

Nokia views on Rel-19 priorities



NOKIA

5G-Advanced Rel-19 in a nutshell

5G-Adv is a stepping stone towards 6G

Complementing work already started in Rel-18

Focus on operational enhancements for wider market adoption

Focus on items that will have market success



XR enhancements

Leveraging additional application awareness, increased focus on UL, tethering.



Energy Efficiency

Dynamic enablers for energy efficiency in RAN and in 5GC.



Time sync & URLLC

Coverage area enhancements for UEs in IDLE and INACTIVE, enhanced replication framework.



Slicing operational & security enh.

NSSAA support in EPS, per UE network slice priorities, simultaneous roaming in two VPLMNs.



Enh. for IP reachability via 5Gs

Enabling 5GS to participate in IETF IP routing protocols running on the UE side and/or on the UPF side.



Registration via multiple 3GPP RATs

Enables the UE to obtain best services offered by different or same network.



Traffic steering via multiple 3GPP RATs

Steering, splitting, switching, duplication of traffic over two 3GPP accesses and potentially one non-3GPP access.



5G Femto

Enabling 5G Femto use cases reusing CAG framework.



AI/ML enhancements

AI Trustworthiness, eNA framework enh.



Edge computing

Support local traffic offload in EPC when UE moves between 5GS and EPS.



General considerations

- **Candidate items that are RAN led should only start in Q1 2024**, i.e. after Rel-19 RAN package is approved.
- Some “**pre 6G**” items such as Sensing and Ambient IoT to be only **studied in Rel-19**. **Normative work in Rel-20**, taking into account RAN progress and conclusions reached in Rel-19.
- Rel-19 should provide **enough room for TEI19** and small work items, at this stage of 5G specifications.
- Rel-19 expected to be a **good mix** between new features, enhanced features, operational improvements for operators and verticals.
- Rel-19 SA workshop is expected to provide **guidance on main directions** for Rel-19.
- **Stage 2 contents needs to be adjusted** to the SA#99 endorsed timeline.

Note: slides 4 to 13 provides 10 items for consideration for Rel-19 contents, without any priority order.



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
1	<p>Support for Multiple Registrations in the 5G System</p> <p>(See backup slides)</p>	<p>Simultaneous registration to 5GC via multiple NR accesses for a UE with single subscription is needed to support new use cases. In the past this was not supported or not possible due to interference and high implementation complexity. However, the situation has changed as 5G supports a wide range of bands. It allows the UE to use services in two networks or in one network at the same time, in the best manner. It also enables traffic aggregation over two 3GPP accesses. Simultaneous registration to 5GC via multiple NR accesses impacts many areas including network selection, mobility, interworking with EPS and services like voice, data, SMS, LCS etc. which justifies to have a separate study item in Rel19.</p> <p>Key objectives:</p> <ol style="list-style-type: none"> 1. Define architectural and procedural enhancements needed to support "Simultaneous registration to 5GC via Multiple NR accesses" for a UE. The UE can be registered to a single PLMN/SNPN, to two different PLMNs/SNPNs, or to one PLMN and one SNPN. The UE may in addition be registered via one non-3GPP access to 5GC. 2. Support UE mobility between 5GS and EPS for above use cases. 3. Support mobile originating and terminating services (e.g., mobile data, voice, SMS, LCS) when the UE is registered to the 5GC network simultaneously via multiple NR accesses and potentially one non-3GPP access. 	Rel-19 FS_DualSteer, Study on Upper layer traffic steering, switching and split over dual 3GPP access	SA2	Unlikely	<p>SA3 for security aspects.</p> <p>SA5 for OAM and charging aspects.</p>



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
2	ATSSS_Ph4 (See backup slides)	<p>Enhancing ATSSS to allow steering, splitting, switching, duplicating traffic over two 3GPP accesses and one non-3GPP access. ATSSS enhancements are fairly independent of the work on simultaneous registration to 5GC via multiple NR accesses and can be studied as a separate study item. Further potential ATSSS enhancements in Rel-19 are:</p> <ul style="list-style-type: none"> • MPQUIC support of IP and/or Ethernet frames allowing to use only one steering function for all kind of traffic. • Use available QoS and congestion information or performance measurement results, e.g., provided by the Access Network or UE, for making high accurate ATSSS decisions. • Potential other left-over topics from Rel18 are FFS. <p>Key objectives:</p> <ol style="list-style-type: none"> 1. Support MA PDU Sessions with two 3GPP accesses and one non-3GPP access. This includes enhancements to existing steering modes, steering functionalities, ATSSS and N4 rules. 2. Use of available QoS and congestion information or performance measurement results, e.g., provided by the Access Network or UE, for making ATSSS decisions. This includes studying potential updates to existing steering modes or definition of a new steering mode. 3. Study whether and how MPQUIC steering function can be applied to IP and Ethernet traffic. 	Rel-19 FS_DualSteer, Study on Upper layer traffic steering, switching and split over dual 3GPP access (for parts of the objectives)	SA2	None	<p>SA3 for security aspects</p> <p>SA5 for OAM and charging aspects</p>



