IPTV content integration, handling and delivery, including standardization aspects

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SG16 Structure and Q13

ACRONYM	TITLE
PLEN	**Plenary**
Q1	Multimedia coordination
WP1	**Multimedia content delivery**
Q11	Multimedia systems, terminals, gateways and data conferencing
Q13 	**Content delivery, multimedia application platforms and end systems for IP-based TV services including digital signage**
Q21	Multimedia framework, applications and services
Q22	Multimedia aspects of distributed ledger technologies and e-services
Q27	Vehicular multimedia communication, systems, networks, and applications
WP2	**Multimedia e-services**
Q23	Digital culture-related systems and services
Q24	Human factors for intelligent user interfaces and services
Q26	Accessibility to multimedia systems and services
Q28	Multimedia framework for digital health applications
WP3	**Media coding and immersive environments**
Q5	Artificial intelligence-enabled multimedia applications
Q6	Visual, audio and signal coding
Q8	Immersive live experience systems and services
Q12	Intelligent visual systems and services

IPTV history in ITU-T SG16

2005-2008	2009-2012	2013-2016	2017-2021	2022-2024	

FG-IPTV

IPTV-GSI (SG9,SG11,SG12,SG13,SG16,SG17)

IPTV Challenge

Q13 IPTV

Q14 Digital signage

Digital signage services

Q21 Multimedia application

CDN services

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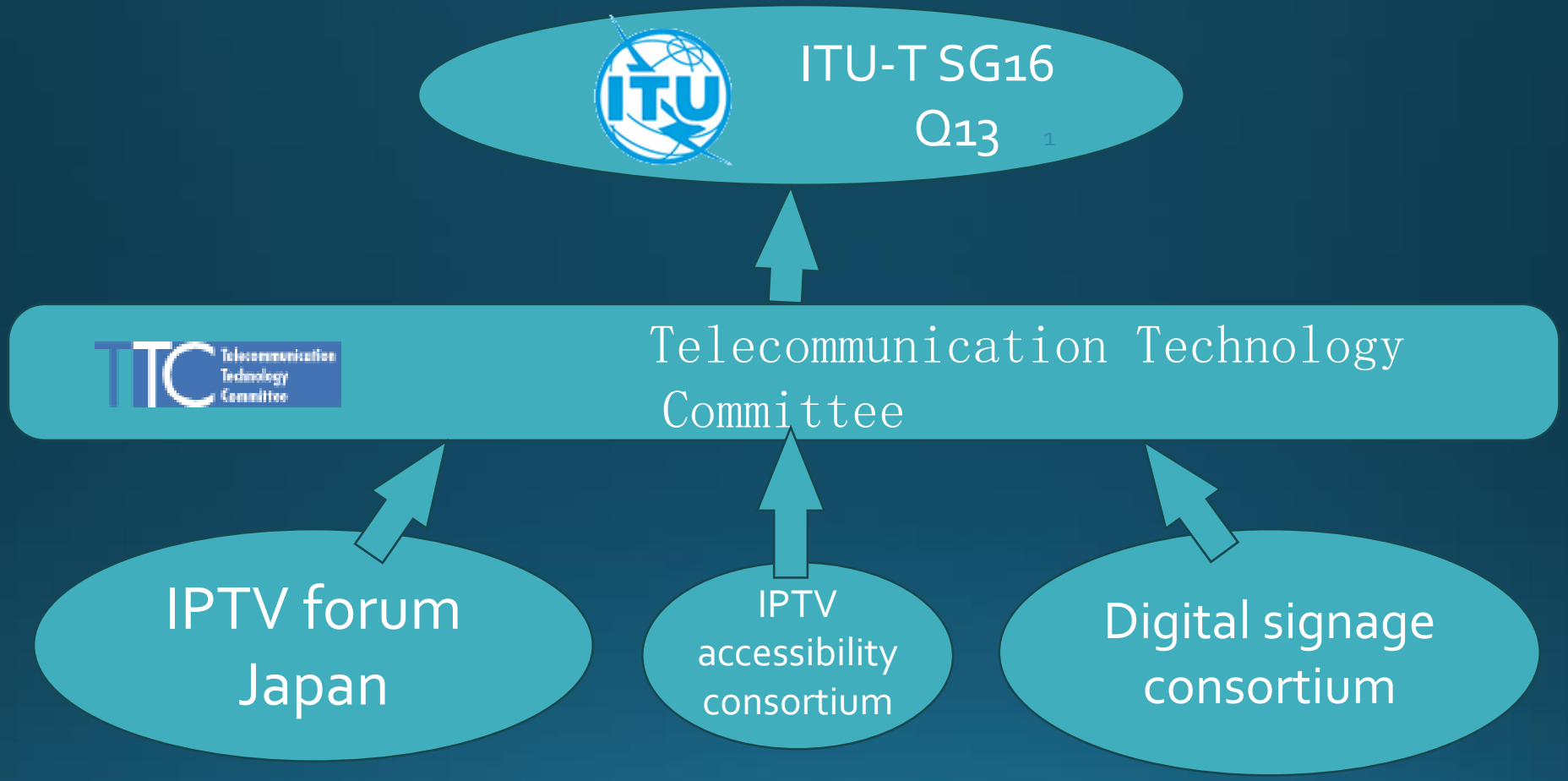
IPTV and DS standard activities in Japan



