



ZTE View on R19 content

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ZTE



Overall View on Rel-19 Content

The sequence number doesn't imply priority

S.NO.	Title	Brief Description and Key Objectives	Related Stage-1 Study/Work Item	Lead Stage-2 WG	RAN dependencies	Other WG dependencies
1	Integrated Sensing & Communications	Key Work Tasks includes defining - <ol style="list-style-type: none"> Overall architecture and function enhancement to support new sensing service. Basic functionality and E2E procedure for Sensing service exposure, Discovery and selection of the sensing entities, Authorization, Sensing control parameter generation and provisioning, related QoS/Policy enhancement. 	Yes, TS 22.xxx	SA2	Yes, Major	SA3 for security, SA5 for charging
2.	Ambient IoT	Key Work Tasks includes defining – <ol style="list-style-type: none"> Architecture of Ambient IoT devices accessing network: w/o and with relay Ambient IoT ID management, and Authentication/Authorization Procedures for MO/MT traffic transferring 	Yes, TS 22.xxx	SA2	Yes, Major	SA3 for security, SA5 for charging
3	Enhanced XRM	Key Work Tasks includes defining – <ol style="list-style-type: none"> Further enhancement on support of multiple modality service, including Additional multiple modality related information visible in RAN Further enhancement on QoS handling enhancement for XR and media service, including support of more protocols besides RTP/SRTP, e.g. HTTP/DASH, QUIC Further enhancement on energy efficiency saving for XRM and media service 	No	SA2	Yes	SA3 for security, SA5 for charging
4	RTC(Real Time Communication)	Key Work Tasks includes defining – <ol style="list-style-type: none"> Leftover from R18: third party using specific user identities; network exposure; GSMA NG input(NG.134): e.g. RTC across multiple operators Standalone DC session without audio/video media 	No	SA2	No	SA3 for security, SA5 for charging
5	Vertical- URLLC	Key Work Tasks, to support the redundant and reliable communication, includes defining – <ol style="list-style-type: none"> Architecture enhancement to natively support the FRER in the 5GS. Support the Industrial Ethernet topology and protocol, i.e. HSR/PRP 	No	SA2	No	SA3 for security, SA5 for charging



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6	AI/ML	Key Work Tasks includes defining – <ol style="list-style-type: none"> NWDAF assisted policy recommendation Detection/prevention/mitigation of signaling storm Items needs to coordinate with RAN WGs: dependent on RAN WGs input 	Maybe	SA2	Yes, Major	SA3 for security, SA5 for charging
7	Network Slicing	Key Work Tasks includes defining – <ol style="list-style-type: none"> Enhancement on the UE deregistration status awareness in the NSSAAF; Enhancement on update of Target NSSAI after UE mobility in connected mode. Enhancement on dynamical Slice MBR provisioning from the network slice consumer. Enhancement on slice mapping information notification from NSSF 	No	SA2	YES	SA3 for security, SA5 for charging
8	Edge Computing	Key Work Tasks includes defining – <ol style="list-style-type: none"> New information from the AF to assist the SMF to select a proper DNAI. Mechanism to establish the data path for Edge Computing without AF involvement. Mechanism to reduce the impact on the operator network when the vertical deploys Edge Computing. 	No	SA2	No	SA3 for security, SA5 for charging
9	CN Failure handling	Key Work Tasks includes defining – <ol style="list-style-type: none"> mechanism to enhance the system architecture and procedures to support operation for both public safety service and non public safety service in the no macro 5GC backhaul scenario Study whether and how to maintain services for online users when UDM or PCF fails 	No	SA2	Maybe	SA3 for security, SA5 for charging
10	QoS enhancement	Key Work Tasks includes defining – <ol style="list-style-type: none"> QoS monitoring enhancement, including UL only traffic, per packet measurement, and capability negotiation among RAN/SMF/UPF QUIC connection level QoS handling 	Yes	SA2	Maybe	SA3 for security, SA5 for charging

