**Title: Informal feedback on companies' position in xRM\_ph2 (TR 23.700-70 v0.4.0)**

# 1 Overall description

TR 23.700-70 v0.4.0 contains 30 solutions covering all KIs except for KI#8. Some solutions contain various options as well like (e.g., using control plane vs. user plane, UPF detection vs. info sending from AS, etc).

To optimize (or consolidate) the input paper for future meetings; companies are requested to provide feedback regarding the solution(s) and/or agreeable principles for various KIs, currently documented in TR 23.700-70 v0.4.0. It also helps to determine the solutions that have majority interest and/or result in significant concerns.

We ask each company to give your view towards this question (one so far). This is not an evaluation for each of the solutions that are currently documented. It is mainly to seek your view on how each key issue can be addressed, based on the input form TR 23.700 so far. Then we will seek a volunteer for each key issue to drive summarizing the input.

**Q1. How should this problem be resolved?**

E.g., list the principles you think are the right approach to resolve this key issue and point to the subclause of TR 23.700-70

E.g., none of the principle suggested defined so far is good enough and why.

**Key Issue #1**

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| Key area | Input from Company - ABC |
| (1a): Active discard by RAN due to FEC (all FEC related Solutions - #1, #2, #3, #4, #21) | [Nokia] – prefer approach where FEC ratio parameter is provided via the CP rather than a UP approach where a FEC ratio parameter is included as PDU Set Information. Note SA4 has a new study item 5G\_RTP\_Ph2 as part of Rel 19. Any new RTP HE extensions, including studying FEC in RTP HE will be part of this SID. This will have to wait for the next 9-12 months for completion |
| (1b): Alternative PDU Set QoS handling (Sol #6, #7, #19) | [Nokia] – Prefer solution #19 - allow alt-QoS profiles with PDU Set QoS parameters, to enable switching between profiles based on PDU Set information (e.g. media type, or QoS/Alt-QoS Indicator) provided as PDU Set Information to the RAN, and notification of profile switching to the AF. This switch can happen when there is a transition in the media transition over a period of time.  [LGE] - Solution #19, Support the Alternative QoS profile to include alternative PDU Set QoS parameter Set(s) with PSDB and PSER and QoS notification via control plane |
| (1c): Other PDU set and QoS related topics (Sol #5, #8, #20, #22, #23) | [Nokia] – Solution 8 is a must to provide consistent PDU Set handling between AF and UPF. Also, Solution #23 with PDU Set Group and cross-PDU Set correlation identifier should be considered  [LGE] - Solution #23, Agreable for the PDU Set correlation to be taken into account for the RAN discarding decision during congestion. |
| Do you plan to submit a new solution for this KI? | [Nokia] – Yes - discard notification contribution S2-2401170 was not opened at S2-161 |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] – Support: 1 – FEC ratio in CP is sent to the RAN, 2 – Solution #19 - Alt-QoS with PDU Set QoS Params and profile switching based on new PDU Set Information (in GTP-U HE from UPF) 3 – AF providing info. on PDU Set Types and PSI mapping to UPF (solution 8) 4 – Discard notification optimization.  [LGE] - RAN2 specified discarding PDU Set in the congestion based on the PDU Set Importance in TS 38.300 and SA4 specified the guidance for PDU Set marking in TS 26.522 with the PDU set importance considering PDU set dependencies. Prefer solutions having less impact on legacy. |

Key Issue #2

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| (2): end-to-end encrypted XRM (Sol #9, #10, #11, #12, #24, #25, #26, #27) | Nokia preferred approach is based on UDP-Connect from UE to AS. Nokia views that MoQ is not mature enough IETF and is too early for 3GPP. Nokia will not support non-secure solution such as UDP-option, ~~PDU set information in GTP-U headers~~.  Sol #9, and Sol#10 are based on MoQ. IETF work is not complete and matured enough.  Sol#11 complex solution on correlating QUIC and XRM metadata deviating from IETF protocol  Sol#12. Better align with IETF/industry solution for security aspect.  Sol#24: UDP-Connect (between UPF and AS) is feasible solution. Nokia will support.  Sol#25: Adding PDU Set information over GTP-U (between AS and UPF) requires AS to support GTP-u and IPsec which may not take place in actual deployments.  Sol#26 UDP-Connect (UPF and AS) is feasible solution. Nokia will support  Sol#27: UDP-option is not secure. |
| Do you plan to submit a new solution for this KI? | [Nokia] we will submit a solution with UDP-connect starting from the UE because the UE is more suitable (than UPF) to know that an XRM app has started and a related UDP Connect to the AS is needed (The UPF cannot easily detect an XRM app due to traffic being ciphered)  [Nokia] we are also planning to resubmit the IPSec based solution as an alternative. |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] IETF MASQUE based tunnelling (UDP-connect) based solution started from the UE (see above). Metadata defined in 3GPP (SA4)  [Nokia] No MoQ based solutions as they are less generic and also less mature in IETF |

