**SA WG2 Meeting #170 S2-2507885**

**25 – 29 Aug, 2025, Goteborg , SE**

**Source: Ericsson**

**Title: [WT#1.2.x, QoS] QoS Framework**

**Document for: Agreement**

**Agenda Item:** **20.6.1.2**

**Work Item / Release: FS\_6G\_ARC/Rel-20**

*Abstract of the contribution: This contribution provides content on WT and KI 1.2.x QoS Framework with 5GS QoS Framework as a baseline.*

# 1. Contributions input for the baseline

The following is proposed as baseline as starting point for drafting the WT and KI(s) for QoS Framework based on the list of Tdocs:

| **AI**  | **TD#**  | **Subject**  | **Source**  |
| --- | --- | --- | --- |
| 20.6.1.2 | **[S2-2506320](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506320.zip)** | 23.801-01: [WT#1.2, User Plane Architecture, QoS Framework] User Plane Architecture and QoS Framework  | InterDigital Inc. |
| 20.6.1.2 | **[S2-2506388](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506388.zip)** | 23.801-01: [WT#1.2] Session and QoS enhancement for Error Tolerant Communication  | OPPO |
| 20.6.1.2 | **[S2-2506503](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506503.zip)** | 23.801-01: WT#1.2, QoS Framework - Study proposal for QoS aspects | Nokia, T-Mobile US |
| 20.6.1.2 | **[S2-2506524](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506524.zip)** | 23.801-01: [WT#1.2, User plane architecture, QoS framework] 6G QoS framework | Ofinno |
| 20.6.1.2 | **[S2-2506579](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506579.zip)** | 23.801-01: [WT#1.2, QoS Framework] Scope and New Key Issue for QoS framework | LG Electronics |
| 20.6.1.2 | **[S2-2506637](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506637.zip)** | 23.801-01: [WT#1.2, QoS Framework] QoS Framework for 6G | vivo |
| 20.6.1.2 | **[S2-2506724](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506724.zip)** | 23.801-01: [WT#1.2 QoS framework] Work task #1.2 QoS framework enhancement for 6G | SAMSUNG |
| 20.6.1.2 | **[S2-2506824](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506824.zip)** | 23.801-01: [WT#1.2, QoS framework] Discussion and proposal for new QoS in 6GS | China Telecom |
| 20.6.1.2 | **[S2-2506872](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506872.zip)** | 23.801-01: [WT#1.2, Enhanced User Plane and QoS] Scope and Key Issue for Enhanced User Plane and QoS | Futurewei |
| 20.6.1.2 | **[S2-25](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506888.zip)****[06888](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506888.zip)** | 23.801-01: [WT#1.2, QoS] Key Issue for 6G QoS framework enhancements | Apple |
| 20.6.1.2 | **[S2-250](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506900.zip)****[6900](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506900.zip)** | 23.801-01: [WT#1.2, QoS framework] Potential enhancements to QoS framework | Qualcomm Incorporated |
| 20.6.1.2 | **[S2-2506935](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2506935.zip)** | 23.801-01: [WT#1.2.x, QoS] QoS Framework | Ericsson |
| 20.6.1.2 | **[S2-2507118](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2507118.zip)** | 23.801-01: [WT#1.2, QoS] Discussion and proposal for QoS | ZTE |
| 20.6.1.2 | **[S2-2507177](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2507177.zip)** | 23.801-01: [WT#1.2, QoS] Key Issue for WT#1.2: QoS framework for 6G system  | Lenovo |
| 20.6.1.2 | **[S2-2507192](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2507192.zip)** | 23.801-01: WT#1.2, 6G QoS Framework Study proposal for 6G QoS Framework | CATT |
| 20.6.1.2 | **[S2-2507](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2507305.zip)****[305](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2507305.zip)** | 23.801-01: [WT#1.2, QoS Framework] QoS Framework Enhancements  | Huawei, HiSilicon |
| 20.6.1.2 | **[S2-2507362](https://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_170_Goteborg_2025-08/Docs/S2-2507362.zip)** | 23.801-01: [WT#1.2, QoS Framework] WTs and KIs for 6G QoS | Xiaomi |

The contributions listed above provide proposals for WT#1.2 and the related Key Issue. For the sake of discussion these proposals are further categorized into either:

- requiring further discussion or,

- are considered being contained in the list of the proposed content of the WT and Key Issue in this tdoc in the Annex A.X for the WT and clause 5.X for the Key Issue respectively.

