ITU-T SG9 AI and Future Cable Standardization

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Chairman, ITU-T SG9

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SG9: Audiovisual content transmission and integrated broadband cable networks

SG9 Mandate in study period 2022 – 2024 (ITU-T Resolution 2)
Responsible for studies relating to:

1 *__use of telecommunication systems for__ contribution, primary distribution and secondary __distribution of audiovisual content__, e.g. television programmes and related data services, including interactive services and applications, providing advanced capabilities, e.g. ultra-high definition and high-dynamic range, 3D, virtual reality, augmented reality and multiview;*

2 *__use of cable networks__, e.g. coaxial cable, optical fibre, hybrid fibre coaxial (HFC), etc., __to also provide integrated broadband services__. The cable network, primarily designed for audiovisual content delivery to the home, also carries time critical services like voice, gaming, video-on-demand, interactive and multiscreen services, etc. to customer premises equipment (CPE) in the home or enterprise;*

3 *__use of cloud computing, artificial intelligence (AI) and other advanced technologies__ to enhance audiovisual content contribution and distribution as well as integrated broadband services over the cable networks;*

4 *__use of accessibility services__ (like captioning, audio caption) and new interaction technologies (like haptic, gesture, eye tracking and so on) __to enhance accessibility of audiovisual content and related data services__ for people with different ranges of abilities.*

SG9 Questions responsible for AI and advanced service platforms

ITU-T SG9

WP1/9   **Cable transport and terminals, including video and data**

Q1/9   TV and sound transmission and distribution

Q2/9   Conditional access and content protection

Q4/9   Guidelines for implementations and deployment (focus on Developing Countries)

Q6/9   Set-Top Box and other terminal devices

Q7/9   TV transmission and interfaces (IP/packet-based data, cable modems)

WP2/9   **Cable-related platforms and applications**

Q3/9   **AI-enabled functions over integrated broadband cable network**

> Rapporteur: Mr Evan Sun
> Associate: Mr Avinash Agarwal

Q5/9   APIs for advanced content distribution services

Q8/9   Voice and video IP applications over cable television networks

Q9/9   **Advanced service platforms**

> Rapporteur: Ms Yanhua Niu, Associate: Mr Soonchoul Kim

Q11/9   Accessibility to cable systems and services

Q10/9   Work Programme, Coordination and Planning

Recommendation series related to the mandate #3

ITU-T Recommendations under Study Group 9 responsibility

- SG9 Recommendations
  - J series: Cable networks and transmission of television, sound programme and other multimedia signals
    - J.1-J.9: General Recommendations
    - J.10-J.19: General specifications for analogue sound-programme transmission
    - ⋮
    - J.1600-J.1649: Artificial intelligence (AI) assisted cable networks
      - J.1600-J.1609: General requirements for the AI-assisted cable network platform
      - J.1610-J.1619: Requirements for the set-top box
      - J.1630-J.1639: Data models of the communicated data for the AI-assisted cable network platform

source: https://www.itu.int/ITU-T/recommendations/index_sg.aspx?sg=9

Published Recommendations

- ⊟ J.1600-J.1649: Artificial intelligence (AI) assisted cable networks
    - ⊞ J.1600-J.1609: General requirements for the AI-assisted cable network platform

        J.1600: Premium cable network platform – Framework

    - ⊞ J.1610-J.1619: Requirements for the set-top box

        J.1611: Functional requirements for a smart home gateway

        J.1612: Architecture for a smart home gateway

    - ⊞ J.1630-J.1639: Data models of the communicated data for the AI-assisted cable network platform

        J.1631: Functional requirements of E2E network platforms to enhance the delivery of cloud-VR services over integrated broadband cable networks

