TVX-in-Industry

Introducing IP Technology into Broadcasting

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Outline

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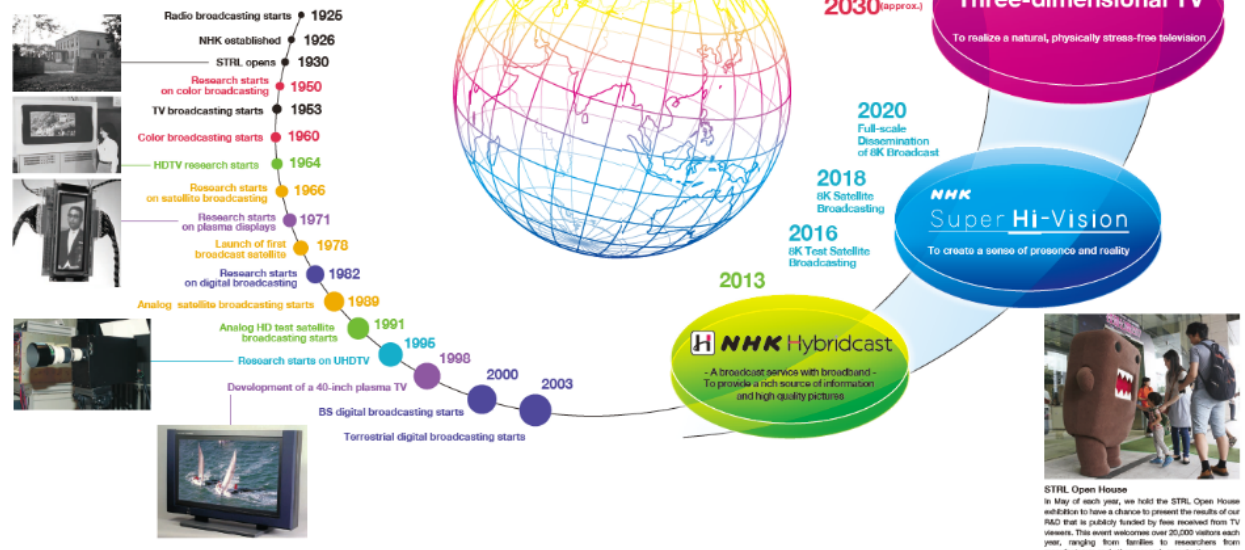
Company Introduction

- NHK, Nippon Hoso Kyokai (Japan Broadcasting Corporation), is Japan's only public broadcaster.
- NHK Science & Technology Research Laboratories (STRL) is the sole research institute in Japan specializing in broadcasting technology.

The role of NHK Science & Technology Research Laboratories (STRL) is to build a richer broadcasting culture from a research and development viewpoint, both as Japan's only research organization dedicated to broadcast technology, and as part of Japan's public broadcaster. NHK STRL is conducting a wide range of R&D, from basic research to practical applications: advanced program production technology, internet technology for broadcast services, 8K Super Hi-Vision, 3D television. We are using these technologies to enrich programming and are actively working on the international standardization, which is essential for implementation of new services.

