



6G Progress Report



Advancing 6G through 3GPP developments
and industry collaboration

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1. Executive Summary

This GSMA 6G Progress Report provides a structured overview of recent 3GPP 6G standardisation activities across TSG SA, TSG RAN, and TSG CT, covering the period spanning SA2#173 in Goa (February 2026) and SA2#174 in Malta (April 2026). A landmark milestone during this period was the approval of the first 3GPP 6G Work Item (WI) at SA#111 in Fukuoka, marking the formal start of normative 6G standardisation under Rel-21. The target completion for Rel-21 stage 2 work is March 2028, with ASN.1 and OpenAPI freezes planned for March 2029, enabling early commercial 6G deployments from 2030. The SA2 6G Architecture Study (FS_6G_ARC), captured in TR 23.801-01, now encompasses 24 Key Issues (KIs) spanning control and user plane design, AI integration, computing, sensing, data frameworks, non-terrestrial networks, and migration and interworking aspects.

At TSG RAN#111, approximately 90% completion was achieved on the 6G RAN scenario and requirements study (TR 38.914). A key technical outcome was the agreement on maximum channel bandwidth for sub-7 GHz operation, settled at 400 MHz in the downlink and 200 MHz in the uplink following extensive debate among chipset vendors, infrastructure vendors, and operators. Initial convergence was also achieved on 6G band and node naming conventions. Several strategic items remain open, including waveform and channel coding selection, RAN–CN interface evolution, Ambient IoT Phase 2 enhancements, and NTN use of terrestrial spectrum, with decisions expected at RAN#112 in June 2026. At TSG CT#111, three Study Item Descriptions (SIDs) were approved in CT4 covering control plane protocols, user plane protocols, and resilience in the 6G core network, while CT1 approved a Study Item Description (SID) on NAS protocol for the 6G System. CT3 is advancing candidate SIDs on network capability exposure, artificial intelligence, and interworking with external data networks, with approval anticipated at CT#112.

Within SA2, the 6G architecture study has made considerable structural progress across all 24 KIs. Solution variant categories have been agreed and high-level principles documented, with the emphasis now shifting towards detailed technical content, procedure definition, and resolution of open editors' notes. For control and signalling (KI#1), four solution variant categories have been defined for NAS evolution, covering reuse of 5G NAS, a new split architecture separating routing from mobility management, AI-enabled control plane agents, and new RAN–CN interaction models. Network slicing (KI#3), user

plane (KI#4), QoS (KI#5), and policy and charging (KI#6) have each produced structured variant classifications with corresponding TDoc mappings. Voice (KI#12) and emergency voice (KI#13) services are approximately 80% complete, location services (KI#14) have been extended to include AI-driven positioning variants, and migration and interworking (KI#17) has agreed comprehensive variants for single and dual registration between the 6G System (6GS), 5G System (5GS), and Evolved Packet System (EPS).

The AI-related KIs are among the most active in the study. KI#18 (AI for 6G) has defined 22 solution variants covering intent handling, ML inference and training, AI capability exposure, performance monitoring, and operator control over AI autonomy. KI#19 (6G for AI) addresses UE AI agent communication, application-layer approaches, network capability exposure to AF-hosted AI agents, and CN-based AI training and inference services. KI#22 (Computing) has produced 15 solution variants across five groups, spanning computing coordination architectures, service authorisation, capability exposure, and resource monitoring. KI#20 (Integrated Sensing and Communication) has agreed five top-level architecture variants, KI#21 (Data Framework) has aligned 12 functional topics and 14 use cases, and KI#23 (NTN) has documented three solution variants building on 5G NTN as the baseline. Overall, the study is well positioned for its planned completion in March 2027, with SA2#175 expected to advance detailed technical descriptions across all KIs. The GSMA 6G Community continues to track and synthesise these developments, with two further white papers on 6G System architecture and 6G terminals planned for launch at MWC Shanghai 2026.

2. GSMA 6G Community

2.1. GSMA 6G Community Objectives

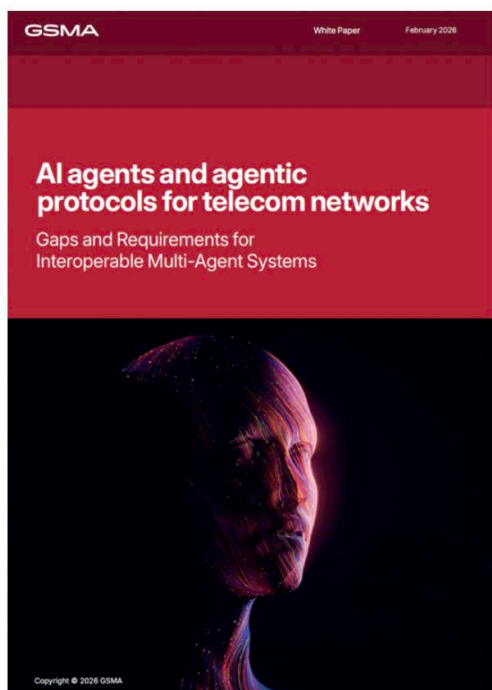
The GSMA 6G Community, also referred to as the 6G Task Force (6GTF), aims to establish a structured and collaborative platform to guide the evolution of future mobile networks. It seeks to identify, assess, and build consensus on emerging trends, key use cases, and enabling technologies that will shape 6G Systems, while ensuring alignment with market demands and broader societal needs, such as sustainability and inclusivity. The 6G Community also supports global standardisation efforts by highlighting priority topics and fostering early industry convergence to reduce fragmentation. Central to its approach is the promotion of open collaboration and knowledge sharing across operators, vendors, academia, and the wider ecosystem. At the time of writing, the 6GTF has 150 members on the GSMA internal platform.

2.2. High-Priority Work Areas in 2026

2.2.1. Group 1: AI/ML

This group focuses on the integration of advanced AI/ML capabilities, particularly Agentic AI, into future network and service architectures. It explores relevant use cases, requirements, and their potential value, including return on investment and associated infrastructure requirements. The group also examines enabling architectures, protocols, interfaces, and APIs needed to support AI agents within telecom environments, while assessing the broader impact of AI-driven systems on network functions and services, such as core and RAN control, interoperability, voice, and roaming.

The group has already launched a white paper entitled [“AI Agents and Agentic Protocols for Telecom Networks: Gaps and requirements for interoperable multi-agent systems”](#) at MWC Barcelona 2026. The paper is available to download (scan the QR code below).





Paper Summary. Telecom networks are entering a new phase where traditional automation and isolated AI functions are no longer sufficient to meet the demands of scale, complexity, and flexibility expected in the 6G era. Future networks will operate across highly dynamic environments, spanning radio, core, cloud, edge, devices, and external service platforms, while simultaneously meeting strict performance, regulatory, and economic constraints. In this context, agentic systems, comprising autonomous, goal-oriented, and collaborative AI agents, represent a promising opportunity to realise AI-native telecom networks. This white paper investigates the current state of AI agents in telecom networks, identifies key gaps in existing agentic frameworks and protocols, and outlines the requirements for telecom-ready agentic systems. While recent advances in generative AI (GenAI) and large language models (LLMs) have accelerated adoption of AI agents across operations, most existing agentic solutions were designed for general-purpose, software-centric environments. When applied to telecom networks, they fall short in areas such as coordination at scale, real-time operation, semantic consistency, reliability, security, and interoperability across vendors and domains.

The paper highlights that telecom agents differ fundamentally from general-purpose agents. They interact with physical network infrastructure, operate under strict timing and safety constraints, and must comply with regulatory and standards requirements. Moreover, telecom use cases typically involve the orchestration of multiple specialised agents, operating across terminals, networks, and services, rather than the simple execution of isolated autonomous entities. This makes coordination, planning, and communication central architectural challenges. To address these challenges, the paper defines a comprehensive set of requirements for telecom-

ready agentic systems, covering multi-agent operation, QoS-aware communication, service continuity, task-oriented resource management, intent-based interaction, governance, security, extensibility, and interoperability. These requirements motivate the need for telecom-aware agentic protocols, which go beyond basic message exchange to support shared semantics, structured actions, constraint-aware planning, and efficient coordination.

Finally, the paper positions the agentic approach as a promising opportunity for future 6G networks and, where relevant, standardisation efforts. By elevating goals, constraints, semantics, and coordination to protocol-level constructs, telecom operators and vendors can enable scalable, trustworthy, and interoperable multi-agent systems that align technical autonomy with business and regulatory objectives.

2.2.2. Group 2: Deterministic Transport and Compute

This group investigates the convergence of transport and compute capabilities to enable deterministic network performance required by emerging 6G applications. It identifies key use cases that depend on predictable latency, reliability, and performance, such as Compute as a Service, and evaluates existing technological enablers. The group further conducts gap analysis to highlight limitations, including insufficient cross-domain coordination, lack of standardised interfaces between compute and transport layers, and the need for enhanced AI-driven orchestration mechanisms.

2.2.3. Group 3: Data Framework

This group examines the role of data as a critical enabler in 6G Systems, focusing on use cases for data and analytics collection, transport, storage and exposure and their associated business and operational models. It assesses existing data frameworks, such as NWDAF (TS 23.288^[1] and TS 29.520^[2]), DCCF (TS 23.288^[1] and TS 23.501^[3]) and MDAF (TS 28.104^[4] and TS 28.105^[5]), to identify gaps and limitations, and develops the rationale for a unified or common data framework that can improve interoperability, efficiency, and scalability. The group also explores how such frameworks can enable operator value creation, including service innovation and data-driven monetisation opportunities.

2.2.4. Group 4: System Architecture

This group addresses the evolution of system architecture towards 6G, including enhancements to the SBA and related operational considerations. It investigates the principles and requirements of intent-based networking, including APIs and closed-loop automation mechanisms, to support more autonomous and adaptive networks. Additionally, the group analyses migration strategies, including the feasibility of deploying 6G capabilities on top of existing 5G infrastructure, ensuring a smooth and practical transition path.

This group is currently working on a white paper to report on the progress of this workstream with completion deadline of June 2026. The white paper is planned to be launched during [MWC Shanghai 2026](#).

Paper Summary. As networks become increasingly complex and service demands continue to grow, existing architectural paradigms must evolve to support distributed intelligence, advanced automation, and new interaction models. Building on lessons learned from 5G, this work examines key architectural principles, including the evolution of the Service-Based Architecture, the introduction of intent-based service provisioning, and the integration of emerging paradigms such as agent-to-agent communication. These developments are essential to support diverse use cases, ranging from immersive services to multi-agent systems operating across terminals, networks, and cloud environments.

The paper further analyses key enablers and design considerations for a flexible, scalable, and interoperable 6G architecture. This includes defining frameworks for intent representation and delivery, identifying architectural options and evaluation criteria, and addressing migration and interworking with existing 5G deployments. The work aims to establish a robust architectural foundation capable of supporting automation, enabling new service models, and facilitating continuous innovation, while ensuring alignment with standardisation efforts and industry-wide convergence.

2.2.5. Group 5: Upper Layer Architecture (MAC, RLC, PDCP, RRC)

This group focuses on the evolution of upper-layer protocols to meet the performance, efficiency, and flexibility requirements of 6G. It identifies use cases that necessitate new or enhanced protocol capabilities and conducts gap analysis of existing protocol stacks. The group also explores adaptive, cross-layer, and energy-efficient design approaches to support advanced radio features and AI-driven workflows, ensuring that protocol evolution aligns with overall system performance objectives.

2.2.6. Group 6: 6G Terminals

Paper Summary. This group explores the evolving role of terminals within 6G ecosystems, particularly in enabling distributed AI, compute, and sensing capabilities. It analyses key use cases such as immersive services, edge collaboration, and multi-agent interactions, while considering a wide range of device form factors, including handheld, wearable, vehicular, and IoT devices. The group also identifies emerging capabilities such as on-device AI processing, integrated sensing and communication, energy-efficient designs, and NTN support, and examines associated challenges including interoperability, security, and sustainability.

This group is currently working on a white paper on 6G terminals, with a target completion date of June 2026. The white paper will be launched during MWC Shanghai 2026.

The number of global 6G terminal connections is expected to reach 289 million by 2030 and grow to 3.5 billion by 2035^[6]. Over the next decade, general-purpose embodied intelligent robots are also anticipated to experience rapid growth, with global shipments expected to reach 2.6 million units by 2035^[6]. Emerging trends, such as new use cases (e.g., AI agents and industrial digitalisation), key technologies (e.g., 6G, Generative AI, large language models, and AI hardware), and evolving requirements (such as enhanced privacy and security), are driving significant transformations in terminal devices. As a critical component of the 6G ecosystem, terminals will play a vital role in supporting 6G System goals and enabling new capabilities. They serve as a bridge between the virtual and physical worlds, integrate diverse advanced technologies, and act as the primary gateway for future application services, including AI agents. The evolution of terminals is expected to have far-reaching impacts on society, the economy, and users' daily lives.

Based on recent industrial advancements, emerging technologies, and terminal development trends, this study explores typical use cases, form factors, capabilities, and research directions for 6G terminals to address the increasingly complex scenarios and diverse challenges of future networks. This report aims to provide insights and guidance to support the development and evolution of the terminal ecosystem.

3. 3GPP 6G Updates

3.1. Next Steps Towards 6G

The following summary outlines the key milestones and progress towards 6G standardisation within 3GPP^[7].

- Rel-20 adopts a dual-track approach, progressing 5G-Advanced normative work while initiating 6G studies under the Rel-20_6G framework.
- The SA1 study on 6G service requirements (TR 22.870^[8]) has been completed, and corresponding normative work for Rel-21 has been approved with a target completion of March 2027. RAN studies are also well underway, aligned to the same timeframe.
- In parallel, SA2's architecture study (FS_6G_ARC) is advancing across multiple work tasks, covering areas such as control plane and user plane design, AI integration, computing, sensing, data frameworks, NTN, and migration aspects.
- SA3 has initiated studies on 6G security, including AEAD algorithms and the transition towards post-quantum cryptography.
- SA4, SA5, and SA6 are defining the scope of their respective 6G studies on media, OAM, and application enablement, with approval targeted for the December 2026 plenary.
- Rel-21 is expected to mark the start of normative 6G work and preparation for IMT-2030 submission, with the timeline to be finalised by June 2026 and ASN.1 and OpenAPI freezes targeted for March 2029.

3.2. 3GPP TSG SA#111

3GPP TSG SA#111 provided important updates on early 6G standardisation activities across SA working groups. Key discussions covered the completion of the first 6G study and approval of the initial Work Item, alongside coordination on AI traffic characteristics, satellite voice in Rel-20, and application user consent. The outcomes reflect ongoing alignment across SA groups and help guide the next phase of 6G work towards Rel-21.

3.2.1. SA1 (First 6G WID)

The first 3GPP 6G Study Item has been successfully completed and the first 6G WID has been approved. 3GPP SA#111 in Fukuoka, Japan confirmed the SA1-approved WID on 6G Service Requirements. It is the first 6G WID of

3GPP. The target completion time is March 2027, which is confirmed during the SA/RAN/CT joint meeting on the Rel-21 timeline.

TR 22.870, 'Study on 6G Use Cases and Service Requirements', was approved. Appreciation was expressed to the SA1 group and the rapporteurs, Xiaonan Shi (China Mobile) and Jean Trakinat (T-Mobile USA), for their significant efforts over the past 1.5 years in producing a 585-page TR covering 212 use cases.

3.2.2. SA4 (Satellite Voice in Rel-20 & AI Traffic Characteristics)

Satellite Voice in Rel-20. Operators have a strong requirement for the timely deployment of satellite voice features. To facilitate successful commercial deployment in Rel-20, interested companies initiated discussions on timely standardisation to ensure commercial readiness of GEO-based voice services.

SA discussed the overall progress of the SA4 Study on "Ultra Low Bitrate Speech Codec", and there is general consensus on strong market demand for the Voice over NB-IoT GEO feature. Therefore, SA sent an LS to SA4 to prioritise the necessary functionality to support this feature. SA4 is further requested to provide feedback to SA in June 2026 on their proposed plan to deliver the necessary functionality to support a deployable Voice over NB-IoT GEO feature in Rel-20. This plan may include details such as concluding the FS_ULBC study and normative work on an ultra-low bitrate codec (ULBC), RTP header compression, etc. (see SP-260324).

AI Traffic Characteristics. SA4 will proceed with AI traffic characteristics work first, and SA2 will wait for at least one quarter. After three meetings of discussion, SA agreed on the coordination between SA2 and SA4 work on AI traffic. The discussion is based on the assumption of avoiding overlap as much as possible, while recognising that SA2 and SA4 have different remits and have coordinated well in XRM in Rel-18. SA has requested SA4 to continue work on AI-related application traffic characteristics between the UE and application server, prioritise this work, and provide initial feedback to SA2 and other relevant Working Groups (WGs) by May 2026. SA2 was requested to wait until May 2026 for this initial feedback from SA4 for their work.

3.2.3. SA6 (Application User Consent)

SA6 was asked to consider GSMA-related progress on user consent before concluding the study and starting normative work. The plenary noted the new WID on Application User Consent, approved by SA WG6. SA6 has been asked to conclude the study on Application User Consent, taking into account any information from GSMA, before proceeding with related normative work.

3.2.4. Key Takeaways

3GPP TSG SA#111 marks a significant step forward in 6G standardisation. The successful completion of the first 6G study (TR 22.870^[8]) and approval of the first 6G WID establish a clear foundation for Rel-21, with a defined timeline towards March 2027. At the same time, the SA plenary ensured effective coordination across working groups: prioritising SA4 work on AI traffic characteristics to inform SA2, accelerating satellite voice capabilities in Rel-20 in response to strong operator demand, and aligning SA6 activities on user consent with ongoing GSMA efforts. Overall, SA#111 demonstrates strong momentum, improved cross-WG alignment, and a structured path towards early 6G System definition.

3.3. 3GPP TSG RAN#111

Focus areas: Rel-21, 6G RAN studies, spectrum, AI/ML, Ambient IoT, NTN

3GPP RAN#111 in Fukuoka, Japan marked a critical consolidation phase for early 6G RAN work, with approximately 90% completion of the 6G RAN plenary Study Item^[9]. The 3GPP Technical Report on 6G scenario and requirements (TR 38.914) is expected to be completed by the next plenary (TSG#112) which will be held in June 2026 in Singapore. TSG chairs proposed initial plans for Rel-21 timeline and the freeze date for 6G stage-1 specification which is planned by March 2027 has been endorsed.

Key progress was achieved on:

3.3.1. Rel-21 Timeline Alignment and Pending Approval at RAN#112

Maximum channel bandwidth (CBW) for sub-7 GHz 6G operation. Ambient IoT Phase 2 normative work, extending beyond Rel-19. Initial convergence on 6G band and node naming conventions. However, several strategic issues remain unresolved, including AI/ML use case prioritisation, NTN use of terrestrial spectrum, and 6G migration architecture downselection.

3.3.2. Rel-21 Timeline: Directionally Aligned, Details Pending

Generally, there was broad support for the Rel-21 timeline proposed by TSG chairs (see [Table 3-1](#)). Proposed timeline aligns with 18 months per release cadence where the telecommunication industry is familiar with this timeline allowing to develop and implement necessary feature enhancements based on commercial needs. One of the different approaches was to approve 5G-Advanced RAN1/2/3/4 led WI (Work Item)/SI (Study Item) as a whole package in March 2027. In previous releases, RAN had a separate package approval for RAN4-led WI/SI as some of the RAN4-led core features clearly had dependency on the outcomes of RAN1/2/3. TSG chairs' intention was that compared to 6G specification works, 5G-Advanced specification works will be relatively small and expected to have a smaller set of new features for Rel-21 allowing all WG items to be approved in a single package. Some RAN4 delegates showed strong preference on this approach as RAN4 usually have the heaviest workloads during the meetings as RAN4 needs to handle both RAN4-led WI/SIs and other core features coming from other WGs.

Rel-21 5G-A

- 5G-A / 6G Package Approval: Mar 2027
- Stage-1 freeze: Mar 2027
- Stage-2 freeze: Mar 2028 (>=80%); June 2028 (100%)
- Stage-3 freeze: Dec 2028
- ASN.1/OpenAPI freeze: Mar 2029

Table 3-1: Rel-21 timeline proposed by TSG chairs [RP-260039]

There were also some comments on the ASN.1/OpenAPI freeze timeline, which is currently planned for March 2029. While this timeline enables early 6G commercial deployments and large scale trials from the beginning of 2030, some concerns were raised because there is only one working group meeting in the first quarter during which all ASN.1 freeze activities would need to be completed. Other alternatives, such as moving the ASN.1 freeze to June 2029 or organising an ASN.1 ad hoc meeting in January, were suggested. However, given the potentially strong commercial demand from the industry for early 6G commercial deployment in 2030, it is likely that the specification work will still be targeted for completion by March 2029. Therefore, ensuring that a stable specification containing all commercially implementable and necessary 6G Day-1 features is delivered will be important.

3.3.3. 6G Spectrum: Maximum Channel Bandwidth Agreement

There was RAN4 working agreement on 6G maximum channel bandwidth (CBW) challenged and brought to RAN plenary for agreement or potential voting. This issue contained a considerable number of controversies as most of the UE/chipset vendors claiming that supporting UL/DL max CBW of 400 MHz has issues with power consumption, RF complexity, large FFT size, etc., which makes DL implementation difficult and UL implementation potentially infeasible. A chipset vendor and network infrastructure vendors claimed that 400 MHz is already being supported

with 5G NR in mmWave and the same approach can be made for 6G sub-7 GHz. Also as we are targeting commercial products for 2030 and Wi-Fi 7 already supports 320 MHz channel bandwidth, it was suggested to continue study the feasibility of UL 400 MHz support. Operators insisted that the maximum CBW should consider operators' possible spectrum allocations which may allow up to 400 MHz contiguous spectrum for 6G. RAN1 also claimed that they are currently assuming max. CBW of 400 MHz for the PHY layer design and some decision needs to be made in this plenary. In order to prevent voting, delegates made every effort to reach consensus on this issue.

