



# Overview and status of 3GPP SA WG2

Andrew Bennett  
3GPP SA WG2 Chair

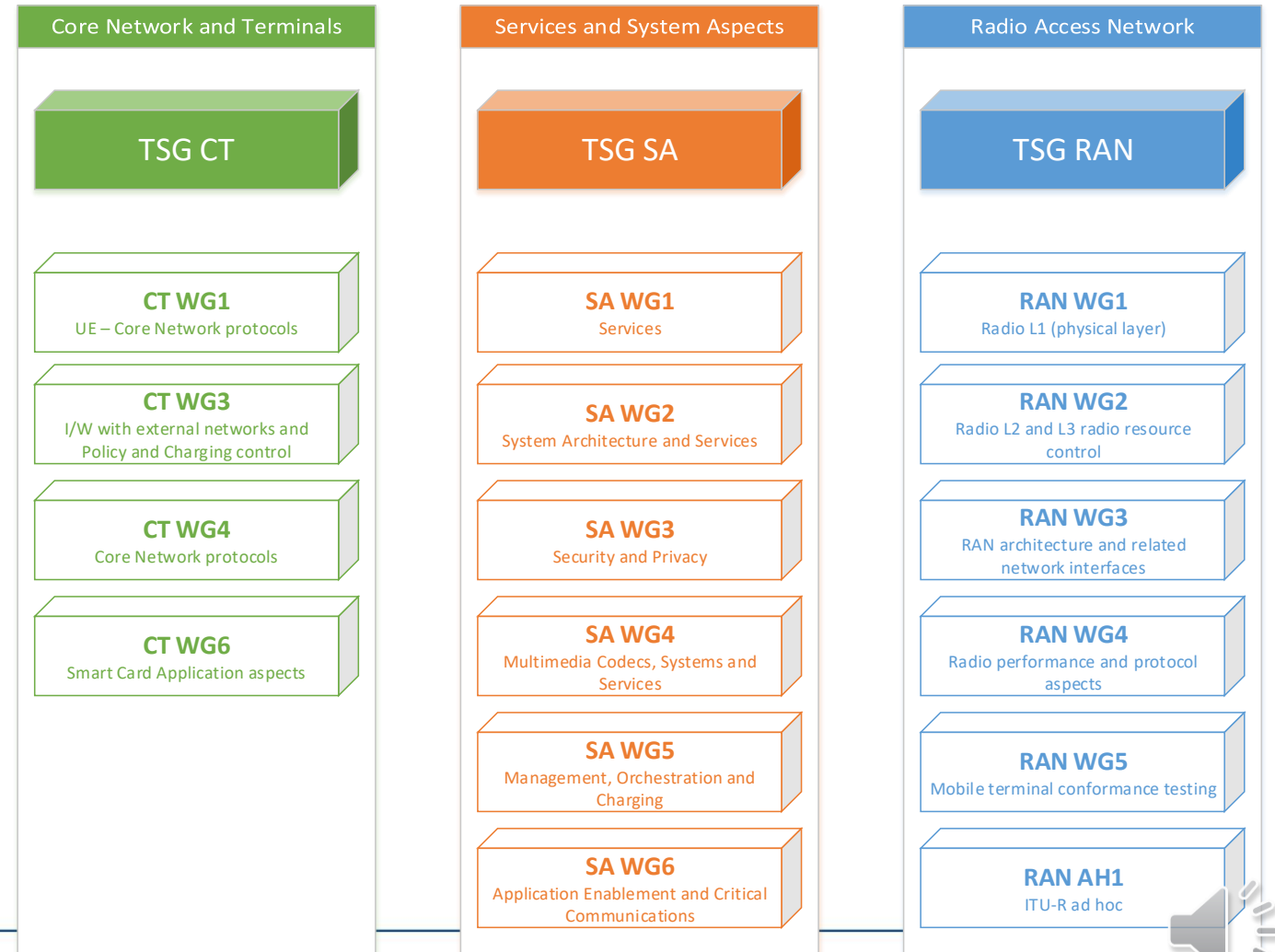


# Background and introduction to 3GPP SA WG2



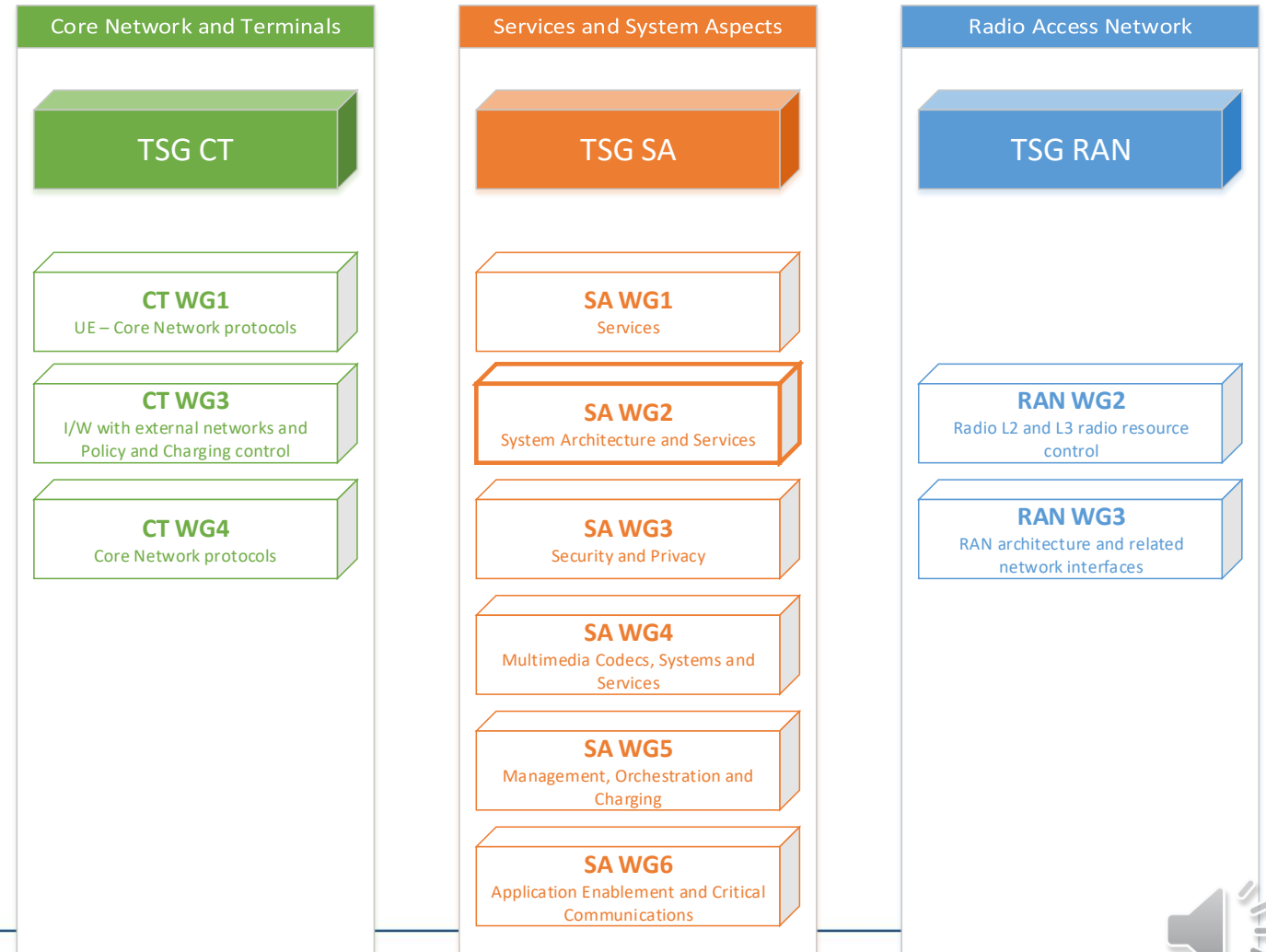
# Overview of 3GPP

- 3GPP consists of three Technical Specification Groups, and their Working Groups, each with different responsibilities
- The TSG's decide on the scope of the work that will be done in each release
- Each TSG co-ordinates the work done in their Working Groups, and formally approves the technical work (specifications and Change Requests), Work Item Descriptions
- The Working Groups are where the great majority of the technical work takes place