The history of STRL
Leading the world in broadcast technology

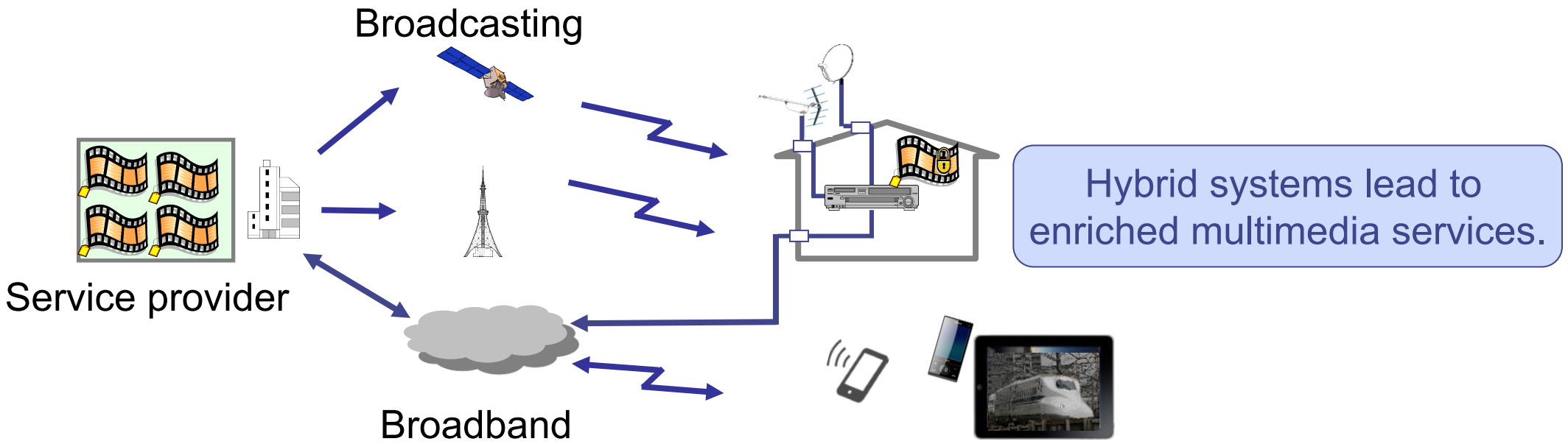


STRL Open House
In May of each year, we hold the STRL Open House exhibition to have a chance to present the results of our R&D that is publicly funded by fees received from TV viewers. This event welcomes over 20,000 visitors each year, ranging from families to researchers from manufacturers and other research organizations.

The Problem

- The difference of protocols between broadcasting and broadband is big hurdle to harmonize them.