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
3	Energy saving (See backup slides)	<p>Energy consumption is a significant source of operations costs for Mobile Network Operators (MNOs) and depending on the energy generation mix that is used to power networks, it can also have impact on the environment. To improve the sustainability of the 3GPP ecosystem, it is recommended that SA2 investigates options for improved system behaviour aimed at energy saving.</p> <p>Key objectives -</p> <ol style="list-style-type: none"> 1. Energy savings by dynamically pooling of RAN resources among operators, beyond the traditional static network sharing agreements. 2. Energy savings by adaptation of service provided to UE. 3. Enhancement of the 5GS procedures to leverage the 5GC Network Functions energy states defined by SA5 to reduce the network energy consumption. 4. Impact on the system of normative outcomes of the Stage 1 work on “Energy Efficiency as service criteria”. 	Rel-19 FS_EnergyServ, Study on Energy Efficiency as service criteria	SA2	Yes	<p>SA3 for security aspects</p> <p>SA5 for OAM and charging aspects</p>



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S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
4	Timing resiliency & URLLC enh (See backup slides)	<p>RAN may be broadcasting RTI (Reference Time Information) in cells/gNBs even if it is not part of the time synchronization coverage area resulting in wasted radio resources and/or not broadcasting in areas where interested UE(s) are present.</p> <p>3GPP specifies replication mechanisms since Rel-16 for URLLC however the drawback is that it is either done for all traffic or no traffic for a given application. This impacts capacity utilization. Furthermore, replication framework assumes application control mainly, no operator control.</p> <p>Key objectives: Time synchronization enhancements:</p> <ol style="list-style-type: none"> 1. Access Stratum based time synchronization enhancements for subscribed time synchronization coverage area for UEs in RRC_IDLE and RRC_INACTIVE. 2. Impact on connected mode mobility due to time synchronization service. <p>Mechanisms to support traffic with stringent latency, reliability or redundancy requirements in an optimized manner with network control:</p> <ol style="list-style-type: none"> 1. 3GPP system-controlled replication procedure. 2. Selective duplication rules of low latency traffic; Multi-UE URSP rules to influence devices with two UE(s) for establishing one or two PDU Sessions for a certain application. 	Rel-18 5TRS, 5G Timing Resiliency System	SA2	Yes	SA3 for security aspects SA5 for OAM and charging aspects



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
5	5G Femto (See backup slides)	<p>Define the overall architecture and required functional and procedural impacts for supporting 5G Femto deployments with focus on Femto access control. 5G Femto or Home gNB or HgNB is analogous to the LTE concept for Home eNodeB(s) with NR capable base stations deployed at home or at enterprise premises providing better indoor coverage, increased throughput, lower delay, better voice quality and a way to offload traffic from the macro network.</p> <p>Key objectives:</p> <ol style="list-style-type: none"> 1. Define the overall architecture and required functional and procedural impacts for supporting 5G Femto deployments. 2. Define the 5G Femto access control mechanism based on the existing CAG concept. 3. Enable provisioning of subscribers allowed to access 5G Femto cells and how to manage 5G Femto access control by the CAG owner or an authorized administrator. 4. Enable access to local services via an UPF integrated in the HgNB. 	N/A	SA2	RAN architecture aspects and enhancements to the RAN-Core interface need to be studied in RAN WGs (RAN3)	<p>SA3 for security aspects</p> <p>SA5 for OAM and charging aspects</p>



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
6	XR enhancements (See backup slides)	<p>SA1 is working on specific use cases and service requirements for 5GS support of enhanced XR-based services as well as potentially other functionality, to offer shared and interactive user experience of local content and services, accessed either by users in the proximity or remotely.</p> <p>The study also investigates gaps between the identified new potential requirements and the requirements already specified for the 5G system.</p> <p>Key objectives –</p> <ol style="list-style-type: none"> 1. Enhancements to PDU Set based QoS handling. 2. Better support for layered media with base layer and many additional temporal and/or spatial enhancement layers with inter-dependencies. 3. Enhanced PDU Set delivery requirements. 4. Better support for AF to provide information for 5GS to classify PDU Sets considering adaptive application traffic characteristics. 5. Improvements to Uplink QoS and power saving for XRM. 6. QoS Framework enhancements necessary to address SA1 requirements (Avatar). 7. MDBV enforcement. 	Rel-19 FS_Metaverse, Study on Localized Mobile Metaverse Services	SA2	Yes	<p>SA3 for security aspects</p> <p>SA5 for OAM and charging aspects</p>



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
7	Slicing operational improvements, isolation and SLA security (See backup slides)	Network Slicing has been evolved over a number of 3GPP releases and now it has reached maturity from feature richness standpoint. However, there are still some improvements that are needed to ensure existing features are more deployable and make operators task of running a network where network slicing is deployed easier. Key objectives - <ol style="list-style-type: none"> Support of NSSA in EPS. Support of NSSRG constraints in EPS. Support of per UE network slice priorities. Allow simultaneous roaming in two VPLMNs. Support open mechanisms to indicate TA and cell level topology to the AMF, including availability of network slices at cell level. 	Stage 1 requirements available for 4.	SA2	TBC	SA3 for security aspects SA5 for OAM and charging aspects
		The 5G system should allow Network Slice Customers to apply their own security policies, e.g. use encryption and integrity protection mechanisms, and/or the enforcement of isolation. Key objectives - <ol style="list-style-type: none"> Enforce isolation for network slices. Fulfill differentiated security SLA in network slices. 				SA3



