**3GPP TSG-CT WG3 Meeting #118eC3-215151\_r2**

**E-Meeting, 11th – 15th August 2021**

**Source: ZTE, China Mobile**

**Title: Potential Services and Service Operations**

**Release: Rel-17**

**Agenda item: 17.35**

**Document for: Discussion and Decision**

# Introduction

In CT #93e, the new WID of CT aspects for enabling MSGin5G Service has been approved in CP-212268. A new TS 29.538 is allocated for Enabling MSGin5G Service.

This paper discusses the potential Services and Service operations based on the normative Stage 2 technical specifications.

# Discussion for service

# Service for configuration procedure

According to TS 23.554, the configuration procedure is used by Message Gateway on behalf of the Non-MSGin5G UE as:

“*In the Non-MSGin5G UE configuration procedure, the Message Gateway acts as Configuration management client specified in 3GPP TS 23.434 [5] on behalf of each Non- MSGin5G UE.*”

**Observation: The configuration procedure between the Message GW and the MSGin5G Server should be considered in CT1 and will not be defined in TS 29.538.**



# Service for registration procedure

According to TS 23.554, the registration procedure is used by Message Gateway on behalf of the Non-MSGin5G UE and also used by Application Server to as:

“*Non-MSGin5G UEs (i.e., Legacy 3GPP UEs or a Non-3GPP UEs) are connected to the MSGin5G Server through a Message Gateway.* ***The Message Gateway performs registration with the MSGin5G Server on behalf of the Non-3GPP UEs****, based on the registration request from the Non-3GPP UE or on pre-provisioned information. After the procedure is complete, the Message Gateway may communicate the result to the UE to enable MSGin5G services at the Non-3GPP UEs.*”

“*The signalling flow for Application Server registration is illustrated in figure 8.2.5-1. Application Server may use the procedure in this clause to do registration. The procedure assumes that the* ***Application Server*** *i****s responsible for triggering registration to the MSGin5G Server in order to establish association with the MSGin5G Server to receive MSGin5G services****.*”

Thus it is proposed to use the new service of Nms\_Communication Service and following table shows the Nms\_Communication Service Operation.

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nms\_Communication | UERegistration | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEDeregistration | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| ASRegistration | Request/Response | Application Server |
| ASDeregistration | Request/Response | Application Server |

# Message delivery procedures

According to TS 23.554, all MSGin5G message traffic is routed via the MSGin5G Server. A Legacy 3GPP Message Gateway or a non-3GPP Message Gateway can send a new MSGin5G message request to the MSGin5G Server on behalf of a Legacy 3GPP UE or Non-3GPP UE. Application Server also can initiate a request for sending an MSGin5G message to UE.

Thus it is proposed to use the new service of Nms\_Communication Service and following table shows the Nms\_Communication Service Operation.

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nms\_Communication | UEMessageDelivery | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliverySubscribe | Subscribe/Notify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryUnSubscribe | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryNotify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| ASMessageDelivery | Request/Response | Application Server |

The MSGin5G Server can send an MSGin5G message to the Legacy 3GPP Message Gateway, a non-3GPP Message Gateway and Application server. Thus it is proposed to add new services of Nas\_Communication Service and Ngw\_Communication Service

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nas\_Communication | UEMessageDelivery | Request/Response | MSGin5G Server |

**Note: Whether the service and service operation provided by Application server should be defined in TS 29.538 is FFS.**

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Ngw\_Communication | UEMessageDelivery | Request/Response | MSGin5G Server |
| UEMessageDeliverySubscribe | Subscribe / Notify | MSGin5G Server |
| UEMessageDeliveryUnSubscribe | MSGin5G Server |
| UEMessageDeliveryNotify | MSGin5G Server |

# Message delivery status report procedures

According to TS 23.554, the Legacy 3GPP Message Gateway, the non-3GPP Message Gateway or the Application server can ask for a message delivery status report from the MSGin5G Server.

When the Legacy 3GPP Message Gateway, the non-3GPP Message Gateway or the Application server sends a message to the MSGin5G Server, it can indicate to subscribe a message delivery status report implicitly. Thus it is proposed to use the new service of Nas\_Communication Service and Ngw\_Communication Service and following table shows the Nas\_Communication Service Operation and Ngw\_Communication Service Operation.

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nas\_Communication | UEMessageDeliveryStatusTransfer | Request/Response | MSGin5G Server |

**Note: Whether the service and service operation provided by Application server should be defined in TS 29.538 is FFS.**

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Ngw\_Communication | UEMessageDeliveryStatusTransfer | Request/Response | MSGin5G Server |

The Legacy 3GPP Message Gateway, the non-3GPP Message Gateway or the Application server can also subscribe a message delivery status report from the MSGin5G Server explicitly. Thus it is proposed to use the new service of Nms\_Communication Service and following table shows the Nms\_Communication Service Operation.

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nms\_Communication | UEMessageDeliveryStatusSbuscribe | Subscribe / Notify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryStatusUnSubscribe | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryStatusNotify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| ASMessageDeliveryStatusSbuscribe | Subscribe / Notify | Application Server |
| ASMessageDeliveryStatusUnSubscribe | Application Server |
| ASMessageDeliveryStatusNotify | Application Server |

The MSGin5G Server can ask for a message delivery status report from the Legacy 3GPP Message Gateway, a non-3GPP Message Gateway and Application server.