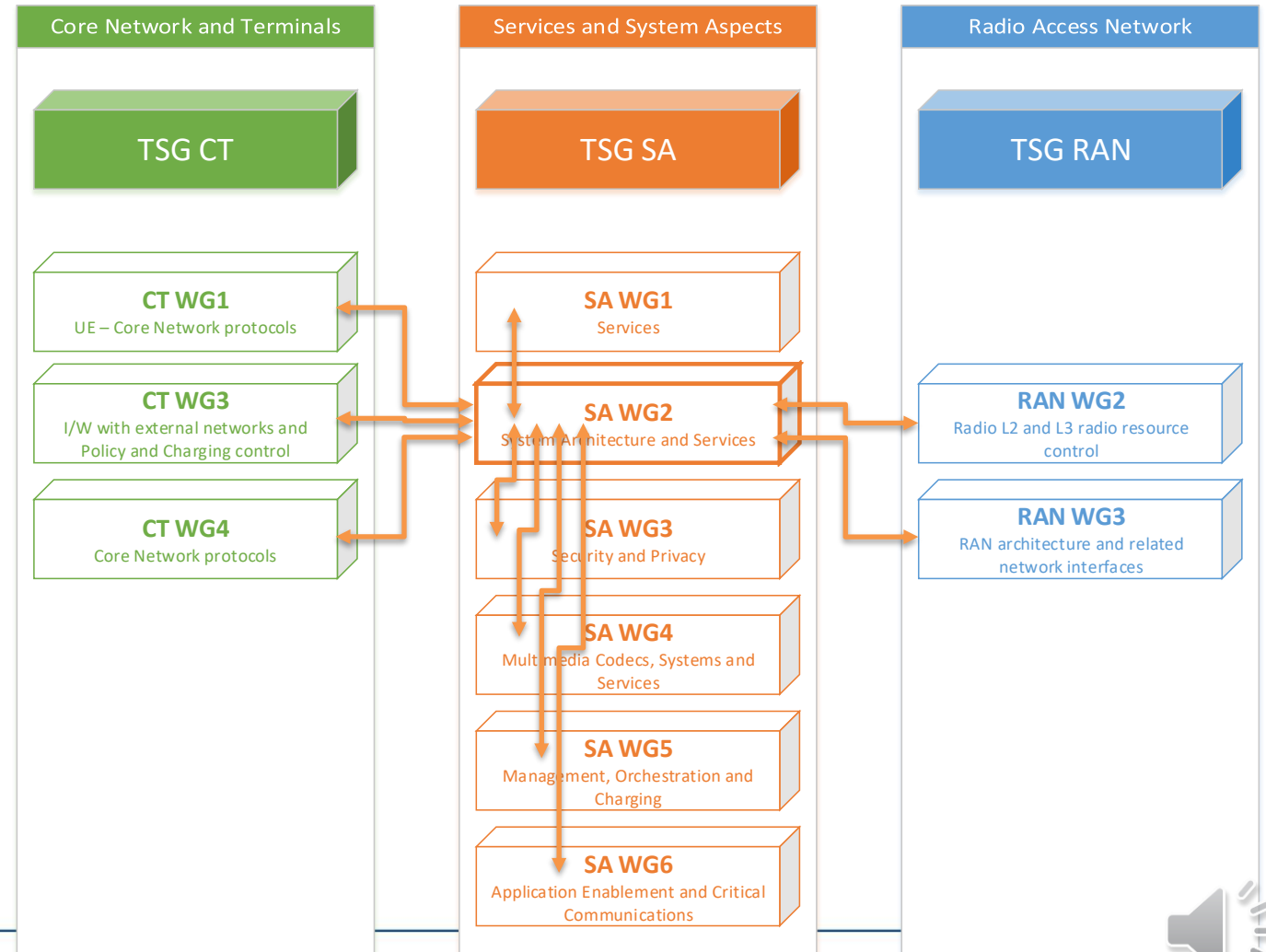
# SA WG2's place in 3GPP

- SA WG2 (or SA2 as is more informally known) is a Working Group of SA with overall responsibility for the 3GPP system architecture and services
- It takes in service requirements developed by SA1 (Stage 1 requirements), and develops architectural requirements of its own, to specify Core Network entities and the interactions between them (Stage 2)
- Stage 3 specifications are developed from the Stage 2 specifications
- Performing these activities requires close co-ordination between SA2 and many of the Working Groups in 3GPP



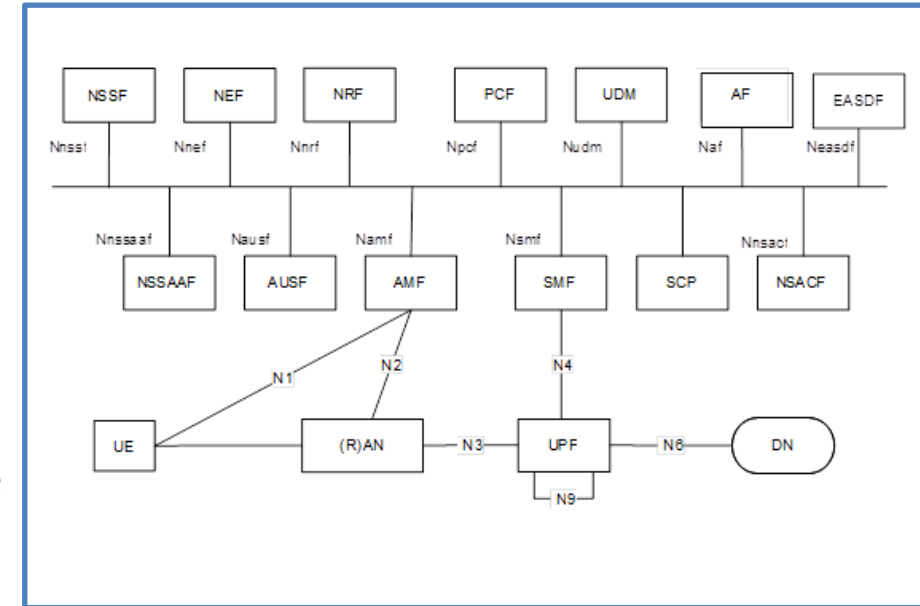
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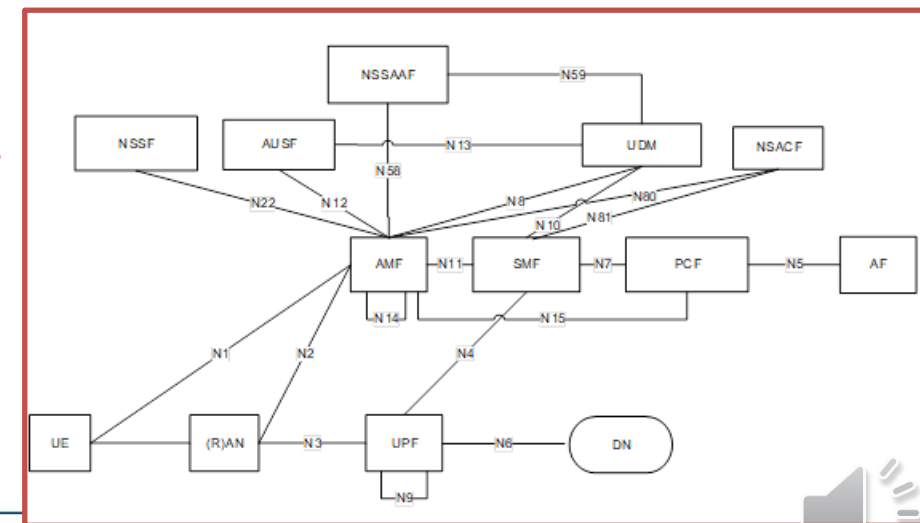


