

Media Streaming Beyond OTT: 3GPP SA4 Perspectives on Advanced Delivery

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Chair of 3GPP SA4 WG and Video SWG

Content

- The role of 3GPP
- Advanced Media Delivery for 5GMS
- QUIC-related activities
- 6G, including AI





The role of 3GPP and SA4



3GPP: 3rd Generation Partnership Project

Nothing related to 3G...



3GPP Organizational Partners (OPs)

800+ members



3GPP Market Representation Partners (MRPs)



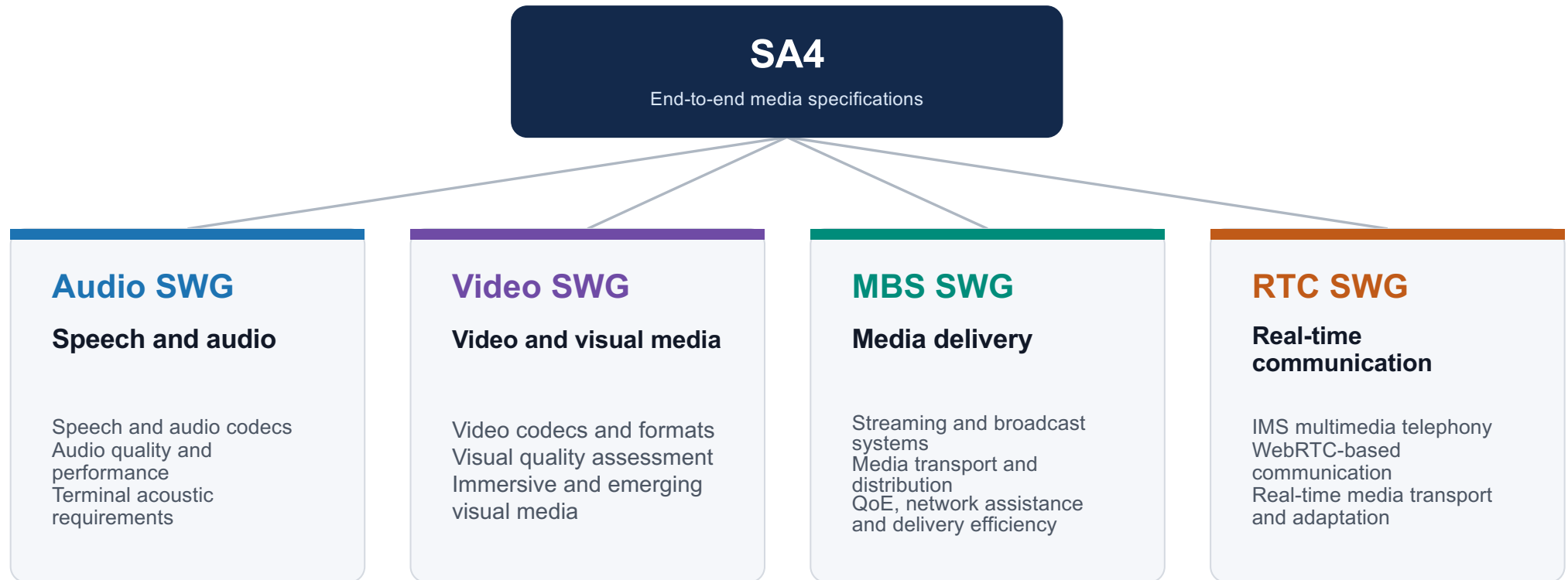
- ☞ The 3GPP **Organizational Partners (OP)** - 7 Standards Organizations - from China, Europe, India, Japan, Korea and the United States.
- ☞ Participation in 3GPP by companies and organizations becoming Members of one of these 7 OPs.
- ☞ Inputs on market requirements may come in to the Project via 3GPP **Market Representation Partners (MRP)**.
- ☞ There is a lot of additional **external liaison** activity...SDOs, Industry bodies, projects...

