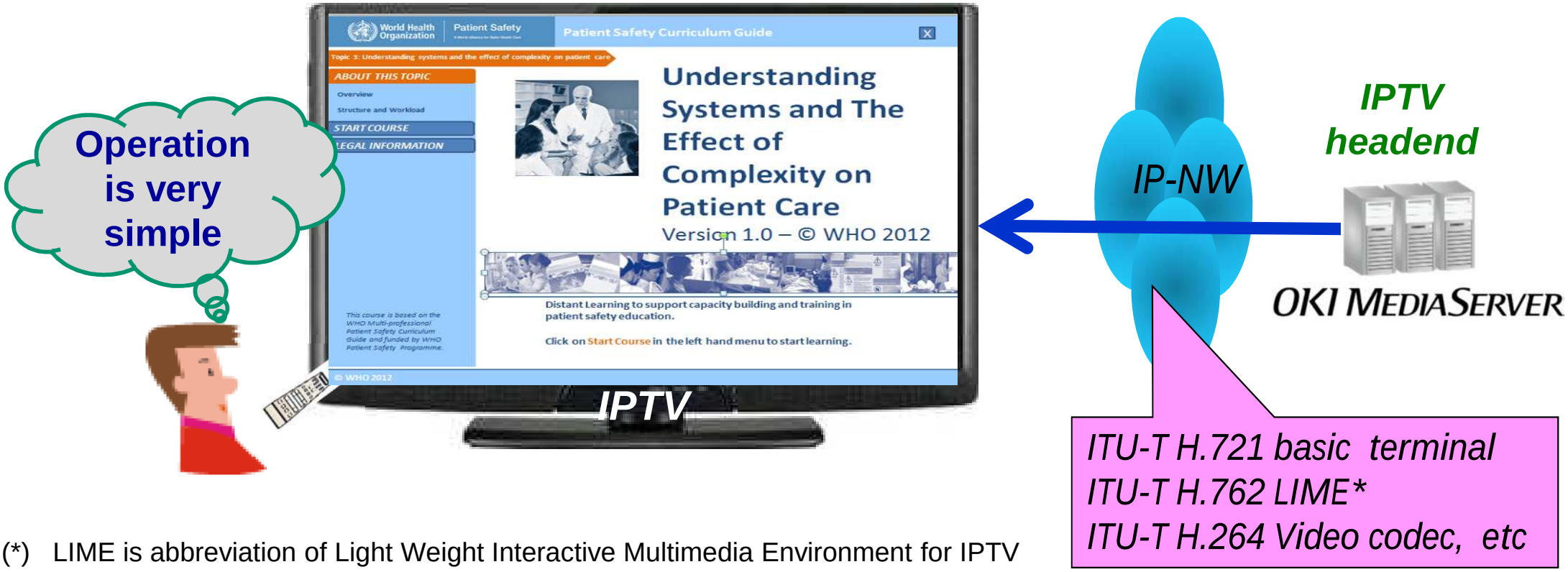


(*) ITU-T H.762 Lightweight interactive multimedia framework (LIME) for IPTV services
(**) ITU-T H.810 Interoperability design guidelines for personal health systems

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

Source: World Health Organization Patient Safety Curriculum Guide, http://who.int/patientsafety/education/curriculum/en/

Conclusions

- High-realistic communication systems developed by our group make office workers feel like working together and support in collaborative F2F communications on large screens.

- NHK in Japan will present highly realistic broadcasts of the 2020 Olympic Games in Tokyo via 8K Super Hi-Vision, the world's most sophisticated broadcasting system. The 8K test broadcasting via satellite started in August, 2016.
- In order to realize high realistic video services, visions are shared in Japan and new organization was established.

- ITU-T IPTV standards is/will be extended to cover high quality video service now.
- OKI MediaServer is an IPTV head end system supporting ITU-T IPTV standards.
- OKI succeeded in the test of 8K IPTV in 2015 and now leads the standardization of new IPTV recommendations (new H.721) to high realistic video entertainments and other services.
- *OKI will open up your dream to the better quality of life by high quality IPTV*

135th Anniversary

Thank you for your attention