# SA2's role

- Develop the overall 3GPP system architecture and services including User Equipment, Access Network, Core Network, and IP Multimedia Subsystem
- System-wide view and defines the main entities of the system architecture, and how these entities are linked to each other. SA2 also defines the main functionality and the information exchange between these entities
- Currently responsible for the 5G System and Evolved Packet System (EPS) Architectures including the 3GPP enhancements for multimedia services (including emergency services), IoT, and other market sectors/vertical industries related use-cases
- Coordinate with other 3GPP WGs and all relevant Standards Developing Organizations (SDOs), industry fora, and Market Representation Partners (MRPs)




Core Network Architecture (SBA)



Core Network Architecture (Ref point)



## Leadership

- Chair: Andrew Bennett (Samsung) – ETSI
  - Vice Chair: Wanqiang Zhang (Huawei) – CCSA
  - Vice Chair: Dario Serafino Tonesi (Qualcomm) – ATIS
  - There are three parallel streams of work during a meeting to handle discussion of the many Work Items, moderated by the Chair and Vice Chairs
  - Technical leadership of individual Work Items is provided by the Rapporteurs, helping to resolve technical debates, organizing between-meeting conference calls and in-meeting drafting sessions, and reporting on progress of their Work Items
-  Essential to the running of SA2 (and all the 3GPP groups) is the support provided by the meeting Secretaries from MCC



# Profile of SA2: Typical SA2 meeting plan

Time	Monday	Tuesday	Wednesday	Thursday (revisions)	Friday (revisions)
<b>Q0</b> Early Session		Drafting	Drafting	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)
<b>Q1</b> 09:00 - 10:30	Plenary Session [Single Stream]	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)
10:30 - 11:00	<i>Morning Coffee Break</i>	<i>Morning Coffee Break</i>	<i>Morning Coffee Break</i>	<i>Morning Coffee Break</i>	<i>Morning Coffee Break</i>
<b>Q2</b> 11:00 - 12:30	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)
12:30 - 14:00	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
<b>Q3</b> 14:00 - 15:30	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Plenary Session
15:30 - 16:00	<i>Afternoon Coffee Break</i>	<i>Afternoon Coffee Break</i>	<i>Afternoon Coffee Break</i>	<i>Afternoon Coffee Break</i>	<i>Afternoon Coffee Break</i>
<b>Q4</b> 16:00 - 17:30	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Plenary Session [Single Stream for SID/WID]	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	Plenary session (if needed)
17:30 - 18:00	<i>Break</i>	<i>Break</i>	<i>Break</i>	<i>Break</i>	<i>Break</i>
<b>Q5</b> 18:00 - 19:30	Available for single or multiple streams, or drafting	Available for single or multiple streams, or drafting	Plenary Session [Single Stream for Work Planning]	Stream#1 (1TU) Stream#2 (1TU) Stream#3 (1TU)	