For that purpose, the proposals listed below are tagged with information whether they are contained the WT/KI or are considered for further discussion. Proposals with a tag that includes a reference to a Sub-WT (SWTx) or a Sub-KI (SKIx) (where SWT/SKI is indicated in the bullets provided as part of the WT/KI) are considered being contained in Annex A.X or in the clause 5.X respectively.

Furthermore, proposals tagged with [FFS] are proposed to be further discussed with respect to 4 specific Aspects which are defined below. [Please see Annex A.X where these proposals are listed under specific Aspects.]

* Aspect 1: Whether this WT shall address new services, e.g., sensing, AI etc.
	+ It needs to be discussed whether new services like sensing should be part of the WT, especially as there is no 6G baseline for such services and it is unknown at this stage whether any QoS related functionality needs to be considered.
* Aspect 2: Non-QoS Framework specific proposals.
	+ Some proposals refer to aspects that are anchored in other WTs.
* Aspect 3: Whether there is a “need to be studied again” aspects that were discussed in previous releases
	+ Self explanatory.
* Aspect 4: Requiring further clarification
	+ The content is unclear, solution oriented etc.

S2-2506320 (InterDigital) WT and KI:

* Whether and how the QoS Framework can be designed to efficiently accommodate traffic flows whose PDUs can receive treatment on a per packet basis and traffic flows whose PDUs can receive treatment that is based on the status of other PDUs in the same or different traffic flows. [FFS]
* Whether and how the UE, Application Layer, RAN, and UPF can be provided with information and constraints that can be used to determine how to map traffic to a set of QoS Requirements, packet handling rules, or packet markings based on the real-time application needs, radio resource utilization, QoE measurements, energy efficiency considerations, and local UE conditions (e.g. speed). [FFS]
* Whether and how a single protocol can be used to influence how traffic is transported within a PDU Session. For example, what protocol is used to send and receive QoS Rules and traffic steering, switching, and splitting rules. In other words, whether and how a single protocol can be used to influence traffic handling within a PDU Session. [FFS]
* What are the architectural requirements for the interface between the UPF and RAN Node and between UPFs. For example, whether and how the UPF and RAN Node should be able to influence (i.e. steer) how traffic is routed towards the traffic destination and how meta data is signalled between the UPF and RAN. [FFS]
* Whether and how to optimize downlink data handling so that the user plane (e.g. UPF and SMF) functionality is less involved in the overall paging procedure. [FFS]

S2-2506388 (OPPO) WT and KI:

- Whether and how to enhance the QoS parameter (e.g. PER) to transmit the data traffic with adaptive QoS which is used for Error Tolerant Communication allowing data transmission with high error rate.] [SWT2], [SKI 2.3]

- Whether and how to support 6G system to get aware of when and which data traffic needs to be applied for data transmission with high error rate for the Error Tolerant Communication. [SWT2], [SKI 2.3]

- Whether and how to enhance session management related procedure to support Error Tolerant Communication. [SWT2], [SKI 2.3]

S2-2506503 (Nokia, T-Mobile US) WT and KI:

* Study whether and how to introduce a new resource type with better guarantee of QoS than the best effort approach of existing non-GBR and less resource intensive than the existing GBR, DC-GBR resource types to improve capacity utilization in the network while offering better QoS to adaptive applications. [SWT&SKI1, 2]

- Study whether and how to further improve QoS parameters by leveraging PLR instead of PER. [SWT&SKI2]