Sensing

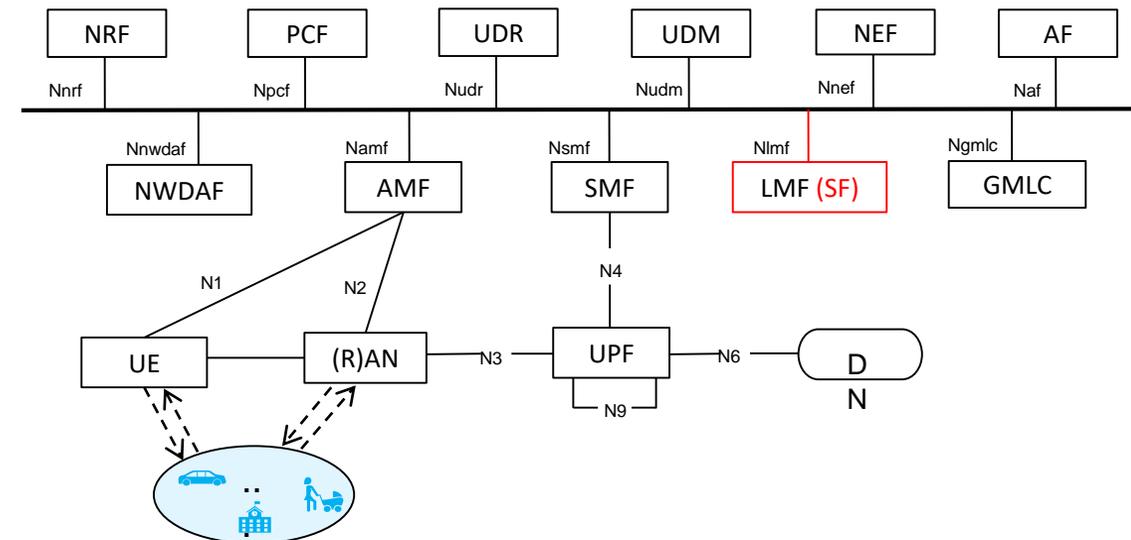
Background

- 5G-based Integrated Sensing and Communication can be beneficial for multiple market segments and verticals (e.g intelligent transportation, enterprise/factories, smart city/home, etc).
- SA1 R19 study FS_Sensing (22.837) has defined 32 use cases and will be frozen at June 2023. Normative work is expected to be completed at Dec 2023.

Objective:

- The architecture enhancement to support Integrated Sensing and Communication, including where to place the SF
- Sensing capability/result Exposure
- Procedures enhancement for sensing data collection and process

This scope needs to avoid the dependency on RAN



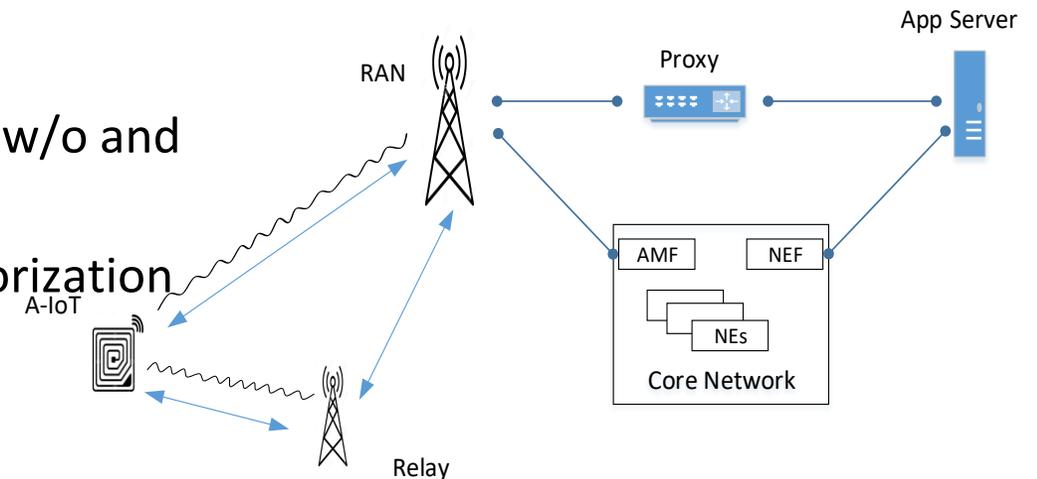
Ambient IoT

Background

- SA1 WG: R19 Study on Ambient power-enabled Internet of Things (22.840); The normative work start after Jun
- RAN WG: R18 Study on Ambient IoT (Internet of Things) in RAN (38.848);

