**3GPP TSG-SA WG6 Meeting #48-e S6-220639 rev1**

**e-meeting, 5th – 14th April 2022 (revision of S6-22xxxx)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | MSGin5G message aggregation and segment | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Mobile | | | | | | | | | |
| ***Source to TSG:*** | S6 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | C |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This CR is proposed to cover the objective f)1) in the Rel-18 5GMARCH WID, I,e, service logic between message aggregation and segment. If an aggregated message is sent to a recipient whose supported message segment size is smaller than the aggregated message, will the message be split or segmented. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | This CR is proposed to specify the service logic between message aggregation and segment | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The service logic between message aggregation and segment is not clear. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 8.4.1, 8.4.2, 8.4.3 and 8.5.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Change 1\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 8.4 Message Aggregation

### 8.4.1 General

Based on maximum segment size allowed to transmit over available transport, the MSGin5G Service can optimize communications by aggregating one or more messages towards the same target. The target may be an UE, an Application Server, and Broadcast Service Area, an MSGin5G Group or a Messaging Topic.

The following pre-conditions apply for message aggregation:

1. The recipient UE(s) support an MSGin5G Client or the (Legacy-3GPP and non-3GPP) Message Gateway supports the MSGin5G Client capability.

2. The MSGin5G Client 1 and MSGin5G Client 2 are registered with the MSGin5G Server, or an Application Server has established a secured communication with the MSGin5G Server.

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Change 2\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 8.4.2 Message Aggregation at MSGin5G Client

Figure 8.4.2-1 shows the procedure for an MSGin5G Client aggregating Point-to-Point messages including a group of messages each carrying small amounts of data. All of the aggregated Point-to-Point messages are sent to a same recipient UE.

Editor's note: the detailed procedures of Message Aggregation used in Group messaging, Broadcast messaging and Message delivery based on Messaging Topic is FFS.

NOTE 1: Aggregation of multiple messages can also be done with the Application Client; in this case it is implementation specific and out of the scope of the current specification.



Figure 8.4.2-1: MSGin5G UE aggregates messages towards target MSGin5G UE

Figure 8.4.2-2 shows the procedure for an MSGin5G Client aggregating Point-to-Application messages each carrying small amounts of data. All of the aggregated Point-to-Application messages are sent to a same Application Server.



Figure 8.4.2-2: MSGin5G UE aggregates messages towards target Application Server

The following procedure applies to the above figures 8.4.2-1 and 8.4.2-2 with the exception that step 7 only applies to figure 8.4.2-1.

1. Application Client(s) on UE 1 initiates a request to the MSGin5G Client 1 to send a message to another target or to send a group message.

2. The MSGin5G Client 1 checks if aggregation is allowed for this message as per the service configuration, The MSGin5G Client 1 also checks the message data size, and the priority level to determine if the received message can be aggregated. For example, MSGin5G Client 1 finds that the messages have small payload size when compared to the maximum segment size that can be transmitted over available transport and are not high priority messages, which could be sent as per scheduling policy towards a selected target.

NOTE 2: MSGin5G Client 1 decides to continue aggregating messages until optimal use of segment size before sending message towards MSGin5G Server.

NOTE 3: The configuration of whether aggregation is allowed for MSGin5G messages and how the MSGin5G Client 1 uses information such as individual message priority, maximum time to wait, etc for aggregating and sending is out of scope of the present document.

NOTE 4: The maximum segment size that can be transmitted over available transport is configured to the MSGin5G Client 1 in the MSGin5G Service specific information IE as specified in Table 8.1.2-2.

3. The MSGin5G Client 1 aggregates multiple MSGin5G message requests intended for a selected target and sends the Aggregated message request as defined in Table 8.4.2-1 and Table 8.4.2-2 according to scheduling policy towards MSGin5G Server.

Table 8.4.2-1: Aggregated message request (MSGin5G Client to MSGin5G Server)

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Originator UE Service ID | M | The service identity of the sending MSGin5G Client. |
| Recipient UE Service ID/AS Service ID (see NOTE) | M | The service identity of the receiving MSGin5G Client or the receiving Application Server. |
| Message ID | M | Unique identifier of the aggregated message |
| Security credentials | O | Security information required by the MSGin5G Server.  This is a placeholder for SA3 security information. |
| Number of individual messages | M | Indicates total number of messages which are aggregated into single message |
| List of individual messages | M | Each element in this list contains information as specified in Table 8.3.2-1. |
| Store and forward flag | O | An indicator of whether store and forward services are requested for this aggregated message. If the value indicates that store and forward services are requested by the sender, the store and forward procedure in clause 8.3.6 applies. The forward services can be applied to the aggregated message only if all messages in this aggregated message can be store and forwarded. |
| Store and forward parameters | O | Parameters used by MSGin5G Server for providing store and forward services, as detailed in table 8.3.2-2. This IE shall be included only if the value of the Store and forward flag IE indicates that store and forward services are requested. The MSGin5G store and forward procedure is detailed in clause 8.3.6. |

Table 8.4.2-2: Individual message data

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Individual Message ID | M | Unique identifier of this individual message. |
| Application ID | O | Identifies the application for which the payload is intended. |
| Delivery status required | O | Indicates if delivery acknowledgement from the recipient is requested. |
| Payload | M | Payload of the message |
| Priority type | O | Application priority level requested for this message. |

NOTE 5: Total size of Aggregated message request is less than or equal to maximum segment size allowed to be transmitted over available transport.

