

3GPP Mission Critical Standards – Past, Present and the Future

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Past

- The 3GPP MCX working groups and workflow
- 11 years of MCX standardization in 3GPP



Present

- MCX Rel-19 and Rel-20 - new features and enhancements



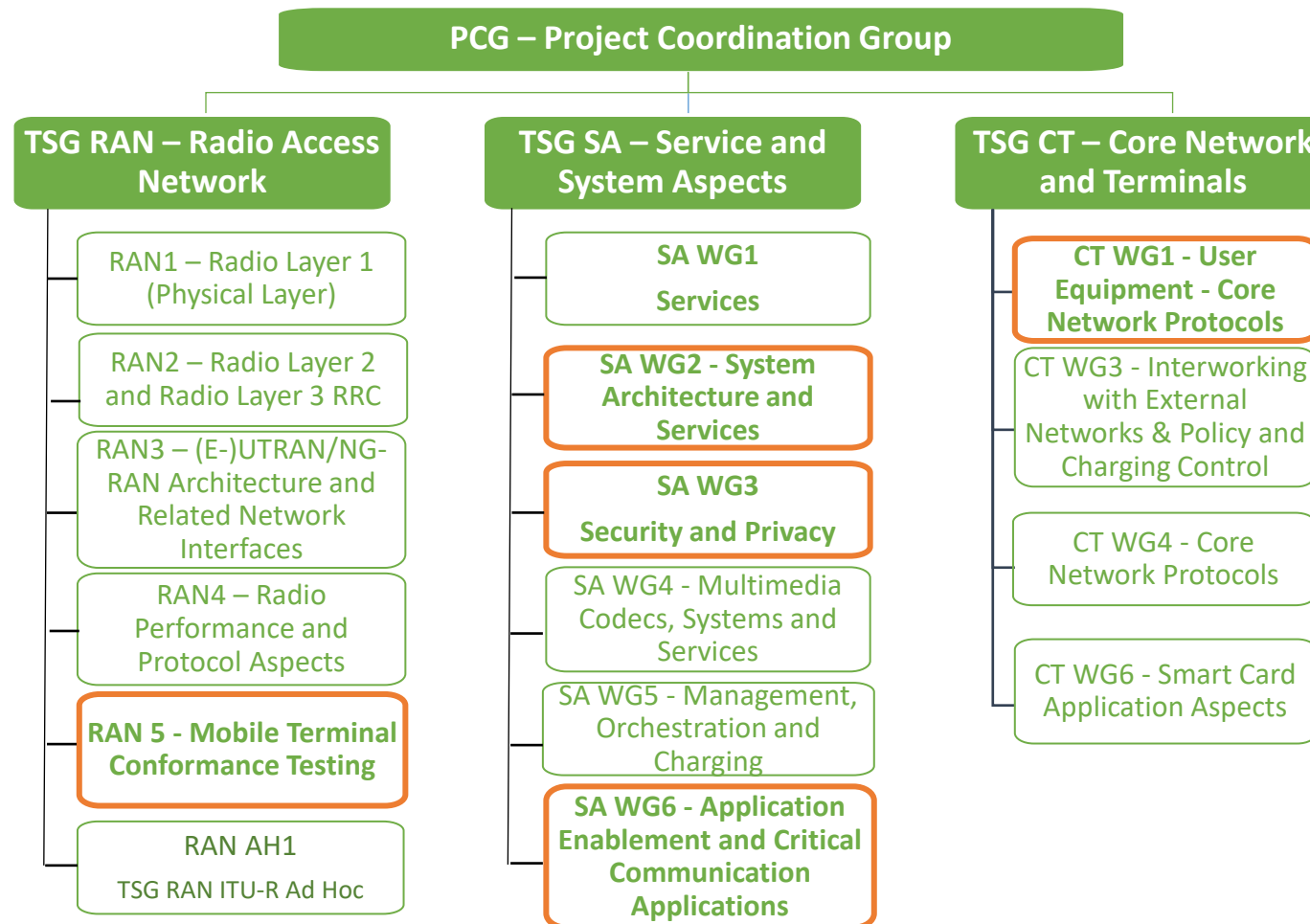
The future

- Potential MC topics for Rel-21
- 6G

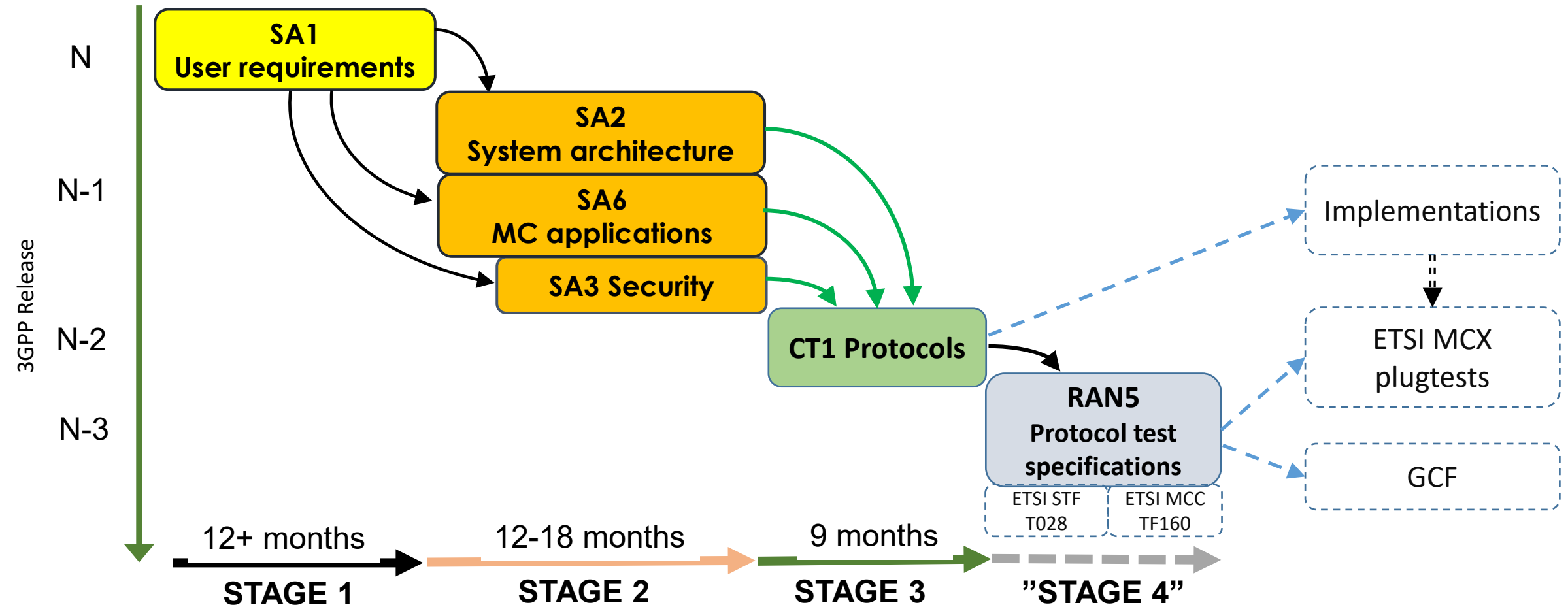


Summary

MCX working groups in 3GPP



MCX standardization workflow