IPTV and DS basic standards

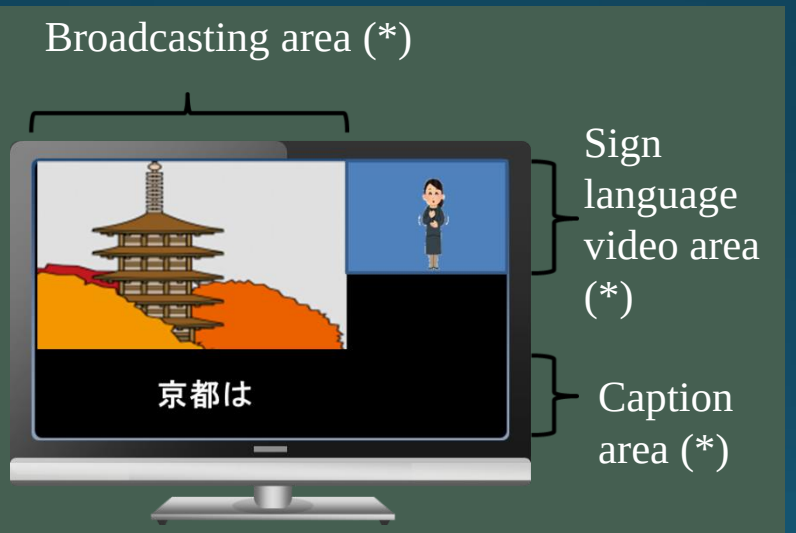
H.721: IPTV Terminal (basic model)

- Defines Terminal supporting VoD and Linear TV
- Targeted at Embedded TV sets in the retail market as well as STB
- IPv6 ready
- Network attachment and Service Discovery (H.770)
- Supports Portal service and interactivity (H.762:LIME)

IPTV forum Japan

H.702 IPTV accessibility profile

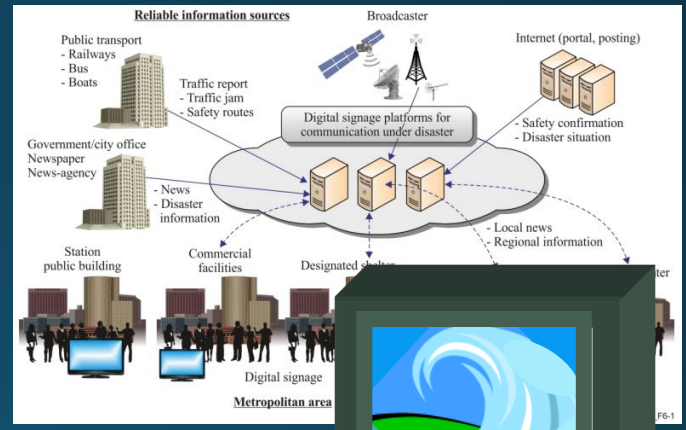
Accessibility function on IPTV display



(*) Area size and position can be changed by remote controller

IPTV accessibility consortium

H.785 Digital signage: Requirements for disaster information services



Digital signage consortium

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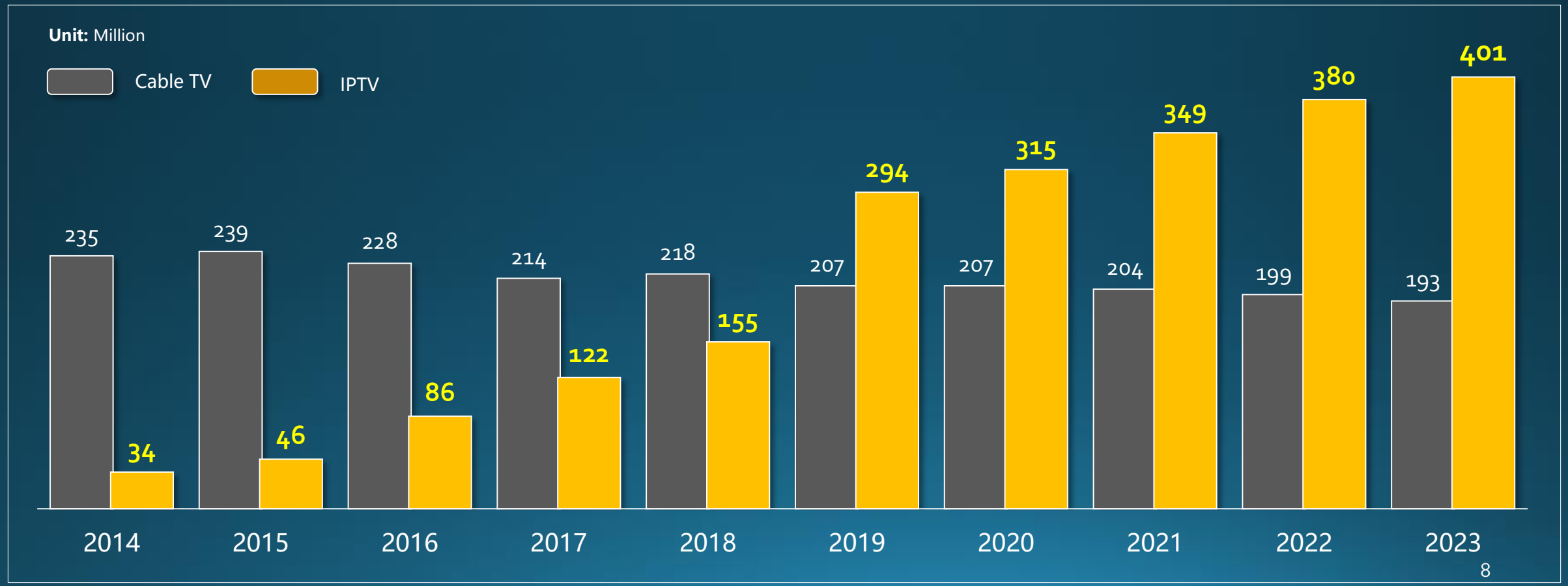
IPTV Market in China