- Study whether and how to support leveraging information exchanged by the AF/UE and the network on the observed QoE to improve capacity utilization, service offerings with better QoE, and adapt the QoS offered by the network. [SWT8&SKI8]

S2-2506524 (Ofinno)

WT

* How define and enhance QoS control granularity for 6G services such as AI/ML services, sensing services, immersive media, time-sensitive networking. [FFS]
* How to enhance QoS control mechanisms to support dynamic and adaptive controls with reduced signalling dependencies and lower latency. [SWT6]
* How to enhance QoS control signalling path management with the aim of avoiding multi-node involvement (e.g. dependent on AMF availability), including the signalling via the control plane and signalling via the user plane supporting in-band signalling. [FFS]

KI

* QoS control granularity for 6G services: the possible levels of QoS control (e.g. per QoS Flow, per PDU Set) to support diverse services for 6G such as AI/ML services, sensing services, immersive media, and time-sensitive networking.[FFS]
* QoS control signalling path management: the signalling paths for QoS management and adjustments, including the conventional UE-SMF signalling via the control plane and possible direct signalling over the user plane between the UE and the UPF, supporting in-band signalling [FFS]

S2-2506579 (LG Electronics) WT and KI:

- Whether and how to enhance 5GS QoS framework including

- support of packet level synchronization for multi-modal service [FFS]

- enhancement of Reflective QoS [FFS]

S2-2506637 (vivo)

WT

* On the one hand, it can meet the distinctive QoS requirements of new traffic(such as AI applications traffic, computing offloading traffic, and data collection traffic, etc.).[SWT2]
* On the other hand, it can efficiently adapt to increasingly variable and bursty service attributes. [SWT6]
* In scenarios involving lightweight terminals, it can optimize energy efficiency while satisfying the experience of large bandwidth transmission.[FFS]
* In terms to realize real personalized QoS requirement, which reflect different individual users’ needs, to support UE involvement during QoS negotiation.[FFS]
* In terms of the integration of communication and new services, it will demonstrate integrated performance across different kinds of resources and cooperate to provide the optimal QoS experience [FFS]
* In terms of the allocation of communication resources, it will adapt to meet communication and perception needs, maximizing the commercial value of wireless resources. [SWT8, 2.3]
* In terms of QoS monitoring, it will realize the real E2E monitoring between UE and UPF to make consumer understand the real QoS performance, to close the cycle of QoS guaranteed. ~~It can also support the training the NW modal and realized the AI-driven QoS strategies and resource scheduling~~ [SWT7]
* It can also support the training the NW modal and realized the AI-driven QoS strategies and resource scheduling [FFS]
* Achieved precise QoS control from multiple dimensions such as flow level, PDU set, and packet. [FFS]
* A unified, smart framework compatible to both communication and new beyond communication services. [FFS]

KI

**- #**1: Study how to support QoS for new traffic, including the following detail: [SKI2.2]

- Identify the traffic characteristic for new traffic (such as AI applications traffic, computing offloading traffic, and data collection traffic, etc.).

- Study QoS control, congestion control, power saving and rate limitation for different new traffic.

- Study how to efficiently adapt to increasingly variable and busty service attributes. e.g., a flexible and adaptive mechanism will be developed to adjust QoS in real-time.

- Study what XR mechanisms can be reused for the new traffic.

- #2: Study how to support QoS for new light weight AI/AR terminals [FFS]

- How to optimize energy efficiency while satisfying the experience of large bandwidth transmission.

- #3: Comparing to AF centric QoS negotiation, study how to support UE centric QoS negotiation additionally. [FFS]

- How the UE is involved into the QoS negotiation.

- What information from UE is useful to reflect the user real personized needs and useful for the QoS negotiation.

- #4: Study how to support traffic Detection for new protocol (e.g. QUIC) [FFS]

- #X1: QoS monitoring over UP [SKI7]

Editor's Note: With regard this direction is left to UP architecture, the study is not repeated in QoS framework during the study phase.