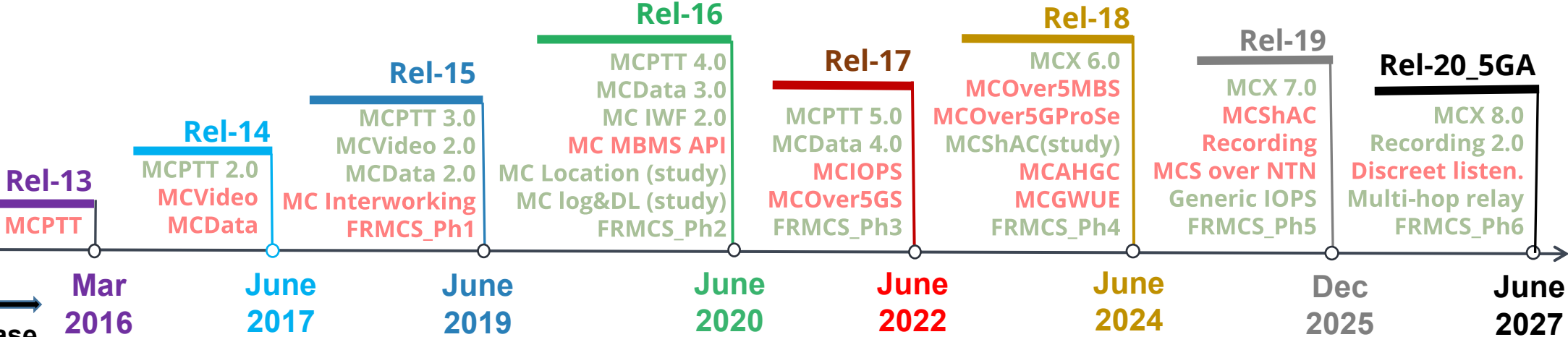


11 years of Mission Critical application layer standardization in 3GPP



WG SA6
Established
Dec 2014

3GPP Release
'end' date
(Stage3 stable)



Rel-19 new and enhanced MCX features

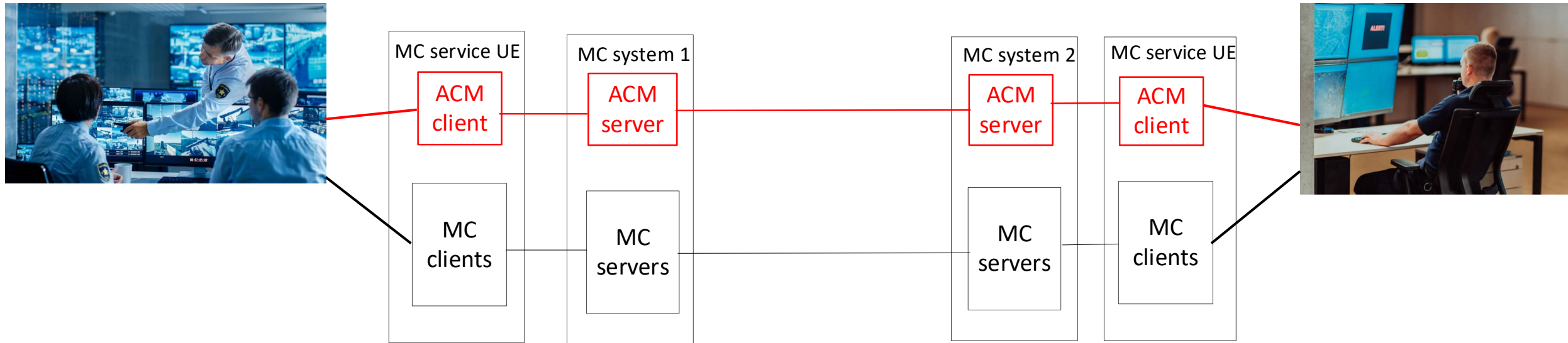


- 📶 **Rel-19 schedule**
 - Stage 2 completed 12/2024
 - Stage 3 freeze 09/2025
 - Release end 12/2025
- 📶 **New MC features**
 - MCSShAC
 - MCS over NTN
 - Recording
- 📶 **Enhancements**
 - Location protocol (stage 3)
 - Location reporting (stage 2)
 - FRMCS_Ph5
 - Generic IOPS
 - Other

Rel-19 new MCX features - MCSHAC

❏ **MCSHAC** – Sharing administrative configuration between interconnected MC systems

- Information required to enable migration of users and usage of interconnected groups
 - Configuration parameters for user profiles and group profiles
- Standardized procedures and messages instead of informal communication methods (e.g. email, MCPTT,...)
- Optional feature – “...not essential to enable MC services...”