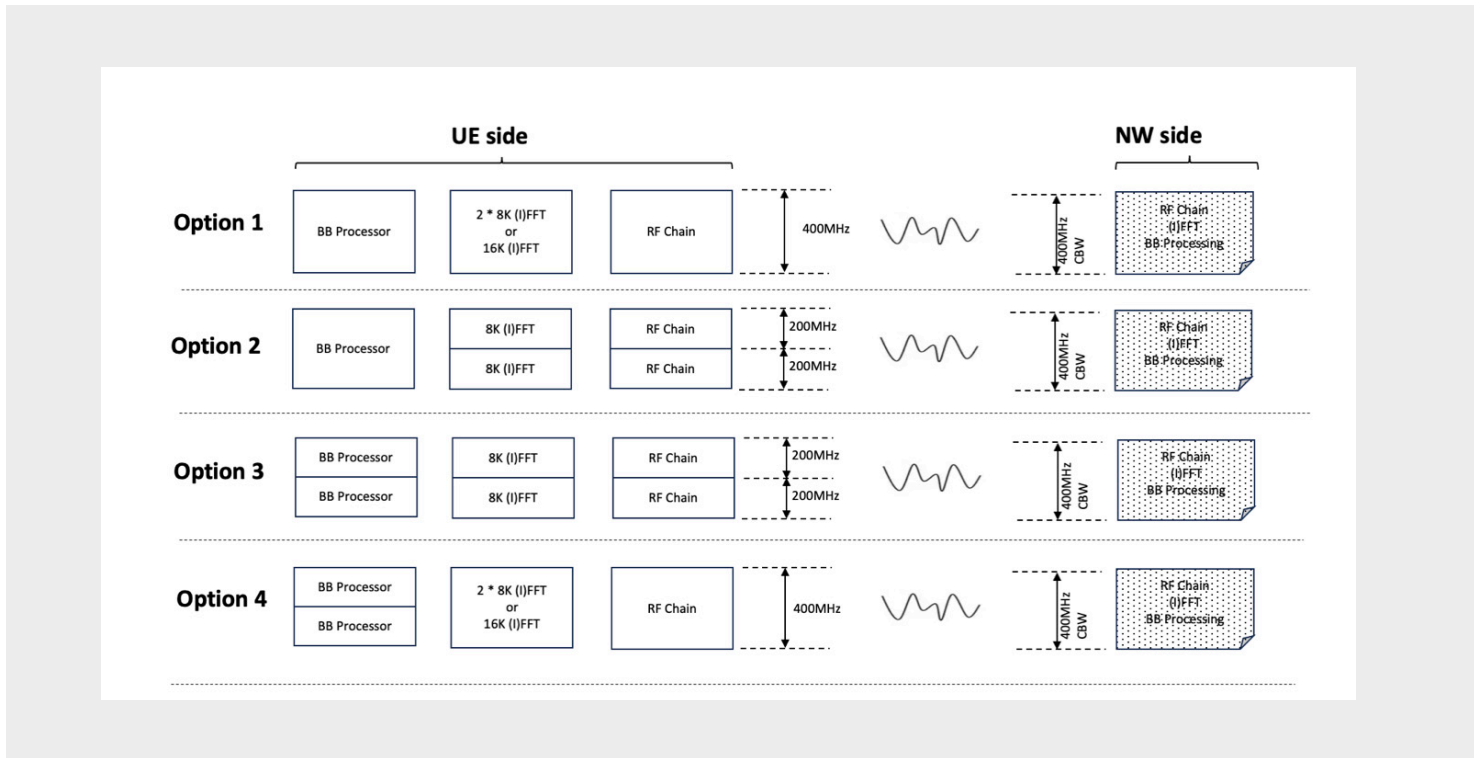


Figure 3-1: Options on implementing 400 MHz CBW for UE and network side (RP-260746)

RAN was able to reach consensus on a working agreement as below:

- Downlink: up to 400 MHz
- Uplink: up to 200 MHz
- Specifications will support other CBW values in DL between 200 MHz and 400 MHz as needed based on operator's spectrum needs
- Studying UEs operating with maximum CBW 400 MHz in the UL may be revisited in future releases beyond Rel-20 based on contributions

This was considered a practical compromise reached during RAN#111, as a maximum CBW of 400 MHz in the downlink will enable higher data rates for 6G users, enhancing the user experience. This will also allow regulators to consider 400 MHz contiguous spectrum allocation to operators that require additional bandwidth for enhanced performance. This also reduces burdens on UE/chipset vendors, for whom UL 400 MHz support remains very challenging, and supports broader device availability for operators, particularly given previous challenges in diversifying UE support for 5G NR in mmWave spectrum. However, as 6G may initially start with uplink limitations, there will still be a significant amount of specification work required, based on lessons learned from 5G, to enhance uplink performance towards downlink levels.

3.3.4. Progress of 6G RAN Studies

RAN plenary SI on 6G scenarios and requirements made good progress with key KPIs including coverage, energy efficiency, sensing, AI/ML, positioning, data rates agreed achieving overall completion rate of 90%^[9]. These agreements were captured in the latest version of the technical report TR 38.914^[10]. Some open issues still remain and one of the most discussed topics was on 6G architecture and migration. As 6G standalone with MRSS (multi-radio spectrum sharing) and CA (carrier aggregation) being regarded as the baseline for 6G architecture and migration option, there were still demands on introducing other architecture and migration options as MRSS performance is yet to be identified and need to figure out how to overcome the overhead which was suffered from DSS (dynamic spectrum sharing) for 5G-4G aggregation. Based on lessons learned from 5G with various architecture options, approach on introducing DC (dual connectivity) seems to be cautious. However, as operators have different migration plans, still there are many options such as 6G-6G DC, 6G-5G DC, 5G-6G DC, and dual-stack are being discussed. These architecture and migrations option discussion is due to be finalised by RAN#113 in September 2026. Before making down selection on architecture and migration options, RAN also needs to decide on hardware related 6G features such as waveform, modulation, channel coding, numerology, frame structure, etc. Also RAN-CN interface evolution (P2P vs. SBI), CU/DU, CP/UP split options will be checked at RAN#112 in June 2026.

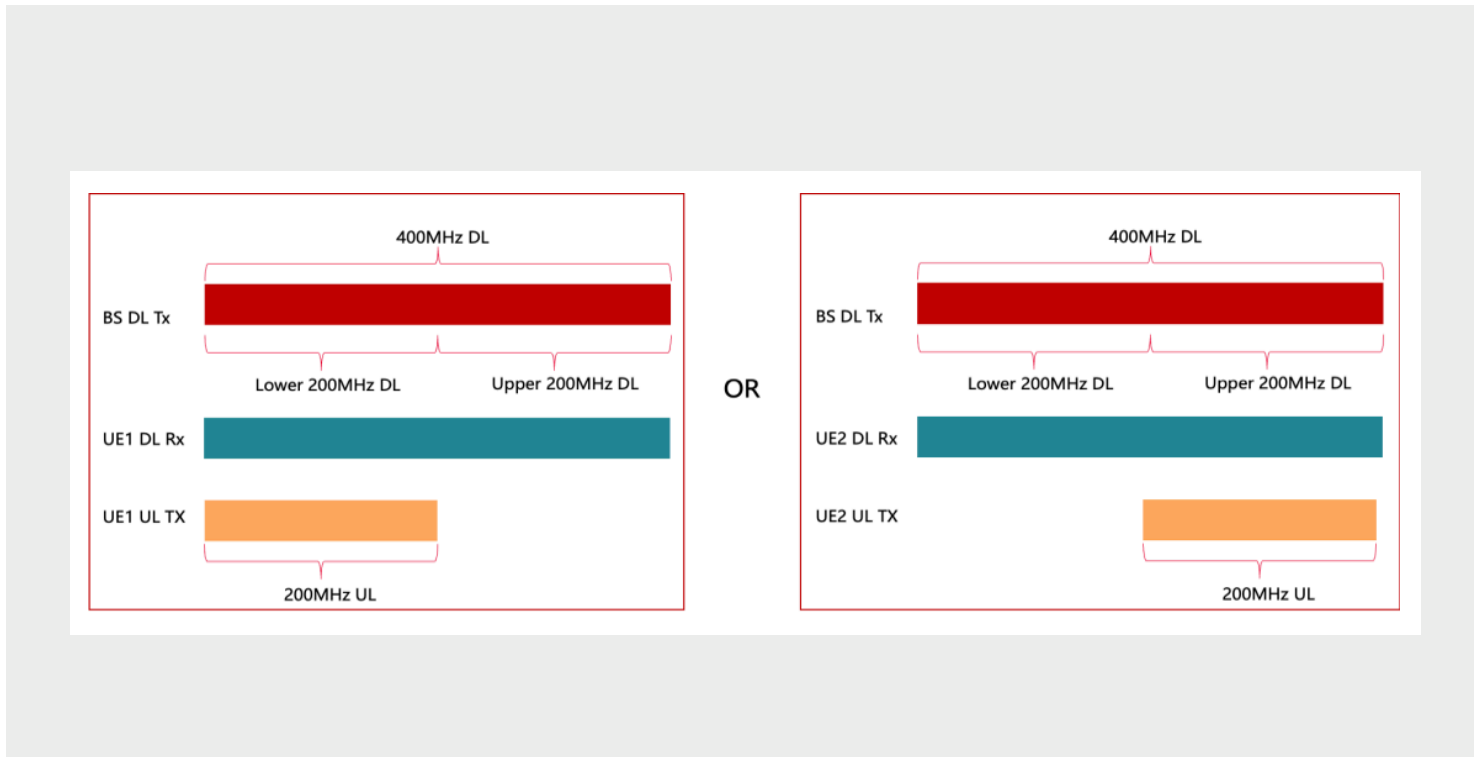
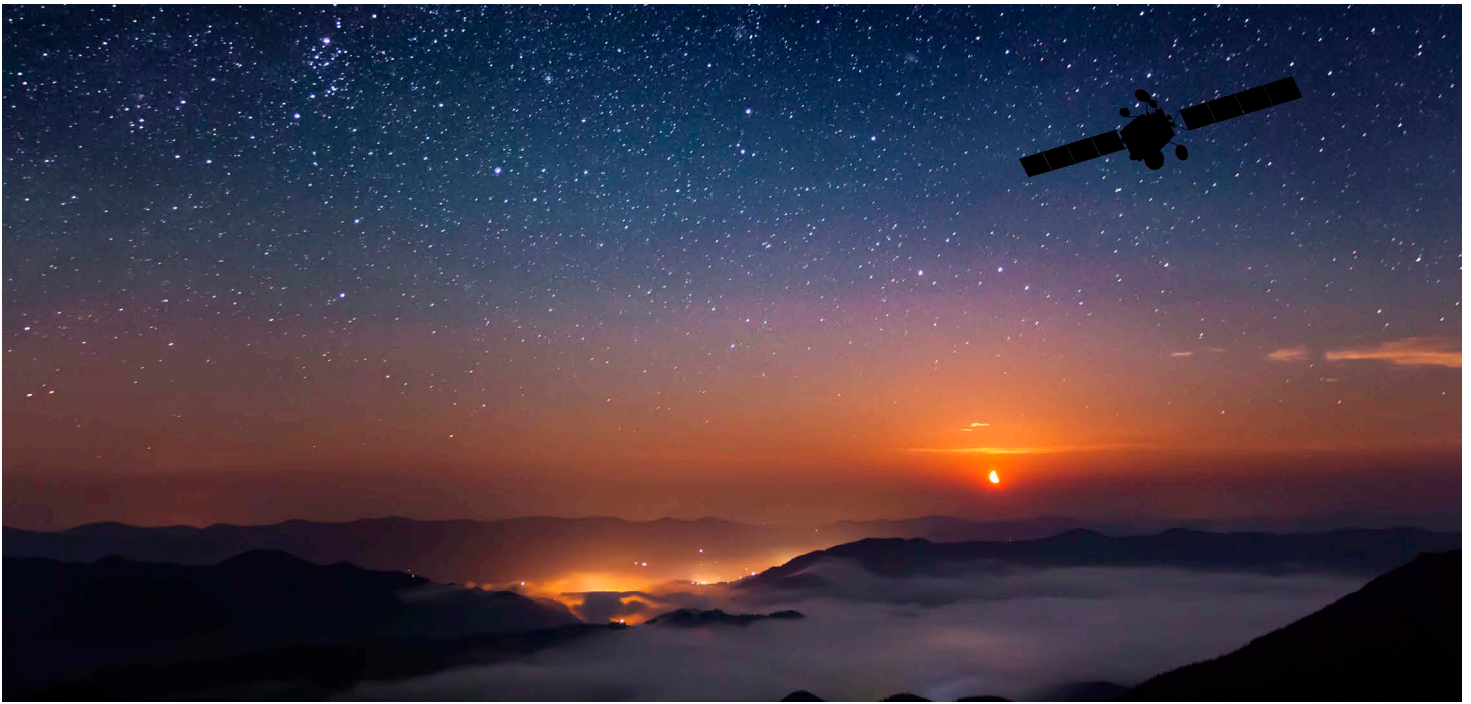


Figure 3-2: DL 400 MHz and UL 200 MHz operations for network and UE (RP-260746)



3.3.5. NTN Use of Terrestrial Spectrum

Use of terrestrial spectrum for NTN has been under discussion for some time. In this plenary both parties were still far from reaching consensus as the coexistence issue between NTN and TN when NTN is using TN spectrum has not been done in 3GPP and this is being discussed as Agenda Item 1.13 of WRC-27. As there are urgent commercial needs from specific countries using legacy TN bands for NTN some proposals were made to continue with country specific specification. However, this not being the normal process of 3GPP, a lot of concerns were raised including NTN-TN coexistence issues and NTN-NTN coexistence issues. Still there is a lack of ITU-R coexistence conclusions and regulatory uncertainty remains across various regions. 3GPP RAN was able to reach consensus on conducting RAN-level regulatory survey aligned with national and regional regulations, ITU-R WRC-27 (agenda item 1.13) and review the progress in June 2026. Considered bands are n1 (2.1 GHz), n7 (2.6 GHz), and n25 (Extended PCS).

3.3.6. Ambient IoT Phase 2: Expansion Beyond Rel-19

For 5G-Advanced, Ambient IoT is considered one of the new features which can drive the creation of new business models for operators. Strategic objectives clearly highlight the aim to enable ultra-low-power IoT devices well below NB-IoT and RedCap capabilities, without replacing existing Low Power Wide Area (LPWA) technologies. The ongoing Study Item has now been converted to a Work Item covering both indoor and outdoor scenarios using two different device classes. Device 2b is targeted for indoor usage, consuming a few hundred μ W. Device C is targeted for outdoor usage with maximum transmission power up to 5 dBm. Key enhancements will include outdoor macrocell deployments, improved localisation beyond ReaderID, coexistence with LTE/NR in FR1 bands

and unified air interface for Device C and Device 2b. Operator expects ambient IoT as a distinct 6G-era IoT layer, supporting massive sensor and inventory use cases. Also ambient IoT will reinforce operators site reuse and spectrum efficiency.

3.3.7. Harmonised 6G Naming

There were proposals to harmonise 6G naming as RAN4 decided to use prefix "s" for 6G spectrum bands and RAN3 decided to use aNB as 6G nodeB. Proposal was to harmonise with "s" as we are targeting 6G however, RAN has decided to keep the decisions made from WGs and continue to use "s" for 6G spectrum bands and "aNB" for 6G node B.

3.3.8. Key Takeaways

6G RAN work is moving from exploration to convergence with the aim to make decisions on hardware oriented features at the next RAN plenary. This will help vendors to consider early design of the product enabling early 6G trials with standards compliant 6G prototypes. It is important to reach consensus on the checkpoints delivered from RAN WGs to continue discussions achieving a global harmonised solutions for 6G air interface and RAN.

3.4. 3GPP TSG CT#111

CT WGs have been discussing 6G SIDs for a few meetings and were finally able to approve a number of SIDs at CT#111 in Fukuoka, Japan, in March 2026. CT WGs are working towards the official Rel-20/21 deadlines to finalise the expected Stage 3 specification work on time. However, Stage 3 work will have a strong dependency on the progress and stability of Stage 2 work, for example in SA2, SA3, and SA5.

3.4.1. CT1 (Discussion and Approvals on 6G SIDs)

Three major topics for 6G have been subject for discussion in CT1.

- NAS protocol
- "Umbrella" SID combining small topics (UAC, PWS, etc):
- Network selection

No agreement was reached in CT1 during Q1 2026. However, a company contribution to TSG CT#111 "New SID on NAS protocol for 6G System" was finally approved in CP-260171.

The expected work in CT1 NAS protocol for 6G System SID will include the following:

- WT#1: Identification of any limitations of legacy NAS protocol.
- WT#2: Objectives related to the study of the NAS protocol for 6G System. This includes:
 - WT#2.1: Study of NAS protocol architecture.
 - WT#2.2: Study of NAS message format and encoding.
- WT#3: Objectives related to the study of stage 3 NAS protocol for 6G System based on the SA2 and SA3 studies for 6G as captured in 3GPP TR 23.801-01 and 3GPP TR 33.801-1. This includes:
 - WT#3.1: Study of stage 3 protocol aspects for NAS to fulfil control signalling requirements.
 - WT#3.2: Study of stage 3 protocol aspects for NAS to fulfil security and privacy requirements.

Note that the work on WT#1 and WT#2.2 can be started. The work on WT#2.1 and WT#3, including the impacts of control signalling requirements for the use of AI (e.g. AI agents, intent), computing, sensing and data framework on NAS, will be further discussed at a later time.

3.4.2. CT3 (Discussion on 6G Candidate SIDs)

Three major areas for 6G have been identified as candidate SIDs in CT3, with companies assigned as pen holders until approval of the SIDs:

- Network Capability Exposure
- Artificial Intelligence
- Interworking between 3GPP network and External Data Networks

Significant progress was made during Q2 to develop further the SID discussions in CT3 and expected approval at CT#112 in June.

3.4.3. CT4 (Approval for Three 6G SIDs)

CT4 has also been discussing 6G SIDs during Q1 with focus on the following areas:

- Study on Control Plane Protocols in Core Network of the 6G System (CP-260165)
- Study on Protocol aspects for User Plane in Core Network of 6G System (CP-260166)
- Study on Resilience and Reliability in Core Network of the 6G System (CP-260167)

All three SIDs were approved at CT#111 and further progress made during Q2 in CT4.

The expected work in Control Plane Protocols in Core Network of the 6G System SID will include the following:

- WT#1: Study candidate protocols for the Control Plane within the Core Network of the 6G System, based on architectural and functional requirements (including enabling the use of AI) defined by SA2.
- WT#2: Study the protocol framework for the technical realisation of the Control Plane within the Core Network for 6GS.
- WT#3: Study the technical realisation of the registration and discovery framework for 6GS.
- Study the impacts required to support 6G services and requirements (e.g. to enable the use of AI) defined by SA2.
- WT#4: Study protocol aspects for the event exposure framework within the Core Network for 6GS.
- WT#5: Study protocol impacts for supporting interworking between 5G System (5GS) and 6G System (6GS), based on SA2 requirements.
- WT#6: Study the design of subscriber data models and procedures for 6GS, following SA2 requirements.
- WT#7: Study protocol aspects for supporting essential and regulatory services (such as Voice Services, Emergency Services, Location Services, Messaging Services, MPS/MCX Service, PWS) in accordance with requirements from SA2 and CT1.
- WT#8: Study the models, principles and guidelines for API definitions in 6GS and Interface Definition Languages.
- WT#9: Study the formats of UE and network identifications for 6GS, following SA2 requirements.

The expected work in Protocol aspects for User Plane in Core Network of 6G System SID will include the following:

- WT#1: Study User Plane protocols within the Core Network and between the Core Network and the Radio Access Network for the 6G System, based on SA2 user plane architectural and functional requirements, to support a diverse range of 6G applications and traffic patterns.
- WT#2: Study the protocol for the interface between the Control Plane and the User Plane within the Core Network for the 6G System, based on SA2 user plane architectural and functional requirements.

The expected work in Resilience and Reliability in Core Network of the 6G System will include the following:

- WT#1: Study requirements for the 6G Core Network and IMS network to improve resilience and reliability.
- WT#2: Study mechanisms and procedures for the 6G Core Network and IMS network to improve resilience and reliability.

CT4 also discussed the data plane protocol study, but no agreement could be reached during Q1 2026.

3.4.4. CT6 (No Discussion for 6G SIDs)

CT6 will discuss their 6G related topics later.

3.4.5. Key Takeaways

3GPP TSG CT#111 showed steady early progress towards 6G Stage 3 standardisation, with a few SIDs approved and further work advancing across CT WGs. 6G SIDs were approved in CT1 and CT4 and work on TR templates and structuring the work started in Q2. CT3 is also expected to approve its 6G SIDs by TSG CT#112 including the structuring of the work during Q2. Overall, momentum is building, with clearer structuring of 6G protocol work expected in the coming meetings.

3.5. 3GPP SA2

The 6G System Architecture Study Item (FS_6G_ARC) has been approved during TSG SA#110 in Baltimore, USA (SP-251633) and its technical report is being captured in TR 23.801-01. The details of the FS_6G_ARC work task scopes were approved in the TSG SA#111 (SP-251634). The TR 23.801-01 includes a list of Key Issues (KIs) and corresponding solution variants.

As part of FS_6G_ARC, 24 key issues have been identified, covering both core network enhancements such as QoS and policy, as well as new capabilities including AI integration, sensing, and computing. The study builds on the 5G Service-Based Architecture (SBA) as a baseline and assumes that 6G will natively support both terrestrial and non-terrestrial networks (NTN). Various solution variants are currently being developed and evaluated, including detailed work on voice services, emergency fallback, location services, and AI agent coordination. Finally, the SA2 6G architecture study (FS_6G_ARC) is expected to be completed by March 2027.

3.5.1. KI#1 (NAS): Study the Support for Control Signalling for the 6G System

3.5.1.1. KI#1.1 principles

Study the support for control signalling for 6G System, including at least the following:

- a. Whether and how to enable the introduction of a new non-access stratum functionality with minimal or no impact to other non-access stratum functionalities.

3.5.1.2. KI#1.2 principles

Study the support for control signalling for 6G System, including at least the following:

- a. Whether and how to support generic mechanisms (e.g. service discovery, service authorisation, transport mechanism) for UE to Core Network interaction to support operator services.

3.5.1.3. KI#1.1 solution variants

There are 4 solution variants that have been proposed in KI#1.1. A high-level summary is listed below. Further details are available in [Table 3-2](#).

- **Evolution of 5G NAS.** Reuses 5G NAS with minor enhancements, keeping a single MM and security termination point.
- **Introduction of 6G NAS (Split Architecture).** Introduces a new NAS design separating routing from MM, enabling distributed and flexible architectures.
- **AI-Enabled Control Plane (CP NF / Agent).** Explores the impact of AI-driven control plane functions on NAS procedures and identifiers.
- **RAN-Core (RAN-CN) Aspects.** Addresses impacts on NAS due to RAN-Core interactions and system-level procedures.

Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)
1	<p>Evolution of 5G NAS for 6G capable UE(s). 5G NAS procedures are reused for 6G, 6G-specific information may be added on top of 5G NAS.</p> <p>This solution variant assumes a single termination point for NAS-MM and single security termination point for NAS. Other NAS procedures e.g. NAS-SM, make use of NAS-MM for transport.</p> <p>To address the objective to minimise impact on NAS MM while introducing new NAS functionality, some solutions propose an enhanced NAS transport for routing of new NAS messages. This includes defining identifiers for the NF, NF type and/or service for routing to the respective entity.</p>	<p>A04 (S2-2601845, Mediatek Inc) A05 (S2-2602263, NTT Docomo) A08 (S2-2601903, Ericsson) A22 (S2-2602227, S2-2602228, Apple) A23 (S2-2602457, Ofinno) A25 (S2-2602446, Qualcomm) A28 (S2-2601995, Google) A17 (S2-2602225, Samsung)</p>
2	<p>Introduce 6G NAS: split routing functionalities from MM functionalities. Introduction of routing functionalities above RRC in the protocol stack. This category of solutions also addresses the objective to minimise impact on NAS MM and other NAS functionalities, while introducing new NAS functionality by introducing routing functionality and by avoiding overlap between NAS functionalities in the UE and network (e.g. avoid PDU session management being supported in both MM/AMF and SM/SMF). This includes defining identifiers for the NF, NF type and/or NAS message type for routing to the respective entity. Different NAS functionality terminates in different/corresponding NF.</p>	<p>A31 (S2-2602441, DT AG)</p>
	<p>A1: Keep Routing functionalities as part of AMF in the network.</p>	<p>A07 (S2-2602190, Lenovo) A09 (S2-2602058, LG Electronics) A20 (S2-2601991, Nokia, SKT) A21 (S2-2602407, Xiaomi)</p>
	<p>A2: Introduce a dedicated 6GC NF for Routing functionalities.</p>	<p>A01 (S2-2601861, China Mobile) A03 (S2-2601832, Vivo) A06 (S2-2602307, Jio Platforms) A13 (S2-2601929, OPPO) A14 (S2-2602030, Huawei, HiSilicon) A15 (S2-2602173, ZTE) A18 (S2-2602162, ETRI, LG Uplus) A19 (S2-2602323, IIT Bombay) A24 (S2-2602419, InterDigital) A30 (S2-2601950, TCL) A32 (S2-2602380, S2-2602077, CATT) A33 (S2-2602238, HONOR)</p>
	<p>B1: single termination point for NAS-MM and single security termination point for NAS.</p>	<p>A13 (S2-2601929, OPPO) A14 (S2-2602030, Huawei, HiSilicon) A19 (S2-2602323, IIT Bombay) A20 (S2-2601991, Nokia, SKT) A24 (S2-2602419, InterDigital)</p>
	<p>B2: NAS termination and security termination per NAS association (e.g. one security context per NAS -MM, per NAS-SM etc).</p>	<p>A07 (S2-2602190, Lenovo) A14 (S2-2602030, Huawei, HiSilicon) A20 (S2-2601991, Nokia, SKT) A31 (S2-2602441, DT AG)</p>
3	<p>Potential impact on NAS identifiers and control plane procedure impact due to Control Plane Network Function (AI agent) in a 6G CN.</p>	<p>A01 (S2-2601861, China Mobile) A14 (S2-2602030, Huawei, HiSilicon)</p>

Table 3-2: KI#1.1 (NAS) solution variants [S2-2603240]

Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)
4	Solutions proposing RAN-CN aspects for NAS functionalities and System procedures.	A05 (S2-2602263, NTT Docomo) A06 (S2-2602307, Jio Platforms) A11 (S2-2602403, NEC Corp.) A17 (S2-2602225, Samsung) A19 (S2-2602323, IIT Bombay) A23 (S2-2602457, Ofinno) A10 (S2-2602024, Rakuten Mobile) A27 (S2-2602409, Xiaomi) A29 (S2-2601812, Cisco Systems) A31 (S2-2602441, DT AG)

Table 3-2 (continued): KI#1.1 (NAS) solution variants [S2-2603240]

3.5.1.4. KI#1.2 solution variants

The following high-level description outlines the solution variants proposed for KI#1.2. A summary of solution variants, together with a brief description, alongside the corresponding TDocs and company names is provided in [Table 3-3](#).