- Objectives

- Architecture of Ambient IoT devices accessing network: w/o and with relay
- Ambient IoT ID management, and Authentication/Authorization
- Service flows for MO/MT traffic transferring;



The scope needs to avoid the dependency on RAN

XRM

Background

- R18 has defined PDU Set based QoS handling in 5GS to optimize the XR traffic handling
- Enhancement enhancements are needed to further optimize the XR traffic handling and energy saving

Objective

- Further enhancement on support of multiple modality service
 - Additional multiple modality related information visible in RAN
- Further enhancement on QoS handling enhancement for XR and media service
 - Support more protocols besides RTP/SRTP, e.g. HTTP/DASH, QUIC
- Further enhancement on energy efficiency saving for XRM and media service

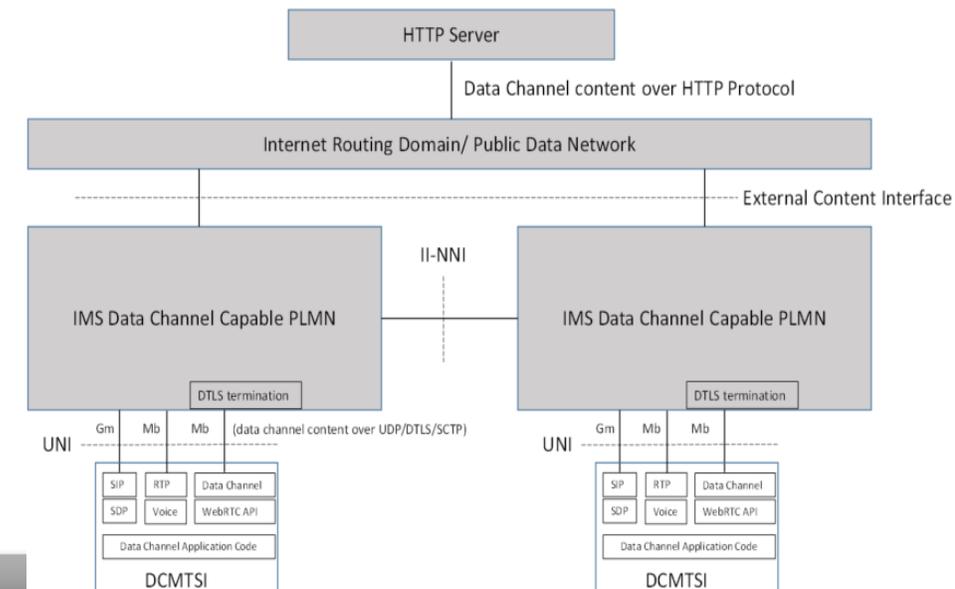
RTC(Real Time Communication)

Background

- In R18 the TR 23.700-87 has following leftovers:
 - Key Issue #3 regarding third party using specific user identities: normative work is not progressed in R18 ;
 - The interaction between the signalling function supporting Data Channel and NEF is not standardized in R18;
 - Whether DC is PS Data Off exempt service depends on SA1 conclusion.
- Enhancements to the N33 reference point (between NEF and DC App Server) for support of data channel services are not specified in R18.