Stable, Point to Multi Point, Simultaneous, Unidirectional

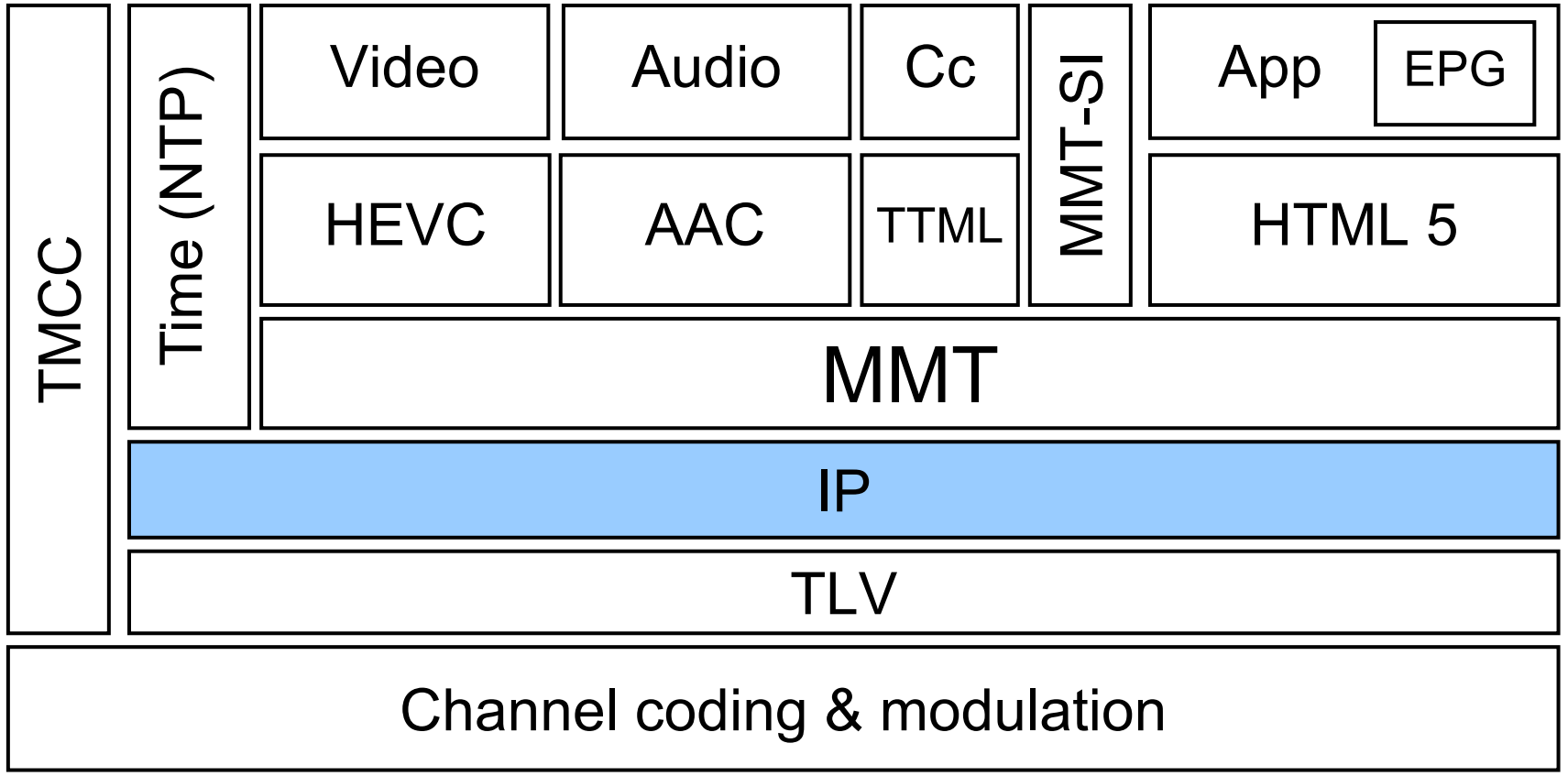


Hybrid systems lead to enriched multimedia services.

Point to Point, Bidirectional, Congested

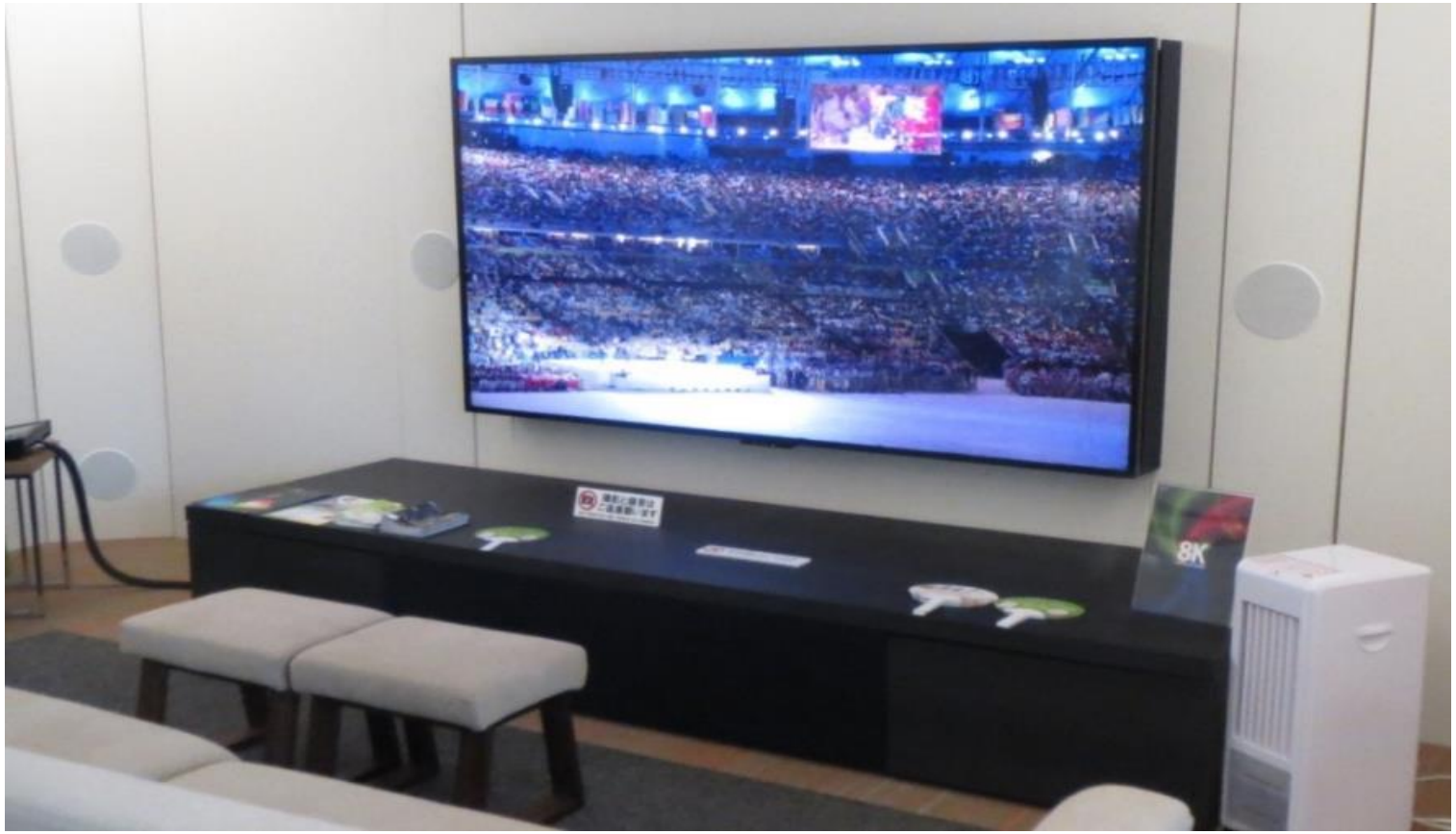
The Challenge: Introducing IP into broadcasting