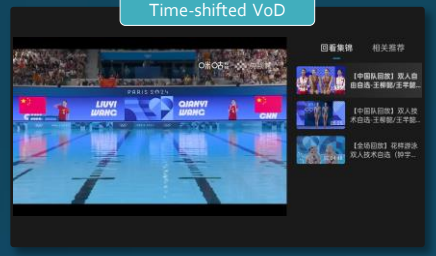
- Since the first IPTV service launched in **2006**, China's IPTV subscribers surpassed Cable TV subscribers for the first time in **2019**, with Cable TV steadily declining.
- By the end of 2023, China had **401 million** IPTV subscribers and is the **LARGEST** IPTV market in the world.
- **China Mobile Communications Corporation (CMCC)**, with **200 million** subscribers, is the **LARGEST** IPTV service provider in the China.



IPTV Service provided by CMCC

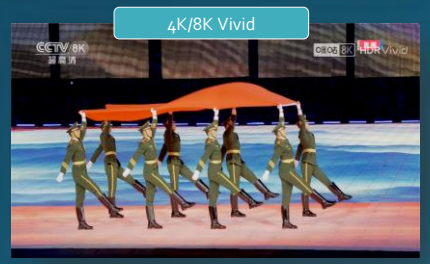
- Providing **IP-based streaming** service, with **QoS grantee** for CMCC subscribers, on various terminals including STB, mobile phone, tablet, VR HMD, vehicle, digital signage and etc.
- A network-bundled /non-bundled service with 200+ live channels, 10,000+ movies, 5,000+ TV series, 3,000+ TV shows, 5,000+ cartoons, 10,000+ sports.