- #X2: Study how to support QoS for new services [FFS]

- A unified, smart framework compatible to both communication and new beyond communication services.

- Support Task level QoS to fulfil the requirement for multiple resources and meet task-level performance.

- Support the optimal adaptation of multiple resources combinations and the overall performance optimization. - For computing: e.g., computing resources and communication resources.

- Support the performance requirement for single resource, to meet distinctive performance requirements: e.g. computing resource only.

S2-2506724 (Samsung)

WT&KI

* Whether and how to enhance 5G QoS framework to support better intra QoS flow and inter QoS flow dependency. [FFS]
* Whether and how to define or enhance new QoS parameters or QoS characteristics. [SWT2, SKI2.1, 2.3]

S2-2606824 (China Telecom)

- Study how to enhance the connectivity-oriented QoS. [SWT2, SKI2.1, 2.2, 2.3]

- Study how to provide an integrated QoS mechanism for emerging connectivity/beyond connectivity-oriented services.[FFS]

- Study how to support AI-based QoS mechanism.[FFS]

S2-2506872 (Futurewei)

* Investigate mechanisms and procedures for QoS that are adaptive over the life of flows, ~~including flows that are encrypted,~~ to support a wide range of traffic characteristics. [SWT6, SKI6]
* Investigate mechanisms and procedures for QoS ~~that are adaptive over the life of flows, including~~ flows that are encrypted, to support a wide range of traffic characteristics. [FFS]

S2-2506888 (Apple)

Provided as KI, WT text not included.

KI:

* How to provide differentiated treatment for traffic within a QoS flow (e.g., intra-flow prioritization of PDUs/PDU Sets, differentiated priority handling of data bursts) [FFS]
* How to avoid head of line blocking in 6GS for traffic that can be processed independently. [FFS]
* How to enable dynamic QoS adaptation with additional UE input. [SWT6, SKI]

S2-2506900 (Qualcomm)

WT

* It should use the existing 5G System QoS framework as the baseline and focus on the potential adaptation to the 6G CN and RAN architecture. [Included in the WT]
* The QoS support for new services, e.g. Sensing, should be studied after requirements are identified in the study of such services first. In this work task, the focus should be addressing corresponding transport requirements by the QoS framework. [FFS]
* This work task should also address further improvements to the existing 5G QoS framework to better serve certain application needs. [SWT2]

 KI:

- whether and how to enhance the QoS parameters/profiles to allow better RAN awareness of application layer requirements, e.g. QoE; [SKI2.3]

- whether and how to enhance the signalling to allow better UE assistance in QoS management. [FFS]

S2-2507118 (ZTE)

KI:

* Whether and how to enhance QoS framework to support new service.[SKI2.3]
* Whether and how to support service-aware QoS framework.[FFS]
* Whether and how to support real-time reporting of RAN information for QoS adaption.[FFS]

Editor’s Note: This sub-bullet has dependency on, and requires coordination with RAN.

* Whether and how to define QoS adaption mechanism to support QUIC based applications (featured with e.g. IP migration, multi-path, multiplexing, etc.)[FFS]

S2-2507177 (Lenovo)

WT:

* Study support of an enhanced QoS framework for 6G to support new services and better satisfy user experience [SWT:1, 2]

KI:

* Study whether and how to enhance 5GS QoS framework to cater for 6GS. As part of this Key Issue the following are to be studied:
* Study whether and how to extend QoS framework to better satisfy user experience, e.g., considering the E2E transmission delay and the dynamic nature of traffic characteristics of media applications. [SKI2.3, 6]
* Study whether and how to extend QoS framework to support new services, e.g., considering execution delay for new services.[FFS]

S2-2507192 (CATT)

WT:

- Whether and how to improve the QoS for the 6G connectivity services, e.g., avatar-based immersive communication service. [SWT1, 2]

- Whether and how to support the QoS for the 6G beyond-connectivity services;[FFS]