- For harmonization with broadband,
  IP is introduced for delivery of audio and video in broadcasting



Developed ISDB-S3 for 4K･8K services

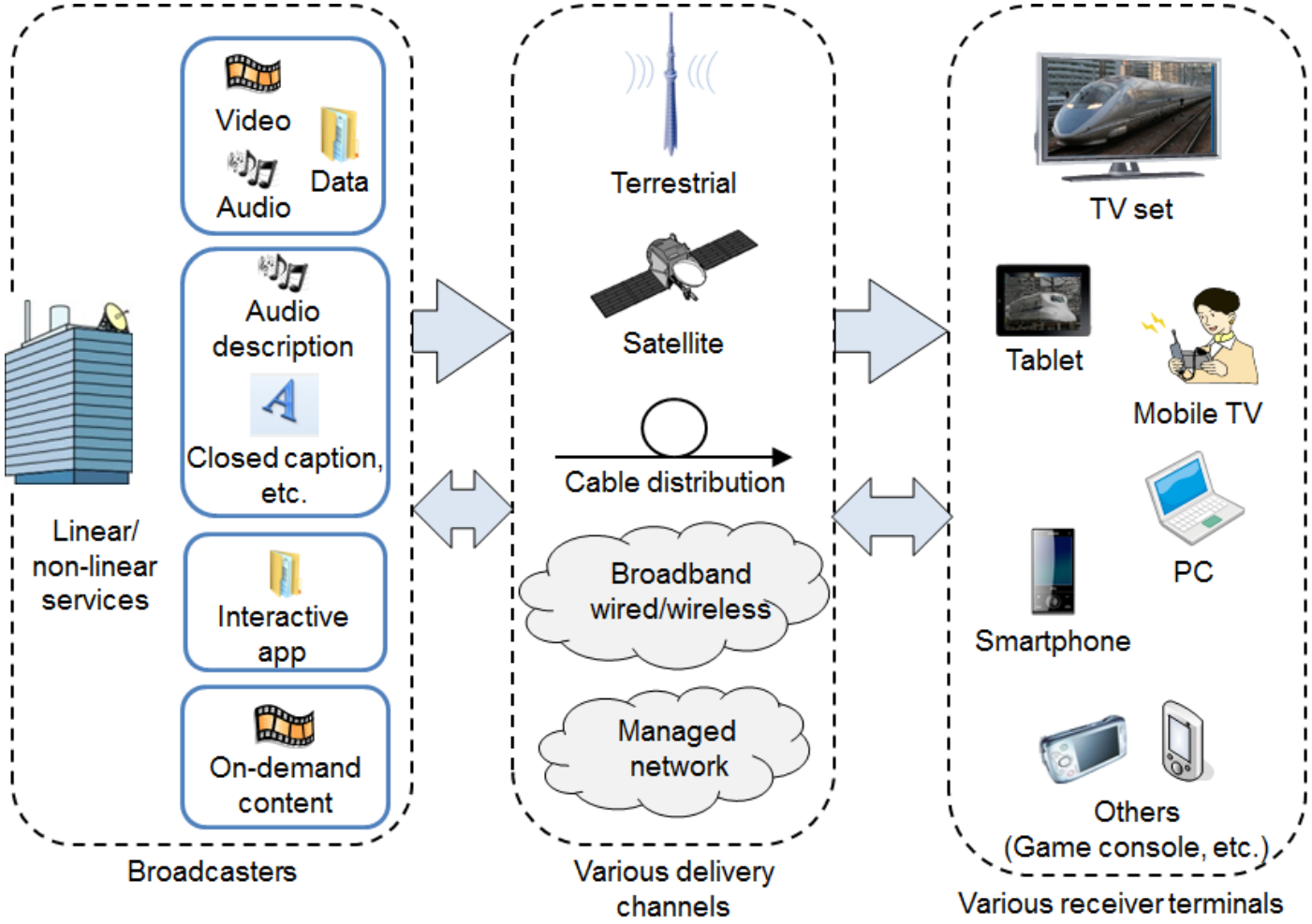
- ISDB-S3 4K･8K test services are now in progress.
- Various TV sets and tuners will be widely sold in 2018.