Similar with the implicit way and explicit way above, it is to use the new service of Nms\_Communication Service in the implicit way.

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nms\_Communication | UEMessageDeliveryStatusTransfer | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| ASMessageDeliveryStatusTransfer | Request/Response | Application Server |

And it is proposed to use the new service of Nas\_Communication Service and Ngw\_Communication Service in the explicit way.

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nas\_Communication | UEMessageDeliveryStatusSubscribe | Subscribe / Notify | MSGin5G Server |
| UEMessageDeliveryStatusUnSubscribe | MSGin5G Server |
| UEMessageDeliveryStatusNotify | MSGin5G Server |

**Note: Whether the service and service operation provided by Application server should be defined in TS 29.538 is FFS.**

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Ngw\_Communication | UEMessageDeliveryStatusSubscribe | Subscribe / Notify | MSGin5G Server |
| UEMessageDeliveryStatusUnSubscribe | MSGin5G Server |
| UEMessageDeliveryStatusNotify | MSGin5G Server |

**Observation: In order to avoid unnecessary signallings, the implicit way is preferred.**

# Message Aggregation

According to TS 23.554, the MSGin5G Service can optimize communications by aggregating one or more messages towards the target, based on maximum segment size allowed to transmit over available transport. It is proposed to reuse the Service Operations in 2.3 and add some attributes.

# Message Segmentation and Reassembly

According to TS 23.554, the MSGin5G Server performs MSGin5G message segmentation and reassembly in following cases:

“***For Application-to-Point use case****,* ***the MSGin5G Server performs MSGin5G message segmentation*** *while the MSGin5G Client performs MSGin5G message reassembly.* ***For Point-to-Application use case,*** *the MSGin5G Client performs MSGin5G message segmentation while t****he MSGin5G Server performs MSGin5G message reassembly.***”

The segmented message delivered to the UE and reassembly of segments delivered to the Application Server can reuse the Service Operations in 2.3 and add some attributes.

# Message Topic Subscription

According to TS 23.554, A MSGin5G Client or an Application Server can subscribe one or more Messaging Topic(s) on the MSGin5G Server.

Thus it is proposed to use the new service of Nms\_Communication Service and following table shows the Nms\_Communication Service Operation.

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nms\_Communication | MessageTopicSubscribe | Subscribe / Notify | Application Server |
| MessageTopicUnSubscribe | Application Server |
| MessageTopicNotify | Application Server |

# Conclusion and proposals

Base on the analysis of procedures defined in TS 23.554, it is proposed to introduce the Services and Service Operations in TS 29.538.

MSGin5G Server Services

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nms\_Communication |  |  |  |
| UERegistration | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEDeregistration | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| ASRegistration | Request/Response | Application Server |
| ASDeregistration | Request/Response | Application Server |
| UEMessageDelivery | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliverySubscribe | Subscribe/Notify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryUnSubscribe | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryNotify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| ASMessageDelivery | Request/Response | Application Server |
| UEMessageDeliveryStatusSubscribe | Subscribe/Notify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryStatusUnSubscribe | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryStatusNotify | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| UEMessageDeliveryStatusTransfer | Request/Response | Legacy 3GPP Message Gateway  Non-3GPP Message Gateway |
| ASMessageDeliveryStatusTransfer | Request/Response | Application Server |
| ASMessageDeliveryStatusSubscribe | Subscribe/Notify  (Note) | Application Server |
| ASMessageDeliveryStatusUnSubscribe | Application Server |
| ASMessageDeliveryStatusNotify | Application Server |
| MessageTopicSubscribe | Subscribe/Notify | Application Server |
| MessageTopicUnSubscribe | Application Server |
| MessageTopicNotify | Application Server |
| Note: The subscription of Message Delivery Status in an explicit way is not preferred. | | | |

Application Server Services

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Nas\_Communication | UEMessageDelivery | Request/Response | MSGin5G Server |
| UEMessageDeliveryStatusTransfer | Request/Response | MSGin5G Server |
| UEMessageDeliveryStatusSubscribe | Subscribe/Notify  (Note) | MSGin5G Server |
| UEMessageDeliveryStatusUnSubscribe | MSGin5G Server |
| UEMessageDeliveryStatusNotify | MSGin5G Server |
| Note: The subscription of Message Delivery Status in an explicit way is not preferred. | | | |

**Note: whether the service and service operation provided by Application server should be defined in TS 29.538 is FFS.**

Message Gateway Services

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation Semantic | Known Consumer(s) |
| Ngw\_Communication | UEMessageDelivery | Request/Response | MSGin5G Server |
| UEMessageDeliverySubscribe | Subscribe/Notify | MSGin5G Server |
| UEMessageDeliveryUnSubscribe | MSGin5G Server |
| UEMessageDeliveryNotify | MSGin5G Server |
| UEMessageDeliveryStatusTransfer | Request/Response | MSGin5G Server |
| UEMessageDeliveryStatusSubscribe | Subscribe/Notify  (Note) | MSGin5G Server |
| UEMessageDeliveryStatusUnSubscribe | MSGin5G Server |
| UEMessageDeliveryStatusNotify | MSGin5G Server |
| Note: The subscription of Message Delivery Status in an explicit way is not preferred. | | | |

# References

1. CP-212268, CT aspects for enabling MSGin5G Service, China Mobile, CT#93e
2. 3GPP TS 23.554, Application architecture for MSGin5G Service; Stage 2