- **NAS for Control and Operator Signalling (over CP).** Uses existing NAS over the control plane for both control procedures (e.g. service discovery/authorisation) and operator service signalling, keeping everything within the control plane.
- **NAS for Control (over CP) and Operator Signalling (over UP).** Retains NAS on the control plane for control functions, while offloading operator service signalling to the user plane for improved efficiency and scalability.

- **New Mechanism over UP.** Introduces new signalling procedures to carry both control and operator service signalling entirely over the user plane, removing reliance on NAS.
- **New Mechanism over New Plane.** Defines a new dedicated signalling plane (e.g. new UE-CN or RAN-CN interfaces) to handle both control and operator service signalling, enabling a more flexible and future-proof architecture.

#	Solution Variant Classification	Solution # (TDoc #, Company Name)	Summary / Key Principles
1	NAS-assisted mechanism to transport control signalling and operator service signalling over control plane	#01 (S2-2601833, Huawei, HiSilicon) #02 (S2-2602270, NTT Docomo) #03 (S2-2602030, Huawei, HiSilicon) #04 (S2-2601904, Ericsson) #05 (S2-2602447, Qualcomm) #06 (S2-2602058, LG Electronics) #22 (S2-2602078, Nokia) #27 (S2-2602228, Apple) #30 (S2-2602441, DT AG)	NAS as control signalling for operator services NAS signalling connection supports mechanisms (e.g., service discovery, service authorisation) for operator services A NAS signalling connection is used to exchange operator service signalling
2	NAS-assisted mechanism to transport control signalling over control plane but operator service signalling over user plane	#08 (S2-2601779, Samsung) #09 (S2-2602192, Lenovo) #15 (S2-2602175, OPPO) #18 (S2-2602408, Vivo) #19 (S2-2602227, Apple) #21 (S2-2602263, NTT Docomo) #25 (S2-2602458, Qualcomm) #28 (S2-2602322, Xiaomi) #29 (S2-2601935, Nokia)	NAS as control signalling for operator services NAS signalling connection supports mechanisms (e.g., service discovery, service authorisation) for operator services Operator service signalling is exchanged over user plane

Table 3-3: KI#1.2 (NAS) solution variants [S2-2603402]

#	Solution Variant Classification	Solution # (TDoc #, Company Name)	Summary / Key Principles
3	New mechanism to transport control signalling and operator service signalling over user plane	#05 (S2-2602447, Qualcomm) #07 (S2-2601859, MediaTek) #10 (S2-2602393, Huawei, HiSilicon) #11 (S2-2601995, Google) #12 (S2-2602404, ZTE) #18 (S2-2602408, Vivo) #24 (S2-2602343, InterDigital)	The control signalling for mechanisms (e.g., service discovery, service authorisation) and operator service signalling are both based on new control signalling/procedures and exchanged over the user plane
4	New mechanism to transport control signalling and operator service signalling over new plane	#13 (S2-2602012, China Mobile) #16 (S2-2602379, Nokia) #17 (S2-2602241, Samsung) #23 (S2-2602319, Ofinno)	The control signalling for mechanisms (e.g., service discovery, service authorisation) and operator service signalling are both exchanged based on new control signalling/procedures and over the new plane (e.g., new UE-CN interface, new RAN-CN interface)

Table 3-3 (continued): KI#1.2 (NAS) solution variants [S2-2603402]

3.5.1.5. KI#1 status

Status: 4 solution variants (KI#1.1 - S2-2603240) identified and high-level principles agreed, including mobility framework (e.g., HO, paging). Key terminology definitions and 4 solution variants (KI#1.2 - S2-2603402) agreed.

Open Issues: Further alignment needed on detailed NAS and RAN-CN aspects. Detailed technical content across solution variants to be further developed.

Next Steps: Further develop all solution variants with detailed principles, procedures, and mobility/session aspects.

3.5.2. KI#2 (SBA): SBA Framework

3.5.2.1. KI#2 principles

The following is a key issue for SBA related work task:

1. Study whether and how to optimise NF/NF service registration, discovery and selection for efficient message forwarding compared with 5G.
2. Study whether and how to improve NF/NF service resiliency, scalability, efficiency and load balancing, compared with 5G

3.5.2.2. KI#2 solution variants

The solution variants for KI#2 can be classified as follows:

- **NF Registration, Discovery, and Selection Optimisation (Variant 2.1).** Focuses on improving how NFs are registered, discovered, and selected to enable efficient message routing and reduce signalling overhead. This category of solutions introduces enhanced data models, routing metrics, caching strategies, and AI-driven mechanisms to support dynamic, scalable, and topology-aware operations.
- **NF Resilience, Scalability, and Load Balancing Optimisation (Variant 2.2).** Aims to strengthen network robustness and scalability through concepts such as NF sets, stateless architectures, and fine-grained service decomposition. Enables flexible load balancing, improved fault isolation, and dynamic recovery mechanisms at both NF and service levels.
- **Architectural and Connectivity Enhancements (Variant 2.3).** Proposes broader architectural evolution, including hybrid centralised–distributed core designs to optimise performance and efficiency. Establishes foundational connectivity improvements (e.g. IPv6 baseline) to support scalable, flexible, and future-proof 6G deployments.

Table 3-4 provides a summary of solution variants proposed across different solution variant classifications for KI#2, together with a brief description, alongside the corresponding TDoc numbers and company names.

Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)
2.1 Optimisation on NF/NF service registration, discovery and selection for efficient message forwarding		
2.1.1	Use 5G SBA as basis, address the connectivity and/or availability dynamical status of NF producer	<p>Option1: SCP-based Solution #1 (S2-2601863, Oracle) proposes the SCP to store routing metrics such as Load, Delay, Error rate and possibly customized info towards a producer NF (or towards a producer SCP) and use Event Exposure service and subscribe/notify service operations to share routing metrics info with other SCPs or/and NFs</p> <p>Option 2: NF profile-based #4 (S2-2602099, Jio Platforms) introduces new profile items (such as topology information) to help NF consumers understand the topology behind a load balancer. Thus, to enable consumers to establish the correct number of connections, addressing bottlenecks caused by HTTP/2 multiplexing in cloud-native deployments.</p> <p>Option 3: AI based #9 (S2-2602337, Samsung) proposes that the NRF forwards the characteristics about NF producer to NWDAF after receiving them from NF consumers and then NWDAF prepares the optimal NF producer prediction by using AI which will be used in future discovery requests.</p> <p>#17 (S2-2602366, Jio Platforms) propose that the SCP uses the predictions with the TTL from external AF (Routing Advisor AI) to help SCP for NF discovery/selection</p> <p>#7 (S2-2602442, Nokia) uses 5G SBA as basis and proposes that the NRF can proactively provide priority-ordered list of NF IDs together with basic information about the NFs (NF type, NSSAI, DNN, served geographical areas, PLMN) to the NF consumer/SCP</p> <p>#15 (S2-2602325, Huawei, HiSilicon) proposes to re-organise the discovery factors and NF profile items in order to have a better structured data modelling:(1) routing category items 2) resilience category items; 3) and service-specific category) and proactive cache signalling forwarding information in SSF to avoid extra real-time "discovery" signalling to support efficient message forwarding.</p> <p>#11 (S2-2602177, ZTE) uses 5G SBA as basis and proposes to reduce the NF profile stored in the NRF to reduce the signalling load of NRF</p>
2.1.2 Reduce the signalling overload		
2.1.3	Prevent Topology exposure of NF producer	<p>#2 (S2-2602438, Nokia) uses 5G SBA as basis and proposes for inter-PLMN service requests that NF selection for an NF producer is always performed by an SCP in the target PLMN and that only PLMN capabilities and no NF profiles are exchanged between PLMNs.</p> <p>#15 (S2-2602325, Huawei, HiSilicon) proposes that the NF consumer always delegates the NF discovery & selection logic to NF producer side. It also proposes Routing Metrics publication between SSFs of different regions (cross-SMFs, cross LSN-public PLMN, cross different networks within a PLMN).</p>
2.1.4	Optimise use of cached NF profiles	#7 (S2-2602442, Nokia) uses 5G SBA as a basis and proposes that the NRF provides a priority-ordered list of NF IDs, together with basic information about the NFs (e.g. NF type, NSSAI, DNN, served geographical areas, and PLMN), to the NF consumer or SCP, in order to optimise the use of the NF profile cache at the consumer NF.
2.1.5	Meet new 6G deployment characteristics	#3 (S2-2602050, Jio Platforms) uses 5G SBA as basis and introduces new profile items (such as Coordinated or chained NF invocation scenarios, Architectural execution modes (e.g. edge vs centralised), Deployment-specific selection hints) indicating relationships or dependencies between NF services, which may assist in optimised service chaining and coordinated NF service selection.
2.1.6	Framework enhancement for Unified Event Exposure Framework	#10 (S2-2602341, Samsung) proposes that the single NF (UEEE) server is responsible for subscription/notification all the NF event.
2.1.7	Enhanced 6G NF Interconnection Framework	#15 (S2-2602325, Huawei, HiSilicon) proposes a new 6G NF Interconnection Framework to unify and simplify the network function registration, discovery and selection mechanism, and further enable "on-path" message distribution for efficient message forwarding by introduce rule-based message forwarding.

Table 3-4: KI#2 (SBA) solution variants [S2-2603520]

Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)
2.2 Optimisation on NF/NF service resilience, scalability, efficiency and load balance		
2.2.1	Uses 5G SBA as basis, support of NF set	#1 (S2-2601863, Oracle) proposes SCP set concept to share routing metrics between SCP in same SCP set. #6 (S2-2602440, Nokia) proposes to use NF set for all NFs to support NF resilience and remove backup AMF/NF Service Set concept to further simplify the system.
2.2.2	Support of Stateless NF	Generic aspects of #8 (S2-2602144, NTT DOCOMO) and #12 (S2-2601821, SKT, DT) propose a stateless architecture for 6G NFs to support NF resiliency and scalability
2.2.3	Service-Granularity Resilience	#16 (S2-2602326, Huawei, HiSilicon) propose to restructure the legacy NF into a hierarchical framework of fine-grained, independent modular Atomic Services and highly granular Service Operations, in order to minimize inter-dependencies and to dimension an appropriate set of functionalities. Load balancing and error-handling are achieved at the modular service level, each service instance can be dynamically isolated or bypassed or replaced in case of failure or congestion.
2.3 Other proposals		
2.3.1	Redesign SBA framework: Hybrid Centralised and Distributed Core Architecture to improve scalability, resiliency, and efficiency	#5 (S2-2602117, Jio Platforms) introduces a Hybrid Centralised and Distributed Core Architecture designed to improve scalability, resiliency, and efficiency by distinguishing between stationary/static devices and mobile devices, utilising Distributed Edge Cores for local processing and a Centralised Core for global coordination.
2.3.2	IPv6-based baseline for SBA connectivity	#14 (S2-2602154, NTT DOCOMO) proposes to define an IPv6-based baseline for SBA connectivity to support efficient service registration, discovery, and message forwarding, avoid address-related constraints that negatively impact NF scaling, relocation, and load balancing, and reduce implementation divergence in NF-to-NF connectivity design.

Table 3-4 (continued): KI#2 (SBA) solution variants [S2-2603520]



3.5.2.3. KI#2 status

Status: Solution structure approved. Scope clarified for stateless architecture (generic SBA vs NF-specific aspects, dependency with KI#4) (S2-2603520).

Next Steps: Further develop detailed solutions per variant. Consider new solution proposals.

3.5.3. KI#3 (Slicing): Support of Network Slicing in the 6G System

3.5.3.1. KI#3 principles

This key issue aims to study the support of Network Slicing in the 6G System, including the following aspects:

1. Study the overall design and functionalities of the network slicing in 6G assuming the network slicing in 5GS as starting point for discussions including the following:
 - a. Identify and address any areas of possible improvement and simplification of network slicing.
 - b. Identify and address any improvements of the application traffic mapping to network slice(s)/ user plane connection(s).
2. Study impacts of the network slicing in 6G on the interworking and migration.

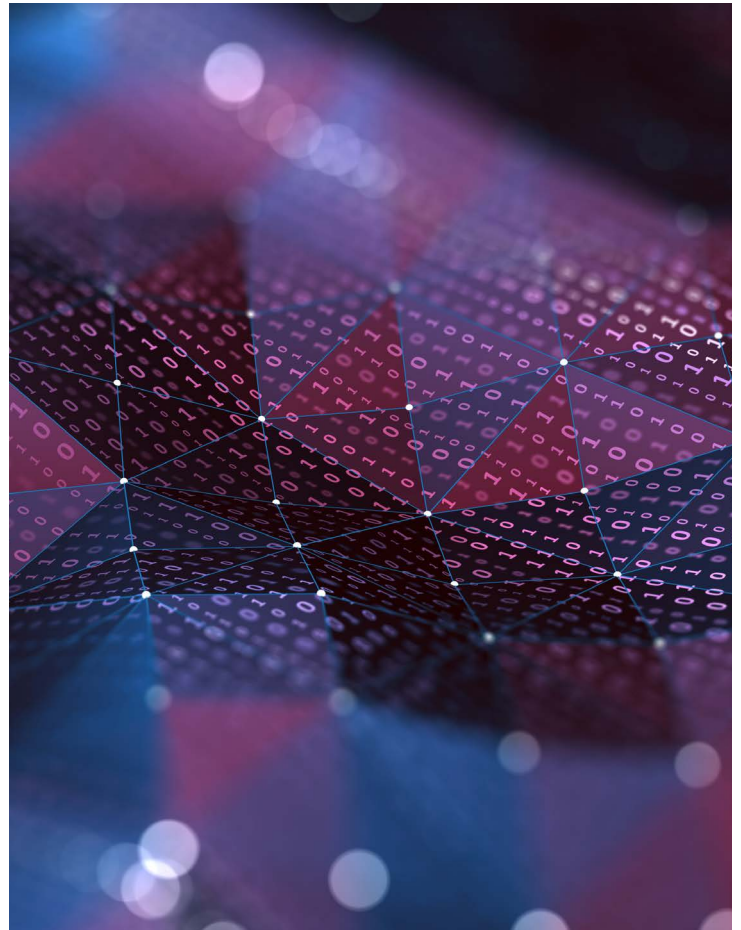
3.5.3.2. KI#3 solution variants

The following categorises the solution variants proposed for KI#3 in a high-level manner.

- **NAS-based Slice Selection (Bullet #1a).** Focuses on how network slice selection is handled via NAS, ranging from direct reuse of 5G slicing mechanisms to more simplified or restructured approaches. This category of solution variants explores different levels of UE involvement, including configurations using Allowed NSSAI, as well as eliminating NSSAI from NAS altogether. Introduces both UE-driven (policy-based) and network-driven (traffic-aware) selection models to improve flexibility and reduce signalling complexity.
- **Operational and User Experience Enhancements (Bullet #1a).** Targets improvements in operational efficiency and end-user experience in the context of slicing. Includes solutions to simplify network management and deployment, as well as enhancements to make services more intuitive and transparent to users. Examples include human-readable service identifiers and mechanisms for UE to express preferences (e.g. energy efficiency), enabling more user-centric and adaptive service delivery.

- **Application Traffic Mapping to Slices (Bullet #1b).** Addresses how application traffic is mapped to network slices or user plane connections in 6G Systems. This category of solution variants covers a spectrum of approaches from UE-centric (policy-based or traffic detection) to network-centric (request-based or traffic-aware) decision-making. Also includes hybrid approaches combining UE flexibility with network validation, enabling more efficient, context-aware, and scalable traffic handling.
- **5G-6G Interworking (Bullet #2).** Focuses on ensuring seamless interoperability between 5G and 6G slicing mechanisms. This includes solutions such as defining common slices across both systems or mapping 5G slices to 6G slices. Generally, this variant aims to support smooth migration, service continuity, and coexistence between legacy and next-generation networks.

Table 3-5 provides a summary of solution variants proposed across different solution variant classifications for KI#3, together with a brief description, alongside the corresponding TDoc numbers and company names.



Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)	
Solutions targeting bullet 1a of the KI description			
3.1	Solutions targeting bullet 1a considering NAS aspects		
3.1.1	Based on 5GS slicing	#04 S2-2601796 (Nokia) #05 S2-2601798 (Ericsson)	#28 S2-2602426 (Huawei, HiSilicon) #31 S2-2602469 (Qualcomm)
3.1.2	Using only Allowed NSSAI in the NAS layer	#02 S2-2602193 (Samsung)	
3.1.3	No UE configuration with NSSAI in the NAS layer		
3.1.3.1	UE based slice selection by reusing URSP configuration	#10 S2-2601931 (Nokia) #11 S2-2602161 (Ericsson)	
3.1.3.2	Network based slice selection considering traffic related information from the UE	#03 S2-2602125 (Huawei, HiSilicon) #06 S2-2601905 (LG Electronics) #12 S2-2602179 (Samsung) #13 S2-2602291 (ZTE) #17 S2-2601916 (China Mobile) #20 S2-2601917 (China Telecom)	#21 S2-2601867 (Qualcomm) #22 S2-2601979 (Nokia) #24 S2-2602381 (InterDigital) #23 S2-2602094 (Ofinno)
3.2	Solutions targeting bullet 1a considering operational and user experience aspects		
3.2.1	Operations improvements	#01 S2-2602444 (Lenovo) #26 S2-2602274 (LG Electronics)	#30 S2-2601797 (Nokia)
3.2.2	User experience improvements		
3.2.2.1	Human readable UP service identification	#25 S2-2602271 (Huawei, HiSilicon)	
3.2.2.2	UE provided information about energy preference to the network	#29 S2-2602052 (Samsung)	
Solutions targeting bullet 1b of the KI description			
3.3	Solutions targeting bullet 1b on application traffic mapping to network slice(s)/user plane connection(s)		
3.3.1	UE centric slice selection based on URSP with enhancements	#02 S2-2602193 (Samsung) #04 S2-2601796 (Nokia) #05 S2-2601798 (Ericsson) #07 S2-2602194 (Lenovo) #10 S2-2601931 (Nokia)	#11 S2-2602161 (Ericsson) #14 S2-2602459 (Qualcomm) #15 S2-2602309 (Huawei, HiSilicon) #19 S2-2602449 (Nokia) #28 S2-2602426 (Huawei, HiSilicon)
3.3.2	UE centric slice selection based on traffic detection	#18 S2-2602449 (Nokia)	

Table 3-5: KI#3 (Slicing) solution variants [[S2-2603446](#)]

Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)	
Solutions targeting bullet 1b of the KI description			
3.3.3	Network centric slice selection based on UE request	#03 S2-2602125 (Huawei, HiSilicon) #06 S2-2601905 (LG Electronics) #12 S2-2602179 (Samsung) #13 S2-2602291 (ZTE) #17 S2-2601916 (China Mobile)	#20 S2-2601917 (China Telecom) #21 S2-2601867 (Qualcomm) #22 S2-2601979 (Nokia) #24 S2-2602381 (InterDigital) #23 S2-2602094 (Ofinno)
3.3.4	Network centric slice selection based on traffic detection	#08 S2-2602180 (Ericsson) #09 S2-2602059 (LG Electronics)	
3.3.5	UE centric with network application verification	#27 S2-2602373 (Samsung)	
Solutions targeting bullet 2 of the KI description			
3.4	Solutions targeting bullet 2 on 5G – 6G interworking		
3.4.1	Common slice between 5G and 6G	#16 S2-2602244 (China Mobile)	
3.4.2	Interworking using 5G slice; 6G slice mapping	#15 S2-2602309 (Huawei, HiSilicon)	

Table 3-5 (continued): KI#3 (Slicing) solution variants [[S2-2603446](#)]

3.5.3.3. KI#3 status

Status: Solution structure agreed with 4 main variants and 12 sub-variants. Covers all KI bullets based on input contributions ([S2-2603446](#)).

Next Steps: Further develop variants (principles, descriptions, procedures). Consider potential new solutions.

3.5.4. KI#4 (UP): User Plane Architecture

3.5.4.1. KI#4 principles

In order to support 6G user plane for a diverse set of applications and traffic patterns, the following are studied taking the 5GS user plane framework as a starting point for discussion:

1. Whether and how to enhance CP-UP functional split and interaction for better multi-vendor interoperability.
2. Whether and how to enhance user plane flexibility (by user plane function (re)selection) for different service requirements, session

continuity and mobility with consideration of user plane function capability and path performance between access network and data network.

3. Whether and how to enhance resilience, scalability, and high availability of user plane function.

3.5.4.2. KI#4 solution variants

This section describes the solution variants proposed for KI#4 "User Plane Architecture":

- **Enhance CP–UP Functional Split and Interaction (Bullet #1).** This set of solutions focuses on improving the interaction between the control plane (CP) and user plane (UP) to enable better multi-vendor interoperability in 6G Systems. It explores different approaches, including reusing PFCP, introducing service-based interfaces (SBI), or combining both, to balance backward compatibility with architectural evolution. The objective is to simplify CP–UP interactions, reduce unnecessary options, and enable a more modular, flexible, and interoperable design.

- **Flexible (Re)Selection of User Plane Entities (Bullet #2).** These solutions aim to enhance user plane flexibility by enabling dynamic selection and re-selection of UP entities based on service requirements, mobility, and network conditions. They introduce concepts such as anchor and serving UPFs, path-based routing, and traffic-aware decision-making using performance metrics like latency, bandwidth, and load. The goal is to support efficient, adaptive, and service-aware traffic routing, along with optimisations for path efficiency and session continuity.
- **User Plane Resilience and Scalability (Bullet #3).** This group of solutions addresses resilience and scalability by introducing mechanisms such as sets of functionally equivalent UPFs to support

redundancy and high availability. It includes models like active-active and active-standby, along with failover handling and session migration with minimal disruption and state preservation. The objective is to ensure robust operation, seamless recovery from failures, and scalable deployment in cloud-native 6G environments.

Table 3-6 provides a summary of solution variants proposed across different solution variant classifications for KI#4, together with a brief description, alongside the corresponding TDoc numbers and company names.

Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)	Summary / Key Principles
Bullet #1: Enhance CP-UP functional split and interaction for better multi-vendor interoperability			
4.A	5G PFCP as base for 6G N4 CP-UP interaction	#01 S2-2601901 (Huawei, HiSilicon)	PFCP as a base for N4
4.B	SBA for 6G N4 between 6G SMF and 6G UPF	#03 S2-2601993 (Huawei, HiSilicon) #04 S2-2602048 (Ericsson) #05 S2-2602321 (Qualcomm)	SBA based N4
4.C	Service Based Node, new non-session related Procedures and PFCP Based Session Management	#02 S2-2601869 (Nokia)	PFCP as a base for session management; SBA for node management/other new aspects
Bullet #2: Enhance user plane by flexibly (re)selecting user plane entities			
4.P1	Enhanced User Plane including (Re)Selection of UP Entities	#06 S2-2602250 (Futurewei) #07 S2-2602280 (Nokia) #08 S2-2602251 (Huawei, HiSilicon) #09 S2-2601860 (ZTE) #10 S2-2602096 (Qualcomm) #11 S2-2602098 (Qualcomm) #12 S2-2601791 (Ericsson) #13 S2-2601958 (Huawei, HiSilicon)	A-SMF and S-SMF architecture A-UPF and S-UPF architecture Use more benchmark parameters, e.g., transmission bandwidth, path loss, link load, etc., that are related to the performance of the transmission path between 6G UP NF(s) (e.g., UPF) and/or the endpoint (e.g., AS) in the DN
4.P2	Path-based Routing for Enhanced User Plane Flexibility	#14 S2-2601962 (Huawei, HiSilicon) #15 S2-2601818 (Nokia) #16 S2-2601961 (Huawei, HiSilicon) #17 S2-2602116 (Samsung) #18 S2-2602210 (Ericsson) #19 S2-2602390 (Qualcomm) #20 S2-2602134 (Huawei, HiSilicon) #26 S2-2601996 (Nokia)	UL classification at the 6G gNB - Path-based Routing for Enhanced User Plane Flexibility
4.P3	User Plane Path optimisations	#06 S2-2602250 (Futurewei) #21 S2-2602259 (Ericsson) #22 S2-2601987 (Nokia) #23 S2-2602280 (Nokia)	Data forwarding enhancement (redirection indication in GTP-U)

Table 3-6: KI#4 (UP) solution variants [S2-2603482]

Variant #	Solution Variant Classification	Solution # (TDoc #, Company Name)	Summary / Key Principles
Bullet #2: Enhance user plane by flexibly (re)selecting user plane entities			
4.P4	User Plane Session continuity optimisations	#23 S2-2602280 (Nokia) #24 S2-2602278 (Huawei, HiSilicon)	Reuse the existing context as much as possible (for session continuity optimisations)
Bullet #3: Enhance resilience and scalability of the user plane function			
4.Y	Supporting UP resiliency and high availability	#26 S2-2601996 (Nokia) #27 S2-2601792 (Samsung) #28 S2-2601822 (Huawei, HiSilicon) #29 S2-2602279 (Ericsson)	

Table 3-6 (continued): KI#4 (UP) solution variants [[S2-2603482](#)]

3.5.4.3. KI#4 status

Status: 26 contributions received. Solution variants identified: 3 (Bullet#1), 4 (Bullet#2), 1 (Bullet#3). Scope clarified: CP procedures towards UE handled under KI#1.1 ([S2-2603482](#)).

Next Steps: Agree further details and procedures for existing variants. Consider new and updated solutions. Address editor notes.

3.5.5. KI#5 (QoS): QoS Framework for 6G

3.5.5.1. KI#5 principles

This key issue is based on the WT#1.2 on the QoS Framework for 6G. This KI includes following aspects:

- Investigate whether and what new functionality in 6G QoS framework is required considering, the emerging new traffic characteristics and application needs, e.g. AI/ML application traffic.
- Whether and how to enhance QoS mechanisms to:
 - support QoS targets fulfilling application's QoS requirements (e.g. dynamic QoS requirements) in a less resource intensive manner than the existing GBR, Delay Critical-GBR.
- Study whether and what enhancements are needed to adjust the QoS targets, in case the current QoS targets cannot be met, to minimize the impacts to application operation or user experience.
- Study whether and how to support the UE, application and network QoS collaboration to improve awareness in the 6GS of application traffic needs, e.g. traffic pattern, dynamic QoS requirements and to improve awareness in the application/UE of what can be provided by the network, e.g. maximum bitrate.

5. Whether and how to enhance QoS monitoring, based on the identified needs, e.g. to determine the end-to-end per-packet delay, packet loss rate between the PSA-UPF and the UE for the verification of the QoS target fulfilment.

6. Study whether and what enhancements are needed to enforce QoS differentiation, e.g. in case of frequent address change of the server, application traffic with multiplexed media flows.

3.5.5.2. KI#5 solution variants

- **QoS Flow Concepts and Enhancements (Bullet #1).** This group establishes the foundational QoS framework for 6G by extending the QoS flow concept with new parameters, characteristics, and flexibility compared to 5G. It introduces support for emerging service types such as delay- and error-tolerant applications (e.g. AL-FEC-based services), and enables more advanced packet treatment mechanisms. In addition, it explores QoS handling beyond individual flows, including group-based QoS for multiple flows or UEs, allowing coordinated and service-aware resource management aligned with new 6G use cases.
- **Dynamic QoS Handling Mechanisms (Bullet #2).** This set of solutions focuses on enabling dynamic and adaptive QoS behaviour to better match varying network conditions and application requirements. It introduces mechanisms where a QoS flow can be associated with multiple QoS profiles or parameter ranges, allowing real-time adjustment by the RAN, UE, or UPF. Alternatively, multiple QoS flows can be mapped to a single service data flow, with traffic dynamically steered based on conditions. Overall, these approaches aim to improve efficiency, flexibility, and service continuity in highly dynamic 6G environments.

- **QoS Handling under Constraint Conditions (Bullet #3).** This variant addresses scenarios where the target QoS cannot be achieved due to network limitations or changing conditions. It introduces mechanisms for adaptive QoS adjustment, enabling graceful degradation of service while maintaining continuity and acceptable performance levels. The focus is on ensuring robustness and reliability by dynamically adapting QoS behaviour rather than strictly enforcing unattainable targets.
- **UE–Network/Application QoS Collaboration (Bullet #4).** This group introduces enhanced collaboration mechanisms between the UE, network, and application servers to enable more intelligent QoS management. It includes both user plane and control plane-based approaches for exchanging rich contextual information such as traffic characteristics, QoS requirements, QoE metrics, and network status. A key concept is the introduction of a collaboration layer, enabling real-time or near-real-time adaptation of QoS based on end-to-end awareness, thereby improving service performance and user experience.
- **QoS Monitoring Enhancements (Bullet #5).** This set of solutions enhances QoS monitoring capabilities across the system by introducing more granular, accurate, and flexible measurement mechanisms. It supports monitoring at different levels (e.g. per flow, per burst, per slice) and enables improved reporting and exposure of performance metrics such as delay, packet loss, and throughput. These enhancements aim to provide better visibility for network optimisation, policy control, and adaptive QoS management in 6G Systems.
- **Advanced QoS Handling for Emerging Traffic Patterns (Bullet #6).** This group addresses advanced and evolving traffic scenarios in 6G, such as multiplexed media flows and dynamic server endpoint changes. It enables differentiated QoS treatment for individual sub-flows within a single aggregated flow (e.g. based on stream IDs or metadata) and supports adaptive QoS handling when server addresses frequently change. These solutions aim to better support complex, application-driven traffic behaviours and ensure consistent QoS in highly dynamic service environments.



Table 3-7 provides a summary of solution variants proposed across different solution variant classifications for KI#5, together with a brief description, alongside the corresponding TDoc numbers and company names.

Variant #	Solution Variant Classification	Solutions Variant Proposals	Summary / Key Principles
Bullet #1			
5.1	QoS flow considerations for 6G - Variant 1	11, 28 of SA2#173 and 46, 60 of SA2#174	Introducing considerations for QoS concepts for 6G
5.1a	QoS flow considerations for 6G - Variant 2	42 of SA2#173 and 51, 63 of SA2#174	Introducing considerations for QoS concepts for 6G
5.2	Enhanced QoS handling for delay/error tolerant applications	22, 26, 32, 38, 42, 48 of SA2#173 and 15, 59, 65, 73 of SA2#174	Introduce new QoS parameters to support new QoS handling for new 6G services such as delay, error tolerant applications.
5.3	QoS collaboration for a group of flows/UEs	7, 19, 34 of SA2#173, 26, 66 of SA2#174	The key principle proposed by this solution variant is to support new QoS concept for handling QoS for a group of flows/UEs
Bullet #2			
5.4	Support a QoS flow with dynamic QoS requirements	1, 8, 12, 17, 20, 23, 24, 29, 33, 35, 36, 42, 46 of SA2#173, 1, 3, 8, 9, 16, 19, 29, 34, 37, 38, 39, 42, 47, 48, 57, 62, 67, 71 of SA2#174	A new type of configuration for a QoS flow is proposed to be supported in 6G which is defined by dynamic QoS requirements. Multiple QoS Profiles, or range of values for QoS parameter(s) are provided to the 6G RAN and optionally to the UE for this QoS Flow. The 6G RAN adjusts the QoS based on network condition and/or the input from the UE and/or the UPF.
5.5	Supporting dynamic QoS requirement by using multiple QoS flows	24, 28, 46, 49 of SA2#173, 7, 36, 54 of SA2#174	Multiple QoS Flows are associated for a single service data flow. The 6G UE determine which QoS flow of the multiple QoS flow to use for a service data flow in uplink. The 6G UPF determine which QoS flow of the multiple QoS flow to use for a service data flow in downlink.

Table 3-7: KI#5 (QoS) solution variants [[S2-2603521](#)]

Variant #	Solution Variant Classification	Solutions Variant Proposals	Summary / Key Principles
Bullet #3			
5.12	QoS handling in case the target QoS cannot be met	12, 27, 28 of SA2#174	When the target QoS cannot be met, the QoS handling will be adjusted.
Bullet #4			
5.6	Enhanced UE/NW QoS collaboration via a collaboration layer between UE/application and UPF via user plane signalling	2, 6, 9, 10, 14, 21, 31, 37, 41, 45, 46, 47, 51, 53 of SA2#173, 4, 14, 17, 20, 24, 25, 32, 37, 45, 52, 53, 55, 64, 68 of SA2#174	UE/application and 6G UPF use an additional user plane layer (collaboration layer) to exchange additional information (e.g. traffic characteristics, QoS requirements, etc.) for a service data flow, QoS flow or a PDU session. The additional information provided by the UE/application is used by the network to fine tune/adapt the QoS requirements for the application session. The additional information provided by the network (UPF) to the UE/application is used by the application in the UE to adapt their behaviour.
5.7	Enhanced QoS collaboration based on enhanced control plane signalling functionality	12, 50, 52 of SA2#173, 13, 19, 37, 40, 43, 61 of SA2#174	UE exchanges QoS related information with the 6G core network using enhanced control plane signalling.
5.8	NW/DN QoS collaboration via user plane signalling	21, 41 of SA2#173, 5, 44, 53 of SA2#174	QoS collaboration between the network and the application server in the DN via user plane signalling.
Bullet #5			
5.9	QoS monitoring enhancements in 6G	10, 11, 18, 23, 41, 49 of SA2#174	Propose QoS monitoring enhancements in 6GS
Bullet #6			
5.10	QoS differentiation for application traffic with multiplexed media flows	2, 31, 44, 50, 69, of SA2#174	For downlink scenario, the 6G PSA UPF identifies the multiplexed DL traffic based on the metadata/stream ID carried on the N6 packets, and marks the information to the DL packets sent to RAN for differentiated QoS handling. For uplink direction, the UE identifies the multiplexed UL traffic, and marks the information to the UL packets sent to RAN for differentiated QoS handling. RAN enables differentiated QoS handling based on the information from 6G UE/UPF.
5.11	QoS handling in case of frequent server IP address change	22, 30, 33 of SA2#174	UE detects the server IP change for an SDF and determines the QoS handling to be applied. UE notifies to the 6G network for the corresponding DL traffic handling. 6G network updates the PDR/QER accordingly to map the DL traffic to the corresponding QoS Flow.

Table 3-7 (continued): KI#5 (QoS) solution variants [[S2-2603521](#)]

3.5.5.3. KI#5 status

Status: Pen holder summary agreed, including new variants (6.5.9–6.5.12) for bullets #3, #5, #6. Existing variants (6.5.1–6.5.8) updated (S2-2603521).

Next Steps: Address editor notes and provide supporting use cases. Add detailed procedures to existing variants. Consider new inputs (extend existing variants or define new ones if needed).

3.5.6. KI#6 (Policy): Policy and Charging Control Framework

3.5.6.1. KI#6 principles

To support the Policy and charging control in 6GS, the policy and charging control framework defined in 5G for policies (i.e. SM Policy, UE Policy, AM Policy) is considered as starting point for discussion, the following aspects are to be studied:

1. Whether and how to simplify the policy and charging control framework for 6G, including:
 - a. whether and how to reduce the number of policy control services e.g. the same policy control association for both AM and UE policies or the number of interactions to efficiently provide policies to the different policy enforcement points.
 - b. whether and how to support the UE to request UE policies from the 6G CN and/or the 6G CN to provide UE policies to the UE.
2. Whether and how to consider user preferences during UE policy evaluation at UE, without conflicting with network provided UE policies.
3. Whether and how to improve the External Parameter Provisioning aspects of policy control for 6G.
4. Whether and how to improve events notification about policies to the AF (e.g. to notify the AF that policy and charging control, e.g. charging key changed).
5. Whether and what parameters the UE can provide as input for PCC decision, e.g. related to QoS control to the 6G CN. The UE input for PCC decision related to QoS is based on the progress in KI#5 - QoS.

3.5.6.2. KI#6 solution variants

The following provide a high-level description of solution variants according to items defined in KI#6 principles.

- **Simplification of Policy Framework (Bullet #1a):** This set of solutions aims to simplify and converge the policy framework by unifying AM, UE and optionally SM policies under a common Policy Control Function (PCF), supported by a single policy association and

shared context per UE. It promotes the use of common service APIs and streamlined interactions across network functions, including roaming scenarios, to reduce signalling overhead and ensure consistent, scalable and maintainable policy handling.

- **Request and Delivery of UE Policies (Bullet #1b):** These solutions define flexible mechanisms for provisioning UE policies, either dynamically requested by the UE with optional UE-provided parameters, or fully controlled by the network. They support on-demand policy delivery, lifecycle management including validity and updates, and reuse or enhancement of existing signalling procedures, with the objective of balancing flexibility, efficiency and operator control.
- **User Preferences for UE Policies (Bullet #2):** This group introduces mechanisms to incorporate user preferences into policy decisions, including support for multiple connectivity profiles, UE Route Selection Policy (URSP) sets and user-influenced traffic routing. Both UE-centric and network-centric approaches are considered, enabling preference evaluation at different entities while ensuring that operator policies and constraints remain enforced.
- **External Parameter Provisioning (Bullet #3):** These solutions enable application functions to provide service-specific parameters and contextual information, such as application guidance and validity conditions, to support policy decision-making. By integrating external inputs through the policy framework, they enhance context awareness and enable more dynamic and application-driven policy control.
- **Event Notification of Policies to AF (Bullet #4):** This set of solutions introduces mechanisms for notifying application functions of policy-related events, such as changes in charging rates or policy conditions. This enables applications to adapt their behaviour dynamically based on network status and policy updates, supporting improved end-to-end service optimisation.
- **UE Inputs for Policy Decisions (Bullet #5):** These solutions allow the UE to provide inputs, including application information, QoS requirements and user preferences, to influence policy and charging decisions. Such inputs can be leveraged by the PCF to optimise both ongoing and future sessions, while also requiring consideration of signalling mechanisms, authorisation and privacy aspects.
- **Reuse of 5G PCC Framework (All Bullets):** This solution proposes reusing the 5G Policy and Charging Control (PCC) framework as a baseline for 6G, with enhancements introduced as required to support new services and capabilities. This approach enables continuity, reduces standardisation complexity and facilitates a smooth evolution towards 6G Systems in alignment with other key issues.

Table 3-8 provides a summary of solution variants proposed across different solution variant classifications for KI#6, together with a brief description, alongside the corresponding TDoc numbers and company names.

#	Solution Variant Classification	Solution # TDoc #
Bullet #1a (Simplification of Policy framework)		
1	Converge of Policy framework for AM and UE policies	#01 S2-2600277 #02 S2-2600476 #03 S2-2600283 #04 S2-2600419 #05 S2-2600220
2	Converged PCF and convergence of Policy Association and context across policy types	#03 S2-2600283 #04 S2-2600419 #05 S2-2600220
Bullet #1b (Request and Delivery of UE policies)		
1	UE request for UE policies with UE determined parameters	#07 S2-2600232 #08 S2-2600408 #09 S2-2600437 #10 S2-2600482 #12 S2-2600544 #23 S2-2600429
2	UE policy control without UE determined parameters	#11 S2-2600180
Bullet #2 (User preferences for UE Policies)		
1	Support of multiple connectivity profiles and related URSPs and network policies	#01 S2-2601795
2	User influence in URSP rule evaluation	#07 S2-2601889
3	Evaluation of UE Policies considering user/local preferences	#30 S2-2602283
4	Network centric user preference handling	#21 S2-2602126
Bullet #3 (External Parameter Provisioning)		
1	Provisioning of AF Service-Specific Information in 6G	#09 S2-2601891
2	Supporting periodicity of time validity in URSP rule and application guidance for URSP rule determination	#20 S2-2602062

Table 3-8: KI#6 (Policy) solution variants [S2-2603531]

#	Solution Variant Classification	Solution # TDoc #
Bullet #4 (Event Notification of policies - AF)		
1	Charging rate based events notification about policies to AF	#31 S2-2602332
Bullet #5 (UE inputs for policy decisions)		
1	UE inputs and transport mechanisms	#06 S2-2600612 #18 S2-2600436 #19 S2-2600443 #20 S2-2600478
All bullets		
1	Reuse 5G PCC framework for 6G	#03 S2-2601826 #33 S2-2602348

Table 3-8 (continued): KI#6 (Policy) solution variants [[S2-2603531](#)]

3.5.6.3. KI#6 status

Status: Solution variants have now been documented for all bullets (1a, 1b, 2, 3, 4, 5 - [S2-2603531](#)). New solution variants introduced for previously unhandled bullets (2, 3, 4).

Open Issues: Alignment needed for new solutions across all bullets. Outstanding issues and editor notes remain. Limited discussion so far on earlier bullets (1a, 1b, 5).

Next Steps: Align new contributions with existing variants or define new variants. Address issues and editor notes. Continue solution discussions, including updates for earlier bullets.

3.5.7. KI#7 (NW Exposure)

3.5.7.1. KI#7 principles

This key issue is to study whether and how to support a common network exposure framework in 6G. The capabilities that are exposed via the framework fall into one of two categories.

1. The first category is new capabilities. New capabilities refer to capabilities that are not exposed in the 5G network. This category of exposed capabilities is dependent on other key issues. This key issue will include a review of exposure requirements that derive from other key issues.
2. The second category refers to capabilities that are exposed in the 5G network and are used as a starting point for discussion of this key issue. This category of exposed capabilities may be dependent on other key issues.

Since this key issue depends on other key issues, time will not be allocated for solutions for this key issue by SA WG2 before SA2#175.

Aspects that can be studied under this key issue are:

1. How to support a common network exposure framework in 6G for the exposure of network capabilities to an AF.
 - a. Whether and how to support a common network exposure framework in 6G for the exposure of network capabilities to AFs, in an access independent manner (to the extent that exposure in an access independent manner is possible). The exposure framework of the 5GS (i.e. exposure via the NEF) is assumed to be the starting point for discussion of this key issue.
 - b. Whether and how to support co-existence with the 5G exposure framework.
 - c. Whether and how to support privacy protection, user consent, data anonymisation, and service authorisation mechanisms.
 - d. Whether and how to restrict Network Exposure procedures in roaming, aiming to avoid information being sent between the home network and visited network when not allowed or when not necessary.
2. How to support Capability Exposure to the UE and Application Endpoints.

Depending on the outcome of the QoS key issue, this key issue is about whether and how to integrate solutions from the QoS key issue for collaboration between the UE, applications and network in a common exposure framework. As a prerequisite for this key issue, the QoS key issue is expected to determine if specific information needs to be exchanged. This key issue will cover:

- a. Based on the work in the QoS key issue, whether and how to integrate solutions from the QoS key issue into a common exposure framework in 6G in order to improve awareness in applications and the UE of what information can be provided by the network.
 - b. Whether there is a need to and how to have the common framework support how to discover what information can be provided by the network and authorize the network to provide specific information to the applications and the UE.
3. Whether and how to support Intent-Based Exposure.
- a. Whether, how, and what intents should be supported on the northbound interface (i.e. the interface to an AF in a DN) of a common network exposure framework in 6G. The intent-based work in this key issue is limited to the northbound interface of a common network exposure framework in 6G and needs to be coordinated with the AI key issue. AI aspects will be covered under the AI key issues and will not be covered under this key issue.

3.5.8.2. KI#8 solution variants

The following provides a high-level description of the solution variants for KI#8.

- **6G Multi-Operator Core Network (MOCN):** Enables multiple operators to share a common 6G RAN while each operator connects directly to its own 6G CN, maintaining independent control of services and policies. The shared RAN broadcasts multiple PLMN IDs.
- **6G Indirect Network Sharing (INS):** Supports network sharing via a hosting operator, where participating operators access the shared 6G RAN indirectly through the host's core network. This model simplifies integration and interconnection, with the shared RAN broadcasting participating operator identifiers, while traffic and control are routed via the hosting operator's core.

Table 3-9 provides a summary of solution variants proposed across different solution variant classifications for KI#8, together with a brief description, alongside the corresponding TDoc numbers and company names.

3.5.7.2. KI#7 status

Status: Solution discussions to start from SA2#175 (May).

Next Steps: Agree to groupings of different solution variants.

3.5.8. KI#8 (NetShare): Network Sharing in the 6G System

3.5.8.1. KI#8 principles

Study on how to support network sharing in 6G, including the following aspects:

1. How to support the following network sharing architectures in 6G: Multi-Operator Core Network in 6G and Indirect Network Sharing in 6G.

Variant #	Solution Variant Classification	Solution # TDoc # (Company Name)
1	6G Multi-Operator Core Network	#01 S2-2600069 (China Unicom) #02 S2-2601963 (China Unicom et al.) #03 S2-2601972 (China Telecom, China Unicom)
2	6G Indirect Network Sharing	#02 S2-2601963 (China Unicom et al.) #03 S2-2601972 (China Telecom, China Unicom)

Table 3-9: KI#8 (NetShare) solution variants [S2-2603431]

3.5.8.3. KI#8 status

Status: Updates to existing solution variants 8.1 and 8.2 were approved. However, additional updates and new solution proposals did not reach consensus (S2-2603431).

Open Issues: Lack of consensus on proposed new solutions and certain updates to existing variants.

Next Steps: Continue discussions on potential new solutions and updates to existing variants.

3.5.9. KI#9 (Localized): Localized Service Access

3.5.9.1. KI#9 principles

The scope of localized service access is to study the overall architecture design and enablers for localized service access in 6G, which consists of the following:

1. Whether and how to support localized service access provided via PLMN, and study how to perform authorisation and authentication of UE for localized service access, and minimize service interruption during UE mobility, including:
 - a. Whether, how and which aspects (e.g. provisioning, updating, retrieval) for the part of subscription (that is needed for localized service access) can be performed/managed via the NFs present locally in the network providing localized service access.
2. Study whether and how to make use of 5G NPN (SNPN and PNI-NPN) for localized service access in 6G.

3.5.9.2. KI#9 solution variants

The following bullets provide a high-level description for each solution variant category according to the principles of KI#9.

- **New mechanisms for localized service access via PLMN (Bullet 1):** This group introduces new architectural approaches where localized services are delivered within the PLMN through operator-managed Localized Service Networks or local cores. It covers key aspects such as UE subscription management, localized service discovery and selection, signalling and traffic routing between local and central networks, and policy coordination. The solutions seem to support flexible deployment models, including enterprise scenarios, allow simultaneous access to localized and PLMN services, and enable continued operation even when connectivity to the central network is limited or unavailable.
- **Reuse and enhancement of 5G NPN mechanisms (Bullet 2):** This group builds on existing 5G Non-Public Network (NPN) frameworks, including Standalone NPN and Public Network Integrated NPN, to support localized services in 6G. It reuses established concepts such as slicing, subscription-based access, authentication, and access control, while extending them to accommodate new service requirements. These solutions seem to provide an evolution path with minimal architectural changes, enabling efficient integration of localized services across public and private deployments.