Objectives

- R18 Leftover
 - Normative work for third party using specific user identities;
 - Network exposure: interface between DCSF and NEF, and between DCSF and DC App Server;
 - Services based on DC as PS Data Off exempt services clarification according to reply LS from SA1
- GSMA NG input(NG.134): e.g. RTC across multiple operators
- Standalone DC session without audio/video media





Vertical- URLLC

Background

- The existing FRER is transparent to 5GS, which depend on the application level. Dual PDU sessions solutions from R16 need UE capability while some industrial device does not support. So, the 5GS need to natively support FRER. It can be requested by 3rd party
- In the industry Ethernet, the ring topology and related protocol (e.g. HSR, High-availability Seamless Redundancy, defined in IEC 62439-3) are widely deployed to provides the redundancy and reliability. The existing 5GS does not support that the UE access the ring Ethernet via 5GS

Objective

- Redundant transmission: The architecture enhancement to the 5GC to natively support the FRER.
 - The ability for 5G to detect packets, duplicate and eliminate packets.
 - The 5G FRER capability exposure for the 3rd party.
 - The 5GC can provide the FRER based on the UE subscription.
- Seamless Redundancy: The architecture enhancement for 5GC to support industry Ethernet (IEC 62439-3)
 - The ability for 5GC to support ring Ethernet topology and protocol, i.e. HSR/PRP

AI/ML

Background

- NWDAF has been enhanced in r16, r17 and r18. New scenarios and further optimizations are expected in R19.
- R18 AIMLsys has introduced optimization to support AI traffic.

Objectives

- NWDAF assisted policy recommendation
- Detection/prevention/mitigation of signaling storm
- Items needs to coordinate with RAN WGs: dependent on RAN WGs input



Network Slicing

Background:

- 📶 Network slicing are supported since R15 and enhanced in R16,R17 and R18.
- 📶 Several topics are discussed in R18 outside of eNS_Ph3 and suggest to study in future release
- 📶 Further enhancements are needed for operator to deploy network slice

Objectives

- Study whether and how to enhance the NSSAA procedure to support the UE deregistration status awareness in the NSSAAF;
- Study whether and how to enhance the Target NSSAI to support the update of Target NSSAI after UE mobility in connected mode.
- Study whether and how to support dynamical Slice MBR provisioning from the network slice consumer.
- Study whether and how to support slice mapping information notification from NSSF

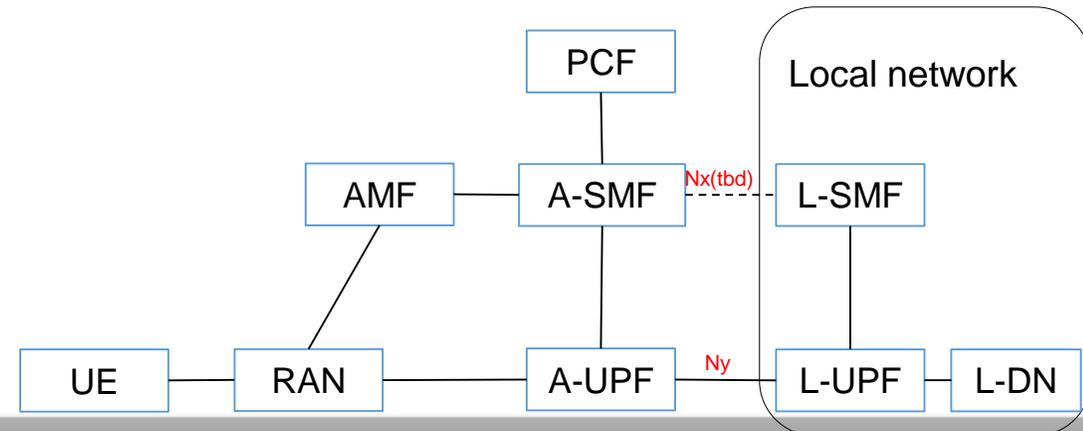
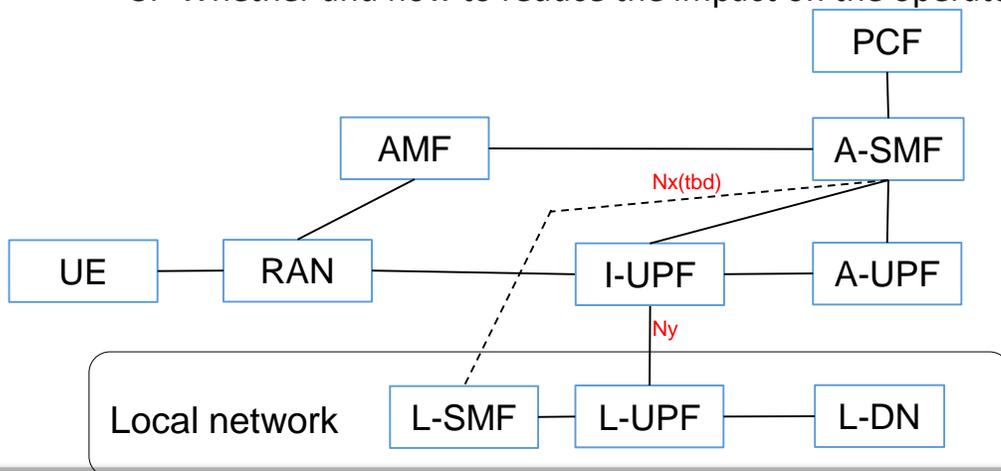
Edge Computing