Key Issue #3

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| (3): Leverage PDU Set QoS information for DSCP marking over N3/N9 in the transport network (Sol #13, #27) | [Nokia] DSCP marking is done per PDU Set based on the PDU Set Importance either as determined by UPF or based on SMF configuration. |
| Do you plan to submit a new solution for this KI? | [Nokia] No new solution |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | **[Nokia] Solution #13 Multiple DSCP markings per QoS Flow.** DSCP marking is done per PDU Set based on the PDU Set Importance either as determined by UPF or based on SMF configuration.  Do not prefer DSCP marking based on EoDB (drop of the packet with EoDB may also happen, so it is unnecessary to assign a dedicated DSCP value. Also assigning DSCP for a dedicated PDU brings complexity in UPF).  [LGE] - Solution#13, The legacy 5GS considers 5QI, Priority Level and optionally the ARP priority level for the transport level marking. The enhancement in addition to consider the PDU Set Importance based on the mapping information between PSI and DSCP value is sufficient. |

Key Issue #4

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| (4): Traffic detection and QoS flow mapping for multiplexed data flows (Sol #8, #9, #12, #14, #15, #27, #28, #29) | [Nokia] - Support Solution #29 – including extension of traffic flow description information from AF and expansion of PDR PDI to detect unencrypted multiplexed sub-streams so they can be mapped to different QoS flows. Support mapping of PDUs within a media sub-stream that do not belong to PDU Sets (lone PDUs) to a separate QoS flow if requested by the AF. Also support encrypted multiplexed data flows by extending the flow description information so that the AF can target its QoS requirements to a specific encrypted sub-stream.  The above involves extending the PDR’s Packet Detection Information and Packet Filter Set to include Application Layer fields such as the first byte of UDP, SSRC, Payload Type. |
| Do you plan to submit a new solution for this KI? | [Nokia] - No. Solution updates should be sufficient. |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] - Solution #29 - For (S)RTP based traffic: Support extension of traffic flow description information from AF to PCF and onwards and Packet Detection Information (PDI) in PDRs and UE QoS rules so that individual sub-streams and other protocols (RTCP, data channel, ...) multiplexed into the same transport layer traffic flow can be detected and mapped to dedicated QoS flows as required. Each QoS flow can be provided either “ordinary” or PDU Set based QoS handling. Protocol Description (PD) and PDU Set detection logic can also be used to map lone PDUs in a sub-stream to a separate QoS flowif requested by the AF. (Update to Sol#29)  For end-to-end encrypted traffic (e.g., QUIC connections): Support identification of individual sub-streams so that they can be mapped to dedicated QoS flows similarly to the (S)RTP case. (Update to Sol#29)  [LGE] - Solution #29, The AF to provide QoS requirements for the identified protocol/stream and the 5GS to identify multiplexed stream for transport protocols with existing fields are agreeable. The AF/AS providing additional information that is dependent to specific transport protocol or providing PSI is not preferred. |

Key Issue #5

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| (5): QoS handling with dynamic traffic characteristics (Sol #12, #16, #30) | [Nokia] |
| Do you plan to submit a new solution for this KI? | [Nokia] - Yes, resubmit the solution which sends in-band the Time To Next Burst |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] A basic principle for this KI is that solutions do not violate QoS/Policy architecture mechanisms and especially authorization. |

Key Issue #6

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| (6): L4S for non-3GPP access networks and intermediate 5GS nodes (Sol #17) | [Nokia] Support Solution #17 with a mechanism ensuring that the ECN markings are forwarded between the inner and outer IP layers, . |
| Do you plan to submit a new solution for this KI? | [Nokia] No. Solution updates should be sufficient. |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] - Solution #17 with proper updates as described above. |

Key Issue #7

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| (7): Support for PDU Set in non-3GPP access (Sol #18) | [Nokia] Support Solution #18. |
| Do you plan to submit a new solution for this KI? | [Nokia] - No. |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] Solution #18 |

Key Issue #8

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| (8): Enhancement for UE with the tethered devices (Sol #--) |  |
| Do you plan to submit a new solution for this KI? | [Nokia] yes, need to take into account NAT in the UE applying on tethered traffic (IP address indicated by the device in e.g. sdp may not be accurate if mechanisms like STUN /ICE are not used)  NAT in UPF may also need to be considered |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] The normative work will address issues with “stand-alone” tethered devices i.e. application is running in a tethered device and UE act as an IP GW/relay for traffic to/from device (the UE is unaware of XRM application). For this purpose the normative work will at least address issues related with NAT between the tethered device and the XRM AS; |

Key Issue #9

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| (9): Enhancement for XR related network information exposure (Sol #19) | [Nokia] – See plan for new solutions below.  [LGE] - Solution#19, The AF subscription for the Alternative PDU Set QoS notification and the exposure via control plane is agreeable. |
| Do you plan to submit a new solution for this KI? | [Nokia] - Yes, one or more contributions (solutions) on exposure of PDU Set Loss Rate (PSLR) measurements and PDU Set Delay (PSD) measurements. |
| What is your preferred conclusion (e.g. solution#, agreeable principles) for this KI? | [Nokia] – Exposure of PSD and PSLR measurements to the AF. Exposure from RAN via the UPF should be justified especially if control plane actions are required. |