# Profile of SA2

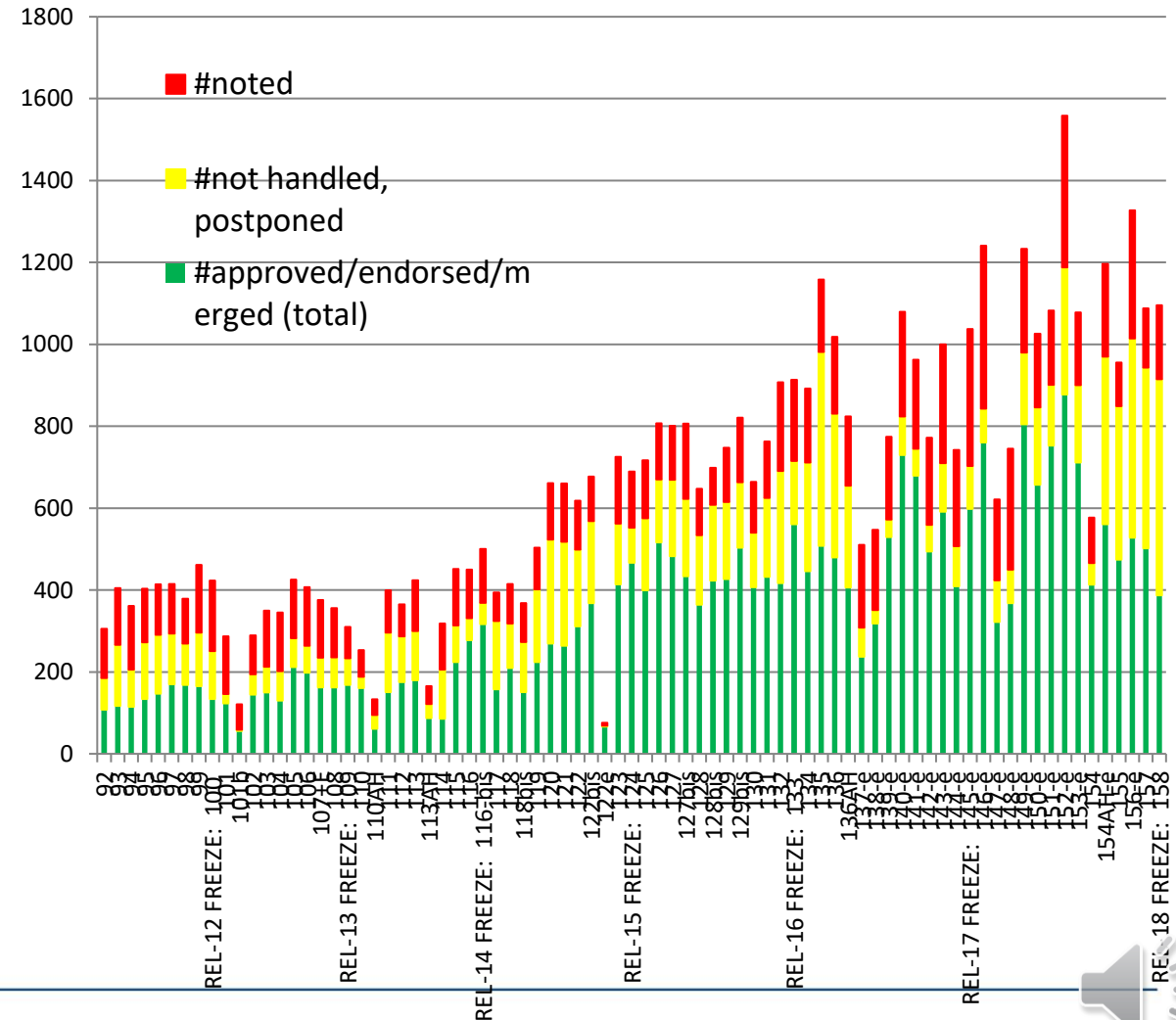
- As one of the busiest Working Groups in 3GPP, SA2 typically has six Ordinary meetings a year, and one ad hoc meeting, each lasting one week
- The Ordinary meetings are face to face and globally distributed
- The ad hoc meeting is expected to be electronic via email discussion and conference calls
- Between meetings there are additional conference calls and email discussions, so the delegates rarely rest

SA2#158	August 21, 2023	August 25, 2023	Gothenburg
SA2#159	October 9, 2023	October 13, 2023	Xiamen
<b>SA2#160</b>	<b>November 13, 2023</b>	<b>November 17, 2023</b>	<b>Chicago</b>
SA2-Ad Hoc	January 22, 2024	January 26, 2024	Electronic
SA2#161	February 26, 2024	March 1, 2024	Athens