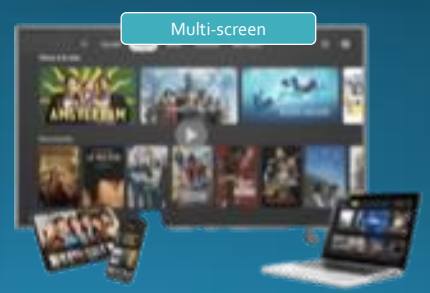
Services



Contents

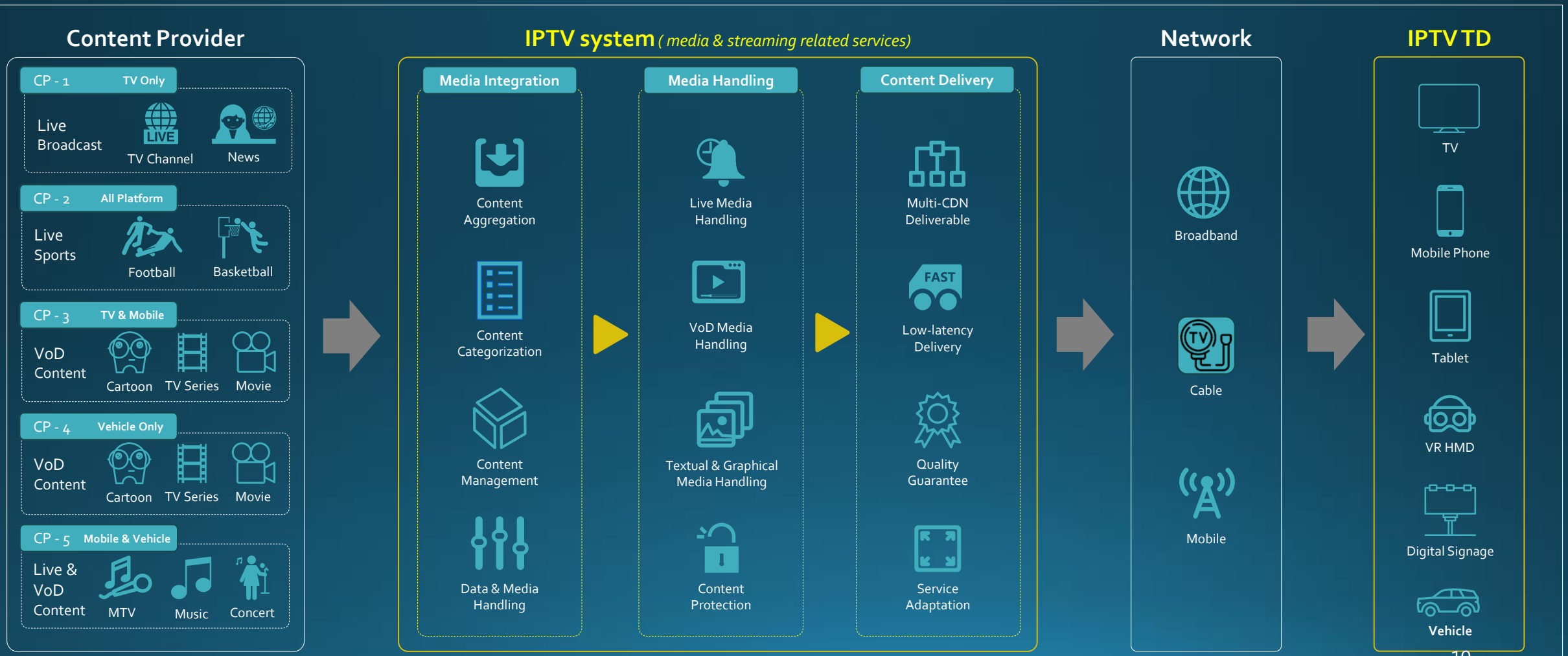
Functionalities





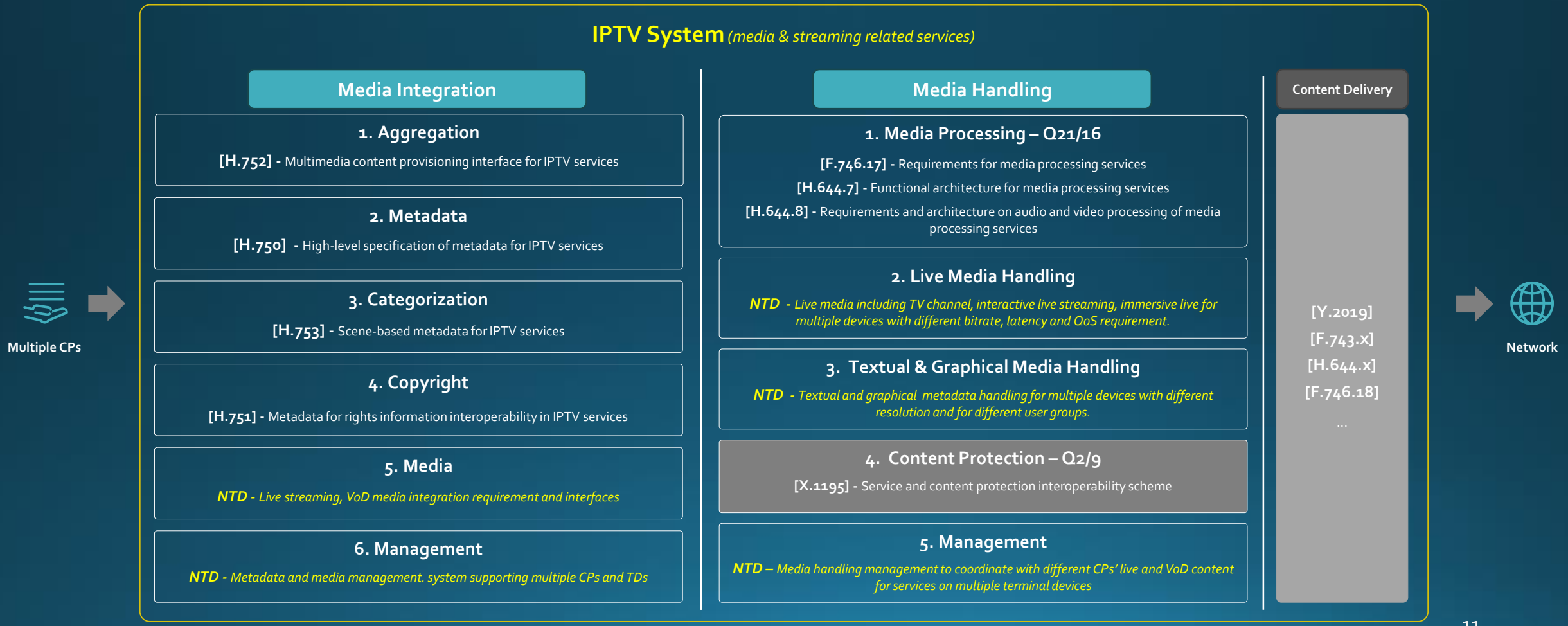
IPTV Service Trend

- IPTV has evolved to support multiple devices beyond just TVs, with each device requiring tailored bit rates, resolutions, and QoS.
- Various CPs offer TV channels, live streaming, VoD, and more, delivering content to different devices with copyright limitation to meet the diverse needs of subscribers.



ITU-T Recs on Media Intg. & Hndl. Studied by Q13/16

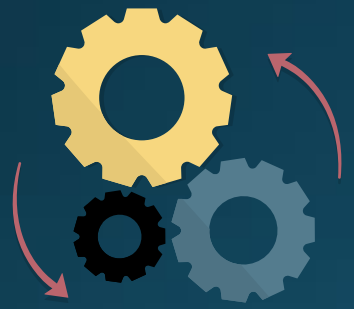
- In the past study periods, Q13/16's study on IPTV systems has mainly focused on architecture, applications and terminal devices.
- In future study period, Q13/16 will focus on media integration, handling, and content delivery to develop an OPEN IP-based media service architecture, together with other Questions within ITU-T and other SDOs.



Benefits of an OPEN Media Service Architecture

- An OPEN Media Service including media integration, handling and delivery is an evolution for IP-based multimedia streaming service.
- Providing a more interactive user experience by integrating advanced artificial intelligence technologies, real-time processing capabilities, cross-platform compatibility, and support for multiple platforms and terminal devices across.

Simplicity



- Streamlined and integrated workflows **reduce the complexity** of managing multiple media tasks.

Efficiency

- By centralizing media handling services, resource utilization will be improved, which significantly **saves time and costs**.

Interoperability

- Ensures that media content is **uniformly processed and presented** across different platforms and devices.