KI

* Study whether and what new QoS requirements and QoS parameters are needed for the 6G connectivity services (e.g., Avatar-based multimodality immersive communication) and 6G beyond-connectivity services; [FFS]

- Study whether different QoS parameters are used between 6G connectivity services and 6G beyond-connectivity services. [FFS]

- Study whether the 5GS QoS control and enforcement mechanisms (e.g., Notification Control, Alternative QoS profile, Reflective QoS, QoS Flow mapping, Packet filter, QoS rules to UE, PDU Set QoS, QoS Monitoring) can be reused and or need further enhancement to support 6G connectivity services and 6G beyond-connectivity services. [FFS]

- Study whether different QoS control and enforcement mechanisms are used between 6G connectivity services and 6G beyond-connectivity services. [FFS]

- Study whether and how to enable AI functionalities in the 6G to support and improve the QoS for 6G connectivity services and 6G beyond-connectivity services. e.g., AI-enabled traffic identification, traffic characteristics identification, traffic marking and QoS Monitoring[FFS]

S2-2507305 (Huawei)

WT:

* Support flexible QoS mechanisms. [SWT6]

- Support coordination mechanism between the application on the UE and the network. [FFS]

- Support the encrypted traffic handling. [FFS]

- Support to minimize the impact from the network fluctuations on transport layer protocols [FFS]

- Support leveraging the capabilities of next generation of media codecs. [SWT2]

KI:

* Study whether and how to support flexible QoS mechanism.[SKI6]

- Study how to support the dynamic QoS demand.

- Study how to enable flexible QoS adjustment in real time.

- Study how to support the existing functionalities, i.e. monitoring, charging and policing for flexible QoS mechanism.

- Study whether to how to enhance the coordination mechanism between the application on the UE and the network.[FFS]

- Study how the network can obtain information on the service-level attributes (e.g. performance, requirements, etc.) for QoS management even if it is difficult for the application to provide the information.

- Study how the application can obtain information from the network (e.g. QoS monitoring results.).

NOTE 1: The coordination mechanism between the application on the UE and the network should also support enhancements resulting from the other bullets.

- Study whether and how to enhance the encrypted traffic handling.[FFS]

- Study whether and how to minimize the impact from the network fluctuations on transport layer protocols.[FFS]

- Study whether and how to leverage the capabilities of next generation of media codecs. [SKI2.3]

S2-2507362 (Xiaomi)

WT

- Study whether and how to support the QoS adjustment to ensure consistent QoE/user experience considering the diverse devices, varying/real-time network status. [SWT6]

- Study whether and how to support the synchronization and coordination of multiple UEs including tethered devices to fulfil the critical QoS requirements (e.g., bidirectional haptic traffics, multimodal traffics). [FFS]

- Study whether and which QoS parameters/assistant information introduced to support the efficient delivery (e.g., spatial information) in 6G. [SWT2]

- Study whether and how to support the adaptive QoS in 6G, e.g., to adjust the reliability and latency automatically with or without influence from 3rd party application, to enable the authorized third party(ies) to adapt QoS dynamically considering the fluctuations of the connection conditions and QoE requirements.[SWT6]

KI:

- Study whether and how to support the QoS adjustment to ensure consistent QoE/user experience considering the diverse devices, varying/real-time network status. [SKI6]

- Study whether and how to support the synchronization and coordination of multiple UEs including tethered devices to fulfil the critical QoS requirements (e.g., bidirectional haptic traffics, multimodal traffics).[FFS]

- Study whether and which QoS parameters/assistant information introduced to support the efficient delivery (e.g., spatial information) in 6G. [SWT2]

- Study whether and how to support the adaptive QoS in 6G, e.g., to adjust the reliability and latency automatically with or without influence from 3rd party application, to enable the authorized third party(ies) to adapt QoS dynamically considering the fluctuations of the connection conditions and QoE requirements. [SKI6]

\*\*\*\* First Change \*\*\*\*

# Annex A.X WT#1.2.X: Evolution of QoS Framework for 6G

Editor’s Note: Describe the technical scope of the proposed Work Task. If applicable, suggest logical subdivision of this WT into smaller sub-WT. This clause is part of the TR Annex.