4. MSGin5G Server checks whether the MSGin5G Client 1 is authenticated and authorized to send Aggregated message request. If authenticated and authorized, the MSGin5G Server skips step 5.

5. If MSGin5G Client 1 is not authorized to send Aggregated message request, the Aggregated message request is not valid, or the message is stored for deferred delivery, the MSGin5G Server sends Aggregated message response to the MSGin5G Client 1. The information elements defined in Table 8.4.2-3 are included in the response.

Table 8.4.2-3: Aggregated message response (MSGin5G Server to MSGin5G Client)

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Original MSGin5G Client ID | M | The identity of the MSGin5G Client sending the original message. |
| Message ID | M | Unique identifier of this message |
| Delivery Status | O | Indicates if delivery is a failure, or if the message is stored for deferred delivery. |
| Failure Cause | O | This IE contains the failure reason, e.g. the originator is not authorized to send a message request or one of the multiple messages aggregated has an issue, may be included in this IE. |

Editor's note: If the Application ID should be in table 8.4.2-3 instead of table 8.3.2-3 is FFS.

6. If MSGin5G Client 1 is authorized to send Aggregated message request, the MSGin5G Server sends Aggregated message request towards the selected target MSGin5G Client(s) 2/ Application Server. If the aggregated message is sent to a recipient whose supported message segment size is smaller than the aggregated message, the MSGin5G Server should remove the last individual message in the List of individual messages element from the aggregated message until the aggregated message is smaller than the maximum segmentation size that can be transmitted over available transport. The MSGin5G messages removed from the aggregated message may be sent individually or aggregated again by the MSGin5G Server according to service configuration.

7. The MSGin5G Client 2 splits the received Aggregated message request into multiple individual MSGin5G message requests per application and sends them towards Application Client(s).

8. The Application Client(s)/ Application Server may initiate sending a message delivery status report, if requested in the original message that is received as in Step 7 (for MSGin5G UE) or Step 6 (for Application Server). MSGin5G Client 2/ Application Server sends the message delivery status report towards the Application Client(s) on UE 1 via MSGin5G Server and MSGin5G Client 1.

NOTE 6: The message delivery status reports can also be aggregated into a single message.

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Change 3\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 8.4.3 Message Aggregation at MSGin5G Server

Figure 8.4.3-1 shows the procedure for MSGin5G Server aggregating Application-to-Point messages each carrying small data targeted towards the target UE.

NOTE 1: Aggregation of multiple messages can also be done at the Application Server; in this case it is implementation specific and out of the scope of the current specification.



Figure 8.4.3-1: MSGin5G Server aggregates messages towards target end point

1. The Application Server initiates to send Application-to-Point message or a group message towards target UE(s) 1 and sends the request to MSGin5G Server and includes an indication that message aggregation is allowed for this message.

2. The MSGin5G Server checks the message data size and the priority level to determine if the received message can be aggregated. For example, MSGin5G Server finds that the messages have small payload size when compared to the maximum segment size that can be transmitted over available transport and are not high priority messages, which could be sent as per scheduling policy towards a selected target.

NOTE 2: MSGin5G Server decides to continue aggregating messages until optimal use of segment size before sending message towards MSGin5G Client 1.

3. The MSGin5G Server aggregates multiple MSGin5G message requests intended for the target UE and sends the Aggregated message request as defined in Table 8.4.3-1 and Table 8.4.2-2 according to scheduling policy towards the MSGin5G Client 1.

Table 8.4.3-1: Aggregated message request (MSGin5G Server to MSGin5G Client)

|  |  |  |
| --- | --- | --- |
| Information element | Status | Description |
| Originating AS Service ID | M | The service identity of the sending Application Server. |
| Recipient UE Service ID | M | The service identity of the receiving MSGin5G Client. |
| Message ID | M | Unique identifier of this message |
| Number of individual messages | M | Indicates total number of messages which are aggregated into single message |
| List of Individual messages | M | Each element in this list contains information as specified in Table 8.3.3-1 |

NOTE 3: Total size of Aggregated message request is less than or equal to maximum segment size allowed to transmit over available transport.

4. The MSGin5G Client 1 splits the received Aggregated message request into multiple individual MSGin5G message requests per application and sends towards Application Client(s) as notifications.

NOTE 4: The MSGin5G Server may aggregate messages towards the target UE if it receives message from multiple MSGin5G UEs (instead of application server).

### \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Change 4\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 8.5 MSGin5G Message Segmentation and Reassembly

### 8.5.1 General

This clause introduces MSGin5G message segmentation and reassembly functionality to the MSGin5G Service.

Segmentation and reassembly operations are performed either by the MSGin5G Server or by the MSGin5G Client, depending on the communication models. 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 the MSGin5G Server performs MSGin5G message reassembly.

The Aggregated message request should not be segmented. If aggregated message is sent to a recipient whose supported message segment size is smaller than the aggregated message, the MSGin5G Server should handle the Aggregated message as specified in clause 8.4.2.

The maximum segmentation size of MSGin5G message is 2048 bytes and can be configurable.