Recommendation J.1600 – the first AI Recommendation in ITU-T

J.1600 (10/2019) Premium cable network platform – Framework
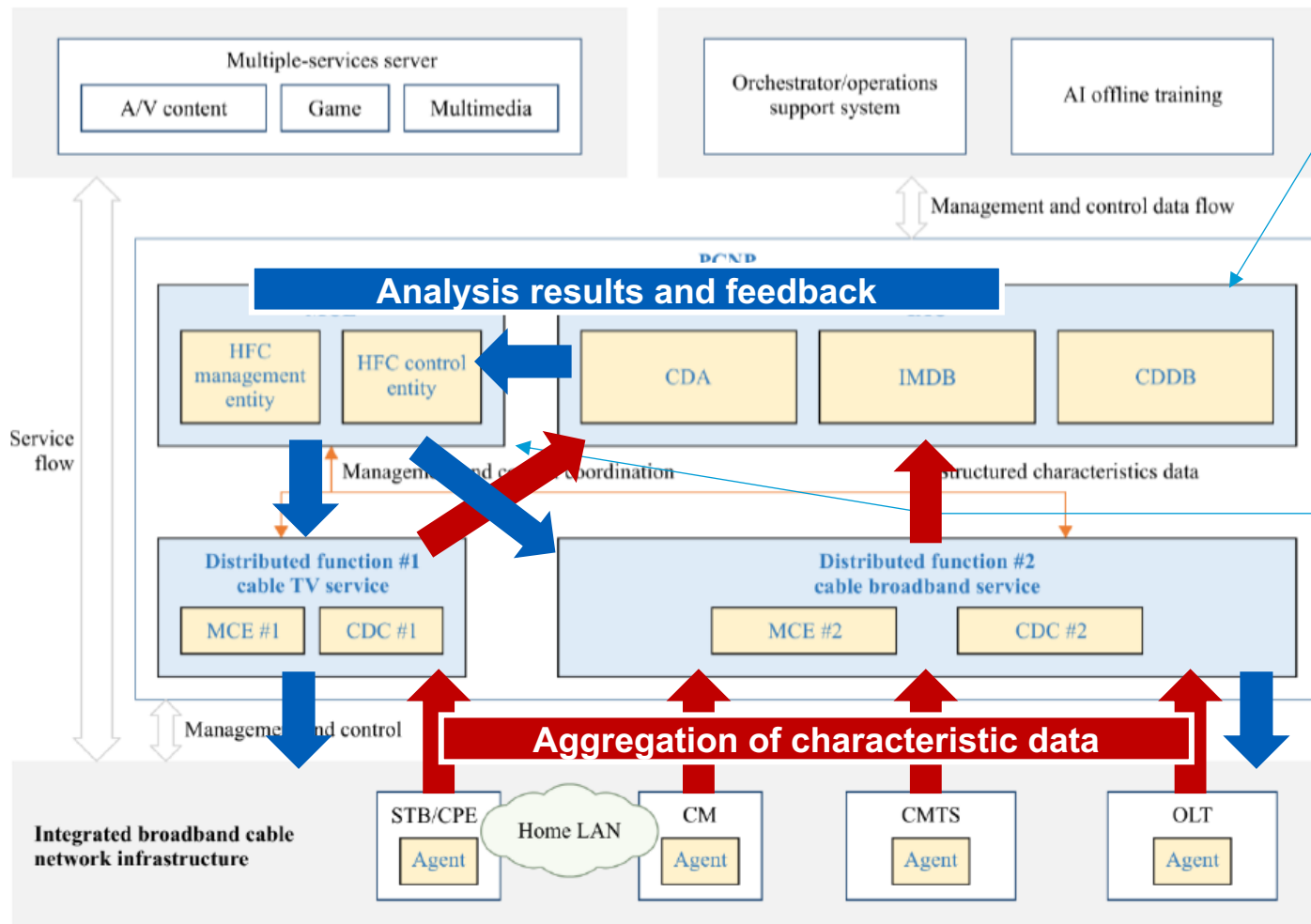
IAC: Intelligent Analyser and Controller

- ✓ **IAC** collects network characteristics data of network and devices.
- ✓ Assisted by AI, characteristics data are measured and analysed.
- ✓ Analytical results and instructions will be sent to **MCE** for automated network configuration and/or troubleshooting.

MCE: Management and Control Entity

- ✓ Coordinated with **IAC**, **MCE** instructs network and CPE devices to configure and optimize integrated broadband cable network.