This WT assumes that the 5G QoS Framework is used as a baseline.

1. [SWT1]: The QoS Framework concept should clearly distinguish between the 6G System provider perspective (predictable packet treatments like target bitrates and/or packet delay) and the 6G System usage perspective by the application (like application traffic load and pattern).
2. [SWT2]: Study what functionality described by legacy QoS parameters (TS23.501 Cl 5.7.2) and QoS characteristics (TS 23.501 Cl 5.7.3) is needed (e.g. for defining 6G system targets), and if any changes/simplifications (“refactoring”) to the identified parameters/characteristics set and their definitions would be beneficial. Investigate if any new functionality is needed requiring new QoS metrics in order to improve RAN awareness of the application needs. (S2-2506900, Qualcomm).
3. [SWT3]: Study what information, e.g., QoS parameters and QoS characteristics shall be provided to the RAN, UE and other 3GPP entities.
4. [SWT4]: Study what feedback, if any, from RAN to the Core Network with respect to realization of a certain packet treatment shall be supported, and for what purpose.
5. [SWT5] Study how to ensure interworking with 5GS.
6. [SWT6]: Whether and how to enhance QoS control mechanisms to better support QoS targets than the best effort approach of existing non-GBR and less resource intensive than the existing GBR, DC-GBR to improve capacity utilization in the network while offering better and dynamic QoS to adaptive applications. (S2-2506524 Ofinno)
7. [SWT7]: Whether and what to monitor in context of QoS Framework (S2-2506637 (vivo))
8. [SWT8]: Study whether and how to adapt the QoS offered by the networkto improve capacity utilization and service offerings.(S2-2506503, Nokia)

**WT and KI scope pending for further discussion:**

* Aspect 1: Whether this WT shall address new services, e.g., sensing, AI:
	+ S2-2506900 (Qualcomm)
		- The QoS support for new services, e.g. Sensing, should be studied after requirements are identified in the study of such services first. In this work task, the focus should be addressing corresponding transport requirements by the QoS framework.
	+ S2-2506524 (Ofinno)
		- How define and enhance QoS control granularity for 6G services such as AI/ML services, sensing services, immersive media, time-sensitive networking.
	+ S2-2506637 (vivo)

WT

* + - In terms of the integration of communication and new services, it will demonstrate integrated performance across different kinds of resources and cooperate to provide the optimal QoS experience
		- It can also support the training the NW modal and realized the AI-driven QoS strategies and resource scheduling
		- A unified, smart framework compatible to both communication and new beyond communication services.

KI

* + - #X2: Study how to support QoS for new services
			* A unified, smart framework compatible to both communication and new beyond communication services.
			* Support Task level QoS to fulfil the requirement for multiple resources and meet task-level performance.
			* Support the optimal adaptation of multiple resources combinations and the overall performance optimization. - For computing: e.g., computing resources and communication resources.
			* Support the performance requirement for single resource, to meet distinctive performance requirements: e.g. computing resource only.
	+ S2-2606824 (China Telecom)
		- Study how to provide an integrated QoS mechanism for emerging connectivity/beyond connectivity-oriented services.
		- Study how to support AI-based QoS mechanism.
	+ S2-2507192 (CATT)

WT

* + - Whether and how to support the QoS for the 6G beyond-connectivity services;

 KI

* + - All proposals
* Aspect 2: Non-QoS Framework specific proposals:
	+ S2-2506320 (InterDigital)
		- Whether and how a single protocol can be used to influence how traffic is transported within a PDU Session. For example, what protocol is used to send and receive QoS Rules and traffic steering, switching, and splitting rules. In other words, whether and how a single protocol can be used to influence traffic handling within a PDU Session.
		- What are the architectural requirements for the interface between the UPF and RAN Node and between UPFs. For example, whether and how the UPF and RAN Node should be able to influence (i.e. steer) how traffic is routed towards the traffic destination and how meta data is signalled between the UPF and RAN.
		- Whether and how to optimize downlink data handling so that the user plane (e.g. UPF and SMF) functionality is less involved in the overall paging procedure.
	+ S2-2506637 (vivo)

 WT

* + - In scenarios involving lightweight terminals, it can optimize energy efficiency while satisfying the experience of large bandwidth transmission.