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
8	<p>5GC enhancements for IP routing</p> <p>(See backup slides)</p>	<p>5GS may be deployed in a corporate environment where IP routing/forwarding applies at UE side and at N6/DN side and where the same IP subnet may be reachable behind multiple UE/PDU Sessions.</p> <p>Key objectives -</p> <ol style="list-style-type: none"> 1. Enabling connectivity to the same IP subnet/prefix reachable via multiple UEs . 2. How the 5GS can actively participate in IETF IP routing protocols running on the UE side and/or on the UPF side. 3. Enhancements for explicit IP route selection and steering influenced by an AF. 	None	SA2	None	SA3 for security aspects



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
9	AI/ML trustworthiness (See backup slides)	Standards key enablers to introduce trustworthy AI principles are essential to the adoption and successful use of AI in 5GC (NWDAF). Key objectives - <ol style="list-style-type: none"> 1. Study trustworthiness for data used by MTLF (Model Training Logical Function) and AnLF (Analytics Logical Function) to provide ML models and analytics. 2. Study trustworthiness for ML models provided by MTLF. 3. Study trustworthiness for analytics provided by AnLF. 	None	SA2	None	SA3 for security aspects (TBC)



Overall View on Rel-19 Content

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
10	Edge Computing (See backup slides)	Key objectives - <ol style="list-style-type: none"> 1. Support local traffic offload in EPC when a combo SMF+PGW-c and UPF+PGW-u are used to support the PDN connection (UE mobility between 5GS and EPS) (while minimizing MME/SGW impacts). 2. Support HPLMN providing a private DNS server IP address for FQDN not eligible to HR SBO (left over from R19). 3. Leverage HR SBO concepts to ensure local control (EDI, traffic influence) of local traffic offload (e.g. when local control and local traffic offload relates to corporate traffic). 	None	SA2	None	SA3 for security aspects

5G Femto

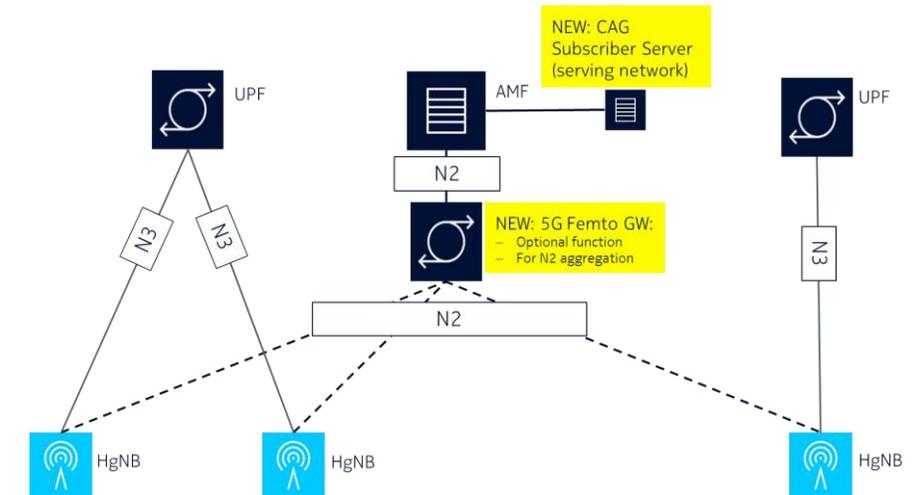
SA2 lead

Motivation:

- 5G Femto offers a cost-effective way to improve 5G indoor coverage, offload traffic from the macro network, enable improved support for voice and Enterprise mobility.
- 5G Femto extends coverage using higher frequency bands, allowing customers to deploy HgNB on their own premises. This leads to efficient and effective usage of higher frequency spectrum.

Objectives:

- Study how to define the overall architecture and required functional and procedural impacts for supporting 5G Femto deployments.
- Study how to define the 5G Femto access control mechanism based on the existing CAG concept.
- Study how to enable provisioning of subscribers allowed to access 5G Femto cells (such as using a function like CSG Subscriber Server (CSS) specified for EPS) and how to manage 5G Femto access control by the CAG owner or an authorized administrator.
- Study how to enable access to local services via an UPF integrated in the HgNB.



Multiple Registration

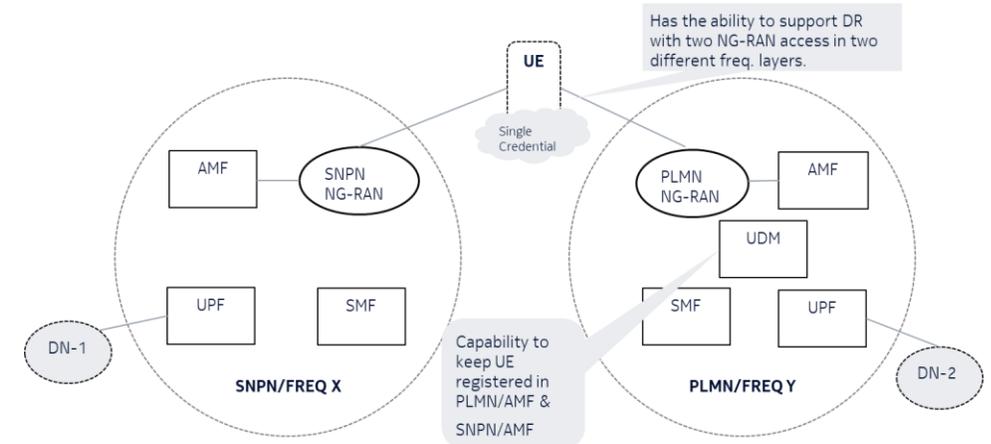
SA2 lead

Motivation:

- Use case 1 (SNPN): UE using different services offered by a PLMN and/or SNPN.
- Use case 2 (ATSSS): Support for steering, splitting and switching of user data across two 3GPP accesses.
- Use case 3 (FRMCS): Trains can be connected to two NR or one NR and one LTE access at the same time.