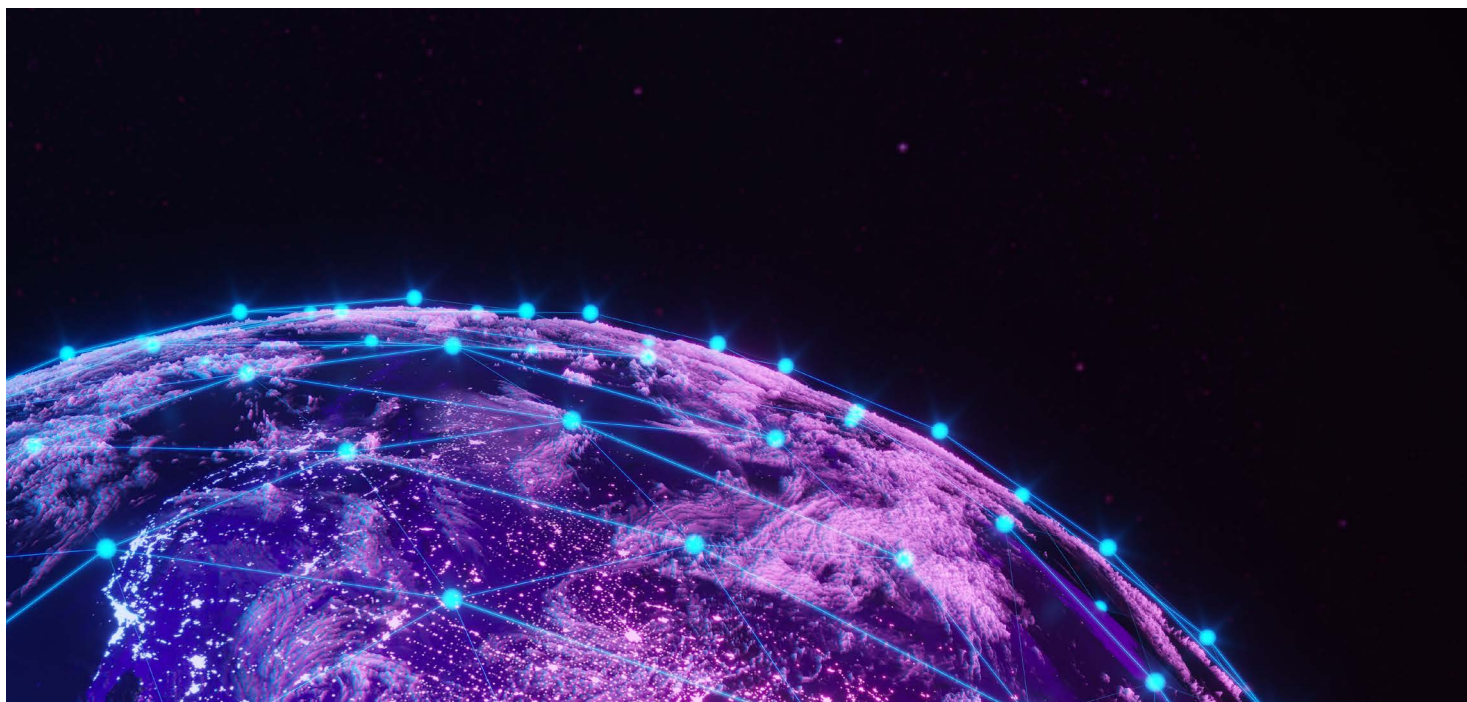


Table 3-10 provides more fine-grained categories of solution variants proposed for KI#9. For further information and a full description of the solution variants, see [S2-2603429](#).

Variant #	Solution Variant Classification	Solution # TDoc # (Company Name)
Bullet #1: Localized Service Access via PLMN and Local Network Integration		
A	UE's subscription management and Localized Service Network management for localized service access provided via PLMN	#02 S2-2601862 (China Mobile) #04 S2-2601982 (China Telecom) #05 S2-2601986 (China Mobile) #14 S2-2602245 (Huawei, HiSilicon) #15 S2-2602265 (Nokia) #16 S2-2602277 (Nokia) #19 S2-2602364 (OPPO) #20 S2-2602385 (Futurewei)
B	UE's access to local service via PLMN registration	#01 S2-2601793 (CATT) #02 S2-2601862 (China Mobile) #04 S2-2601982 (China Telecom) #11 S2-2602187 (ZTE) #19 S2-2602364 (OPPO) #20 S2-2602385 (Futurewei)
C	MNO controlled PLMN service access when UE registers via local deployed network	#03 S2-2601902 (Ericsson)
D	6G CN routes signalling and traffic to PLMN and Localized Service Network	#14 S2-2602245 (Huawei, HiSilicon)
E	Requesting operator service(s) not supported by the registered network	#09 S2-2602185 (ZTE) #11 S2-2602187 (ZTE)
F	Local Core insertion in front of Central Core	#06 S2-2602053 (Rakuten Mobile)
J	UE subscription data for PLMN and Localized services are stored and managed	#15 S2-2602265 (Nokia) #16 S2-2602277 (Nokia)
Bullet #2: Re-use of 5G NPN features for Localized Service Access in 6G		
G	Localized Service access in 6G using 5G SNPNs	#07 S2-2602063 (LG Electronics) #08 S2-2602143 (Qualcomm) #13 S2-2602240 (Nokia)
H	Localized Service access in 6G using 5G PNI-NPNs	#07 S2-2602063 (LG Electronics) #08 S2-2602143 (Qualcomm) #10 S2-2602186 (ZTE) #12 S2-2602188 (Samsung) #13 S2-2602240 (Nokia)

Table 3-10: KI#9 (Localized) solution variants [[S2-2603429](#)]

3.5.9.3. KI#9 status

Status: 9 solution variants agreed (S2-2603429).

Open Issues: Further refinement needed across agreed solution variants.

Next Steps: Refine and update solution details. Encourage new inputs building on existing solution variants.

3.5.10. KI#10 (FWA): Fixed Wireless Access

3.5.10.1. KI#10 principles

The key issue aims to:

1. Analyse issues encountered in 5G deployments to efficiently support FWA and determine requirements to be taken by other KIs for 6G. The result of this analysis will serve as the basis for architectural requirements to relevant KIs related with WT 1.1 and WT 1.2.

3.5.10.2. KI#10 solution variants

The solution variants for KI#10 consolidate multiple contributions into a single overarching variant focused on identifying KIs and improvement areas for supporting FWA in 6G. The proposals highlight challenges specific to FWA-CPE, including the lack of mechanisms for device identification and tailored network function or slice selection, inefficiencies in CP behaviour such as excessive signalling due to CONNECTED-IDLE transitions, and limitations in subscription handling such as the inability to bind subscriptions exclusively to FWA devices. They also identify the need for optimised user plane handling for high traffic volumes and adaptations in network parameters to reflect the stationary and less energy-constrained nature of FWA deployments. Overall, the solution variant provides a baseline to capture issues, define enhancements, and guide further work across relevant key issues to enable efficient and scalable FWA support in 6G Systems.

3.5.10.3. KI#10 status

Status: 1 solution variant agreed, capturing 3 issues based on 5GS FWA analysis (S2-2603405).

Next Steps: Develop 6G requirements to address identified issues. Align on appropriate KI(s) for documenting these requirements.

3.5.11. KI#11 (N3GPP): Support of Non-3GPP Access

3.5.11.1. KI#11 principles

For non-3GPP access:

1. Study how to support untrusted non-3GPP access in 6G System architecture.

2. Study how to support service continuity between 3GPP access and non-3GPP access in the above bullet(s).
3. Study how to support Interworking aspects between 5GS and 6GS related to non-3GPP access.

For Non/Seamless WLAN Offload:

4. How to support UE policy necessary for Non-Seamless WLAN Offload (NSWO).

3.5.11.2. KI#11 solution variants

The following provides a concise overview of the solution variants proposed for KI#11, focusing on support for non-3GPP access in 6G. It summarises the key principles and architectural approaches of each variant, highlighting how different solutions address control plane handling, user plane connectivity, service continuity, and integration with existing 5G mechanisms.

- **NAS enabled UE (Variant #11.1):** This variant extends 6G NAS support to non-3GPP access, maintaining alignment with 3GPP access procedures for registration, mobility, and session management. A gateway such as 6G N3IWF relays NAS signalling, enabling a unified control plane and consistent security framework across access types.
- **Gateway initiated NAS procedures (Variant #11.2):** This variant removes the need for NAS support in the UE by introducing a gateway that performs registration, session management, and policy control on behalf of the UE. It relies on widely deployed transport and security mechanisms such as QUIC and EAP, simplifying UE requirements while preserving core network control.
- **No NAS used (Variant #11.3):** This variant eliminates NAS signalling entirely over non-3GPP access and instead relies on transport layer protocols such as IKEv2 or QUIC. A gateway function maps transport signalling directly to core network service operations, supporting a simplified architecture while maintaining authentication and session management.
- **Service continuity and 5G interworking (Variant #11.4):** This variant focuses on maintaining seamless service continuity across 3GPP and non-3GPP access as well as between 5G and 6G Systems. It is based on unified user plane anchoring and consistent session management, with IP address preservation during mobility.
- **Non-3GPP Access based on Enhanced NSWO (Variant #11.5):** This variant proposes a non-3GPP access architecture based on enhanced Non-Seamless WLAN Offload (NSWO) principles, where the UE establishes a direct secure connection with the UPF without relying on an N3IWF. The solution leverages enhanced EAP signalling for authentication and session bootstrapping, while QUIC and HTTP/3-based tunnelling mechanisms are used to support secure user-plane connectivity over untrusted non-3GPP access.

- **Support for Non Seamless WLAN Offload (Variant #11.6):** This variant reuses and extends the 5G NSWO framework to support policy-based traffic offload over WLAN. It includes mechanisms for traffic categorisation and policy enforcement, allowing selective use of non-3GPP access alongside 3GPP connectivity.
- **Adaptive NAS and NAS less architecture (Variant #11.7):** This variant defines an architecture that supports both NAS-based and NAS-less operation through a unified gateway. It allows selection of the operation mode based on UE capability and service requirements for non-3GPP access in 6G.

Table 3-11 provides a summary of solution variants proposed across different solution variant classifications for KI#11, together with a brief description, alongside the corresponding TDoc numbers and company names.

Variant #	Solution Variant Classification	Solution # TDoc # (Company Name)
11.1	NAS-enabled UE	#03 S2-2600256 (Lenovo) #04 S2-2602064 (LG Electronics) #05 S2-2602199 (Mediatek) #06 S2-2602133 (Samsung) #07 S2-2602298 (Xiaomi) #08 S2-2602031 (Huawei, HiSilicon) #16 S2-2601875 (Nokia)
11.2	N3NAS-GW initiated NAS procedures on behalf of the UE	#13 S2-2602388 (CableLabs, Rogers)
11.3	No NAS used	#01 S2-2602157 (Qualcomm) #02 S2-2601900 (Ericsson) #09 S2-2602311 (ZTE) #10 S2-2602312 (ZTE) #11 S2-2602400 (China Telecom) #12 S2-2602361 (OPPO) #14 S2-2601848 (Charter, Rogers) #15 S2-2601915 (Apple) #17 S2-2602367 (Lenovo)
11.4	Service continuity and 5GS interworking	#02 S2-2601900 (Ericsson) #05 S2-2602199 (Mediatek) #06 S2-2602133 (Samsung) #09 S2-2602311 (ZTE) #10 S2-2602312 (ZTE) #13 S2-2602388 (CableLabs, Rogers)
11.5	Non-3GPP Access based on Enhanced NSWO	#18 S2-2602405 (Lenovo)
11.6	6G support for Non-Seamless WLAN Offload (NSWO)	#19 S2-2601850 (Charter, Rogers) #20 S2-2602135 (Samsung)
11.7	Adaptive NAS/NAS-less Architecture with Stateless Service Continuity	#21 S2-2601997 (Google)

Table 3-11: KI#11 (N3GPP) solution variants [S2-2603407]

3.5.11.3. KI#11 status

Status: 7 solution variants documented for bullets 1, 2, and 4 (S2-2603407).

Next Steps: Update the approved solutions, including adding procedures, resolving the ENs. Potential new solutions (e.g. for bullet 3).

3.5.12. KI#12 (Voice): Voice Services for 6G

3.5.12.1. KI#12 principles

This key issue will investigate how to support voice services for the 6G System (referring to the mechanisms used in 5GS to support voice services as the starting point for discussion) - the following aspects will be studied:

1. How the 6GS natively supports IMS based voice over the 6G access network, including how a UE supporting 6G RAN selects and connects to 6G network for voice service.
2. Whether and how to update the IMS specification to support an IP-CAN in the 6GS.
3. How to support the voice continuity between 6G RAT and selected 3GPP RATs or between 6G RAT and selected non-3GPP Accesses when 6G RAT supports voice natively.
4. How to support migration to Vo6G.
5. Whether and how to support voice services if they are not provided in the serving 6G Network (Assuming this covers both domain selection and RAT/System selection at the time of the call).
6. How to support the compatibility between 6G CN and the existing deployed IMS with minimum impacts on the existing deployed DIAMETER interfaces (e.g. Rx, Cx, Sh).

3.5.12.2. KI#12 solution variants

This subsection provides an overview of the solution variants proposed for KI#12, S2-2603424, addressing voice services in the 6G System architecture. The summary outlines the key characteristics and approaches of each variant, including native IMS-based voice support, fallback mechanisms when voice is not available in 6G, and compatibility with existing IMS deployments.

- **IMS based voice service using IP-CAN in the 6GS (Variant #12.1):** This variant supports voice services in 6G using IMS as the primary framework, based on reuse and enhancement of existing IMS mechanisms. It includes procedures for UE registration, access domain selection, IMS connectivity via PDU sessions, QoS support for signalling and media, and continuity of voice services across 6G, 5G, and non-3GPP access through IP address preservation.
- **IMS Voice Call Fallback Mechanism (Variant #12.2):** This variant defines mechanisms to support voice services when IMS voice is not available in the serving 6G network. It includes UE-based and network-based fallback approaches, where the UE or network triggers interworking to another system such as 5G, using procedures such as handover, redirection, or reselection, supported by fallback assistance information and QoS-based triggers.
- **Compatibility with existing deployed IMS (Variant #12.3):** This variant addresses interoperability between the 6G core network and existing IMS deployments. It maintains existing Diameter and service-based interfaces for IMS interaction, avoids introducing new Diameter reference points, and supports continued use of established IMS architecture with minimal changes.

Table 3-12 provides a mapping between solution variants and the proposed solutions for KI#12 (Voice).

Solution Variant 12.1: IMS based voice service using IP-CAN in the 6GS			
#01 S2-2600142	#03 S2-2600342	#05 S2-2600415	#07 S2-2600599
#02 S2-2600251	#04 S2-2600350	#06 S2-2600451	#08 S2-2601885
Solution Variant 12.2: IMS Voice Call Fallback Mechanism			
#09 S2-2600273	#12 S2-2601828	#14 S2-2601922	#17 S2-2602314
#10 S2-2600363	#13 S2-2601884	#15 S2-2601923	#18 S2-2602437
#11 S2-2600364		#16 S2-2602079	
Solution Variant 12.3: Compatibility with existing deployed IMS			
#19 S2-2600252		#20 S2-2601886	

Table 3-12: KI#12 (Voice) variants mapping [S2-2603424]

3.5.12.3. KI#12 status

Status: Updates to existing solutions, removal of editor notes (ENs), and one new solution were agreed (S2-2603424).

Open Issues: Further proposals for new solutions and updates to existing solutions require discussion and alignment.

Next Steps: Continue discussions on potential new solutions and updates to existing solutions. Address remaining ENs and aim for further convergence.

3.5.13. KI#13 (Emergency Voice): Emergency Voice Services for 6G

3.5.13.1. KI#13 principles

This key issue will investigate how to support emergency voice services over the 6G System using the capabilities defined for voice service in KI#12.

Additionally, this key issue will study:

1. The functionality required in the UE and the 6G System to enable emergency voice service for 6GS.
2. The functionality required in the UE and the 6G System to establish emergency session via 6GS for the emergency voice service.
3. How to identify emergency services in 6GS in case of non-UE detectable emergency call, such that the required treatment for an emergency call is applied.
4. How to support a UE in Limited-Service state so that it can establish emergency session via 6GS.
5. Whether and how to support emergency voice services if they are not provided in the serving 6G Network (Assuming this covers both domain selection and RAT/System selection at the time of the call).

3.5.13.2. KI#13 solution variants

This section provides a high-level overview of the solution variants proposed for KI#13. The following highlights the main characteristics and approaches of each variant, covering both native emergency service support in 6GS and fallback options to alternative systems where needed.

- **Support for emergency services via 6GS (Solution Variant 13.1 - S2-2601887, Ericsson):** This category of solutions defines mechanisms for supporting emergency voice services natively in 6G, based on the reuse of existing 5G and IMS emergency procedures. It includes identification of emergency sessions, support for emergency registration including limited-service state, provisioning of emergency-related information such as P-CSCF and emergency numbers, and handling of emergency sessions even without full authentication or subscription. It also includes mechanisms for indicating emergency service support and enabling fallback where required.

- **Support for Emergency Services Fallback to NR and E-UTRAN (Solution Variant 13.2 - S2-2602456, Samsung):** This variant defines procedures to support emergency services when they are not available in the serving 6G network. It includes mechanisms for the UE to request fallback based on indications received during registration, and for the network to trigger handover or redirection to NR connected to 5GC or E-UTRAN connected to EPC. The procedures cover UE and network behaviour during fallback and the establishment of emergency sessions in the target system.

3.5.13.3. KI#13 status

Status: Updates to two existing solution variants agreed. No new variants expected; current variants ~80% complete (S2-2603270).

Next Steps: Further refine and stabilise existing variants. Address dependencies (KI#12, KI#17, KI#14, SA1 requirements). Consider LS to SA1 for requirements confirmation.

3.5.14. KI#14 (LCS): Location Services for 6G

3.5.14.1. KI#14 principles

This key issue will investigate how to support location service in 6G - the following aspects will be studied:

1. The architecture to support location services in 6GS.
2. How to support regulatory location services for emergency voice service in 6GS.
3. How to support location service exposure.

3.5.14.2. KI#14 solution variants

This subsection provides an overview of the solution variants proposed for KI#14 (S2-2603425). It summarises the key characteristics and approaches of each solution variant in a high-level manner, including the evolution of existing 5G location service frameworks, architectural enhancements with new interfaces and user plane support, and the introduction of data framework and AI-based mechanisms.

- **Location services architecture based on existing 5G LCS evolution (Solution Variants 14.1 and 14.2):** These variants extend the 5G location services framework to 6G, covering both regulatory and commercial use cases. They include enhancements to the interaction between the 6G core, RAN, and LMF, support positioning procedures using control plane and user plane mechanisms, and update the scope to avoid restriction to regulatory services only. The architecture supports UE-based and UE-assisted positioning, with interfaces for exchanging positioning data and results between network functions and external clients.



- **Enhanced location service architecture with new interfaces and user plane support (Solution Variants 14.4 and 14.5):** These variants introduce architectural enhancements for location services, including new or extended interfaces between the 6G RAN and LMF, and the use of user plane mechanisms for positioning data transfer. They define procedures for positioning message exchange and support both regulatory and commercial services, with considerations for avoiding reliance on specific core network functions and enabling flexible deployment models.
- **Location services leveraging data framework and AI agent (Solution Variant 14.3):** This variant introduces the use of a data framework and control

plane network functions such as AI agents to support location services. It defines mechanisms for requesting, collecting, processing, and exposing UE location data, including coordination between the data framework, LMF, and RAN. The approach supports data-driven control and positioning procedures, with dependencies on related key issues such as data framework and AI integration.

Table 3-13 provides a summary of solution variants proposed across different solution variant classifications for KI#14, together with a brief description, alongside the corresponding TDoc numbers and company names.

Variant #	TDoc # (Company Name)	Summary / Key Principles
14.1	S2-2600118 (Jio Platforms Ltd)	Privacy-Preserving Regulatory Location Sharing
14.2	S2-2600155 (Jio Platforms Ltd)	LPAF for 6G Location Architecture
14.3	S2-2600248 (Ericsson)	KI#14, bullet 1,2,3 6G LCS architecture and regulatory services
14.4	S2-2600490 (CATT) S2-2602382 (CATT)	Support of location service for 6G Update solution variant#14.2
14.5	S2-2600579 (Qualcomm)	Solution proposals on Location Service for 6G
14.6	S2-2602242 (Huawei, HiSilicon)	New solution of 6G location service leveraging data framework

Table 3-13: KI#14 (LCS) solution variants [S2-2603425]

3.5.14.3. KI#14 status

Status: One new solution variant identified (AI/Data Framework related). Existing variants updated to include non-regulatory services. ENs resolved for Variant #2 (see [S2-2603425](#)).

Next Steps: Resolve remaining ENs (e.g., Variant #3). Align with dependent KIs (potentially defer progress). Reflect LCS progress and RAN dependencies in LS, if applicable.

3.5.15. KI#15 (Messaging Services): Messaging Services for 6G

3.5.15.1. KI#15 principles

For messaging service in 6G this key issue will study:

1. How to support short message services (SMS) in 6GS as per the service requirements specified in [TS 22.101](#), [TS 22.261](#), [TS 22.105](#).

Note that for SMS to Emergency centre support it is assumed that the outcome of 5G-Advanced Rel-20 study will be adopted also for 6G.

3.5.15.2. KI#15 solution variants

This subsection provides a high-level overview of the solution variant proposed for KI#15. It essentially highlights different aspects of a solution variant (15.1) as defined in [S2-2603271](#).

- **SMS over NAS support in 6GS:** This aspect covers the delivery of SMS using NAS signalling between the UE and the 6G core network. It includes mechanisms for UE capability indication, network support indication, SMS transport via NAS messages, SMSF (or equivalent) selection, and handling of message delivery in both roaming and non-roaming scenarios, including support for UE reachability and re-delivery.
- **SMS over IP via IMS framework:** This aspect covers SMS delivery over IP networks using IMS-based mechanisms, including interworking via IP-SM-GW and support for SMS transport over IP-CAN. It allows SMS delivery through IMS where supported, with fallback to NAS-based delivery depending on operator configuration and network availability.
- **Domain selection and security aspects for SMS services:** This aspect includes mechanisms for selecting the appropriate delivery domain between NAS and IP based on operator policies and UE configuration. It also considers security features such as sender verification and message integrity protection, with dependencies on further work in relevant standardisation groups.

3.5.15.3. KI#15 status

Status: Update agreed for solution variant on MT-SMS delivery to out-of-coverage UEs. Alignment noted with existing reachability/notification mechanisms ([S2-2603271](#)).

Next Steps: Further refine solution variant and address dependencies with KI#1.1 and KI#1.2. Consider parking the KI and revisiting towards the end of the year.

3.5.16. KI#16 (Others): Other Essential/Regulatory Services for 6G

3.5.16.1. KI#16 principles

This key issue will study the following services:

1. How to support Multimedia Priority Services (MPS) in 6GS.
2. How to provide priority treatment to access control, signalling and media packets delivery for Mission Critical Services (MCX Services) in 6GS.

3.5.17. KI#17 (IWK): Migration and Interworking

3.5.17.1. KI#17 principles

This key issue studies how to support migration and interworking, including:

1. How to support migration to 6GS.
2. How to support interworking with 5GS.
3. Whether and how to support interworking with EPS.
4. How to support interworking between 6GS and 4G/5G NTN/satellite access that use EPS/5GS.

3.5.17.2. KI#17 solution variants

This subsection sets out a high-level overview of the solution variants proposed for KI#17 ([S2-2603532](#)), focusing on migration and interworking within the 6G System architecture. It outlines the approaches for enabling transition from existing systems and for supporting interworking with 5GS, EPS, and NTNs, including both single and dual registration models.

- **Migration paths to 6GS (Variant 17.1):** This variant covers approaches for migrating from existing systems to 6GS, including principles and architectural options for evolving from 5G and earlier systems. It considers impacts on network functions, deployment strategies, and coexistence during transition phases.

- **Interworking with 5GS based on single registration (Variant #17.2):** This variant addresses interworking between 6GS and 5GS using a single registration approach, with combined or coordinated user plane and data management functions. It includes multiple sub-variants for access and mobility management and session management, covering options such as separate or combined AMFs and SMFs, direct or indirect context transfer, and the introduction of additional network functions.
- **Interworking with 5GS based on dual registration (Variant D2):** This variant considers interworking between 6GS and 5GS using dual registration, where the UE maintains simultaneous registrations in both systems. It captures aspects related to mobility, session continuity, and coordination between systems, with further considerations for access and RAN impacts.
- **Interworking with EPS based on single registration (Variant #17.4):** This variant addresses interworking between 6GS and EPS using a single registration approach. It includes mechanisms for maintaining service continuity and supporting mobility between systems while preserving session context and connectivity.
- **Interworking with EPS based on dual registration (Variant D3):** This variant considers interworking between 6GS and EPS using dual registration, enabling the UE to be registered in both systems simultaneously. It includes aspects related to coordination between systems and handling of mobility and session continuity.
- **Interworking with NTN and satellite access (Variants #17.7 and #17.8):** These variants address interworking between 6GS and non-terrestrial networks, including 5G NTN and satellite-based access using EPS or 5GS. They consider scenarios with and without N26-like interfaces and build on baseline interworking approaches, with additional considerations specific to NTN environments.