KI

* + - #3: Comparing to AF centric QoS negotiation, study how to support UE centric QoS negotiation additionally.
			* How the UE is involved into the QoS negotiation.
			* What information from UE is useful to reflect the user real personized needs and useful for the QoS negotiation.
		- #4: Study how to support traffic Detection for new protocol (e.g. QUIC)
	+ S2-2506524 (Ofinno)
		- How to enhance QoS control signalling path management with the aim of avoiding multi-node involvement (e.g. dependent on AMF availability), including the signalling via the control plane and signalling via the user plane supporting in-band signalling.
	+ S2-2506872 (Futurewei)
		- Investigate mechanisms and procedures for QoS ~~that are adaptive over the life of flows~~, ~~including~~ flows that are encrypted, to support a wide range of traffic characteristics.
	+ S2-2506118 (ZTE)
		- Whether and how to define QoS adaption mechanism to support QUIC based applications (featured with e.g. IP migration, multi-path, multiplexing, etc.)
	+ S2-2507305 (Huawei)

WT

* + - Support coordination mechanism between the application on the UE and the network.
		- Support to minimize the impact from the network fluctuations on transport layer protocols
		- Support the encrypted traffic handling.

KI

* Study whether to how to enhance the coordination mechanism between the application on the UE and the network.

NOTE 1: The coordination mechanism between the application on the UE and the network should also support enhancements resulting from the other bullets.

* Study whether and how to enhance the encrypted traffic handling.
* Study whether and how to minimize the impact from the network fluctuations on transport layer protocols.
* Aspect 3: Whether there is a “need to be studied again” aspects that were discussed in previous releases:
	+ S2-2506320 (InterDigital)
		- Whether and how the QoS Framework can be designed to efficiently accommodate traffic flows whose PDUs can receive treatment on a per packet basis and traffic flows whose PDUs can receive treatment that is based on the status of other PDUs in the same or different traffic flows.
	+ S2-2506579 (LG Electronics)
		- support of packet level synchronization for multi-modal service
		- enhancement of Reflective QoS
	+ S2-2506724 (Samsung)
		- Whether and how to enhance 5G QoS framework to support better intra QoS flow and inter QoS flow dependency.
	+ S2-2506872 (Futurewei)
		- Investigate mechanisms and procedures for QoS ~~that are adaptive over the life of flows~~, including flows that are encrypted, to support a wide range of traffic characteristics.
	+ S2-2506888 (Apple)
		- How to provide differentiated treatment for traffic within a QoS flow (e.g., intra-flow prioritization of PDUs/PDU Sets, differentiated priority handling of data bursts)
	+ S2-2506724 (Samsung)
		- Whether and how to enhance 5G QoS framework to support better intra QoS flow and inter QoS flow dependency.
	+ S2-2507118 (ZTE)

KI

* + - Whether and how to support real-time reporting of RAN information for QoS adaption.

Editor’s Note: This sub-bullet has dependency on, and requires coordination with RAN.

* S2-2507362 (Xiaomi)

 WT

* + - Study whether and how to support the synchronization and coordination of multiple UEs including tethered devices to fulfil the critical QoS requirements (e.g., bidirectional haptic traffics, multimodal traffics).