Viewing equipment of 4K･8K services

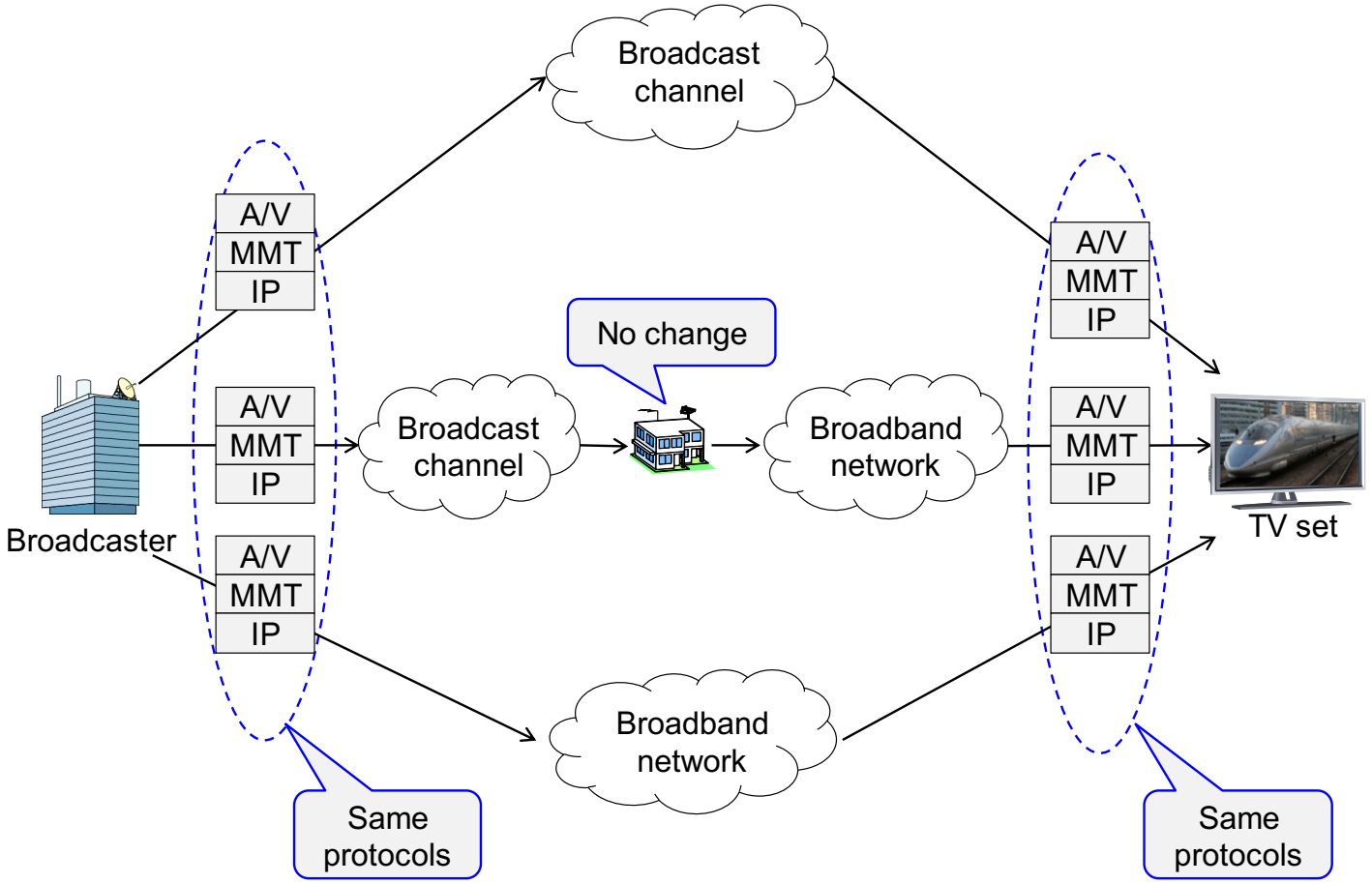
Global platform for broadcasting services