SA2#162	April 15, 2024	April 19, 2024	China
SA2#163	May 27, 2024	May 31, 2024	Korea,
SA2#164	August 19, 2024	August 23, 2024	EU
SA2#165	October 14, 2024	October 18, 2024	India
SA2#166	November 18, 2024	November 22, 2024	Orlando



# Profile of SA2

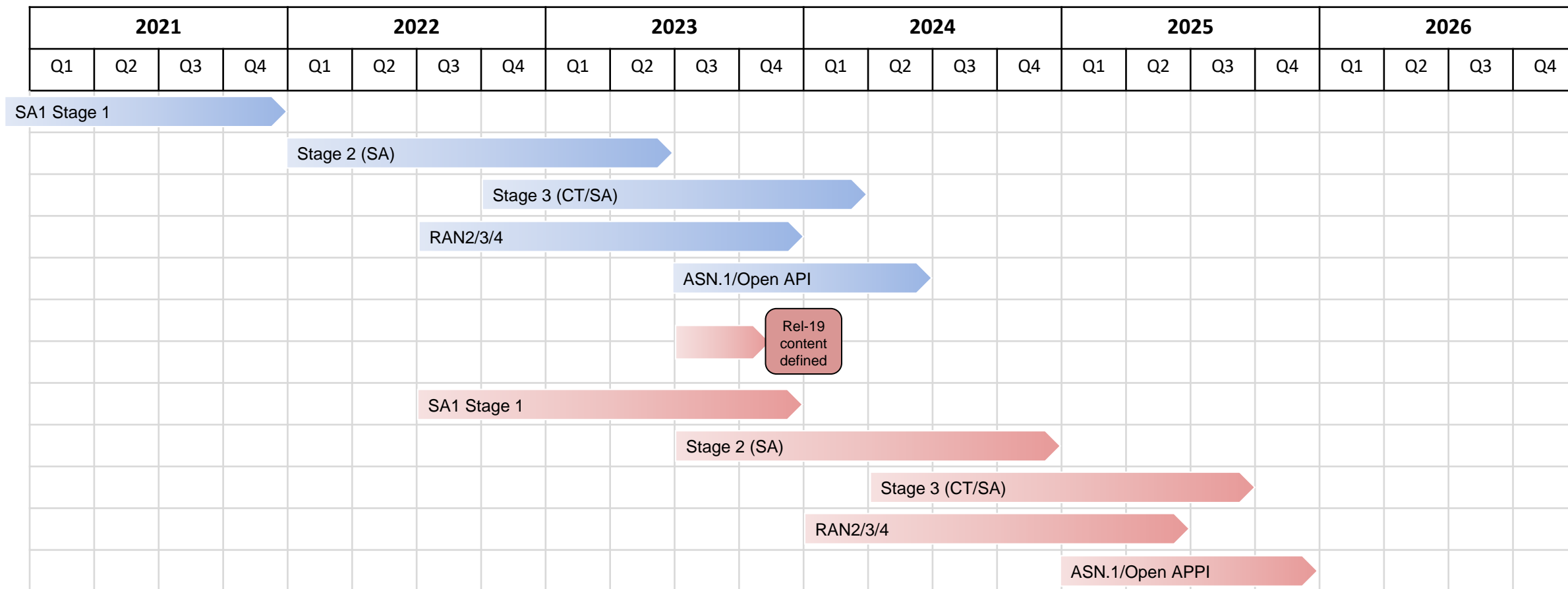
- Over many years SA2 meeting attendance has exceeded 150 delegates
- That number has climbed steadily over recent years, peaking during the pandemic, and now consistently around 250 participants
- The number of input documents per meeting has also climbed steadily, from around 400 back in 2016 to typically more than 1000 since 2020
- Not all can be handled during a single meeting, but those that are will often go through multiple revisions until agreed