Official Liaisons on specification work:

450 MHz Alliance, [AISC, Bluetooth, Broadband Forum \(BBF\), CableLabs, International Special Committee on Radio Interference \(CISPR\), CTIA, Digital Video Broadcasting \(DVB\) Project, Ecma, International Expert Group for Emergency Access \(EGEA\), Eurescom, COST 273, European Radiocommunications Committee \(ERC\), Fixed Mobile Convergence Alliance \(FMCA\), GCF, Global TD-LTE Initiative \(GTD\), GPS Industry Council, GSM Association, HomeRF Forum, IDB Forum, IEEE, Internet Engineering Task Force \(IETF\), IrDA, International Multimedia Telecommunications Consortium \(IMTC\), Internet Streaming Media Alliance, ISO-ITU expert group, ISO MPEG / JPEG](#), ITU-T SG2, JAIN tm (Javatm APIs for Integrated Networks), The Java Community Process (JCP), Liberty Alliance Project, Metro Ethernet Forum (MEF), NENA, NGMN (Next Generation Mobile Networks), oneM2M, OMA (Open Mobile Alliance), Open Networking Foundation (ONF), Open IPTV Forum, Object Management Group (OMG), PCS Type Certification Review Board (PTCRB), Portable Computer and Communications Association (PCCA), Presence and Availability Management (PAM) Forum, [RSA Laboratories, SDR Forum, Sun Micro Systems Inc., Steerco, SyncML Initiative, Trusted Computing Group \(TCG\), TeleManagement Forum \(TMF\), TCCA, TIA /TR45, TIA/TR47, ITU, TV-anytime Forum, Voice eXtensible Mark-up Language \(VXML\) Forum, Wi-Fi Alliance, Wireless Broadband Alliance \(WBA\), WLAN Smart Card Consortium, Wireless World Research Forum \(WWRF\), World Wide Web Consortium \(W3C\)](#)

3GPP SA4: multimedia codecs, systems and services

Four specialized sub-working groups develop the technical building blocks for end-to-end media experiences

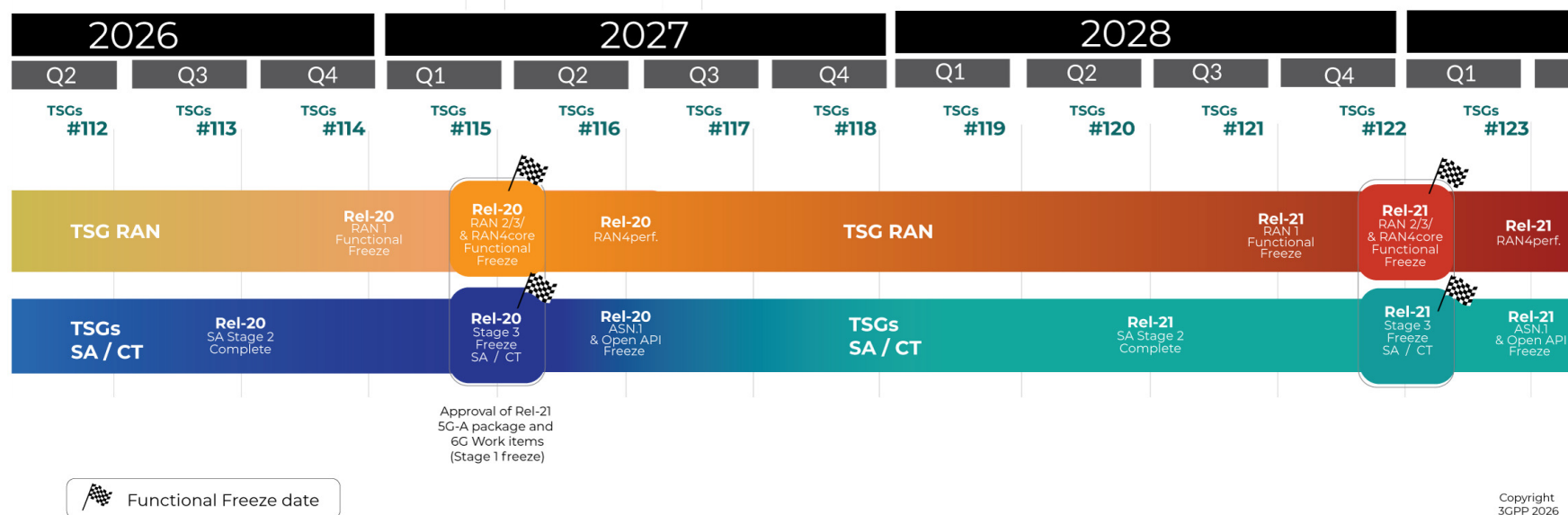


SWG = Sub-Working Group | Scope summarized from current SA4 organization and work programme