KI

* + Study whether and how to support the synchronization and coordination of multiple UEs including tethered devices to fulfil the critical QoS requirements (e.g., bidirectional haptic traffics, multimodal traffics).
* Aspect 4: Requiring further clarification
	+ S2-2506320 (InterDigital)
		- Whether and how the UE, Application Layer, RAN, and UPF can be provided with information and constraints that can be used to determine how to map traffic to a set of QoS Requirements, packet handling rules, or packet markings based on the real-time application needs, radio resource utilization, QoE measurements, energy efficiency considerations, and local UE conditions (e.g. speed).
	+ S2-2506637 (vivo)

WT

* + - In terms to realize real personalized QoS requirement, which reflect different individual users’ needs, to support UE involvement during QoS negotiation.

KI

* + - #2: Study how to support QoS for new light weight AI/AR terminals
			* How to optimize energy efficiency while satisfying the experience of large bandwidth transmission.
	+ S2-2506888 (Apple)
		- How to avoid head of line blocking in 6GS for traffic that can be processed independently.
	+ S2-25069000 (Qualcomm)

KI

* + - whether and how to enhance the signalling to allow better UE assistance in QoS management.
	+ S2-2506118 (ZTE)
		- Whether and how to support service-aware QoS framework.
	+ S2-2507177 (Lenovo)
		- Study whether and how to extend QoS framework to support new services, e.g., considering execution delay for new services.

\*\*\*\* Second Change \*\*\*\*

# 5.X. Key Issue #X: Evolution of QoS Framework for 6G

Editor's Note: This clause defines the potential scope of KI(s) and is part of the TR.

This Key Issue addresses following aspects:

1. [SKI1]: The QoS Framework concept should clearly distinguish between the 6G System provider perspective and the 6G System usage perspective by the application.
	1. [SKI1.1]: The 6G System provider perspective encompasses providing predictable packet treatments like target bitrates and/or packet delay.
		1. Here, predictable refers to providing a deterministic packet forwarding treatment with a certain degree of confidence.
	2. [SKI1.2]: The 6G System usage perspective encompasses the end-point application characteristics like application traffic load and pattern.
2. [SKI2]: 5G supports a large number of QoS parameters and QoS characteristics, which are partially depending on each other, for example, QoS characteristic PER is specified as a function of the QoS characteristic Resource Type.
	1. [SKI2.1]: Study what functionality described by legacy QoS parameters (TS23.501 Cl 5.7.2) and QoS characteristics (TS 23.501 Cl 5.7.3) is needed (e.g. for defining 6G system targets), and if any changes/simplifications (“refactoring”) to the identified parameters/characteristics set and their definitions would be beneficial.
	2. [SKI2.2]: Study whether there is a merit for two metrics, i.e. QoS Parameter metric and QoS Characteristics metric, and relations between QoS parameters and QoS characteristics (e.g. “function of”) to identify any gaps, redundant information, or ambiguities.
	3. [SKI2.3]: Study whether there is any functionality that cannot be described by the legacy metrics in the QoS parameters and QoS characteristics that is beneficial to support in order to improve RAN awareness of the application needs. (S2-2506900, Qualcomm)
3. [SKI3]: Study what information, e.g., QoS parameters and QoS characteristics shall be provided to the RAN, UE and other 3GPP entities.
4. [SKI4]: Study what feedback, if any, from RAN to the Core Network with respect to realization of a certain packet treatment shall be supported, and for what purpose.
5. [SKI5]: Study how to ensure interworking with 5GS.
6. [SKI6]: Whether and how to enhance QoS control mechanisms to better support QoS targets than the best effort approach of existing non-GBR and less resource intensive than the existing GBR, DC-GBR to improve capacity utilization in the network while offering better and dynamic QoS to adaptive applications. (S2-2506524 Ofinno)
7. [SKI7]: Whether and what to monitor in context of QoS Framework (S2-2506637 (vivo))
8. [SKI8]: Study whether and how to adapt the QoS offered by the networkto improve capacity utilization and service offerings.(S2-2506503, Nokia)

\*\*\*\* End of Changes \*\*\*\*