- Report ITU-R BT.2400 “Global platform for broadcasting services” is produced.
- IP-based broadcasting would be one way for harmonization between broadcast and broadband.



Implementation of Global platform

- IP-based broadcasting services can be delivered on broadband without making any changes to the services, such as by transcoding or replacing encryption.

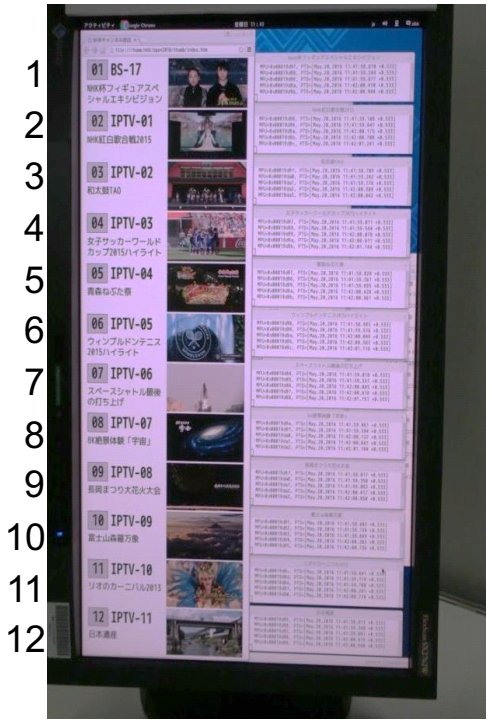


Protocols in IP-based broadcasting and broadband

Delivery of 8K over broadcast and broadband

- IP-based 8K content over broadcast was stably received through broadband.

Item	Configuration
IP version	IPv6
Transport protocol	MMTP/UDP
IP packet size	Max. 1.5 KB
Audio format	Two channels
coding	MPEG-4 AAC LC
Video format	7680×4320/59.94/P
coding	HEVC Main 10 profile



Content server

Receiver

Conclusions & What's next

- 8K services have already been launched by IP-based systems.
- Immersive media like 360° video requires higher resolution than 2D video.
  - 30K x 15K for 360° images is required for viewers not to perceive a pixel structure.
- IP-based systems would easily deliver immersive media including VR/360°.