Release Timelines



Release 21 Timeline



Release 21:

- 1st set of 3GPP 6G technical specifications and IMT-2030 submission, expected to be delivered with a single drop (i.e., a single code freeze).
- Rel-21 timeline was decided in **June 2026**
- ASN.1/OpenAPI freeze date is no earlier than March 2029

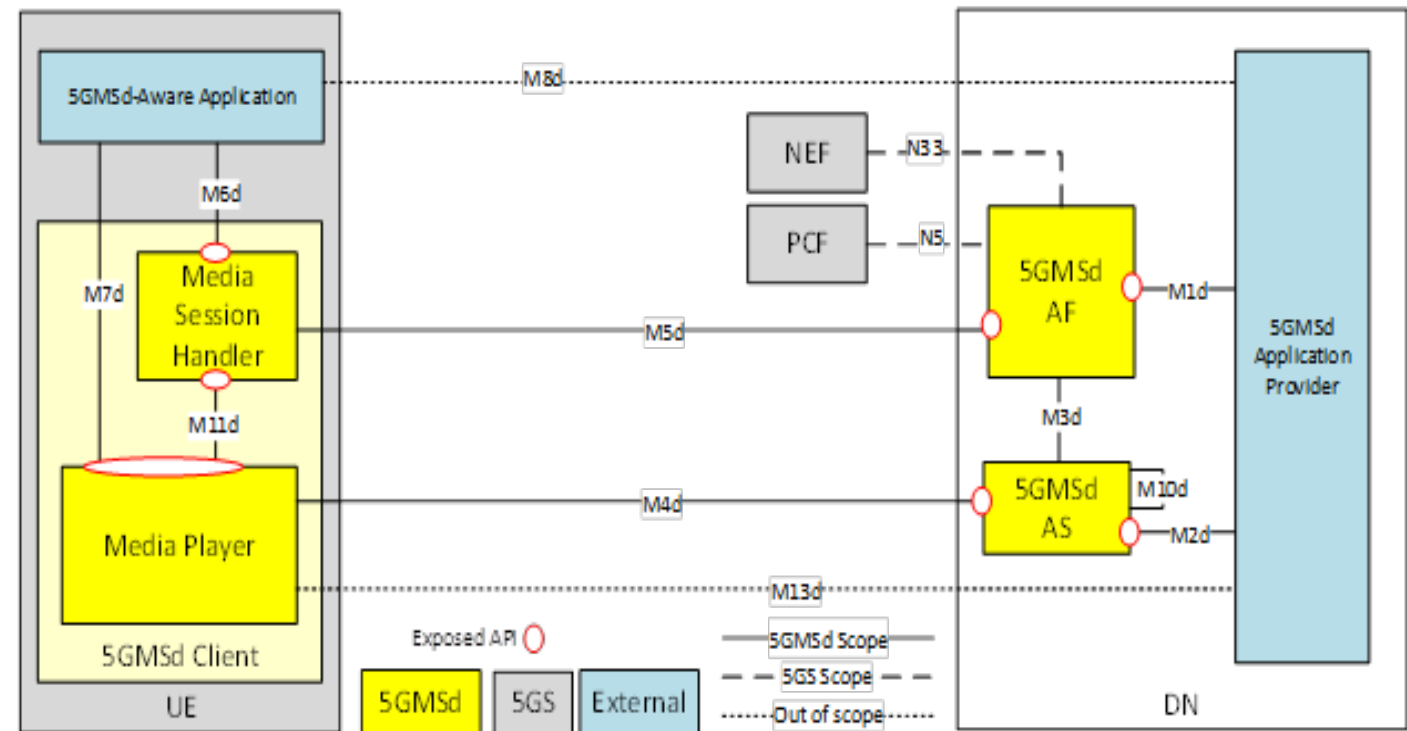


Advance Media Delivery for 5GMS



3GPP
A GLOBAL INITIATIVE

- Architecture aligned with OTT media delivery while enabling 5G System and 5GMS features
- Recommended profiles of codecs and formats etc.