Key objectives:

- Enable multiple registration via NR-NR(*), in TN and/or NTN, in a single PLMN, two PLMNs or one PLMN and one SNPN simultaneously.
- It is assumed that UE has a single SIM, single subscription with one network only, may be dual radio capable but should work with single radio UE.



Use case 1 (SNPN): UE using different services offered by a PLMN and/or SNPN.



ATSSS Phase 4

SA2 lead

Motivation:

- Enhancing ATSSS to allow steering, splitting, switching, duplication of traffic over two 3GPP accesses and one non-3GPP access.
- MPQUIC support for IP and/or Ethernet, allowing a single steering function applicable to all applications.
- Using QoS and congestion information or performance measurement results, e.g., provided by AN or UE, for making accurate ATSSS decisions instead relying on user plane measurements between UE and UPF.

Key objectives:

- Study how an MA PDU Session can be supported with two 3GPP accesses and one non-3GPP access. This may for example include enhancements and adaptations to existing steering modes, steering functionalities, ATSSS and N4 rules. Traffic splitting, switching, and steering is within a single PLMN, a single PLMN and a single NPN or between two PLMNs.
- Study whether and how available QoS and congestion information or performance measurement results, e.g., provided by the Access Network or UE, can be leveraged for making ATSSS decisions.
- Study whether and how MPQUIC steering function can be applied to IP and Ethernet traffic.

URLLC Enhancements for replication framework

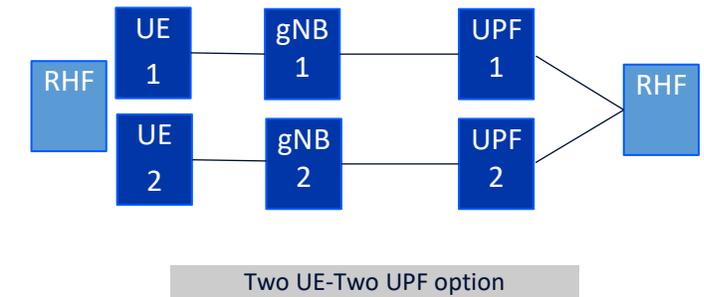
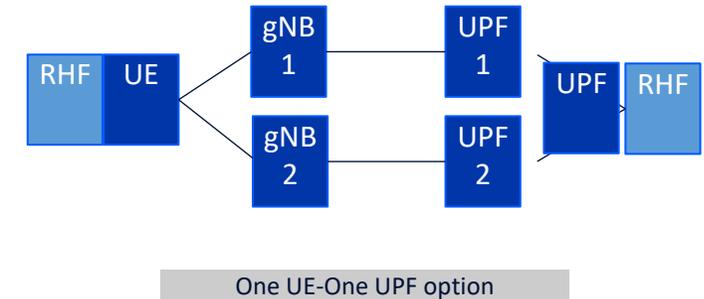
SA2 lead

Motivation:

Providing higher degree of flexibility and control for network operators than with 802.1CB (FRER) and ATSSS.

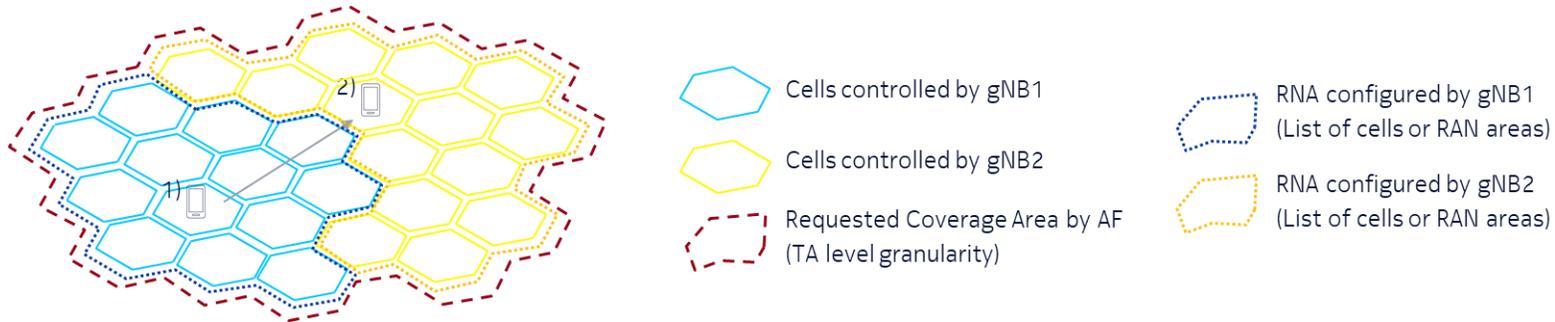
Objectives:

- Replication and elimination within the 3GPP system via so-called Replication Handling Function (RHF)
- RHF collocated or “behind” UE and UPF (i.e., eliminating UE and UPF as single point of failure)
- Replication criteria like app characteristics, e.g., identifying which frames are subject to replication or consider QoS monitoring results from RAN
- Define new or re-use existing protocols for replication
- Allow AF to control duplication: which and how many frames to replicate, start/stop replication



Time Synchron services broadcast in allowed coverage area

SA2 lead



Motivation:

Currently RAN broadcasts access stratum-based timing information (Reference time information) based on OA&M.