Rel-19 new MCX features – MCS over NTN

MCS over NTN

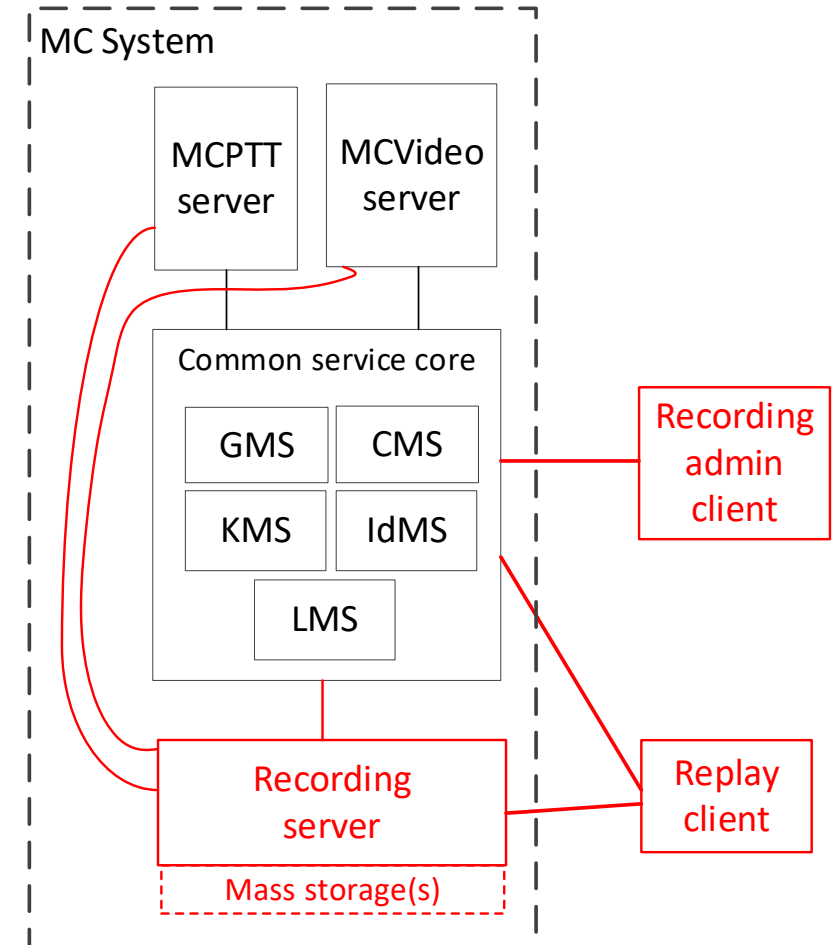
- No new MC functional elements or reference points (interfaces) needed
- From TS 23.289 – MCX over 5G system: *“The MC service UE should utilize satellite access to obtain MC services as specified in 3GPP TS 23.501, 3GPP TS 23.502 and 3GPP TS 23.503. ”*
- “Satellite service provider” added into “business relationships” (TS 23.289).
- One open question from the Rel-19 study: *“How to inform MC group participants of one or more users being connected via NTN?”*
- Further work expected in future releases.