## SA2 and Release 18 and 19

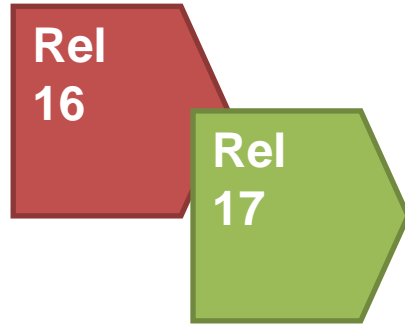


# Release 18 and Release 19 schedules



# Content of Release 18

- Release 18 saw the inclusion of 28 topics (Work and Study Items), the largest number in a release so far
- Many of the Work Items for SA2 in Release 18 are new features and enhancements
- The others are continuations of work that was started in Release 17 and in some cases has been going on since Release 16
- Of course the foundation for all of this was Release 15, and the start of 5G



Continuation of features and enhancements	
Satellite access Phase 2	RedCap Phase 2
Phase 2 for UAS, UAV and UAM	ATSSS support Phase 3
5GC LoCation Services Phase 3	Edge Computing Phase 2
Proximity-based Services in 5GS Phase 2	Support for 5WWC Phase 3
5G multicast-broadcast services Phase 2	Enablers for Network Automation for 5G - Phase 3
Network Slicing Phase 3	Enhanced support of Non-Public Networks phase 2

New features and enhancements	
5G System with Satellite Backhaul	5G Timing Resiliency and TSC & URLLC enhancements
Personal IoT Networks	Vehicle Mounted Relays
Ranging based services	MPS_WLAN
Generic group management, exposure and communication	5G AM Policy
System Support for AI/ML-based Services	Enhancement of 5G UE Policy
XR (Extended Reality) and media services	System Enabler for Service Function Chaining
UPF enhancement for Exposure And SBA	Extensions to the TSC Framework to support DetNet
Evolution of IMS multimedia telephony service	Seamless UE context recovery