Rel-18 introduced the ability for the subscription and/or AF to activate/deactivate ASTI in a certain coverage area.

UE moving into the coverage area will not receive 5G RTI

RAN broadcasting RTI in cells / gNBs not part of the coverage area resulting in wasted radio resources.

Time sync service continuity when UE moves from gNBs supported by one time domain to another.

Objectives:

Time Synchronization optimizations:

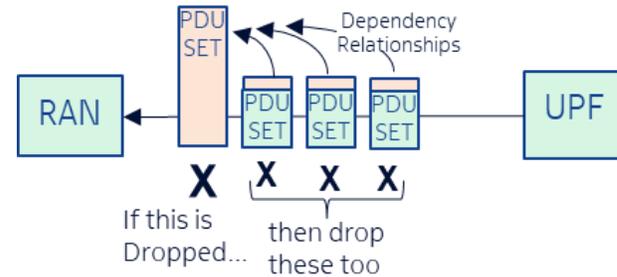
- Access Stratum based time synchronization enhancements considering AF requested time synchronization coverage area and/or subscribed time synchronization coverage area for UEs in RRC_IDLE and RRC_INACTIVE.
- Impact on connected mode mobility due to time synchronization service.
- UE reporting internal inaccuracies for time synchronization service to be fulfilled.

XR and Metaverse enhancements

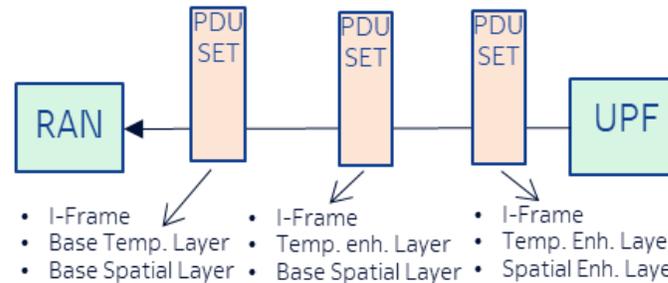
SA2 lead

Motivation and use case:
 Industrial, Enterprise & Consumer Metaverse

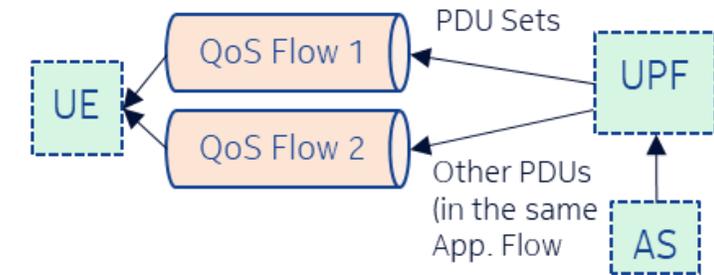
- Key Objectives:**
- AF can request PDU Sets and PDU Set Importance
 - Separate QoS Processing and PDU Set QoS Processing
 - RAN PDU Set Dependency Relationships
 - Better Support of App. when PDU Set PDUs are Dropped
 - 5GS Support for UL PDU Set Detection and Handling at UE
 - PDU Set Delivery when PSDB is exceeded
 - End-of-Data Burst Enhancements for Power Saving (CDRX)
 - Enforcing MDBV for delay critical 5QI on the UL/DL



PDU Set dependency



Support for Layered media



AF influenced PDU Set classification

5GS enhancements for Energy Saving

SA2 lead

Motivation

Energy consumption is a significant source of operations costs for Mobile Network Operators (MNOs).

Depending on the energy generation mix that is used to power networks, energy consumption have a different impact on the environment.

To improve sustainability of the 3GPP system, SA2 should assess means to further reduce the 5G system energy consumption.

Study SA2 impact of outcomes of the ongoing SA1 “Energy Efficiency as service criteria” work.

Objectives:

- Energy saving by pooling / sharing of RAN resources among operators.
- Energy saving by adaptation of service provided to UE.
- Study how to leverage the NFs energy saving characteristics.
- Study the impact on the system of normative outcomes of the stage 1 work on “Energy Efficiency as service criteria”.

Slicing operational improvements

SA2 lead

Motivation:

- Network slice priority information: When UE(s) connect to multiple slices simultaneously, per UE relative priority of different slices is needed to manage network resource allocation and enforcement for UE in connected mode.
- TA topology information: Providing topology info for TAs over NG interface enables proper TA list/RA allocation.
- NSSAA support for UE(s) when registered in EPS: PDU sessions associated with a S-NSSAI subject to NSSAA cannot be moved to EPS /established while the UE moves to/is in EPS.
- Slice roaming: a single VPLMN may not support all the slices that are supported in the HPLMN thus it is essential for the UE to be able to camp in multiple VPLMNs simultaneously (as per Rel-18 Stage 1).