Scalability

- As the volume of media content grows, it can be **easily scaled** without affecting performance.

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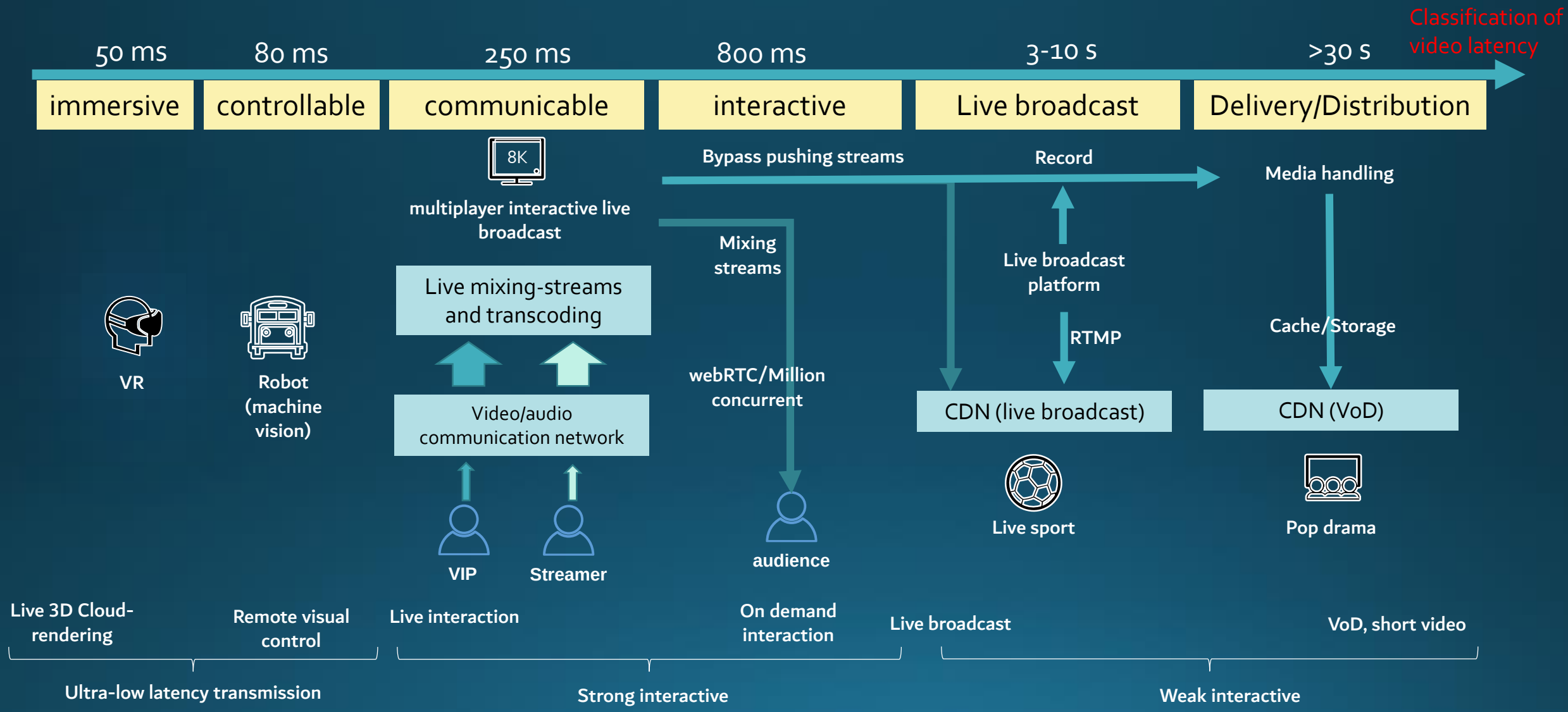
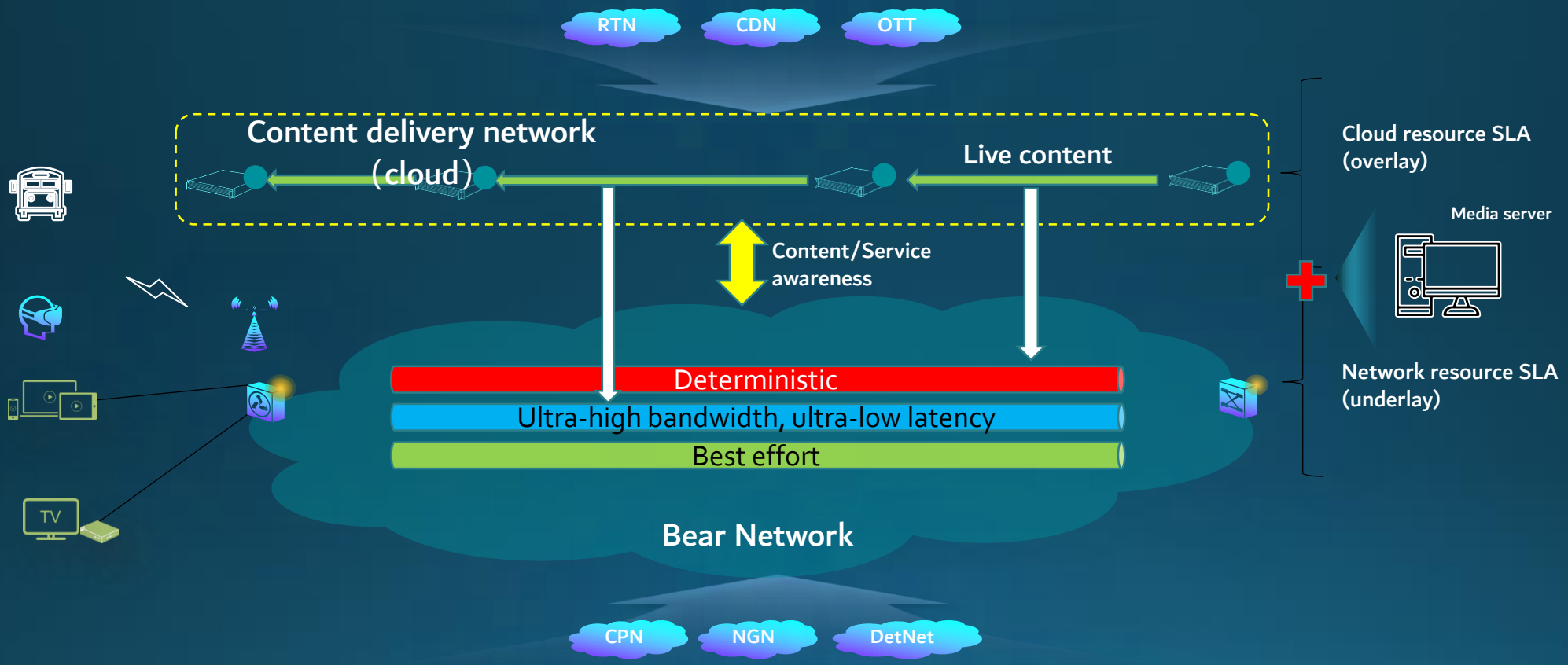
- IPTV and DS standard activities in Japan
- IPTV market trend: Media integration and handling
- From IPTV to IP-TV: content delivery with network innovation