Relevant works in progress

J.pcnp-char (J.1630)	E2E Network Characteristics Requirement for Video Services

J.cloud-game-req	Requirements of E2E Network Platform for Cloud Gaming Services

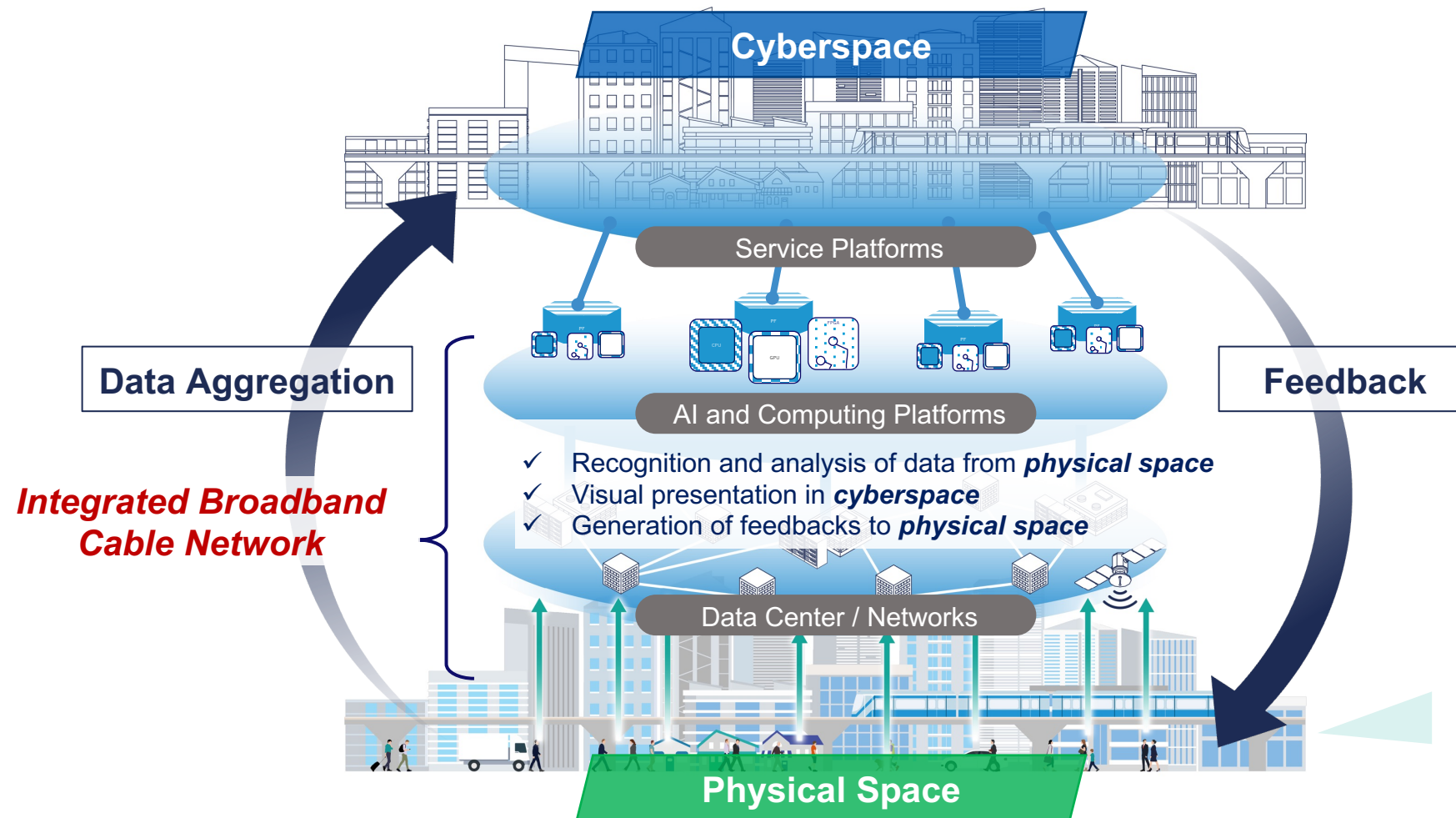|	
J.cloud-vr-arch	Architecture of E2E Network Platform for Cloud-VR service

J.cloud-ow	Requirements of E2E Network Platform for Cloud-based Object Wave Transmissions *object wave: captured light wave scattered off an actual object to be used to reproduce a holographic image of the object.

Evolution of Cable Network – Cyber-Physical Systems (CPS)

Advanced integrated broadband cable network could play an important role as platforms for CPS to provide various types of services that can be realized by CPS.

Cyberspace

Service Platforms

Data Aggregation

AI and Computing Platforms

Integrated Broadband Cable Network

- ✓ Recognition and analysis of data from *physical space*
- ✓ Visual presentation in *cyberspace*
- ✓ Generation of feedbacks to *physical space*

Feedback

Data Center / Networks

Physical Space

Thank you for your attention!