Objectives:

- Providing UE specific slice priority from AMF to RAN and to UE: enables to decide which slice is more important to be used if a decision is necessary (e.g., ensure NSSRG compatible slices are selected or PDU sessions for important slices are retained if it is impossible to maintain all slices)
- TA Topology awareness in the AMF – provide AMF with TA topology information via NG interface (open mechanism versus proprietary OAM)
- NSSAA support for UE(s) when registered in EPS (otherwise UE obtains no connectivity in EPS for the slice)
- Network slice roaming support: roaming UE can use slices via two different VPLMNs

Isolation enforcement and security SLA in network slicing

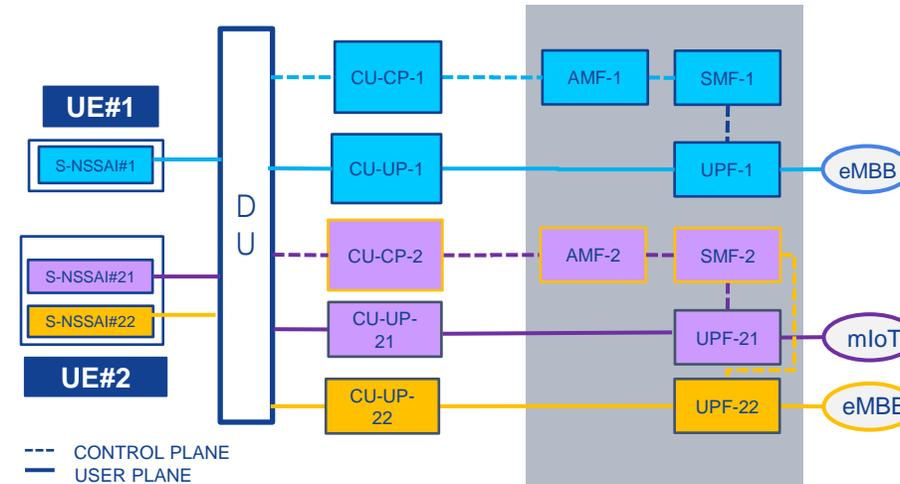
SA3 lead

Motivation:

Network Slicing enables enterprises and operators to address specific requirements, including security requirements coming from different market segments. The 5G system should allow the operator to authorize Network Slice Customers (e.g., Verticals) to manage and use network slices, subject to specific SLAs. The 5G system should allow Network Slice Customers to apply their own security policies, e.g. use encryption and integrity protection mechanisms, and/or the enforcement of isolation.

Risk analysis:

A compromised or malicious low security profiled slice may impact a highly sensitive slice breaching isolation and/or access control.
Denial of Service (DoS) attacks on slices when resources are shared by multiple slices.
Theft of services/resources and data of mission critical slices.



Objectives:

1/ Enforce isolation for network slices

- Improve protection of the resources and data of the Network Slice Customer and ensure that data/traffic of one slice cannot be stolen or intercepted by entities of another slice.
- Ensure that any type of attack occurring in one network slice have no impact on any other network slice.

2) Fulfill differentiated security SLA in network slices

- Satisfy the security requirements of various business cases from different industries in Network Slicing, then better comply with industry regulatory and business requirements.

Privacy aspects in management data collection and sharing

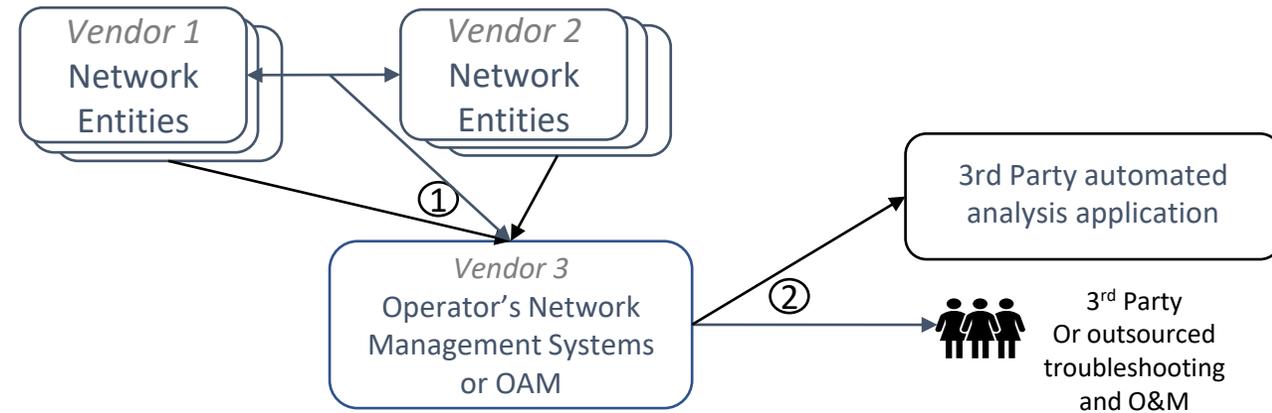
SA3 lead

Motivation:

Various kinds of data collected from different wireless network entities may contain privacy sensitive data, such as: Public IP Address, UE MAC Address, IMSI, GUTI, control plane parameters, subscriber names, email-addresses, cell ids and names with information about the area, operator's user identities, location information from UE and BTS, etc. While collecting logs for operations and management, like syslogs, BTS snapshot logs, Trace data, Performance Metrics, configuration management data or Fault Management data (alarms) from different network entities, it is likely that privacy sensitive information is also gets included in it.

Risk analysis:

In a multi-vendor environment, management data maybe shared between entities provided by different vendors. Data maybe shared with 3rd party automated applications or processing teams located in different parts of the world. If such data is shared with processing teams or applications across geographical boundaries, country specific privacy requirements can get violated.