Table 3-14 provides a summary of solution variants proposed across different solution variant classifications for KI#17, together with a brief description, alongside the corresponding TDoc numbers. Table 3-15 similarly provides a summary of solution variants proposed for KI#17 under dual registration scenarios.

Variant #	Solution Variant Classification	Solution #	TDoc #
Migration			
1	Migration paths		
Interworking with 5GS			
2	Interworking with 5GS based on single registration and combined 5G/6G user plane function (e.g. UPF) and combined 5G/6G user data repository (e.g. UDM/UDR). Single registration is supported		
Access and mobility management aspects			
3	A1: Assumes separate 5G AMF and 6G AMF. N14-like interface between 5G AMF and 6G AMF.	#06 S2-2602402 #09 S2-2602041 #07 S2-2602207 #08 S2-2602209 #11 S2-2602110 #12 S2-2602224	#29 S2-2602022 #30 S2-2602023 #35 S2-2602401 #36 S2-2602406 #38 S2-2602300
	A2: Assumes 5G/6G AMFs are combined into a single node. Only the sub-variant B1 (5G/6G SMFs are combined into a single node) is applicable.	#09 S2-2602041 #13 S2-2602463 #37 S2-2602451	
	A3: Assumes dedicated 6GC NF for Routing functionalities. N14-like interface between AMF and 6G NAS routing NF.	#10 S2-2602025 #17 S2-2602335 #18 S2-2602313	
	A4: Assumes dedicated 6GC NF for Routing functionalities, and dedicated 6GC NF for AI agent in a 6G CN. SBI interface between AMF and 6G dedicated 6GC NF for AI agent	#34 S2-2602330	
Session management aspects			
	B1: Assumes 5G/6G SMFs are combined into a single node.	#09 S2-2602041 #07 S2-2602207 #08 S2-2602209 #10 S2-2602025 #11 S2-2602110 #12 S2-2602224 #13 S2-2602463	#18 S2-2602313 #30 S2-2602023 #35 S2-2602401 #06 S2-2602402 #37 S2-2602451 #38 S2-2602300
	B2: Assumes 5G SMF and 6G SMF are separate, direct interface between SMFs. Target SMF can receive the SM context from source SMF using a direct interface	#15 S2-2602417 #36 S2-2602406 #29 S2-2602022	

Table 3-14: KI#17 (IWK) solution variants [S2-2603532]

Variant #	Solution Variant Classification	Solution # TDoc #
Session management aspects		
	B3: Assumes 5G SMF and 6G SMF are separate, no direct interface between the SMFs. Target SMF can receive the SM context from source SMF using an indirect interface via AMF	#17 S2-2602335
	B4: Assumes 5G SMF and 6G CN NF for session management are separate, context mapping and transfer are performed by the dedicated 6GC NF for AI agent	#34 S2-2602330
New services aspects		
Interworking with EPS		
4	Interworking with EPS based on single registration . Single registration between EPS and 6GS, is considered in this variant	#07 S2-2602207 #08 S2-2602209 #09 S2-2602041
		#13 S2-2602463 #37 S2-2602451 #32 S2-2602055
Solution variant(s) specific to Interworking with NTN/satellite access Note that this variant captures proposals for aspects beyond baseline interworking (applicable to both TN and NTN) that are specific to interworking with NTN/satellite access		

Table 3-14 (continued): KI#17 (IWK) solution variants [[S2-2603532](#)]

Variant	Solution Variant Classification	Solution # TDoc #
D2	Interworking with 5GS based on dual registration. Support for dual registration between 5GS and 6GS	#11 S2-2602110 #28 S2-2602021 #31 S2-2602027 #35 S2-2602401
D3	Interworking with EPS based on dual registration. Support for dual registration between 6GS and EPS	#21 S2-2602026 #28 S2-2602021

Table 3-15: KI#17 (IWK), Dual Registration [[S2-2603532](#)]

3.5.17.3. KI#17 status

Status: KI approved with two main variants: Interworking and Migration (including sub-variants for 5GS/EPS, single/dual registration). Inter-RAT mobility (HO) agreed to be handled under KI#17. Dependencies identified (e.g., SA1 requirements, other KIs); NTN to follow TN baseline ([S2-2603532](#)).

Next Steps: Clarify and document inter-RAT HO handling. Align on dual registration motivation and solution updates. Encourage merging of similar variants and offline alignment. Continue discussion on EPS interworking.

3.5.18. KI#18 (AI for 6G): AI for 6G Architecture

3.5.18.1. KI#18 principles

Study how to support and enable use of AI in 6G (e.g. AI agent, AI framework).

The AI for the 6G architecture shall be multi-vendor interoperable, reliable and sustainable.

Study whether and how to provide an architecture for AI to fulfil the following:

1. Enable the 6G CN to leverage AI capabilities and technologies in the 6G CN (e.g. AI agent), subject to operator policies and configuration and using 6G CN functionalities available in the network:
 - a. Determine how to fulfil requests from the UEs or AFs when intent is included and, in order to ensure interoperability of intents and supporting system test cases, determine the constraints on the use and expression of intents sent from the UEs and the AFs so that the intents can be processed and interpreted unambiguously by the AI capable entities in the 6G CN, and define the mechanisms required to support these constraints.
 - b. Determine how to fulfil requests when intent is not included.
 - c. In order to enable AI capable entities in 6G CN to dynamically compose parts of procedures to fulfil requests from UEs and AFs, determine the design principles and constraints for the modularisation of the procedures for the 6G CN that will be applicable to the system procedures defined in the normative work. How to enable the AI capable entities to compose these procedures in SA2 specifications will be determined by the study.
2. Enable closed-loop operations and learning techniques such as reinforcement learning, in 6G CN.
3. Enable entities in 6G CN to access network AI capabilities provided by 6G NFs.
4. Enable AI capable entities in 6G CN to access trusted external capabilities provided by AF.
5. Enable the monitoring of the performance of all AI capable entities in 6G CN.
6. Enable the operator to control the network's use of AI capabilities in its 6G CN, i.e. support different operator-configurable levels of autonomy based on operational needs, including the option to use or not use any AI capabilities.
7. Support roaming scenarios, e.g. how visited networks using or not using AI technologies can interwork with home network using or not using AI technologies.
8. Enable NFs of the 6G CN to have AI/ML capabilities, ML model provisioning, inferencing, training and monitoring.
9. Enable the 6G CN AI architecture to ensure interoperability with 5G CN AI architecture if needed, for the purpose of maintaining a consistent service for UEs across 5G and 6G.

3.5.18.2. KI#18 solution variants

This section provides a high-level summary of the solution variants identified for KI#18 (AI for 6G architecture), retrieved from an approved tdoc [S2-2603514](#) during SA2#174 in Malta. The variants capture alternative approaches across key architectural aspects, including

intent handling, AI-capable network functions, capability exposure, monitoring, and operator control. The content reflects a structured grouping of proposed solutions for further study and discussion, without implying preference or agreement on any specific approach.

- **Variant #18.1.** Introduces dedicated 6G CN network function(s) (e.g. AI agents or AI-capable entities) to handle requests including intent. These entities are responsible for intent interpretation, decomposition, orchestration, and execution, potentially forming an “agentic” layer within the core.
- **Variant #18.2.** Embeds intent handling capabilities within existing 6G CN network functions (e.g. mobility, session management). Intent processing is integrated into existing functions, avoiding the need for new entities while extending current roles.
- **Variant #18.3.** Defines a separate AI-related domain within the 6G CN, distinct from the packet-switched domain. This introduces a logical or functional separation for AI capabilities, enabling independent evolution and control.
- **Variant #18.4.** Specifies mechanisms for transporting intent from the UE to the 6G CN. Options include CP (via NAS), UP, or a potential new plane, with considerations for validation and clarification.
- **Variant #18.5.** Defines mechanisms for transporting intent from AFs to the 6G CN. Enables application-driven intent requests and complements UE-originated intent, with coordination required with related work.
- **Variant #18.6.** Describes procedures for intent fulfilment, including orchestration and execution of actions. Also considers the scope and granularity of tools, workflows, and procedures used to realise intents.
- **Variant #18.7.** Proposes structures and principles for intent representation, including goals, constraints, and conditions. Focuses on defining intent semantics without prescribing implementation details.
- **Variant #18.8.** Defines roaming architectures for intent-based requests, handled either in the visited or home network. Addresses distribution of responsibilities for intent processing across roaming scenarios.
- **Variant #18.9.** Addresses interoperability with 5G AI capabilities for intent-based operations. Ensures coexistence and alignment with existing 5G AI frameworks.
- **Variant #18.10.** Defines architectural approaches for handling requests without intent. Options include reuse of intent-capable functions or reliance on conventional function-specific mechanisms.
- **Variant #18.11.** Describes fulfilment of non-intent requests, using either shared mechanisms or traditional procedures. Considers how AI capabilities may enhance conventional service handling.
- **Variant #18.12.** Defines roaming principles for non-intent-based requests. Ensures consistent handling of conventional service requests across networks.
- **Variant #18.13.** Introduces machine learning (ML) inference capabilities within the 6G CN. Inference may be provided via dedicated functions or embedded within existing functions, potentially in a distributed manner.

- **Variant #18.14.** Defines AI training and provisioning mechanisms for AI-capable functions. Includes centralised or distributed training, lifecycle management, and model repositories.
- **Variant #18.15.** Supports learning techniques, including federated and collaborative learning approaches. Focuses on enabling distributed training across domains.
- **Variant #18.16.** Defines interaction models for accessing AI capabilities (e.g. tools or services). Includes centralised intermediaries, direct interactions (including agent-based approaches), or service-based interfaces.
- **Variant #18.17.** Specifies registration and discovery of AI capabilities within the 6G CN. Options include NRF-based discovery or dedicated repositories, with support for semantic discovery.
- **Variant #18.18.** Enables access to trusted external AI capabilities provided by AFs. Supports both gateway-based and direct interaction models, with abstraction of capabilities.
- **Variant #18.19.** Defines request-based performance monitoring, linked to handling of service requests. Monitoring focuses on evaluating outcomes and performance of request processing.
- **Variant #18.20.** Defines network function-based monitoring architectures for AI-capable entities. Provides visibility into the behaviour and performance of AI-enabled functions.
- **Variant #18.21.** Enables closed-loop operation, allowing automated adaptation based on monitoring results. Supports continuous optimisation through feedback-driven control.
- **Variant #18.22.** Defines operator control over AI capabilities in the 6G Core Network. Includes control at domain, network, and network function levels, with consideration of autonomy and fallback mechanisms.

Table 3-16 provides a mapping between solution variants and the proposed solutions for KI#18 (AI for 6G).

Solution # TDoc # (Company Name)	Solution # TDoc # (Company Name)
Variant #18.1 – Dedicated 6G CN NF(s) for Intent Handling	
#01 S2-2601774 (ZTE) #04 S2-2601816 (China Mobile) #08 S2-2601839 (NTT DOCOMO) #11 S2-2601855 (China Mobile, Huawei) #13 S2-2601914 (InterDigital) #14 S2-2601924 (ETRI, LG U+, SKT, EWU) #16 S2-2601943 (Tejas Networks) #17 S2-2601946 (Nokia) #19 S2-2601951 (Samsung, AT&T) #21 S2-2601954 (LG Electronics) #23 S2-2601964 (Transsion) #24 S2-2601973 (vivo) #25 S2-2601975 (TCL) #26 S2-2601976 (ETRI, EWU, LG U+) #27 S2-2602000 (Google)	#29 S2-2602033 (Xiaomi) #33 S2-2602069 (OPPO) #35 S2-2602076 (SKT) #37 S2-2602109 (Huawei, HiSilicon) #40 S2-2602211 (China Telecom) #41 S2-2602212 (China Telecom) #44 S2-2602233 (IIT Bombay) #45 S2-2602234 (CATT) #49 S2-2602336 (Futurewei) #50 S2-2602340 (Qualcomm) #53 S2-2602377 (Lenovo) #55 S2-2602411 (Jio) #56 S2-2602428 (NVIDIA) #57 S2-2602487 (Ericsson, T-Mobile, DT)
Variant #18.2 – Intent Handling Embedded in Existing NFs	
#03 S2-2601814 (IPLOOK) #13 S2-2601914 (InterDigital) #16 S2-2601943 (Tejas Networks) #21 S2-2601954 (LG Electronics) #49 S2-2602336 (Futurewei)	#53 S2-2602377 (Lenovo) #54 S2-2602386 (Lenovo) #56 S2-2602428 (NVIDIA) #58 S2-2602464 (Ofinno)
Variant #18.3 – Separate AI Domain for Intent Processing	
#17 S2-2601946 (Nokia) #50 S2-2602340 (Qualcomm)	#57 S2-2602487 (Ericsson, T-Mobile, DT)

Table 3-16: KI#18 (AI for 6G) variants mapping [S2-2603514]

Solution # TDoc # (Company Name)	Solution # TDoc # (Company Name)
Variant #18.4 – Transport of Intent from UE	
#01 S2-2601774 (ZTE)	#25 S2-2601975 (TCL)
#03 S2-2601814 (IPLOOK)	#27 S2-2602000 (Google)
#04 S2-2601816 (China Mobile)	#33 S2-2602069 (OPPO)
#08 S2-2601839 (NTT DOCOMO)	#35 S2-2602076 (SKT)
#10 S2-2601846 (MediaTek)	#37 S2-2602109 (Huawei, HiSilicon)
#11 S2-2601855 (China Mobile, Huawei)	#40 S2-2602211 (China Telecom)
#12 S2-2601895 (AT&T)	#44 S2-2602233 (IIT Bombay)
#13 S2-2601914 (InterDigital)	#45 S2-2602234 (CATT)
#14 S2-2601924 (ETRI, LG U+, SKT, EWU)	#49 S2-2602336 (Futurewei)
#16 S2-2601943 (Tejas Networks)	#51 S2-2602347 (Jio)
#17 S2-2601946 (Nokia)	#55 S2-2602411 (Jio)
#19 S2-2601951 (Samsung, AT&T)	#57 S2-2602487 (Ericsson, T-Mobile, DT)
#22 S2-2601955 (LG Electronics)	#58 S2-2602464 (Ofinno)
#24 S2-2601973 (vivo)	
Variant #18.5 – Transport of Intent from AF	
#04 S2-2601816 (China Mobile)	#27 S2-2602000 (Google)
#08 S2-2601839 (NTT DOCOMO)	#28 S2-2602028 (Rakuten Mobile)
#14 S2-2601924 (ETRI, LG U+, SKT, EWU)	#35 S2-2602076 (SKT)
#16 S2-2601943 (Tejas Networks)	#37 S2-2602109 (Huawei, HiSilicon)
#17 S2-2601946 (Nokia)	#45 S2-2602234 (CATT)
#22 S2-2601955 (LG Electronics)	#53 S2-2602377 (Lenovo)
#23 S2-2601964 (Transsion)	#54 S2-2602386 (Lenovo)
Variant #18.6 – Intent Fulfilment and Execution	
#01 S2-2601774 (ZTE)	#28 S2-2602028 (Rakuten Mobile)
#04 S2-2601816 (China Mobile)	#29 S2-2602033 (Xiaomi)
#08 S2-2601839 (NTT DOCOMO)	#33 S2-2602069 (OPPO)
#11 S2-2601855 (China Mobile, Huawei)	#37 S2-2602109 (Huawei, HiSilicon)
#13 S2-2601914 (InterDigital)	#41 S2-2602212 (China Telecom)
#14 S2-2601924 (ETRI, LG U+, SKT, EWU)	#44 S2-2602233 (IIT Bombay)
#16 S2-2601943 (Tejas Networks)	#45 S2-2602234 (CATT)
#17 S2-2601946 (Nokia)	#49 S2-2602336 (Futurewei)
#19 S2-2601951 (Samsung, AT&T)	#50 S2-2602340 (Qualcomm)
#21 S2-2601954 (LG Electronics)	#53 S2-2602377 (Lenovo)
#22 S2-2601955 (LG Electronics)	#56 S2-2602428 (NVIDIA)
#24 S2-2601973 (vivo)	#57 S2-2602487 (Ericsson, T-Mobile, DT)
#25 S2-2601975 (TCL)	#58 S2-2602464 (Ofinno)
#27 S2-2602000 (Google)	
Variant #18.7 – Intent Structure and Description	
#01 S2-2601774 (ZTE)	#24 S2-2601973 (vivo)
#03 S2-2601814 (IPLOOK)	#26 S2-2601976 (ETRI, EWU, LG U+)
#08 S2-2601839 (NTT DOCOMO)	#27 S2-2602000 (Google)
#10 S2-2601846 (MediaTek)	#28 S2-2602028 (Rakuten Mobile)
#11 S2-2601855 (China Mobile, Huawei)	#33 S2-2602069 (OPPO)
#12 S2-2601895 (AT&T)	#35 S2-2602076 (SKT)
#13 S2-2601914 (InterDigital)	#37 S2-2602109 (Huawei, HiSilicon)
#14 S2-2601924 (ETRI, LG U+, SKT, EWU)	#41 S2-2602212 (China Telecom)
#16 S2-2601943 (Tejas Networks)	#55 S2-2602411 (Jio)
#19 S2-2601951 (Samsung, AT&T)	#57 S2-2602487 (Ericsson, T-Mobile, DT)
#22 S2-2601955 (LG Electronics)	
Variant #18.8 – Roaming Support for Intent	
#01 S2-2601774 (ZTE)	#50 S2-2602340 (Qualcomm)
#27 S2-2602000 (Google)	#55 S2-2602411 (Jio)
#37 S2-2602109 (Huawei, HiSilicon)	#57 S2-2602487 (Ericsson, T-Mobile, DT)
#44 S2-2602233 (IIT Bombay)	

Table 3-16 (continued): KI#18 (AI for 6G) variants mapping [S2-2603514]

Solution # TDoc # (Company Name)	Solution # TDoc # (Company Name)
Variant #18.9 – Principles of interoperability with 5G AI	
#16 S2-2601943 (Tejas Networks)	#27 S2-2602000 (Google)
#18.10 Architecture Principles for Requests Without Intent	
#013 S2-2601914 (Interdigital)	#015 S2-2601936 (Interdigital)
#016 S2-2601943 (Tejas Networks)	#024 S2-2601973 (Vivo)
#021 S2-2601954 (LG Electronics)	#033 S2-2602069 (Oppo)
#027 S2-2602000 (Google)	#044 S2-2602233 (IIT Bombay)
#037 S2-2602109 (Huawei, HiSilicon)	#050 S2-2602340 (Qualcomm)
#045 S2-2602234 (CATT)	#057 S2-2602487 (Ericsson, T-Mobile USA, Deutsche Telekom)
#054 S2-2602386 (Lenovo)	#058 S2-2602464 (Ofinno)
#055 S2-2602411 (Jio Platforms)	
#18.11 Handling Requests Without Intent (Fulfilment)	
#013 S2-2601914 (Interdigital)	#015 S2-2601936 (Interdigital)
#016 S2-2601943 (Tejas Networks)	#017 S2-2601946 (Nokia)
#021 S2-2601954 (LG Electronics)	#024 S2-2601973 (Vivo)
#027 S2-2602000 (Google)	#044 S2-2602233 (IIT Bombay)
#037 S2-2602109 (Huawei, HiSilicon)	#050 S2-2602340 (Qualcomm)
#055 S2-2602411 (Jio Platforms)	#057 S2-2602487 (Ericsson, T-Mobile USA, Deutsche Telekom)
#18.12 Roaming Principles for Requests Without Intent	
#016 S2-2601943 (Tejas Networks)	#037 S2-2602109 (Huawei, HiSilicon)
#18.13 ML Inferencing	
#002 S2-2601775 (ZTE)	#024 S2-2601973 (Vivo)
#005 S2-2601817 (China Mobile)	#040 S2-2602211 (China Telecom)
#009 S2-2601840 (NTT Docomo)	#043 S2-2602231 (Honor)
#016 S2-2601943 (Tejas Networks)	#046 S2-2602235 (CATT)
#018 S2-2601947 (Nokia)	#048 S2-2602264 (Ericsson)
#019 S2-2601951 (Samsung, AT&T)	#050 S2-2602340 (Qualcomm)
#020 S2-2601952 (Samsung)	#054 S2-2602386 (Lenovo)
#023 S2-2601964 (Transsion Holdings)	
#18.14 AI Training and Provisioning	
#002 S2-2601775 (ZTE)	#024 S2-2601973 (Vivo)
#005 S2-2601817 (China Mobile)	#040 S2-2602211 (China Telecom)
#009 S2-2601840 (NTT Docomo)	#043 S2-2602231 (Honor)
#016 S2-2601943 (Tejas Networks)	#046 S2-2602235 (CATT)
#018 S2-2601947 (Nokia)	#048 S2-2602264 (Ericsson)
#019 S2-2601951 (Samsung, AT&T)	#054 S2-2602386 (Lenovo)
#020 S2-2601952 (Samsung)	#050 S2-2602340 (Qualcomm)
#023 S2-2601964 (Transsion Holdings)	
#18.15 Federated and Collaborative Learning Techniques	
#009 S2-2601840 (NTT Docomo)	#043 S2-2602231 (Honor)
#018 S2-2601947 (Nokia)	#048 S2-2602264 (Ericsson)
#019 S2-2601951 (Samsung, AT&T)	#054 S2-2602386 (Lenovo)
#020 S2-2601952 (Samsung)	#056 S2-2602428 (NVIDIA)
#024 S2-2601973 (Vivo)	#058 S2-2602464 (Ofinno)

Table 3-16 (continued): KI#18 (AI for 6G) variants mapping [S2-2603514]

Solution # TDoc # (Company Name)	Solution # TDoc # (Company Name)
#18.16 Interaction with AI Capabilities — Tools and Services	
#001 S2-2601774 (ZTE) #004 S2-2601816 (China Mobile) #011 S2-2601855 (China Mobile, Huawei) #014 S2-2601924 (ETRI, LG Uplus, SKT, Ewha Womans University) #025 S2-2601975 (TCL) #027 S2-2602000 (Google)	#034 S2-2602070 (Oppo) #040 S2-2602211 (China Telecom) #044 S2-2602233 (IIT Bombay) #055 S2-2602411 (Jio Platforms) #056 S2-2602428 (NVIDIA) #057 S2-2602487 (Ericsson, T-Mobile USA, Deutsche Telekom)
#18.17 Centralised Registration and Discovery of AI Capabilities	
#001 S2-2601774 (ZTE) #002 S2-2601775 (ZTE) #005 S2-2601817 (China Mobile) #008 S2-2601839 (NTT Docomo) #011 S2-2601855 (China Mobile, Huawei) #013 S2-2601914 (Interdigital) #014 S2-2601924 (ETRI, LG Uplus, SKT, Ewha Womans University) #017 S2-2601946 (Nokia) #019 S2-2601951 (Samsung, AT&T)	#025 S2-2601975 (TCL) #037 S2-2602109 (Huawei, HiSilicon) #038 S2-2602138 (CSCN) #043 S2-2602231 (Honor) #044 S2-2602233 (IIT Bombay) #046 S2-2602235 (CATT) #050 S2-2602340 (Qualcomm) #054 S2-2602386 (Lenovo) #056 S2-2602428 (NVIDIA)
#18.18 Access Trusted External Capabilities Provided by AF	
#011 S2-2601855 (China Mobile, Huawei) #013 S2-2601914 (Interdigital) #017 S2-2601946 (Nokia) #024 S2-2601973 (Vivo) #025 S2-2601975 (TCL)	#027 S2-2602000 (Google) #034 S2-2602070 (Oppo) #037 S2-2602109 (Huawei, HiSilicon) #050 S2-2602340 (Qualcomm)
#18.19 Request-Based Performance Monitoring	
#025 S2-2601975 (TCL) #032 S2-2602066 (Ewha Womans University) #036 S2-2602082 (ETRI)	#039 S2-2602155 (Xiaomi) #055 S2-2602411 (Jio Platforms)
#18.20 6G CN NF-Based Monitoring Architecture	
#019 S2-2601951 (Samsung, AT&T) #050 S2-2602340 (Qualcomm)	#056 S2-2602428 (NVIDIA)
#18.21 Closed-Loop Operation	
#009 S2-2601840 (NTT Docomo) #011 S2-2601855 (China Mobile, Huawei) #016 S2-2601943 (Tejas Networks) #020 S2-2601952 (Samsung) #021 S2-2601954 (LG Electronics) #025 S2-2601975 (TCL) #027 S2-2602000 (Google) #030 S2-2602045 (LG Uplus)	#032 S2-2602066 (Ewha Womans University) #036 S2-2602082 (ETRI) #037 S2-2602109 (Huawei, HiSilicon) #048 S2-2602264 (Ericsson) #053 S2-2602377 (Lenovo) #054 S2-2602386 (Lenovo) #056 S2-2602428 (NVIDIA) #058 S2-2602464 (Ofinno)
#18.22 Operator Control of AI Capabilities in the 6G CN	
#006 S2-2601823 (SKT, China Mobile, Rakuten Mobile) #007 S2-2601824 (SKT, China Mobile, Rakuten Mobile) #013 S2-2601914 (Interdigital) #015 S2-2601936 (Interdigital) #016 S2-2601943 (Tejas Networks) #019 S2-2601951 (Samsung, AT&T) #021 S2-2601954 (LG Electronics) #023 S2-2601964 (Transsion Holdings) #024 S2-2601973 (Vivo)	#031 S2-2602047 (LG Uplus, ETRI, Ewha Womans University) #040 S2-2602211 (China Telecom) #042 S2-2602213 (China Telecom) #047 S2-2602236 (CATT) #048 S2-2602264 (Ericsson) #050 S2-2602340 (Qualcomm) #055 S2-2602411 (Jio Platforms) #056 S2-2602428 (NVIDIA) #057 S2-2602487 (Ericsson, T-Mobile USA, Deutsche Telekom)

Table 3-16 (continued): KI#18 (AI for 6G) variants mapping [S2-2603514]

3.5.18.3. KI#18 status

Status: Structure agreed with 22 solution variants based on input contributions ([S2-2603514](#)).