Background

- In Edge computing, AF provides information for traffic influence and/or EAS deployment information to operator network and the operator network can establish a data path for Edge Computing. However in some deployment the AF may not exist. It is worthy of studying whether and how to establish the data path for Edge Computing without AF involvement.
- In some scenarios, the operator may require to deploy the local network with limited impact on the existing network, e.g. the L-UPF is controlled by an L-SMF, and the L-SMF is not connecting to the AMF

Objectives

1. Whether and how to provide more information including the weight factor of the DNAI from the AF to assist the SMF to select a proper DNAI.
2. Whether and how to establish the data path for Edge Computing without AF involvement.
3. Whether and how to reduce the impact on the operator network when the vertical deploys Edge Computing.





Enhancement to Core Network Failure handling

Background

- SA1 R19 MINT_Ph2: 1) support UE with 5G-only national roaming to obtain 4G connectivity service when disaster condition applies; 2) In case of shared RAN, the participating PLMNs shall support UE of a given PLMN to obtain connectivity service when disaster condition applies.
- 4G IOPS (Isolated Operation for Public Safety) is used to support public safety service in no macro backhaul scenario. In 5GC. Similar mechanism is missing in 5GS. It needs to study how to support operation for both public safety service and non public safety service in the no macro 5GC backhaul scenario
- When specific NF(e.g. UDM/PCF) of 5GC fails, since the online UE has registered in the network and established PDU session, it is desirable to maintain the PDU session and provide communication service to the online UE. Therefore it needs to study how to maintain the established PDU Session for online UEs when the UDM or PCF in the 5GC fails.

Objective

- Study whether and how to enhance the system architecture and procedures to support operation for both public safety service and non public safety service in the no macro 5GC backhaul scenario
- Study whether and how to maintain services for online users when some NFs in 5GC (e.g, UDM or PCF) fails



QoS enhancement

Background

- QoS monitoring description has been generated and further enhancement are agreed in XRM/AIMLsys/EDGE_Ph2 in R18. However there are still some gaps which are missing, e.g. the capability negotiation among RAN, SMF and UPF, how to monitor the QoS for uplink only traffic, etc.
- New requirement on per packet measurement agreed in SA1 WID **MeasureData**.
- IETF has specified the support for QUIC version 1 (i.e. RFC9000, 9001, 9002, 8900, etc), and QUIC have been adopted by more and more applications, such as Google apps, Facebook, Youtube, Uber, etc.; One IP flow may deliver multiple QUIC connections, and one QUIC connection may be delivered in multiple IP flows. QUIC connection level QoS handling may bring flexibility than current packet filter level QoS handling.

Objectives

- QoS monitoring enhancement
 - QoS monitoring: (a) UL only traffic, (b) Per packet measurement, (c) capability negotiation among RAN/SMF/UPF
- QUIC connection level QoS handling
 - Enhance the packet detection and forwarding model to identify QUIC traffic;
 - Enhance the QoS policy generation mechanism using QUIC characteristics, e.g. using QUIC Connection ID instead of IP 5-tuple;
 - QoS monitoring assistance utilizing the QUIC characteristics and extension, e.g. the latency spin bit in QUIC packet header;