**3GPP TSG-CT WG4 Meeting #99eC4-204255**

**E-Meeting, 18th – 28th August 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.500** | **CR** | **0161** | **rev** | **1** | **Current version:** | **16.4.0** |  |
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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 |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Notification for Default Subscriptions | | | | | | | | | |
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| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eSBA | | | | |  | ***Date:*** | | | 2020-08-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 3GPP TS 29.500 has specified that for notification related to default subscriptions using Indirect Communication with Delegated Discovery, the NF Service producer provide discovery factors to SCP and SCP discover a select a proper target to relay the notification, in clause 6.10.3.3.  There are some issues to deliver notification corresponding to default subscriptions for Indirect Communication with Delegate Discovery.  1/ the URI path used in the notification request sent by NF producer to SCP is unknown. For explicit/implicit subscription where notification URI was already received from NF consumer, the NF producer will use this path in the notification request to SCP. But for notifications to default subscription with delegated discovery, it is not possible for NF producer to learn the URI path beforehand.  One alternative is to send without path (i.e. use root path "/") to the SCP. But it is not optimal as root path may be used for certain specific usage by an HTTP server (e.g. list server state or default page, etc.). It is proposed to use a specific path (e.g. "default-sub-notify-uri") on SCP for default subscription notification delivery.  When a default subscription is selected, the SCP replace the whole request URI with the notification URI of the default subscription before sending the notification request to the target.  2/ Currently notification type is passed by NF producer to SCP to help SCP discover and select the proper default notification For certain notification types, e.g. N1\_MESSAGES or N2\_INFORMATION, one NF consumer may register multiple default subscriptions per different N1 Message Classes or N2 Information Classes. In this case, the SCP cannot needs further information to accurately locate the correct default subscription to relay the notification. | | | | | | | | |
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| ***Summary of change:*** | | 1/ Clarify the request URI path usage for notification requests corresponding to default subscriptions with Delegated Discovery in 6.10.2.4.  2/ Clarify N1 message class and N2 information class is needed for SCP to locate the correct default subscription in 6.10.3.3. | | | | | | | | |
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| ***Consequences if not approved:*** | | Notifications corresponding to default subscriptions with Delegated Discovery cannot work. | | | | | | | | |
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| ***Clauses affected:*** | | 6.10.2.4, 6.10.3.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | Query parameters "n1-msg-class" and "n2-info-class" (which are mapped to the discovery factors) are introduced in separate CR to TS 29.510. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev1:  1/ Add "optional deployment-specific string of the SCP" in ":path" for default notification request send by HTTP client to SCP;  2/ Editorial corrections. | | | | | | | | |

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

#### 6.10.2.4 Pseudo-header setting

For Indirect Communications with or without delegated discovery, when sending a request to the SCP, the HTTP client shall set the pseudo-headers as follows:

- ":scheme"set to "http" or "https";

- ":authority" set to the FQDN or IP address of the SCP (if the scheme is "http"), or to the FQDN of the SCP (if the scheme is "https");

- ":path" including the optional deployment-specific string of the SCP and the path and query components of the target URI excluding the optional deployment-specific string of the target URI.

An HTTP client sending a notification or callback request cannot know whether the callback URI contains any deployment specific string or not. Accordingly, it shall behave assuming that there is no deployment specific string in the callback (i.e. target) URI. When an HTTP client sending a notification request corresponding to default notification subscription where the target URI is unknown (e.g. for Indirect Communicatoin with Delegated Discovery, as specified in clause 6.10.3.3), it shall include the optional deployment-specific string of the SCP and pseudo target URI for default subscription ("**/scp-default-sub-notify-uri**") in the ":path".

Additionally, for HTTP requests for which an HTTP client may cache responses (e.g. GET request), the HTTP client should include the cache key (ck) query parameter set to an implementation specific value that is bound to the target NF (see clause 6.10.2.6).

The HTTP client shall include the apiRoot of an authority server for the target resource (including the optional deployment-specific string of the target URI), if available, in the 3gpp-Sbi-Target-apiRoot header (see clause 6.10. 2.5).

When forwarding a request to another SCP, an SCP shall replace the apiRoot of the SCP received in the request URI of the incoming request by the apiRoot of the next hop SCP. The SCP shall include the apiRoot of an authority server for the target resource (including the optional deployment-specific string of the target URI), if available, e.g. if the 3gpp-Sbi-Target-apiRoot header was received in the request. The SCP shall set the pseudo-headers as specified in clause 6.1, with the following additions:

- the SCP shall modify the ":authority" HTTP/2 pseudo-header field to the FQDN of the next hop SCP.

- the SCP shall remove any optional deployment-specific string of the SCP in the ":path" HTTP/2 pseudo-header and add any optional deployment-specific string of the next hop SCP;

- the SCP shall remove the cache key query parameter, if this parameter was received in the request;

- if pseudo target URI for default subscription ("**/scp-default-sub-notify-uri**") is present in the ":path", the SCP shall replace it with the real path of the target URI registred in the selected default subscription.