Objectives:

- 1/ Identify and detail potential privacy sensitive information elements which maybe shared when management data is collected for O&M and troubleshooting purposes
- 2/ Define privacy protecting mechanisms for the privacy sensitive information elements, while being collected in management data as well as when it is transmitted and stored.
- 3/ Define configuration aspects for privacy protection of management data under storage.

Enhancements for general IP reachability via 5GS

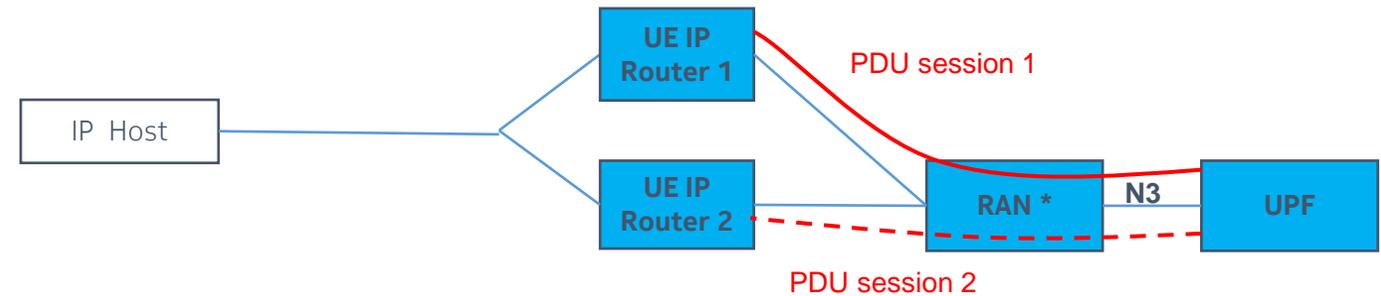
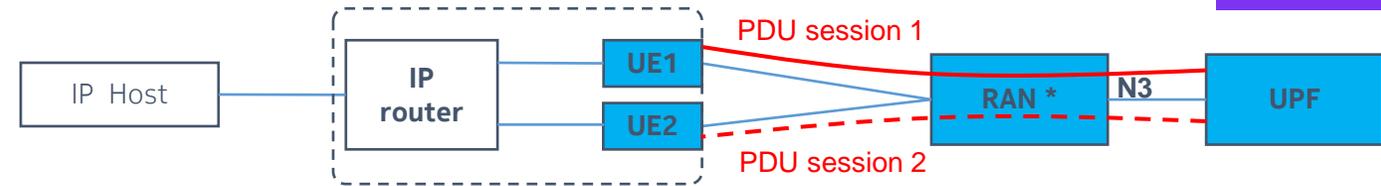
Motivation:

5GS may be deployed in a corporate environment where IP routing/forwarding applies at UE side and at N6/DN side and where the same IP subnet may be reachable behind multiple UE/PDU Sessions.

Gaps:

- Any incoming UP packet may only match PDRs of a single PCF session. If the same prefix/subnet can be reached via two separate UE IP Routers (for redundancy/back-up or load balancing), it is not possible to configure overlapping PDR/FAR rules over multiple PDU/PCF session.
- It is not possible to dynamically decide or update which PDU session is preferred or perform across overlapped PDU sessions.
- Framed routes are static and cumbersome. Prefix delegation only works for IPv6 and it is not always 5GS who would delegate the prefixes. It is not possible for 5GS to dynamically learn which prefixes/subnets are reachable via the UE IP Router.

(a) Host connected to an IP Router with 2 UE interfaces



(b) Host connected to 2 UEs routers, optional via an IP router

* Different UE routers may connect to different RAN nodes, which is not shown for simplicity.

Objectives:

1. enabling connectivity to the same IP subnet/prefix reachable via multiple UEs.
2. how the 5GS can actively participate in IETF IP routing protocols running on the UE side and/or on the UPF side.
3. Enhancements for explicit IP route selection and steering influenced by an AF.