Development Trends in Content Delivery service



QoS/QoE guaranteed content delivery: Service awareness + Network awareness



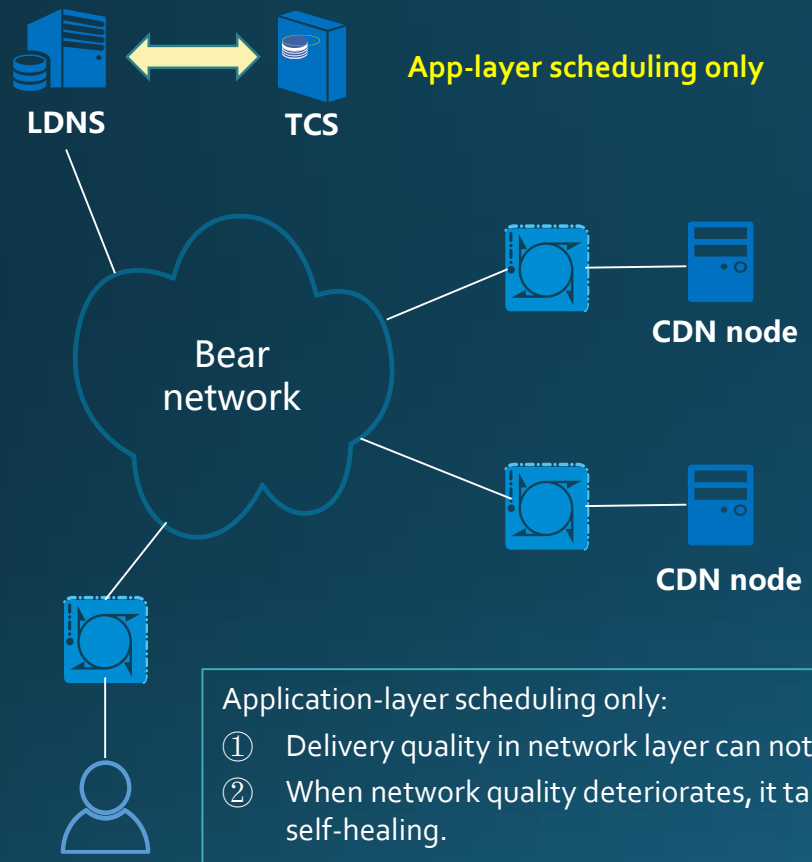
Potential new requirement for content delivery:

① Service layer is still decoupled from Network layer, but coordination is expected.

② The quality of content delivery would be improved by coordination of content/service awareness and network capability awareness.

③ Content delivery services can be tailored to accommodate various applications with different needs by integrating different network services.

Example: CDN scheduling by integrating application-layer scheduling and network-layer scheduling