When forwarding a request to the HTTP server, the SCP shall replace the apiRoot of the SCP received in the request URI of the incoming request by the apiRoot of the target NF service instance. If the 3gpp-Sbi-Target-apiRoot header was received in the request, the SCP shall use it as the apiRoot of the target NF service instance, if the SCP does not (re)select a different HTTP server, and regardless shall remove it from the forwarded request. The SCP shall set the pseudo-headers as specified in clause 6.1, with the following additions:

- the SCP shall modify the ":authority" HTTP/2 pseudo-header field to the FQDN of the target NF service instance.

- the SCP shall remove any optional deployment-specific string of the SCP in the ":path" HTTP/2 pseudo-header and add any optional deployment-specific string of the target URI;

- the SCP shall remove the cache key query parameter, if this parameter was received in the request;

- if pseudo target URI for default subscription ("**/scp-default-sub-notify-uri**") is present in the ":path", the SCP shall replace it with the real path of the target URI registred in the selected default subscription.

EXAMPLE 1: For indirect communication without delegated discovery, if the NF Service Consumer needs to send the request "GET [https://example.com/a/b/c/nudm-sdm/v1/{supi}/nssai](https://example.com/a/b/c/nudm-sdm/v1/%7bsupi%7d/nssai)" to the NF Service Producer (represented by the FQDN "example.com" and where "a/b/c" is the apiPrefix of the NF service producer figured out from NRF discovery):

- the NF service consumer shall send the request "GET [https://scp.com/1/2/3/nudm-sdm/v1/{supi}/nssai](https://scp.com/1/2/3/nudm-sdm/v1/%7bsupi%7d/nssai)" to the SCP (where "1/2/3" is the "apiPrefix" of the SCP), with the "3gpp-sbi-target-apiRoot" header set to "<https://example.com/a/b/c>".

- the SCP shall send the request "GET [https://example.com/a/b/c/nudm-sdm/v1/{supi}/nssai](https://example.com/a/b/c/nudm-sdm/v1/%7bsupi%7d/nssai)" to the NF Service Producer, without any "3gpp-sbi-target-apiRoot" header.

EXAMPLE 2: For indirect communication, if the NF Service Producer needs to send a notification request "POST <https://example.com/a/b/c/>notification" to the NF Service Consumer (represented by the FQDN "example.com", i.e. the host part of the callback URI):

- the NF service producer shall send the request "POST <https://scp.com/1/2/3/a/b/c/notification>" to the SCP (where "1/2/3" is the "apiPrefix" of the SCP), with the "3gpp-sbi-target-apiRoot" header set to "[https://example.com](https://example.com/a/b/c)".

- the SCP shall send the request "POST <https://example.com/a/b/c/notification>" to the NF Service Consumer, without any "3gpp-sbi-target-apiRoot" header.

EXAMPLE 3: For indirect communication with Delegated Discovery, if the NF Service Producer needs to send a notification request to a default subscirpton and SCP selects a target default notification subscription (with callback URI "<https://example.com/a/b/c/notification>" registered):

- the NF service producer shall send the request "POST <https://scp.com/1/2/3/scp-default-sub-notify-uri>" to the SCP (where "1/2/3" is the "apiPrefix" of the SCP).

- the SCP shall send the request "POST <https://example.com/a/b/c/notification>" to the selected NF Service Consumer.

\* \* \* Next Change \* \* \* \*

#### 6.10.3.3 Notifications corresponding to default notification subscriptions

An NF may register default notification subscriptions in its NF profile or NF services in the NRF for notifications the NF is prepared to consume, including for each type of notification the corresponding notification endpoint (i.e. callback URI).

NOTE: This can be used e.g. by an AMF to discover the notification endpoint of other AMFs to forward N1 or N2 messages, or by an AMF to notify location information to a GMLC, or by an UDR to notify data change or removal to an UDM.

The following procedures may be used to support notifications corresponding to default notification subscriptions:

- an NF producer may perform a discovery request towards the NRF (possibly through an SCP) to discover default notification subscriptions of an NF consumer, and if so, send notifications to the corresponding notification endpoints, using routing mechanisms specified in clause 6.1; or

- an NF producer may be configured with the types of notifications corresponding to default notification subscriptions it needs to generate, and send such notifications using delegated discovery, i.e with an SCP discovering and selecting an NF service consumer with a corresponding default notification subscription. To enable the latter, the NF producer shall include in the notification request:

- the 3gpp-Sbi-Callback header including the name of the notify or callback service operation and the API major version if higher than 1;

- the 3gpp-Sbi-Discovery-notification-type header set to the type of notification being set;

- the 3gpp-Sbi-Discovery-n1-msg-class header set to the N1 Message Class of the target default subscription if notification type is "N1\_MESSAGE", or the 3gpp-Sbi-Discovery-n2-info-class header set to the N2 Information Class of the target default subscription if the notification type is "N2\_INFORMATION";

- the 3gpp-Sbi-Discovery-target-nf-type header indicating the type of the consumer NF;

- optionally, additional NF service discovery factors header to be used by the SCP to discover and select the consumer NF.

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