Next Steps: Document key variants (including sub-variants where needed). Capture common aspects and key architectural differences. Prioritise progress in May, considering dependencies from other KIs.

3.5.19. KI#19 (6G for AI): 6G Network for AI

3.5.19.1. KI#19 principles

This key issue is based on the WT#3.2 about the 6G network for AI.

1. Study whether and how to support an AI agent on UE to discover another AI agent on a different UE via the 6G network(s).
2. Study whether and how to enable communication for AI agents on different UEs via the 6G network(s) e.g. identification and authorisation of an AI agent on a UE.
3. Study whether and how to enhance network capability exposure functionalities to AI agent on AF(s).
4. Study whether and how the 6G CN can provide AI services (i.e. AI inferencing and AI training) to applications (AF or in UE).
5. Study the potential system impacts based on the characteristics of AI traffic.

3.5.19.2. KI#19 solution variants

This section provides a high-level summary of the solution variants identified for KI#19 (Network for AI, [S2-2603122](#)). The variants capture different architectural approaches to

supporting AI agents, enabling interaction between agents and the network, exposing network capabilities, and providing AI services. They reflect a range of proposals across key areas, including agent communication, capability exposure, service provisioning, and traffic characteristics, and are intended to support further study and discussion without implying preference or agreement on any specific approach.

- **Variant #19.1.** This solution variant defines how the 6G CN can support UE AI agents through mechanisms for identification, registration, authentication, discovery, and communication. It considers options for assigning AI agent identities, enabling discovery based on agent attributes or skills, and supporting both one-to-one and group communication via control or user plane. The architecture may be realised within the packet-switched domain or a separate AI-related domain, with the possible introduction of dedicated functionalities such as management, discovery, and communication control entities.
- **Variant #19.2.** This solution variant enables UE AI agent registration, discovery, and communication at the application layer within the operator control domain. It relies on application-layer signalling transported over the UP, making it largely transparent to the CN and avoiding impacts on NAS procedures. Communication and authorisation between agents are handled through application-layer mechanisms, including support for distributed authorisation models.
- **Variant #19.3.** This solution variant focuses on enhancing network capability exposure to AI agents hosted on AFs. It supports agentic interaction models, where network capabilities are exposed as tools or services that can be discovered and invoked using agent-native protocols. The architecture may include translation functions to bridge agent protocols and 3GPP interfaces, with deployment options spanning NEF-based exposure, AF-based adaptation, new CN functions, or a separate domain incorporating proxies or gateways, and may support intent-based interactions.

- **Variant #19.4.** This solution variant enables the 6G CN to provide AI services, including model training and inference, to applications located in the UE or on AFs. It defines principles for service request, authorisation, data collection and transfer, and delivery of results, while supporting both UE- and AF-initiated interactions. The variant also considers model lifecycle aspects and coordination with related frameworks for capability exposure, data handling, and computing resources.
- **Variant #19.5.** This solution variant addresses the impact of AI traffic characteristics on the 6G System. It focuses on identifying and supporting emerging traffic patterns associated with AI applications, such as generative AI and token-based interactions, and their implications for network behaviour and optimisation. Further details are expected as the characteristics and requirements of AI traffic are studied.

Table 3-17 provides a mapping between solution variants and the proposed solutions for KI#19 (6G for AI).

Variant #19.1: UE AI agent registration, discovery and communication (CN-controlled)

#01 (S2-2600061, China Mobile)	#28 (S2-2601830, Rakuten Mobile)
#02 (S2-2600062, China Mobile)	#29 (S2-2601851, Xiaomi)
#03 (S2-2600078, China Mobile)	#31 (S2-2601908, LG U+, ETRI, EWU)
#04 (S2-2600094, China Mobile)	#32 (S2-2601937, EWU)
#05 (S2-2600186, China Mobile)	#33 (S2-2601938, OPPO)
#06 (S2-2600223, SKT, China Mobile, Rakuten Mobile)	#34 (S2-2601941, OPPO)
#08 (S2-2600356, Nokia)	#35 (S2-2601956, SKT)
#09 (S2-2600360, Nokia)	#36 (S2-2601985, ETRI)
#10 (S2-2600381, MediaTek)	#37 (S2-2602001, Huawei, HiSilicon)
#11 (S2-2600424, China Mobile, Huawei)	#38 (S2-2602034, China Satellite Communications)
#12 (S2-2600425, AT&T)	#39 (S2-2602035, Xiaomi)
#13 (S2-2600432, InterDigital)	#40 (S2-2602072, China Telecom)
#14 (S2-2600520, ETRI, LG U+, SKT, EWU)	#41 (S2-2602150, China Telecom)
#15 (S2-2600530, InterDigital)	#42 (S2-2602189, China Telecom)
#16 (S2-2600536, Tejas Networks)	#43 (S2-2602191, HONOR)
#17 (S2-2600546, Nokia)	#44 (S2-2602214, IIT Bombay)
#18 (S2-2600561, Nokia)	#45 (S2-2602249, CATT)
#19 (S2-2600369, Samsung, AT&T)	#46 (S2-2602320, CATT)
#20 (S2-2600573, Samsung)	#47 (S2-2602339, CATT)
#21 (S2-2600629, LG Electronics)	#48 (S2-2602369, Ericsson)
#22 (S2-2601777, China Mobile)	#49 (S2-2602392, Futurewei)
#23 (S2-2601784, Transsion)	#50 (S2-2602465, Qualcomm)
#24 (S2-2601786, vivo)	#51 (S2-2602466, Jio)
#25 (S2-2601787, TCL)	#52 (S2-2602168, Jio)
#26 (S2-2601788, ETRI, EWU, LG U+)	#53 (S2-2602340, Qualcomm)
#27 (S2-2601794, Google)	#54 (S2-2601946, Lenovo)

Variant #19.2: Application-layer (operator domain) approach

#7 (S2-2600245, SKT, CM, RM)	#18 (S2-2600561, Nokia)
#15 (S2-2600530, InterDigital)	#30 (S2-2601866, LGU+)

Variant #19.3: Network capability exposure to AI agents (AF side)

#01 (S2-2600224, ERIC);	#06 (S2-2601883, IDCC)
#01 (S2-2602359, ERIC)	#07 (S2-2601908, LGU+, ETRI, EWU)
#02 (S2-2600452, NOK);	#08 (S2-2601939, ERIC)
#02 (S2-2601948, NOK)	#09 (S2-2602074, NOK)
#03 (S2-2600573, QCOM)	#10 (S2-2602165, HUA)
#03 (S2-2602340, QCOM)	#11 (S2-2602360, ERIC)
#04 (S2-2600244, HUA)	#12 (S2-2601946, LEN)
#05 (S2-2601831, CM)	

Table 3-17: KI#19 (6G for AI) variants mapping [S2-2603122]

Variant #19.4: AI services (training & inference in CN)

#01 (S2-2600063, HUA)
#02 (S2-2600079, SAM)
#03 (S2-2600096, NOK)
#04 (S2-2600158, ERIC)
#05 (S2-2600171, QCOM)
#06 (S2-2600191, ZTE)
#07 (S2-2600414, China Mobile)
#08 (S2-2600454, InterDigital)
#09 (S2-2600540, Nokia)

#10 (S2-2601776, SAM)
#11 (S2-2601789, NOK)
#12 (S2-2601852, CM)
#13 (S2-2601854, CM)
#14 (S2-2601949, IDCC)
#15 (S2-2601953, SAM)
#16 (S2-2602075, CM)
#17 (S2-2602166, QCOM)
#18 (S2-2602306, NOK)
#19 (S2-2602368, ZTE)

Variant #19.5: AI traffic characteristics / system impact

#01 (S2-2600095, CM)
#02 (S2-2600173, HUA)
#03 (S2-2600393, NOK)
#04 (S2-2600394, NOK)

#05 (S2-2600403, SAM)
#06 (S2-2600467, ERIC)
#07 (S2-2600537, CM)
#08 (S2-2600540, NOK)

Table 3-17 (continued): KI#19 (6G for AI) variants mapping [S2-2603122]

3.5.19.3. KI#19 status

Status: Solution aspects documented for AI agent communication (ID, registration, discovery, communication). Multiple architecture options defined for capability exposure (e.g., NEF, AF, new entities, separate domain). Principles documented for AI service support (training and inference). Domain-related aspects linked to KI#18 (S2-2603122).

Next Steps: Develop detailed design and procedures per solution variant/option. Continue alignment with KI#18 on domain aspects.

3.5.20. KI#20 (Sensing): Integrated Sensing and Communication

3.5.20.1. KI#20 principles

Study the integration of Sensing and Communication over 3GPP access, covering RAN node and UE operating as 3GPP Sensing Entities in the different sensing modes in alignment with TSG RAN, and considering multiple sources of sensing data.

The following aspects will be studied:

1. Architecture and functional support for Sensing Service, including:
 - a. Sensing Service authorisation and revocation.
 - b. Discovery and (re-)selection of Sensing function and Sensing Entities (i.e. RAN nodes, UEs), including sensing modes selection.
 - c. Configuration parameters and policy provisioning to support sensing service, e.g. to the selected Sensing Entities, Sensing function, etc.

- d. Collection and transport of 3GPP sensing related data for sensing result generation.
- e. Exposure framework of sensing result to the Sensing service consumer (i.e. AFs, UEs, Core NFs).

2. Whether and how to support Sensing Service in consideration of the mobility of the UE as sensing entity.
3. Whether and how to support providing sensing data, which is not obtained from 3GPP radio signals, to the Sensing Function for sensing result generation.

3.5.20.2. KI#20 solution variants

This section provides a high-level summary of the solution variant classifications identified for KI#20 (Integrated Sensing and Communication). The variant classifications capture different architectural approaches to supporting sensing services in the 6G System, including enhancements to existing architectures, introduction of new control and data mechanisms, and the use of AI-driven functions. They reflect a range of proposals across key aspects such as sensing modes, data handling, and service orchestration, and are intended to support further study and discussion without implying preference or agreement on any specific approach

- **#20.1.** This solution variant supports 6G sensing by enhancing the existing 5G sensing architecture to address 6G requirements. It extends the architecture to support multiple sensing modes and different types of sensing consumers, and introduces a 6G Sensing Function comprising control and processing components. The approach builds on established 5G principles while allowing adaptation based on other 6G architectural developments.

- **#20.2.** This solution variant supports 6G sensing through the use of new control signalling mechanisms defined for the 6G System. It leverages enhanced control plane capabilities to enable sensing service procedures and interactions, with dependency on control signalling solutions, while maintaining support for all sensing modes and consumers.
- **#20.3.** This solution variant enables 6G sensing using a 6G data framework, focusing on how sensing data are collected, managed, and utilised within the system. It leverages data framework capabilities to support sensing services across different entities, with dependency on data-related architectural enablers.
- **#20.4.** This solution variant supports 6G sensing by utilising a control plane network function based on AI agent capabilities. It introduces an AI-driven entity to handle sensing service requests and orchestration, enabling more adaptive and intelligent management of sensing operations, with dependency on AI-related architectural solutions.
- **#20.5.** This solution variant captures sensing solutions that are independent of specific architectural approaches. It includes proposals addressing particular sensing aspects or functionalities that can be applied across different architecture variants and are not tied to a specific design choice.

Table 3-18 provides a summary of solution variants proposed across different solution variant classifications for KI#20, together with a brief description, alongside the corresponding TDoc numbers and company names.

Variant #	Solution Variant Classification	Summary / Key Principles	Solution # (TDoc #, Company)
20.1	Support 6G Sensing by enhancing 5GS sensing architecture to support different sensing modes	This variant captures the architecture supporting 6G sensing services through enhancements to the 5GS sensing architecture. It includes various sensing modes and different types of sensing consumers. Multiple options are considered for each aspect of the key issue.	#01 (S2-2601781, LGE) #02 (S2-2601801, MTK) #03 (S2-2601806, NEC) #04 (S2-2601834, VIVO) #06 (S2-2601837, CM) #08 (S2-2601881, IDCC) #09 (S2-2601882, APP) #10 (S2-2601909, ERIC) #13 (S2-2601945, CM) #14 (S2-2601977, ETRI) #15 (S2-2602009, NOK) #17 (S2-2602140, CT) #18 (S2-2602170, HUA, HISI) #19 (S2-2602261, IITB) #20 (S2-2602269, NTTD) #21 (S2-2602272, LEN) #22 (S2-2602284, OPPO) #23 (S2-2602287, OPPO) #24 (S2-2602310, ZTE) #25 (S2-2602331, SAM) #26 (S2-2602352, QCOM) #28 (S2-2602383, CATT) #33 (S2-2602439, XIA) #35 (S2-2602953, KPN)
20.2	Support 6G sensing by using a new control signalling for 6G System	This variant captures the architecture that supports the 6G sensing services by employing the control signalling(s) method(s) of the 6G System. It has dependency on the solutions of KI#1. This variant addresses the specifics on how the new control signalling can be used to support sensing services.	#06 (S2-2601837, CM) #10 (S2-2601909, ERIC) #13 (S2-2601945, CM) #16 (S2-2602046, TEJAS) #20 (S2-2602269, NTTD) #26 (S2-2602352, QCOM)

Table 3-18: KI#20 (Sensing) solution variants [S2-2603350]

Variant #	Solution Variant Classification	Summary / Key Principles	Solution # (TDoc #, Company)
20.3	Support 6G sensing services using a 6G data framework	This variant captures the architecture that supports 6G sensing services by employing a 6G data framework. It has dependency on the solutions of KI#21. This variant addresses the specifics on how the 6G Data Framework can be used to support sensing services.	#13 (S2-2601945, CM) #18 (S2-2602170, HUA, HISI) #26 (S2-2602352, QCOM) #29 (S2-2602421, TURKCELL) #30 (S2-2602424, TURKCELL)
20.4	Support 6G sensing using a CP NF (AI agent) for 6G architecture	This variant captures the architecture that supports 6G sensing services by employing the Network AI agent in the 6G System. It has dependency on the solutions of KI#18. This variant addresses the specifics on how the Network AI agent can be used to support sensing services.	#13 (S2-2601945, CM) #18 (S2-2602170, HUA, HISI) #26 (S2-2602352, QCOM)
20.5	Sensing solutions independent of the architecture variants	This variant captures the solution proposals that are meant to work with any sensing system architecture.	#07 (S2-2601841, SAM, OPPO) #09 (S2-2601882, APP) #23 (S2-2602287, OPPO) #27 (S2-2602363, OPPO) #31 (S2-2602431, CEWiT) #34 (S2-2602468, KYOCERA)

Table 3-18 (continued): KI#20 (Sensing) solution variants [S2-2603350]

3.5.20.3. KI#20 status

Status: Initial solution variants for bullet 1 agreed (sensing modes, variant grouping, high-level principles) S2-2603350.

Next Steps: Continue focus on bullet 1. Develop technical principles per variant group. Review need for additional solution variants.

3.5.21. KI#21 (DF): 6G Data Framework in SA2

3.5.21.1. KI#21 principles

The key issue is based on WT#5, which includes the following aspects:

1. Identify high level use cases (e.g. AI/ML in the core, UE data collection for UE-sided model training, Sensing) potentially subject to the data framework.
2. Study required data framework functionalities to support the identified use cases, e.g.:
 - a. data discovery and data registration.
 - b. data collection and transfer (including configuration of the data source (e.g. about collected data, reporting period and mechanisms to use), transfer of the collected data (including data distribution)).
 - c. data labelling/metadata handling.

- d. data processing (e.g. data anonymisation, data analysis, data generation, etc.).
- e. data storage and retrieval.
- f. data exposure.

The functionalities above may need to consider the quality of data, latency and data volume.

3. Study potential system impacts of user consent, privacy, security and data governance from SA WG2 architectural and system level perspective for data generated in 6G System corresponding to the use cases and functionalities in aspects 1 and 2.

3.5.21.2. KI#21 solution variants

The following provides a high-level summary of the solution variants identified for KI#21 (6G Data Framework). The variants describe alternative approaches to enabling data collection, processing, storage, and exposure across the 6G System, including interactions with UE, RAN, CN, and external entities.

- **#21.1 (Use Cases)** This solution defines high-level use cases for the 6G data framework, covering data exchange between UE, RAN, Core Network, OAM, and third-party applications. Use cases include AI/ML training and inference, sensing support, data exposure, network optimisation, and digital twin enablement, with alignment required across related key issues.

- **#21.2 (Functionality)** This solution specifies the functional capabilities of the data framework, including data collection, transfer, processing, storage, exposure, and lifecycle management. It also includes mechanisms for data registration, discovery, and metadata handling, supporting a range of data-driven services and operations.

Architecture and Design Variants (#21.3)

- **A (Single CN NF “data island”)** This variant realises the data framework as a single 6G CN function, centralising data handling capabilities within one entity. It provides a simplified architectural model with unified control of data storage, processing, and exposure.
- **B1 (Reuse of 5G CN NFs)** This variant implements the data framework by leveraging existing 5G CN functions. It extends current capabilities to support 6G data requirements while maintaining architectural continuity with 5G.
- **B2 (Multiple CN NFs)** This variant distributes the data framework across multiple 6G CN functions without introducing agent functionality. It enables modular deployment and scalability of data handling capabilities.
- **C (Data Agent Functionality)** This variant introduces a dedicated data agent network function within the 6G CN. It provides enhanced coordination, management, and interaction for data-related operations, potentially enabling more dynamic behaviour.
- **D (UE-related Data Handling)** This variant defines mechanisms for data transfer involving the UE, including user plane-based transfer, non-user-plane approaches, and RAN-to-OAM pathways. It supports flexible data exchange models depending on service requirements and architectural choices.

- **E (RAN-related Aspects)** This variant addresses RAN-related considerations for the data framework, including interaction with data collection, transfer, and processing. Further details and alignment with RAN and OAM domains are required.

Sub-feature Variants #21.4 to #21.12

- **#21.4 to #21.6 (Data Collection and Transfer)** These solutions define mechanisms for data collection and transfer involving UE, RAN, and CN entities, addressing procedures, transport methods, and coordination across domains.
- **#21.7 (Data Transfer Aspects)** This solution variant covers data formats, protocols, and transport considerations, ensuring interoperability and efficient data exchange within the framework.
- **#21.8 (Data Processing)** This solution category defines processing capabilities, including transformation, aggregation, and preparation of data for consumption.
- **#21.9 (Data Exposure)** This solution specifies mechanisms for exposing data to consumers, including internal functions and external entities.
- **#21.10 (Storage and Retrieval)** This solution class defines data storage and retrieval capabilities, enabling persistent and on-demand access to data.
- **#21.11 (Registration and Discovery)** This solution defines mechanisms for data registration, indexing, and discovery, enabling efficient access to available data assets.
- **#21.12 (Privacy and User Consent)** This solution addresses data privacy, protection, and user consent mechanisms, ensuring compliance with policy and regulatory considerations.

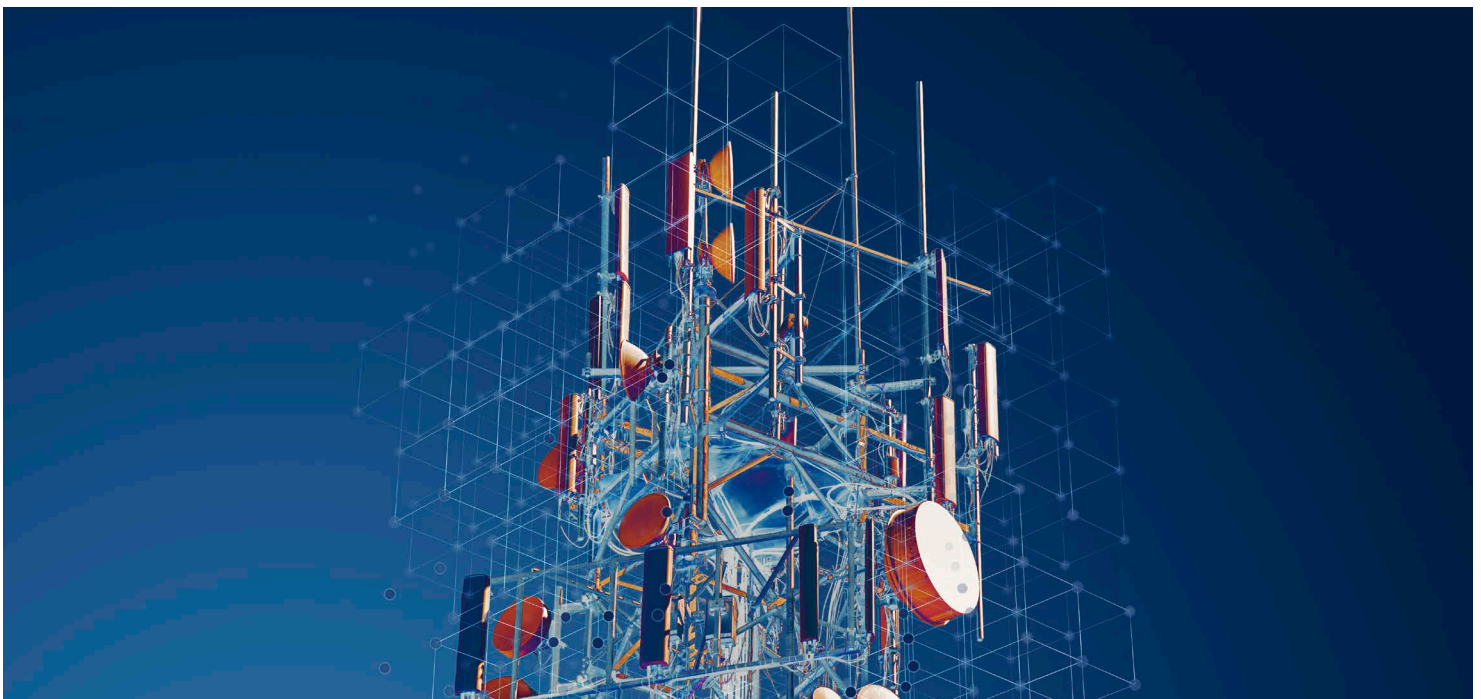


Table 3-19 provides a mapping between solution variants and the proposed solutions for KI#21 (DF).