Enhancements for Edge Computing

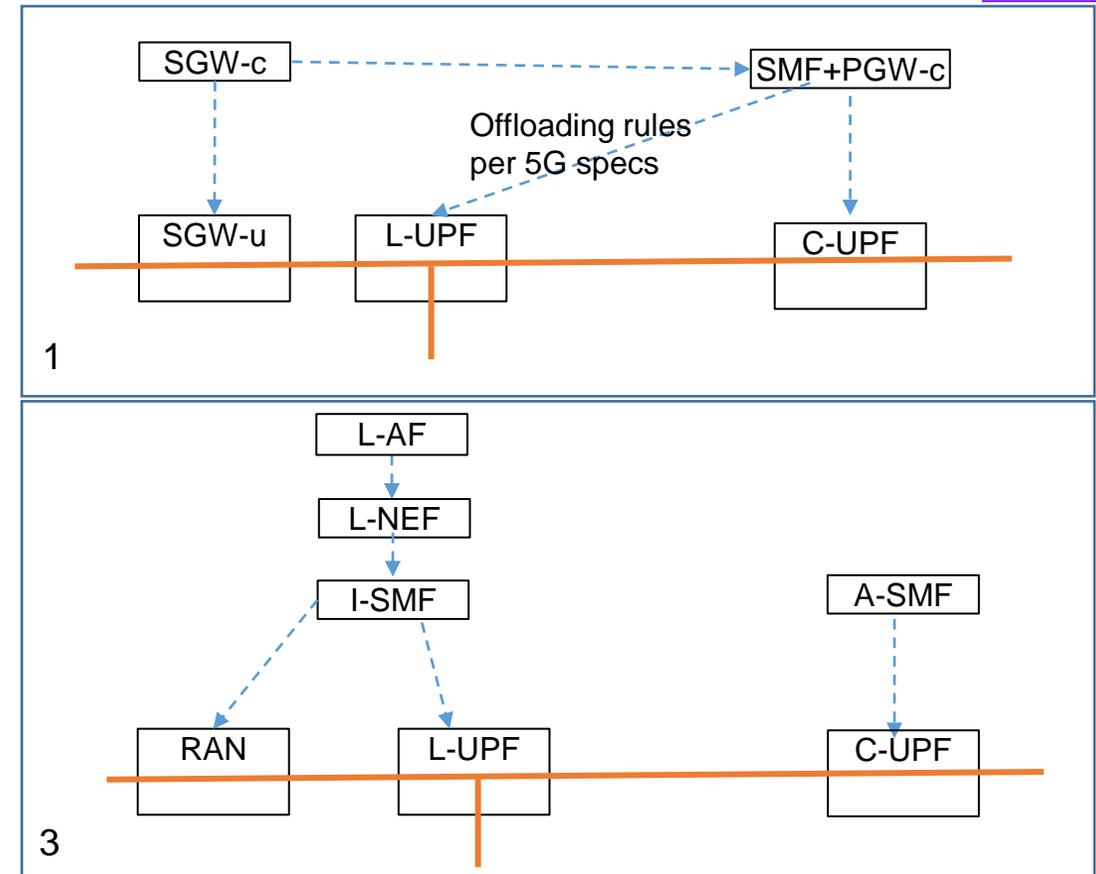
SA2 lead

Motivation:

1. Support local traffic offload in EPC at UE mobility between 5GS and EPS
2. Complete work for HRSBO not finalized in R18
3. Leverage HR SBO to simplify deployment of local offload in corporate cases

Objectives:

1. Support local traffic offload in EPC when a combo SMF+PGW-c and UPF+PGW-u are used to support the PDN connection (UE mobility between 5GS and EPS) (while minimizing MME/SGW impacts)
2. Support HPLMN providing a private DNS server IP address for FQDN not eligible to HR SBO (left over from R19)
3. Leverage HR SBO concepts to ensure local control (EDI, traffic influence) of local traffic offload (e.g. when local control and local traffic offload relates to corporate traffic)





5G Wireless Wireline Convergence (5G-WWC)

SA3 lead

Motivation:

5G-WWC enables wireless and wireline convergence, where new kinds of devices can be authenticated via 5GC.

5G-WWC enables mobility of the devices between non-3GPP connections and reduces the attach time by avoiding full primary authentication.

5G-WWC enables the attachment time reduction when the AUN3 device reattaches to the same RG.

Risk analysis:

Analysis of existing solutions and areas of improvement.

TNAP mobility within the same TNGF was discussed in TR 33887 but not concluded. Secondly, the scope does not cover inter-TNGF mobility.

Objectives:

1) Mobility enhancement for trusted N3GPP access

Ensures mobility of the devices between TNAPs associated with the same TNGF or different TNGFs. Ensure reducing the attach time by avoiding the full primary authentication during the .

2) Mobility enhancement for non-trusted N3GPP access

Ensures mobility of the devices between N3IWF. Ensure reducing the attach time by avoiding full primary authentication during mobility.

3) Improve AUN3 device reattach time.

Ensures the attachment time reduction when the AUN3 device reattaches to the same RG.

Trustworthiness for autonomous networks

SA2 lead

SA5 lead

Standards enablers to introduce trustworthy AI principles are essential to the adoption and successful use of AI

- Trustworthiness for data used by MTLF (Model Training Logical Function) and AnLF (Analytics Logical Function) to provide ML models and analytics.
- Trustworthiness for ML models provided by MTLF.
- Trustworthiness for analytics provided by AnLF.

Fairness / unbiased:

Data cleansing,
removing bias,
ensuring anonymity

Transparency:

Explainability of
AI/ML solutions

Robustness:

Missing data handling,
fall-back options in case
of ML model misbehavior

Management of trustworthiness

- Management of trustworthiness for autonomous network functions and network management functions
- Trustworthiness in the context of network services / network slices
- Trustworthiness in the context of Closed Loops
- Trustworthiness in the context of Management Data Analytics
- Trustworthiness in the context of Intents

Network management items

SA5 lead

SBMA enhancements

Follow-up on ongoing Rel-18 SBMA work.

Candidates for Rel-19 (examples only)

- Support for logging of MnS activities
- Support for transactions over multiple Network Functions and Management Functions
- Support for Hypermedia as the Engine of Application State (HATEOAS)
- Support for the same node selection notation for all uses cases (such as notification subscription)
- Continue transition to a fully info model driven approach

Data management

The importance of data and data management increases due to developments such as the advent of AI/ML.

Value in standardizing a harmonized approach for managing collected data, and aligning the ways data is requested and collected.

Summary

5G-Adv is a stepping
stone towards 6G

Complementing work
already started in Rel-18

Focus on operational
enhancements for wider
market adoption

Focus on items that will
have market success

Keep the workload
under control!