Rel-19 (Phase 1) Advanced Media Delivery features in 5G



3GPP Work on «Advanced Media Delivery» Completed and published (TS 26.501/502/510/512/346/517 – December 2025)

Selected features

- Distributing Encrypted and High-Value Content
- In-Session Unicast Repair for MBS/MBMS Object Distribution
- Improved QoS Support for Media Streaming
- Common Media Client Data (CMCD)*
- Media Delivery from Multiple Service Endpoints/Locations*

Common Media Client Data (CMCD)



- CTA WAVE has developed: CTA-5004: Web Application Video Ecosystem Common Media Client Data (CMCD)
- Enables media delivery optimizations by the 5GMS AF and AS as well as e.g. quality auditing by Service Providers.
- Specified as part of the 5GMS Metric reporting alongside QoE/consumption reporting. Inherits metrics from CTA specification.
- In-band reporting using HTTP request headers over M4 to AS, M3d to AS, possibly NWDAF.

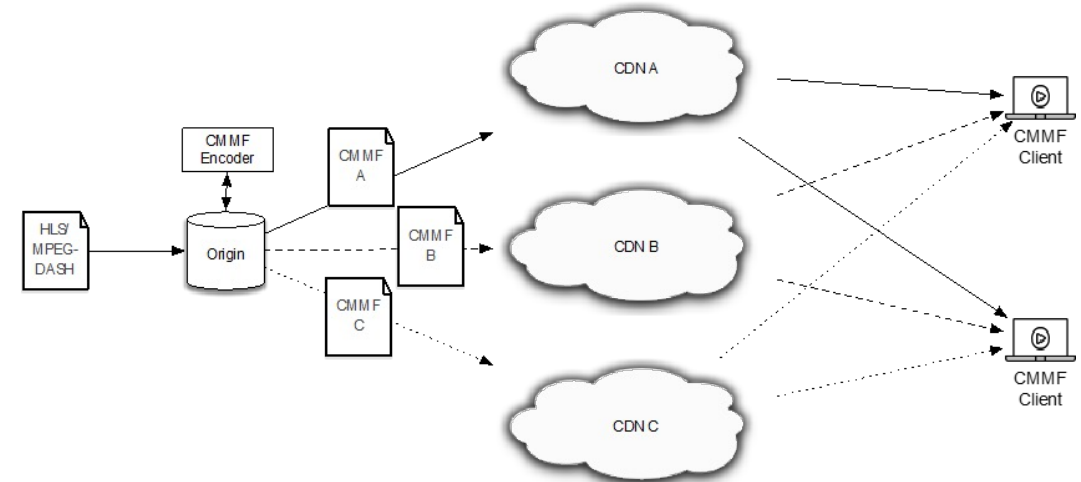
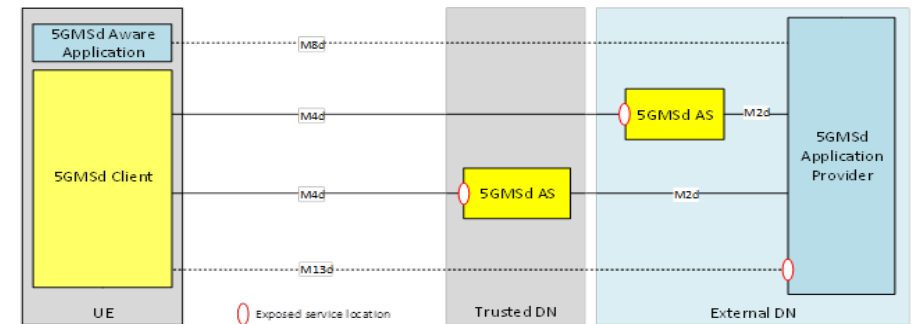