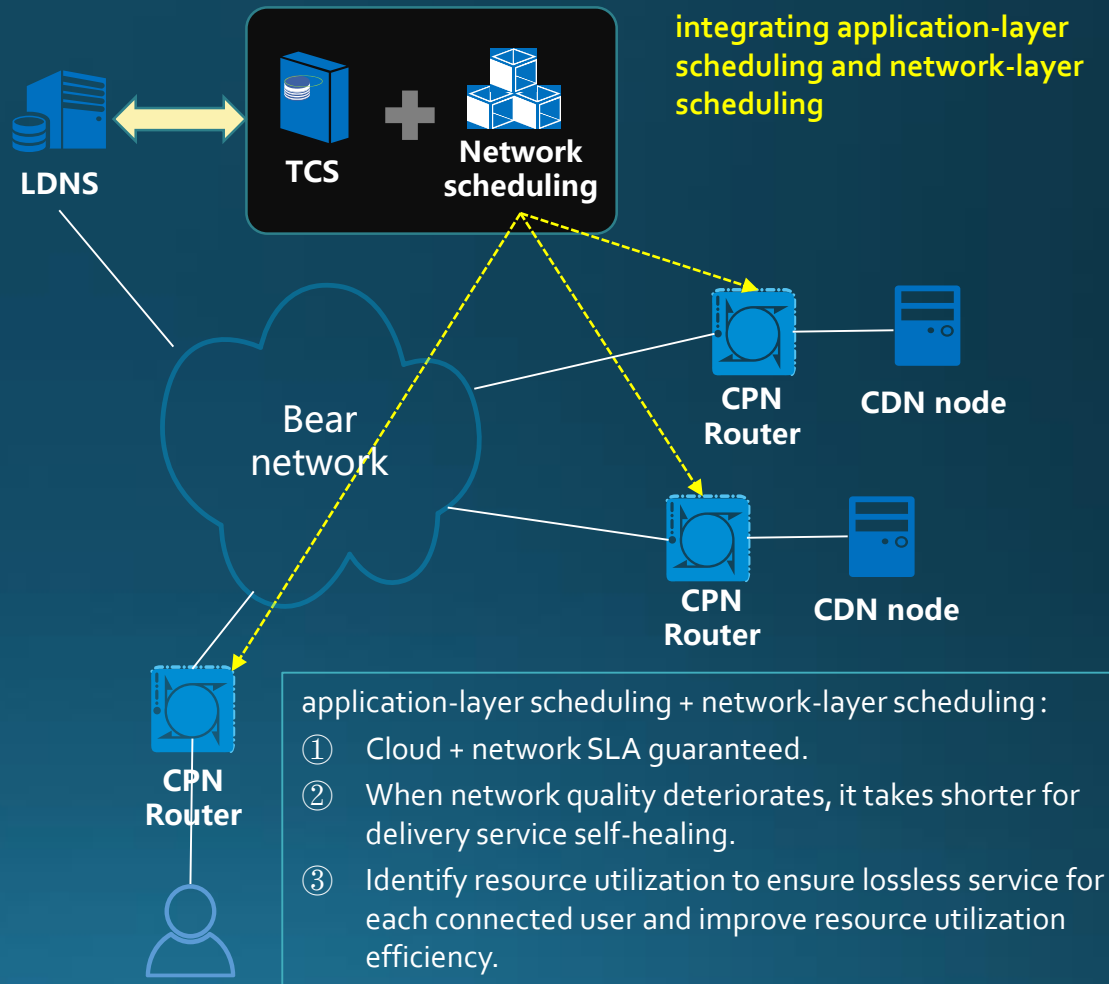
Application-layer scheduling only:

① Delivery quality in network layer can not be guaranteed.

② When network quality deteriorates, it takes longer for delivery service self-healing.

③ The scheduling is unable to detect insufficient network bandwidth, leading to users exceeding the network's capacity and negatively impacting the experience of all users.

④ The short DNS cache time results in a high frequency of DNS requests and longer DNS resolution times.



application-layer scheduling + network-layer scheduling :

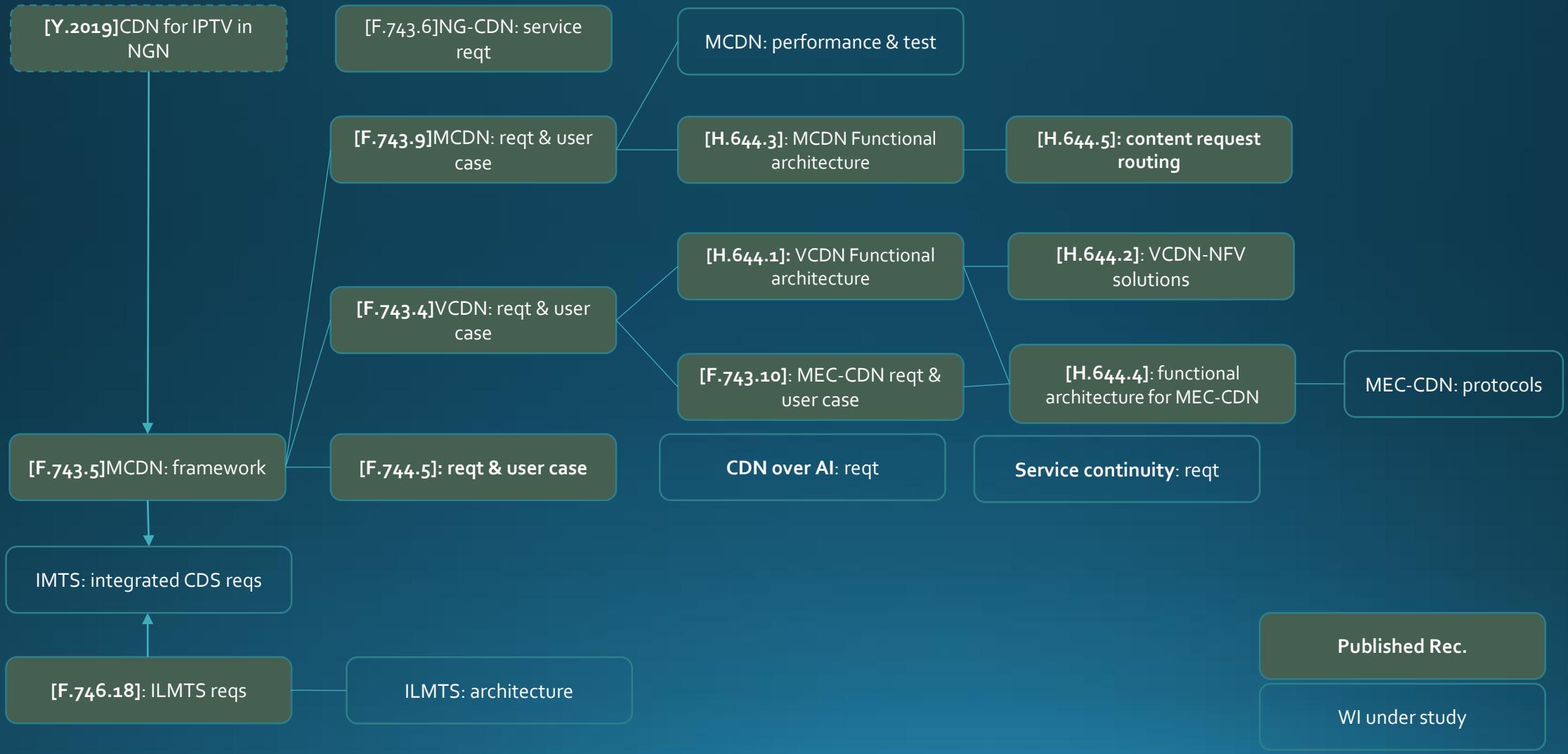
① Cloud + network SLA guaranteed.