Rel-19 new MCX features - Recording



Recording and replay

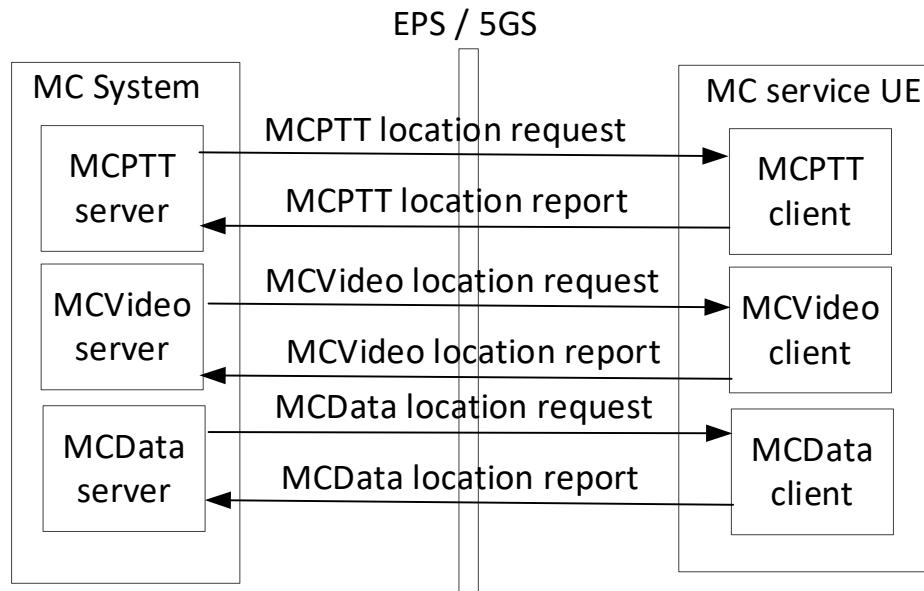
- SA1 requirements already in Rel-13, first SA6 study in Rel-16
- New functional elements:
 - Recording server, Recording admin client, Replay client
- Only part of the functionality completed in Rel-19:
 - Authentication/authorization of the new client types
 - Configurations (target users/groups)
 - Utilizing SIPREC between MCX server – Recording server for MCPTT and MCVideo realtime communications
- To be completed in Rel-20. The missing parts are e.g.:
 - MCData and any non-realtime MCVideo service
 - Non-call related metadata (emergency alert, affiliation change, ...)
 - Migrated users and interconnection/interworking scenarios
 - Details of recording e2ee media
 - Off-network recording



Rel-19 MCX enhancements – Location protocol

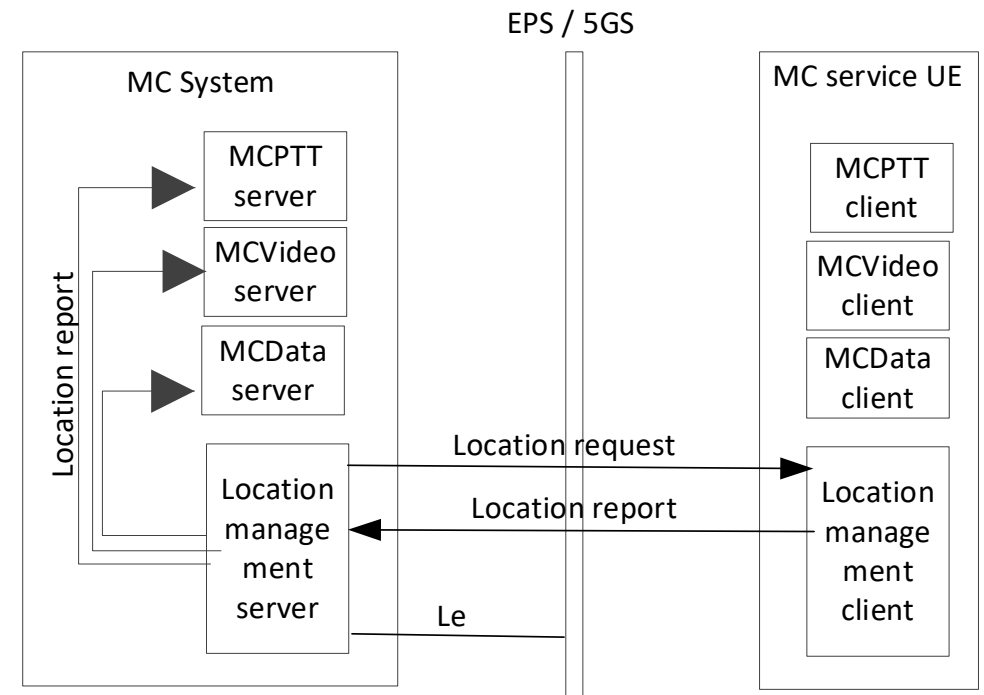
MC Location protocol Rel-18 (stage 3)