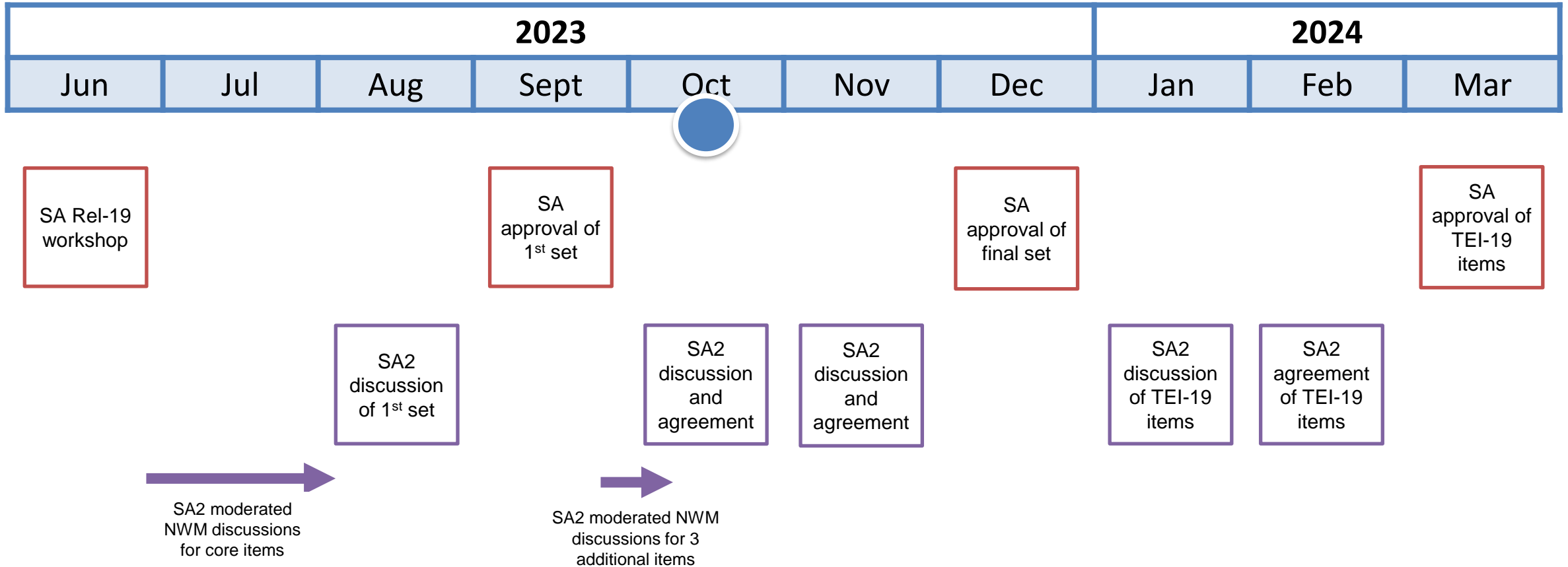


# Content discussions for Release 19

- 📡 Timeline for the discussions
- 📡 Outcome of SA#100 (June 2023)
- 📡 Outcome of Q3 moderated discussions and SA2#158 (August 2023)
- 📡 Outcome of SA#101 (September 2023)
- 📡 Outcome of SA2#159 (October 2023)
- 📡 Plan for SA2#160 (November 2023)
- 📡 Expectations of SA#102 (December 2023)



# Content discussions for Release 19 – Timeline



# Outcome of SA#100 (June 2023)

- 📶 Companies were invited to submit presentations of what topics they wanted to see worked on in Release 19
- 📶 Based on this input a list of 17 core topics were agreed, from which SA2 was requested to create Study Items and Work Items
- 📶 7 of the core topics (1<sup>st</sup> set) were considered candidates for starting technical work in Q4 2023 if they would be Approved by SA in September

Core Topics
Satellite Architecture Enhancements
XRM Enhancements and Metaverse
AI/ML enhancements
Multi-access (Dual 3GPP + ATSSS Enh)
Energy Efficiency / Energy Saving as a Service
Ambient IoT
Integrated Sensing and Communication
IMS and NG_RTC enhancements
Edge Computing Enhancements
Proximity Services enhancements
TSC/URLLC/TRS enhancements
Network Sharing
User identities + identification of device behind RG/AP
5G Femto
UAS enhancements
VMR Enhancements
UPEAS Enhancements





# Outcome of SA#100 (June 2023)

- SA endorsed the guidelines that SA2 endorsed in their May 2023 meeting
  - SA2 assumptions
    - 36 TUs per meeting and 8 SA2 meetings from start of Rel-19 until Rel-19 stage-2 freeze deadline
    - 6 TUs/meeting (out of the 36 TUs) buffer for TEI-19, Rel-18 alignment, overflow, 5G deployment issues, etc
  - SA2 available capacity for Rel-19 SI/WI
    - The Max number of TUs available for Rel-19 SIs/WIs is estimated to be = 134 TUs
    - Should limit to 14 TUs available for any SI/WI
    - The recommended maximum number of Rel-19 SIs/WIs = 10 - 14 SIDs/WIDs



# Outcome of Q3 offline and SA2#158

- The 17 core topics were discussed using NWM ahead of the August SA2 meeting
- Moderated by experienced SA2 delegates
- Companies provided their input and opinions, the moderators created Study Item Descriptions from these
  - Including Work Tasks (defining the scope) and Time Unit estimates
- The Study Item Descriptions were submitted by the moderators for discussion during the August SA2 meeting

Core Topics
Satellite Architecture Enhancements
XRM Enhancements and Metaverse
AI/ML enhancements
Multi-access (Dual 3GPP + ATSSS Enh)
Energy Efficiency / Energy Saving as a Service
Ambient IoT
Integrated Sensing and Communication
IMS and NG_RTC enhancements
Edge Computing Enhancements
Proximity Services enhancements
TSC/URLLC/TRS enhancements
Network Sharing
User identities + identification of device behind RG/AP
5G Femto
UAS enhancements
VMR Enhancements
UPEAS Enhancements



# Outcome of SA#101 (September 2023)

- 📶 Five Study Item Descriptions were Approved, work can begin in SA2 during Q4 2023
- 📶 Three of the 1<sup>st</sup> set candidate Study Item Descriptions were not Approved as discussion of Work Tasks and Time Unit estimates did not reach consensus
- 📶 The additional 10 core Study Item Descriptions were briefly discussed but no further progress made
- 📶 Three additional items were added to the original 17 core items and SA2 asked to have moderated discussions of them
  - Architecture related to roaming value-added services
  - 5GS Operational Improvements of Network Slicing
  - Enhanced Traffic Management

## Approved (1<sup>st</sup> set)

Study on Integration of satellite components in the 5G architecture Phase III

Study on system architecture for next generation real time communication services phase 2