Basic CMCD concept – Media client sends key–value pairs to CDN in-band with requests

Media Delivery from Multiple Service Endpoints/Locations



-  Client is able to stream media content from multiple service locations (multi source/CDN) by switching between sources and/or stream concurrently from multiple sources
-  Multiple service location defined in the Media Player Entry (e.g. an MPD)
-  5GMS Rel-19 includes support for
 -  Content Steering for DASH - ETSI TS 103 998
 -  Coded Multisource Media Format (CMMF) - ETSI TS 103 973



Rel-20 (Phase 2) Advanced Media Delivery

Phase 2 features in 5G



3GPP Ongoing Work on «Advanced Media Delivery Phase 2»

Selected features

- Common Media Client Data (CMCDv2)
- in-band signalling of rate limits (SCONE support)
- 5G System-independent media streaming
- Multi-Access Media Delivery



QUIC

Transport aware streaming



Media over QUIC: 2 studies, one framework



STUDY 1 • SEGMENTED STREAMING

Where does QUIC improve on-demand and live video?

VoD • live at scale • low-latency live • short-form • contribution

STUDY 2 • REAL-TIME COMMUNICATION

When can QUIC benefit interactive communication?

Conferencing • split rendering • immersive 360° communication

TR 26.835

Streaming study report
protocols • applications • results

TR 26.934

Common test platform
network profiles • emulation • metrics

TR 26.836

Real-time study report
protocols • scenarios • results

Media over QUIC: 2 studies

Streaming study: evaluate QUIC for video streaming

OBJECTIVE

TR 26.835 — compare on-demand and live services with today's DASH baseline

1 SERVICES

Long-form VoD, live at scale, low-latency live, short-form video and live contribution.

2 PROTOCOLS

DASH over HTTP/1.1 as anchor; compare HTTP/3 and emerging Media over QUIC approaches.

3 EVIDENCE

QoE, QoS and deployment impact under realistic mobile-network conditions.