- In Rel-18 and earlier, stage 3 location procedures are per service (MCPTT, MCData, MCVideo).
- This is not aligned with stage 2 architecture.



MC Location protocol Rel-19 (stage 3)

- LMS and LMC introduced. Location procedures common for all services
- Now aligned with stage 2 architecture.



- Enhancements to location reporting (stage 2)
 - Groups as target for location request i.e. location report requested from all currently affiliated group members.
 - Aggregation in LMS for location triggers towards the same client.
 - Location info from PLMN operator (optional Le interface between LMS and 3GPP LCS).
 - Default configuration for location reporting (in the user profile).



FRMCS Ph5

- MC gateway UE enhancements
 - MCGWUE was introduced in Rel-18, enables MC service access from non-3GPP device.
 - Several enhancements in Rel-19.
- Ad-hoc Group Communication
 - Introduced in Rel-18. Enables group creation “ad-hoc” with participants list or criteria. AH group is deleted when the communication terminates.
 - Several enhancements in Rel-19.
- CP/UP separation
 - Allow different IP address for MCX server, Floor control (MCPTT) / Transmission control (MCVideo) server and media distribution function.
- Interworking with GSM-R

IOPS

- Isolated Operation for Public Safety
 - Introduced for LTE in Rel-13. TS 23.401 (LTE system architecture).
 - MC application layer functionality in Rel-17. TS 23.180 (MCX services in IOPS mode of operation).
- From TS 23.401:
 - *“Isolated Operation for Public Safety (IOPS) provides the ability to maintain a level of communications for public safety users, via an IOPS-capable eNodeB (or set of connected IOPS-capable eNodeBs), following the loss of backhaul communications”.*
- Rel-19 enhancements:
 - Making the application layer MC IOPS (TS 23.180) agnostic to the 3GPP network (LTE / 5GS).
- 5G-IOPS has a pending update to TS 23.501 (5GS System architecture).



Other MCX enhancements

- 5G capability enhancement for MCVideo
 - L4S: “Low Latency, Low Loss and Scalable Throughput” - service for MCVideo
- Remote floor request in emergency communication
- 5G Prose UE-to-UE relay

Rel-20 5G-Advanced - new and enhanced MCX features



- **Rel-20 5GA schedule**
 - Stage 2 complete 09/2026
 - Stage 3 freeze 03/2027
 - Release end 06/2027
- **New MC features**
 - Discreet listening
 - (Lawful interception)
- **Enhancements**
 - Recording
 - FRMCS_Ph6
 - Multi-hop relay
 - Other