Bullet #1 (Use Cases / High-level aspects)

#A01 (S2-2601829, ZTE)	#A20 (S2-2602013, LG Electronics)
#A02 (S2-2601835, China Mobile)	#A21 (S2-2602054, CATT)
#A03 (S2-2601842, Apple)	#A26 (S2-2602071, LG Electronics)
#A04 (S2-2601847, MediaTek)	#A27 (S2-2602084, OPPO)
#A05 (S2-2601856, Qualcomm)	#A28 (S2-2602087, OPPO)
#A06 (S2-2601858, China Mobile)	#A29 (S2-2602151, ETRI)
#A07 (S2-2601864, Oracle)	#A30 (S2-2602156, Tejas)
#A08 (S2-2601868, Intel)	#A32 (S2-2602169, Huawei, HiSilicon)
#A09 (S2-2601892, Ericsson)	#A33 (S2-2602171, Huawei)
#A12 (S2-2601913, InterDigital)	#A34 (S2-2602208, NTT DOCOMO)
#A13 (S2-2601925, ETRI, LGU+, EWU)	#A35 (S2-2602215, China)
#A14 (S2-2601967, Samsung)	#A38 (S2-2602226, OPPO)
#A15 (S2-2601974, vivo)	#A42 (S2-2602293, Nokia, AT&T)
#A19 (S2-2601998, Google)	#A46 (S2-2602318, CEWIT)

Bullet #2 Architecture and Design Variants

#A01 (S2-2601829, ZTE)	#A27 (S2-2602084, OPPO)
#A02 (S2-2601835, China Mobile)	#A30 (S2-2602156, Tejas)
#A04 (S2-2601847, MediaTek)	#A31 (S2-2602158, ETRI)
#A05 (S2-2601856, Qualcomm)	#A32 (S2-2602169, Huawei, HiSilicon)
#A06 (S2-2601858, China Mobile)	#A34 (S2-2602208, NTT DOCOMO)
#A07 (S2-2601864, Oracle)	#A36 (S2-2602216, China Telecom)
#A10 (S2-2601893, Ericsson, T-Mobile)	#A37 (S2-2602217, China Telecom)
#A11 (S2-2601894, Ericsson)	#A39 (S2-2602232, HONOR)
#A12 (S2-2601913, InterDigital)	#A40 (S2-2602273, HONOR)
#A14 (S2-2601967, Samsung)	#A41 (S2-2602275, OPPO)
#A15 (S2-2601974, vivo)	#A42 (S2-2602293, Nokia, AT&T)
#A16 (S2-2601978, ETRI)	#A44 (S2-2602295, Nokia)
#A17 (S2-2601983, ZTE)	#A45 (S2-2602297, OPPO)
#A18 (S2-2601984, ZTE)	#A47 (S2-2602324, Futurewei)
#A20 (S2-2602013, LG Electronics)	#A48 (S2-2602387, Lenovo)
#A22 (S2-2602056, CATT)	#A49 (S2-2602410, Xiaomi)
#A23 (S2-2602057, CATT)	#A50 (S2-2602422, Orange)
#A24 (S2-2602067, CATT)	#A51 (S2-2602427, Turkcell)
#A25 (S2-2602068, ETRI, LGU+, EWU)	

Bullet #3: Sub-feature Variants (Privacy, advanced aspects, and cross-cutting)

#A03 (S2-2601842, Apple)	#A14 (S2-2601967, Samsung)
#A12 (S2-2601913, InterDigital)	#A32 (S2-2602169, Huawei, HiSilicon)

Table 3-19: KI#21 (DF) variants mapping [S2-2603523]

3.5.21.3. KI#21 status

Status: Solution category table agreed with 12 topics. Architecture topic includes 5 aspects and 7 solution variants. 14 use cases agreed (with further details to be added) [S2-2603523](#).

Next Steps: Prioritise architecture and overarching design (incl. sub-variants and diagrams). Further develop functionalities and remaining topic. Continue populating the solution category table.

3.5.22. KI#22 (Computing): 6G Computing Support

3.5.22.1. KI#22 principles

Study aspects on support of computing for UE, core network and application server in 6G (e.g. coordination among UE, core network and application server, exposure of computing service in the core network, etc.).

In order to support computing, the following aspects need to be studied:

1. Identification of the architectural requirements and computing resource(s):
 - a. Derive architectural requirements for scenario(s) and service requirements defined by SA1 to be enabled by the Computing Service.
 - b. Whether and how to define the computing resource (e.g. computing resource type and/or status, location of the computing resource, etc.).
2. Enablement/authorisation of computing service to UE or AF.
 - a. Whether and how to enable Computing Service.
 - b. Whether and how the operator network may expose the computing resource related information (e.g. its hosting capability (e.g. using compute resources at Service Hosting Environment)) and/or network metrics to AF.
3. Coordination of communication and computing, service continuity and QoS aspects:
 - a. Whether and how to coordinate (e.g. within or outside the core network) communication (for the traffic transferred over user plane) and computing resource(s) in the Computing Site.
 - b. Whether and how to identify, collect/monitor, provision the computing resource related information.
 - c. Whether and how to improve the service experience.
 - d. Whether there is a need to improve QoS to satisfy Computing Service requirements.
 - e. Whether and how to support service continuity for computing service upon change of computing site and/or user plane function (e.g. due to UE mobility, computing load balancing, AF influence etc.).

4. Discovery and (re-)selection of compute site(s) for the Computing Service:

- a. Whether and how to discover and (re-)select Computing Site(s) for the Computing Service.

3.5.22.2. KI#22 solution variants

The following provides a high-level summary of the solution variants identified for KI#22 (Computing support in 6G). The variants describe alternative approaches to enabling computing services across the 6G System, including coordination between communication and computing, service authorisation, capability exposure, and resource monitoring. They reflect a range of architectural options spanning core network control, application-driven models, and external computing frameworks, and are intended to support further study and discussion without implying preference or agreement on any specific approach.

- **Variant #22.1 (Architecture, Definitions, and Requirements).** This solution variant defines common architectural requirements, key concepts, and terminology for 6G computing support, including computing service, computing resources, computing site, and service hosting environment. It also considers the possible location of computing sites and provides a baseline for subsequent solution variants.
- **Variant #22.2 (Coordination controlled by 6G CN).** This solution category looks at architectures where coordination between communication and computing is controlled by the 6G CN. It includes multiple variants covering UE- or AF-initiated requests, different signalling approaches such as NAS, user plane or new planes, and coordinated selection of computing sites and user plane functions.
- **Variant #22.3 (Coordination performed by AF).** This solution defines architectures where coordination between communication and computing is handled by the AF. It shifts control logic outside the core network, allowing applications to manage computing resource selection and coordination.
- **Variant #22.4 (Coordination via AF or Edge Enabler Layer).** This set of solutions enables coordination through the AF or an Edge Enabler Layer. It leverages existing edge frameworks to support computing services, with reduced dependency on core network control.
- **Variant #22.5 (Policy-based authorisation).** This solution class defines computing service authorisation based on UE policies, such as URSP or new computing policies, enforced by functions such as PCF or CCF. It supports policy-driven access control for computing services.
- **Variant #22.6 (Non-policy-based authorisation).** This solution defines authorisation mechanisms without relying on UE policy, including authorisation by network functions such as NEF or AMF. It provides alternative approaches to enabling computing service access.



- **Variant #22.7 (Implicit or subscription-based authorisation).** This solution enables computing service access based on subscription or implicit authorisation, without explicit signalling to the UE or AF. It simplifies authorisation procedures while relying on pre-configured policies.
- **Variant #22.8 (Authorisation by computing framework).** This solution delegates computing resource authorisation to the computing framework itself, without requiring explicit authorisation from the 6G CN. It assumes that external computing platforms manage access control.
- **Variant #22.9 (Computing information exposure to AF).** This solution defines mechanisms for exposing computing-related information from the network to AFs, including computing capabilities, metrics, deployment information, and location-related parameters.
- **Variant #22.10 (Communication delay exposure).** This category of solutions enables exposure of communication delay information to AFs, supporting optimisation of computing service selection and performance.
- **Variant #22.11 (CN-based resource monitoring).** This solution defines monitoring of computing resource status by CP functions within the 6G CN, providing visibility of resource availability and load.
- **Variant #22.12 (QoS monitoring by CN).** This solution enables monitoring of QoS for computing services based on information collected from NFs, supporting performance assurance.
- **Variant #22.13 (Monitoring via AF or DN interaction).** This solution defines monitoring of computing resources located in data networks, including collection of information from AFs or via UP functions.
- **Variant #22.14 (No CN monitoring).** This solution assumes no direct monitoring of computing resources by the 6G CN, relying instead on information provided by AFs, such as delay metrics.
- **Variant #22.15 (SHE-based monitoring).** This solution defines monitoring of computing resources within the Service Hosting Environment by dedicated controllers, with implementation-dependent mechanisms.

Table 3-20 classifies different solution variants in more detail and also links to actual proposals/solutions for KI#22 proposed by 3GPP member companies (see TDoc S2-2603513).

Solution Variant Classification	KI#22 Bullet	Solution Category	Variants Description	Sol #	Sol # in TR
1. Architecture Requirements, Definitions, Location of Computing Node/Site	1a, 1b	(1) Architectural requirements		#11, #22, #27, #29	22.1
		(2) Computing related definitions		#96	
		(3) Architectural representation of Computing Site location			
		(4) Architectural Assumption		#96	
2. Architecture and Coordination of Communication and Computing	1b, 3a, 3c, 3d, 3e, 4a	(1) Coordination between Communication and Computing is controlled by 6G CN (e.g., 6G SMF, CMF, CCF, CCCE, etc.):	(A). UE Requested Computing Support in 6G by using SM NAS	#01, #06, #08, #13, #15, #20, #21, #25, #26, #33, #34	22.2
			(B). UE Triggered Computing Service Support in 6G by using SM NAS and UP connectivity to a Computing Site in the SHE, an Operator controlled domain other than 6G CN	#07	
			(C). UE Requested Computing Support in 6G by using Computing NAS for Computing Site connecting to 6G UPF	#03, #05, #10, #11, #15, #26, #36, #38, #39, #40	
			(D). UE Requested Computing Support in 6G by using Computing NAS for Computing Site connecting to 6G Data Plane Function	#11, #15	
			(E). UE Requested Computing Support with Computing messages over UP	#14, #15, #23	

Table 3-20: KI#22 (Computing) solution variants [S2-2603513]

Solution Variant Classification	KI#22 Bullet	Solution Category	Variants Description	Sol #	Sol # in TR
2. Architecture and Coordination of Communication and Computing	1b, 3a, 3c, 3d, 3e, 4a	(1) Coordination between Communication and Computing is controlled by 6G CN (e.g., 6G SMF, CMF, CCF, CCCE, etc.):	(F). UE Requested Computing Support in 6G over new Plane (e.g., service plane)	#16, #26	22.2
			(G). UE Initiated Computing Service Support and SMF Controlled Coordinated selection of UPFs and compute sites	#35	
			(H). AF Requested Computing Support via CP Function	#05, #10, #16, #17, #33	
			(I). UE Requested Computing Service Support and CCF Controlled Coordinated selection of UPF and computing site in DN	#82	
	(2) Coordination between Communication and Computing is performed by AF	#27, #28, #30	22.3		
(3) Coordination between Communication and Computing is performed by AF or Edge Enabler Layer	#09	22.4			
3. Computing Service Authorisation to UE/AF	2a	(1) UE Policy (i.e., URSP, new Computing Policy) based authorisation to UE by PCF/CCF	(A). URSP based Computing Service Authorisation to UE from PCF	#12, #18, #25	22.5
			(B). CCF based Computing Service Authorisation to UE	#12	
	(2) Non-UE policy-based authorisation	A. Computing Service Authorisation to UE/AF by NEF	#38	22.6	
		B. Computing Service Authorisation to UE by AMF	#34		
	(3) Subscription based authorisation without explicit authorisation to UE/AF	A. Computing Service Authorisation by CCCE	#07	22.7	
		B. Computing Service Authorisation by 6G CCF	#33		
	(4) Computing resource authorisation by computing framework (no need for computing resource authorisation by 6G CN)	#27, #28, #30, #35	22.8		

Table 3-20 (continued): KI#22 (Computing) solution variants [S2-2603513]

Solution Variant Classification	KI#22 Bullet	Solution Category	Variants Description	Sol #	Sol # in TR
4. Computing Exposure from 6G CN to AF	2b	(1) Computing Related Information exposure	A. CMF exposes Computing Capability to AF	#02, #17, #37	22.9
			B. CMF exposes Computing metrics to AF	#24	
			C. NEF exposes CS Deployment Information stored in UDR to AF	#31	
			D. SMF exposes DNAI and Computing Site IP to AF	#35	
		(2) Communication Delay exposure	#24 #28	22.10	
5. Computing Resource Monitoring and Management by 6G CN	3b	(1) CP Function (e.g., 6G SMF, CMF, CCF, etc.) monitors the Computing Resources status in Computing Node/Site (e.g., Computing Node/Site, etc.)		#05, #11, #19	22.11
		(2) CP Function monitors the QoS for Computing Service from other NFs (e.g., from SMF, PCF, NWDAF, etc.) in 6G CN		#34	22.12
		(3) 6G CN Network Function monitors the Computing Resources in DN	A. The CP NF (e.g., EASDF, UDR, CMF, a Proxy NF, NRF, etc.) collects or monitors the computing resource related information (e.g., Status or Load information) from AF	#11, #32, #50	22.13
			B. The CMF collects/monitors computing resource related information of Computing Site in CN via PSA UPF	#50	
		(4) No monitoring in 6G CN: CP function (i.e., SMF) receives computing delay information from AF for each DNAI relevant for the UE		#35	22.14
		(5) A SHE controller in SHE monitoring the computing resources based on implementation		#07	22.15

Table 3-20 (continued): KI#22 (Computing) solution variants [S2-2603513]

3.5.22.3. KI#22 status

Status: Solution categories and variants largely stabilised (with flexibility for potential new category). Key definitions (e.g., Computing Service, SHE) and initial requirements/assumptions agreed. Structure of solution clauses aligned for further development (S2-2603513).

Next Steps: Develop solution descriptions and procedures. Prioritise selected solution groups (e.g., Group#2 and #3) based on TU allocation.

3.5.23. KI#23 (NTN): Support of 6G NTN

3.5.23.1. KI#23 principles

Study how to support 6G RAT for NTN, based on RAN decision, and support service continuity aspects.

3.5.23.2. KI#23 solution variants

The following bullets provide a high-level summary of the solution variants identified for KI#23 (Support of 6G NTN) from TDoc S2-2603423, which has been approved during SA2#174 in Malta. Table 3-21 also provides a summary of solution variants and corresponding TDoc numbers. The variants describe approaches to enabling satellite-based connectivity in 6G, building on existing 5G NTN capabilities and extending them to meet 6G requirements. They cover aspects such as satellite access integration, D2D communication via satellite, and support for discontinuous coverage, and are intended to support further study and discussion without implying preference or agreement on any specific approach.

- **Variant #23.1 (Evolution of 5G NTN features for 6G RAT).** This solution category proposes to reuse and evolve existing 5G NTN features as the baseline for 6G. It includes support for satellite-specific characteristics such as extended latency, large coverage areas, mobility handling, network selection, and integration of satellite access into the core network, with additional 6G-specific enhancements as required.
- **Variant#23.2 (Evolution of UE-satellite-UE communication).** This solution class extends existing 5G mechanisms for UE-satellite-UE communication to 6G. It builds on current capabilities to enable direct communication between user devices via satellite, with further enhancements introduced to meet 6G requirements and interworking considerations.
- **Variant #23.3 (Evolution of discontinuous coverage mechanisms).** This solution variant proposes to reuse and evolve 5G mechanisms for handling discontinuous network coverage in satellite environments. It supports scenarios with intermittent connectivity, enabling continuity of service through adaptations of existing 5G approaches, with additional enhancements for 6G-specific needs.

Variant #	Solution Variant Classification	TDoc #	Summary / Key Principles
23.1	Evolution of 5G NTN features for supporting 6G RAT for NTN	S2-2602085 S2-2602152 S2-2602196	5G NTN features for support of 6G RAT for NTN are used as starting point for 6G, 6G-specific information may be added.
23.2	Evolution of 5G UE-satellite-UE communication	S2-2602085	5G UE-satellite-UE communication mechanism is used as starting point for 6G, 6G-specific information may be added.
23.3	Evolution of 5G mechanism for discontinuous network coverage	S2-2602085	Mechanism for 5G discontinuous coverage is used as starting point for 6G, 6G-specific information may be added.

Table 3-21: KI#23 (NTN) solution variants [S2-2603423]

3.5.23.3. KI#23 status

Status: A table for categorising solution variants has been introduced, with two first-level categories: support of NTN features defined for 5GS, and new NTN features for 6G NTN. Three solution variants have been documented (see [S2-2603423](#)).

Next Steps: Continue developing solutions using NTN features defined for 5GS as the starting point. Further develop solutions for new NTN features for 6G NTN, including clear justification of the underlying motivations.

3.5.24. KI#24 (IoT): Analyse 5GS IoT Features and Solutions

3.5.24.1. KI#24 principles

This key issue will study how to support cellular IoT enablers in 6G including:

1. Analyse whether and which 5GS cellular IoT features are applicable to 6G and identify which of these features that should be further studied.

3.5.24.2. KI#24 solution variants

The following bullet points outline the solution variants identified for KI#24, describing on the evolution of cellular IoT capabilities towards 6G. The variants examine how existing 5G IoT features can be adapted, refined, or extended to meet 6G requirements, alongside targeted enhancements in areas such as power efficiency and data communication.

- **#24.1 (Features applicable for 6G IoT solution).** This solution variant identifies and analyses 5G cellular IoT features that are applicable to 6G, treating them as a baseline for further study and potential enhancement. It includes features related

- to non-IP data delivery, power saving, high latency communication, monitoring, service gap control, and efficient data communication, while also identifying features not applicable to 6G and those requiring further study, particularly depending on control plane versus user plane considerations.
- **#24.A (Power saving enhancements).** This solution type defines approaches to improving power efficiency for IoT devices in 6G. It includes enhancements to discontinuous reception mechanisms, such as extended DRX cycles and scheduled communication windows, as well as mechanisms like MICO to manage device activity and reduce energy consumption, with considerations for coordination with RAN aspects.
- **#24.B (Efficient data communication over user plane).** This solution variant addresses battery-efficient data communication over the user plane for both mobile-originated and mobile-terminated traffic, including small and larger data transfers. It includes mechanisms such as RRC inactive operation, optimised small data transmission procedures, and maintenance of UE context in the RAN, as well as support for non-IP data delivery and high latency communication, with dependencies on overall architectural and RAN design choices.
- **#24.C (Common features).** This solution variant captures IoT-related features that are not directly dependent on power saving or communication optimisation mechanisms. It includes support for monitoring events, service gap control, roaming, and subscription control, providing a set of generic capabilities applicable across different IoT scenarios.

For further information on proposed solution variants and their corresponding TDoc numbers, see [Table 3-22](#).

Solution #	KI Variant #	TDoc #	Summary / Key Principles
1	#24.B	S2-2600121	Only CP based features
2	#24.B	S2-2600246	Only UP based features
3	#24.B	S2-2600316	Only UP based features
4	#24.B	S2-2600332	Support UP solution, but not the UP Clot optimisation feature in 5GS
5	#24.B	S2-2600380	Support for both CP and UP based features.
6	#24.B	S2-2600396	Only CP based features

Table 3-22: KI#24 (IoT) variants mapping [[S2-2603408](#)]

Solution #	KI Variant #	TDoc #	Summary / Key Principles
7	#24.B	S2-2600401	Only UP based features
8	#24.B	S2-2600444	Support for both CP and UP based features
9	#24.B	S2-2600529	Support for both CP and UP based features
10	#24.C	S2-2600590	Important features for 6G IoT, but not connected to CP or UP solution
11	#24.B	S2-2601912	UP only and SDT using RRC Inactive, Only eDRX, No extended buffering
12	#24.C	S2-2602081	RDS, CP congestion, service gap are not needed
13	#24.C	S2-2602086	Features are expected to apply for both TNs and NTN
14	#24.B	S2-2602108	UP only, SMS could be used for when IP connection is lost
15	#24.1, #24.C	S2-2602153	Adding clarifications and dependences to other features and WGs
16	#24.B	S2-2602197	UP only. Adding details to features in procedure clause
17	#24.1	S2-2602202	Support UP and CP need more discussions
18	#24.A, #24.B	S2-2602342	UP only
19	#24.A	S2-2602349	New solution to enhance eDRX
20	#24.C	S2-2602358	Support of RDS, rate control, CP data transfer and service GAP
21	#24.C	S2-2602362	New solution to support CP based data transfer
22	#24.B	S2-2602452	New high level principle to support UP based data transfer

Table 3-22 (continued): KI#24 (IoT) variants mapping [[S2-2603408](#)]

3.5.24.3. KI#24 status

Status: Progress on identifying applicable 5G CIoT features for 6G. 3 new solution variants added for potential enhancements. Open discussion on applicability of control plane solution ([S2-2603408](#)).

Next Steps: Conclude on control plane solution approach. Further evolve solutions and capture 6G enhancements.

4. References

1. 3GPP TS 23.288, "Architecture Enhancements for Data Analytics Services".
2. 3GPP TS 29.520, "Network Data Analytics Services".
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4. 3GPP TS 28.104, "Management and Orchestration; Architecture Framework".
5. 3GPP TS 28.105, "Management and Orchestration; Management Data Analytics Services".
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7. "3GPP Release 20 – An Update on 3GPP 6G Technology Studies". Available at: <https://atis.org/press-releases/3gpp-release-20-update-on-3gpp-6g-technology-studies/>
8. 3GPP TR 22.870, "Study on 6G Use Cases and Service Requirements".
9. RP-260074, "Status Report for SI Study on 6G Scenarios and Requirements," CMCC (Rapporteur).
10. RP-260073, "TR 38.914 v0.4.0 Study on 6G Scenarios and Requirements," CMCC (Rapporteur).

5. Abbreviations

Term	Description
3GPP	Third Generation Partnership Project
6GTF	6G Task Force
AEAD	Authenticated Encryption with Associated Data
AF	Application Function
AI	Artificial Intelligence
AMF	Access and Mobility Management Function
API	Application Programming Interface
ASN.1	Abstract Syntax Notation One
CA	Carrier Aggregation
CBW	Channel Bandwidth
CCF	Computing Control Function
CMF	Computing Management Function
CN	Core Network
CP	Control Plane
CT	Core Network and Terminals
DC	Dual Connectivity
DCCF	Data Collection Coordination Function
DSS	Dynamic Spectrum Sharing
EAP	Extensible Authentication Protocol
EPS	Evolved Packet System
FWA	Fixed Wireless Access
GenAI	Generative Artificial Intelligence
GEO	Geostationary Earth Orbit
GSMA	GSM Association

Term	Description
HO	Handover
IMT	International Mobile Telecommunications
IMS	IP Multimedia Subsystem
KI	Key Issue
LLM	Large Language Model
LMF	Location Management Function
LPAF	Location Privacy Application Function
LPWA	Low Power Wide Area
MAC	Medium Access Control
MDAF	Management Data Analytics Function
ML	Machine Learning
MRSS	Multi-Radio Spectrum Sharing
MWC	Mobile World Congress
N3IWF	Non-3GPP Interworking Function
NAS	Non-Access Stratum
NF	Network Function
NPN	Non-Public Network
NTN	Non-Terrestrial Network
NWDAF	Network Data Analytics Function
OAM	Operations, Administration and Maintenance
PCC	Policy and Charging Control
PDCP	Packet Data Convergence Protocol
PDU	Protocol Data Unit
PFCP	Packet Forwarding Control Protocol
PLMN	Public Land Mobile Network
PNI-NPN	Public Network Integrated Non-Public Network
QoS	Quality of Service
RAN	Radio Access Network
RLC	Radio Link Control
RRC	Radio Resource Control

Term	Description
SA	Service and System Aspects
SBA	Service-Based Architecture
SBI	Service-Based Interface
SCP	Service Communication Proxy
SHE	Service Hosting Environment
SID	Study Item Description
SMF	Session Management Function
SNPN	Standalone Non-Public Network
TSG	Technical Specification Group
UE	User Equipment
ULBC	Ultra-Low Bitrate Codec
UP	User Plane
UPF	User Plane Function
WID	Work Item Description
WT	Work Task
XRM	Extended Reality and Media services

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