Real-time study: test QUIC against WebRTC and RTP delivery



THREE CANDIDATE FAMILIES

WebTransport Browser-facing access to QUIC streams and datagrams

RTP over QUIC Retains RTP semantics while using QUIC transport

MOQT Object-based publish/subscribe with optional relays

THREE SCENARIOS

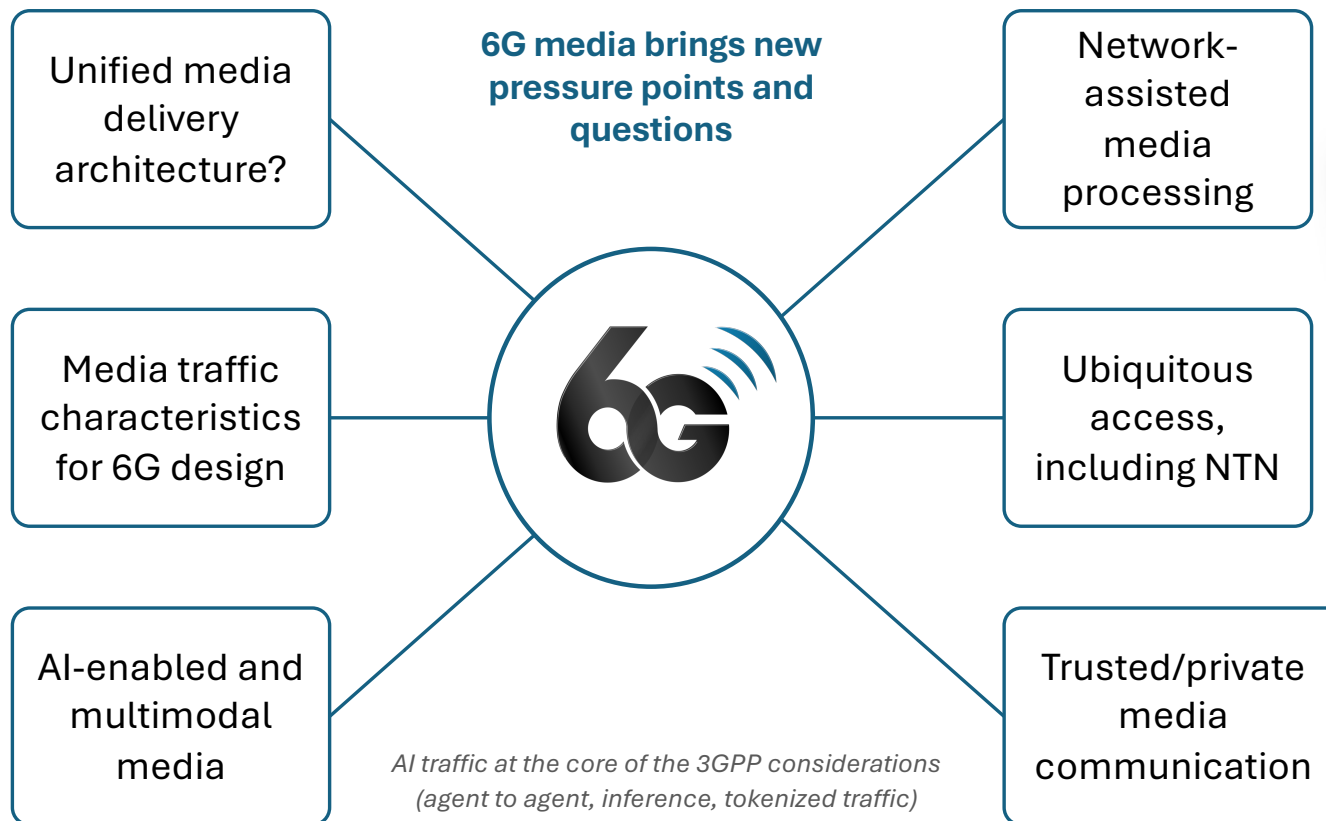
- multiparty conferencing,
- split rendering for interactive applications,
- and 360-degree immersive conferencing.



And what about 6G?