② When network quality deteriorates, it takes shorter for delivery service self-healing.

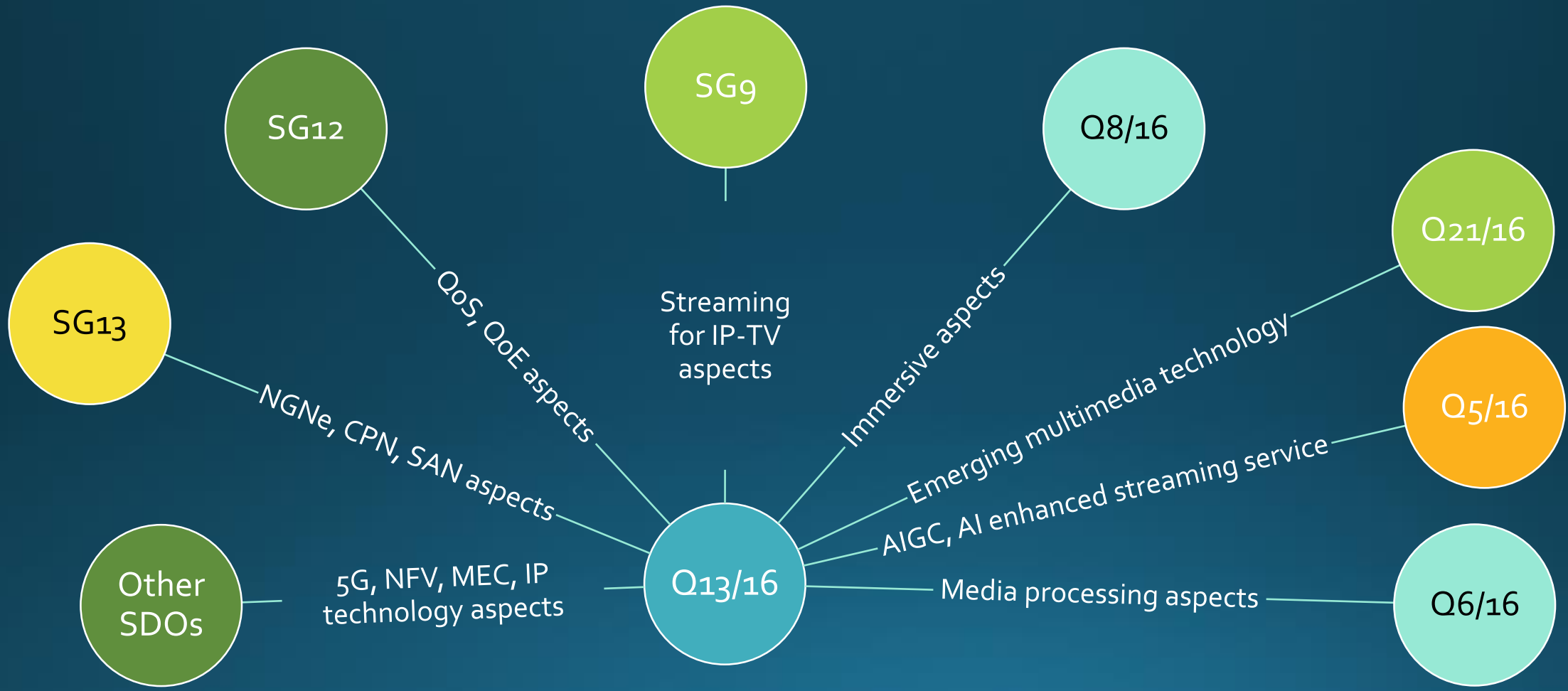
③ Identify resource utilization to ensure lossless service for each connected user and improve resource utilization efficiency.

④ Extend the DNS cache time, reduce the frequency of DNS requests, and save DNS resolution time.

Multimedia content delivery network roadmap handled by Q13/16



The next step of Q13/16



Thank you
Any questions?