Extended Reality and Media service (XRM) Phase 2

Feasibility Study on 5GS Enhancement for Energy Efficiency and Energy Saving

Study on MPS for IMS Messaging and SMS services



# Outcome of SA2#159 (October 2023)

- 📶 Technical work started on 4 of the 5 Approved 1<sup>st</sup> set items
- 📶 Drafting sessions and on-line discussion were used to try to progress the Study Item Descriptions
- 📶 A small number (3) were considered technically stable and to have reasonable Time Unit estimates, and were recorded as “Endorsed”
- 📶 The remaining 15 still had lack of consensus on the technical details in their Work Tasks or Time Unit estimates, or had significant dependencies on RAN
- 📶 These 15 were postponed, and further work is needed ahead of, and during, the SA2 meeting in November



# Overall status after SA2#159 (October 2023)

## In progress

Study on Integration of satellite components in the 5G architecture Phase III

Study on system architecture for next generation real time communication services phase 2

Extended Reality and Media service (XRM) Phase 2

Feasibility Study on 5GS Enhancement for Energy Efficiency and Energy Saving

Study on MPS for IMS Messaging and SMS services

## Endorsed

Study on Architecture Enhancements for Vehicle Mounted Relays (VMR) Phase 2

Study on System Enhancement for Proximity-based Services in 5GS - Phase 3

New Work Item on Indirect Network Sharing

## Postponed

Study on Side link time synchronization

Study on enhancement of Timing Resiliency, TSC&URLLC, and LAN

Study on Enhancement of Usage of User Identifiers in the 5G System

Study on Enhancement of support for Edge Computing in 5G Core network phase 3

Study on Phase 3 for UAS, UAV and UAM

Study on Architecture Enhancement to support Integrated Sensing and Communication

Study on UPF enhancement for Exposure and SBA Phase 2

Study on Architecture aspects of 5G Femto

Study on Roaming Value Added Services

Study on Operational Improvements of Network Slicing

Study on Enhanced Traffic Management

Study on Multi-Access (DualSteer + ATSSS Ph-4)

Study on Architecture support of Ambient power-enabled Internet of Things

Study on Core Network Enhanced Support for Artificial Intelligence (AI)/Machine Learning (ML)



# Plan for SA2#160 (November 2023)

- 📶 Focus discussion on the postponed items
- 📶 Agree or endorse them if possible, ensuring that Time Unit estimates are reasonable, the Work Tasks are technically correct and dependencies between Work Tasks, and with other groups (especially RAN) are documented
- 📶 Request SA to determine the content of Release 19 based on a subset of the SA2-agreed or SA2-endorsed items
- 📶 Fitting within the guidance previously endorsed by SA and SA2
- 📶 Proposals for TEI-19 candidates will be on the agenda for information, but will not be discussed until Q1 2024



# Expectations of SA#102 (December 2023)

In progress
Study on Integration of satellite components in the 5G architecture Phase III
Study on system architecture for next generation real time communication services phase 2
Extended Reality and Media service (XRM) Phase 2
Feasibility Study on 5GS Enhancement for Energy Efficiency and Energy Saving
Study on MPS for IMS Messaging and SMS services
Agreed/Endorsed (was Endorsed)
Study on Architecture Enhancements for Vehicle Mounted Relays (VMR) Phase 2
Study on System Enhancement for Proximity-based Services in 5GS - Phase 3
New Work Item on Indirect Network Sharing
Endorsed/Agreed (was Postponed)
Study on Side link time synchronization
Study on enhancement of Timing Resiliency, TSC&URLLC, and LAN
Study on Enhancement of Usage of User Identifiers in the 5G System
Study on Enhancement of support for Edge Computing in 5G Core network phase 3
Study on Phase 3 for UAS, UAV and UAM
Study on Architecture Enhancement to support Integrated Sensing and Communication
Study on Architecture Enhancement to support Integrated Sensing and Communication
Study on UPF enhancement for Exposure and SBA Phase 2
Study on Architecture aspects of 5G Femto
Study on Roaming Value Added Services
Study on Operational Improvements of Network Slicing
Study on Enhanced Traffic Management
Study on Multi-Access (DualSteer + ATSSS Ph-4)
Study on Architecture support of Ambient power-enabled Internet of Things
Study on Core Network Enhanced Support for Artificial Intelligence (AI)/Machine Learning (ML)

Approved by SA
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Candidates for TEI-19

- SA will determine the package of Release 19 SA2 Study and Work Items
- In line with the previous guidance of 14 items, and a total of 134 Time Units, and Rapporteurs will be assigned
- All In Progress, Agreed or Endorsed SA2 items will be included in the discussion
- Technical work on these can start/continue in Q1 2024
- Items for TEI-19 consideration will be further discussed in SA2 in Q1 2024



# Looking ahead to Release 20

- 📶 SA1 will already be working on service requirements from early 2024
  - Further 5G Advanced requirements will be considered
  - Requirements for 6G could start being discussed mid-2024
- 📶 SA2's freeze date (and 3GPP's Stage 2 freeze in general) for Release 19 is December 2024
- 📶 3GPP will start to discuss the 6G timeline in December 2023 so the decision on the Release 20 timeline is still to be made