Discreet listening

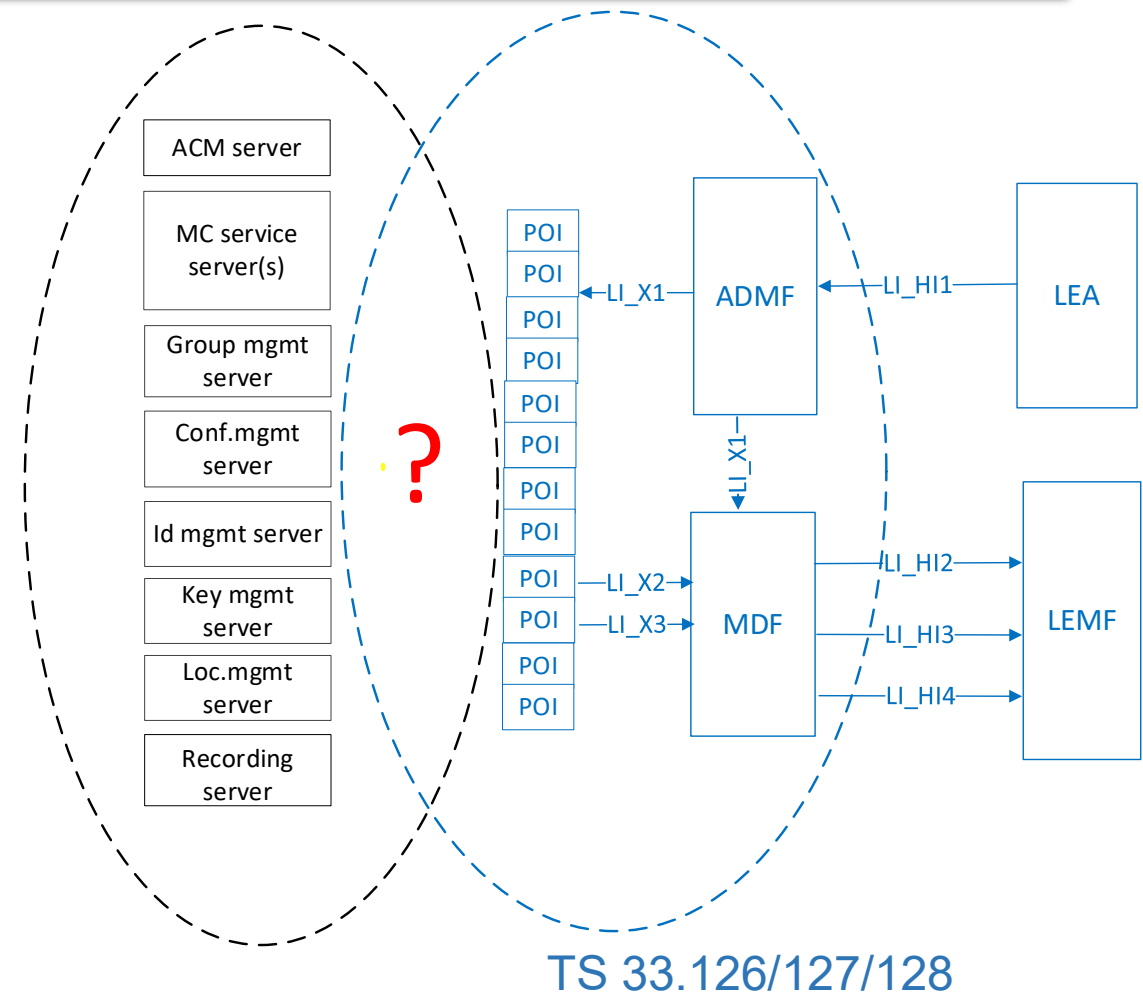
- User requirement (TS 22.280): *“The MCX Service shall provide discreet listening capabilities without noticeable impact on or knowledge of the target MCX User, or the members of the target MCX Service Group....”*.
- SA1 user requirements in Rel-13 → First SA6 study in Rel-16 → SA6 work item in Rel-19 → postponed to Rel-20.
- SA6 Rel-20 new study item approved 03/2025.
- No architecture yet, but potentially can reuse some of the Recording functionality (FFS).
- NOTE: This is not Ambient listening.

Rel-20 5GA new MCX features - LI



Lawful interception of MCS

- NOTE: not in SA6 Rel-20 work plan
- Discussions with SA3-LI group started



Rel-20 5GA MCX enhancements

- 📶 Recording
 - A major update to Rel-19 version.
 - SA6 Rel-20 new study item approved 03/2025
- 📶 FRMCS Ph6
 - Ad-hoc group communication enhancements – e.g. call forwarding, merging multiple ad-hoc group calls, multi-talker control.
 - MCGWUE enhancements – migration, location, interconnection, multiple GWUEs per service.
 - Enhancements to GSM-R interworking.
- 📶 5G Prose multihop relay
 - UE-to-UE and UE-to-network
- 📶 Other enhancements, e.g.
 - Temporary vs permanent UE disable
 - Pause and resume for ambient listening