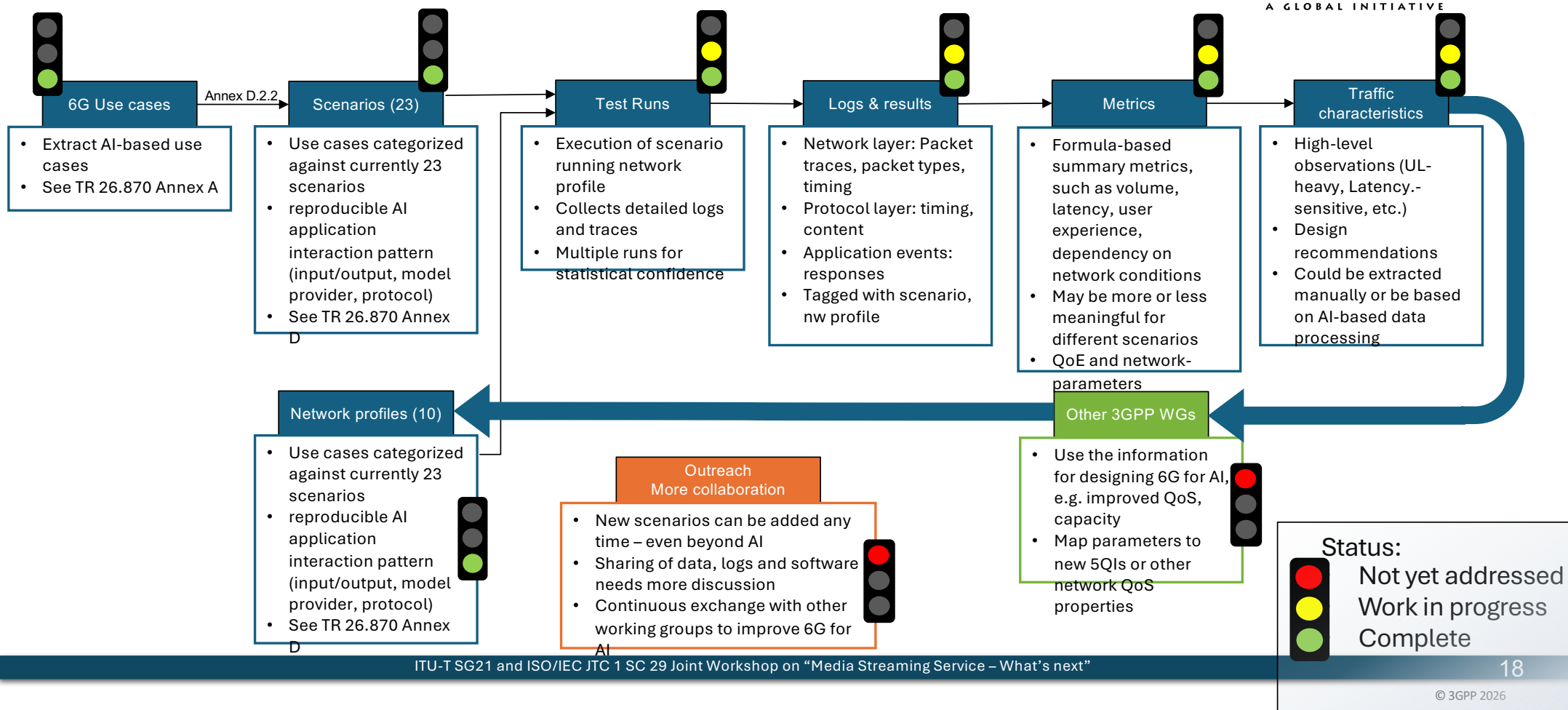


6G, the longer term vision



AI Traffic Characteristics

Evidence-based methodology



Concluding thoughts



- **Network-aware delivery** → shared metadata for endpoints, access, QoE, energy and assistance
- **QUIC as a media substrate** → reusable mappings for streaming and real-time media
- **AI exchanges as media** → representation, packaging, timing, synchronisation and provenance



Thank you

Gilles Teniou – 3GPP SA4 Chair

For more info on 3GPP...



- Specifications, meetings, working documents, news, portal, technology articles:

Website: www.3gpp.org

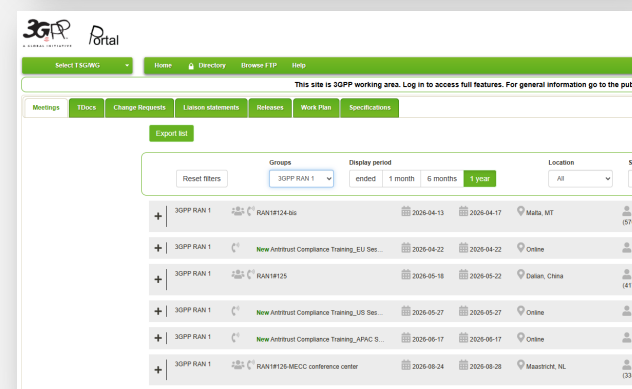
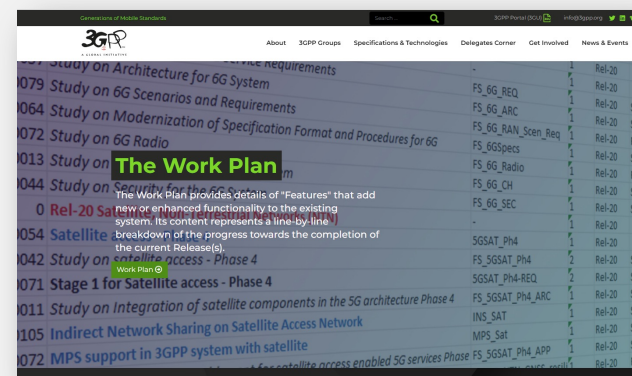
3GPP Portal: <https://portal.3gpp.org/>

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Thanks to
Alain Sultan – 3GPP MCC workplan manager
Kevin Flynn – 3GPP Marketing and Communication