The future - Release-21

- Rel-21 will be the first 3GPP 6G release
 - In Rel-20 only 6G studies, no normative 6G work.
- Rel-21 timeline to be decided latest in June 2026.
- No 6G specific MCX use cases or requirements have been identified (yet).
 - TR 22.870 Study on Use Cases and Service Requirements, Stage 1 (target: 03/2026)
- Possible “G-agnostic” SA6 MCX topics for Rel-21:
 - Enhancements to Rel-20 big features (Recording/Discreet listening)
 - Lawful Interception?
 - FRMCS-Ph7?
 - Feedback from end users and MCX operators
 - MCX stage 2 – stage 3 alignments
 - Review of all SA1 MC requirements – what have been missed?

Summary



Past

- The 8th MCX release - 3GPP Rel-20 – ongoing.
- All releases have introduced at least one new feature in addition to enhancements and corrections.



Present (Rel-19 + Rel-20)

- Several big and small features and essential enhancements/corrections under work.
- Stage 2 Release 19 completed 12/2024. Release 20 target 09/2026.



Future (Rel-21)

- No 6G MCX requirements/use cases identified so far.
- Possible “G-agnostic” topics: e.g. enhancements to Rel-20 features and more real end user feedback.

If you want to learn more about 3GPP



- A general 3GPP presentation (updated every 3 months) is available:
 - https://www.3gpp.org/ftp/Information/presentations/3GPP_PowerPoint_template/2025_06_general_external.pptx

Content



- The role of 3GPP
- 3GPP – How the project works
- Partnership & the 3GPP eco-system
- Technical Specification Groups
- Quarterly meeting cycle
- 3GPP releases & Stages of a release
- Bringing the work in
- 5G Releases
- Rel-20 planning

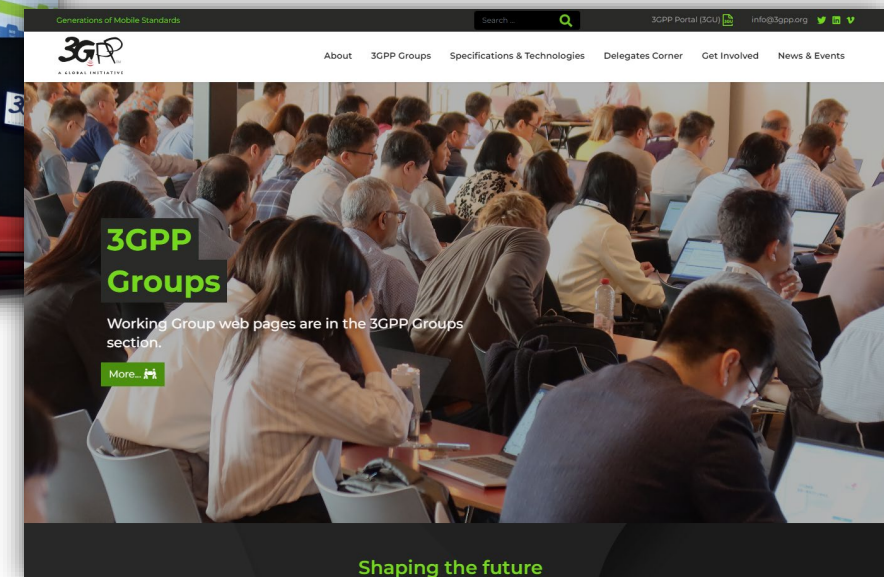


For more info on 3GPP...

- Specifications, working documents, news, portal, technology articles:
 - Online; www.3gpp.org
- Consider attending a WG or TSG meeting (listing):
 - <https://portal.3gpp.org/>
- Subscribe to our regular newsletter:
 - www.3gpp.org/highlights
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