**3GPP TSG-CT WG4 Meeting #101eC4-205340**

**E-Meeting, 03rd – 13th November 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.500** | **CR** | **0190** | **rev** | **-** | **Current version:** | **16.5.0** |  |
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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:*** | Handling of binding on behalf of another NF | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_eSBA | | | | |  | ***Date:*** | | | 2020-10-19 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | Subscriptions may be created on behalf of an NF other than the NF that sends the subscription request to the target NF (e.g. an UDM creates a subscription in AMF on behalf of the NEF).  This scenario is described in clause 6.12.4, and it is also mentioned in EXAMPLE 6 of 5.2.3.2.6.  However, clause 6.12.4 simply says that the intermediate node (e.g. UDM) "*may include Binding Indication for the event notifications to the other NF*", but it does not say where does such information come from.  It is proposed that such information can only possibly be derived from the binding information that the original NF (e.g. NEF) sends in its subscription request to the intermediate node (e.g. UDM).  In addition, the node that sends the original service request (the source node on behalf of which an intermediate node may create a subscription on a target node), may include a parameter (notification receiver or shorted as "nr") allowing the target node to match different binding indication headers with different notifications events (see Discussion Paper in C4-205460 or C3-205072). | | | | | | | | |
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| ***Summary of change:*** | | - Specify that binding information corresponding to notifications sent to the node on behalf of which a subscription is created, can only come from the binding information provided by such node, when it sends a first subscription or service request to the intermediate node.  - Define a new parameter "nr" in the 3gpp-Sbi-Binding header.  - Correct the ABNF to make the existing parameter "recoverytime" optional, as it was the original intention when such parameter was introduced. | | | | | | | | |
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| ***Consequences if not approved:*** | | The scenario for subscriptions on behalf of another NF is not clear, and it is not clearly specified how to build the binding indication for the notifications to the original NF. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.3.2.6, 6.12.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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

##### 5.2.3.2.6 3gpp-Sbi-Binding

This header contains a comma-delimited list of Binding Indications from an HTTP server for storage and subsequent use by an HTTP client (see clause 6.12).

The encoding of the header follows the ABNF as defined in IETF RFC 7230 [12].

3gpp-Sbi-Binding = "3gpp-Sbi-Binding" ":" 1#(OWS "bl=" blvalue 1\*(";" OWS parameter) [";" OWS recoverytime] [";" OWS notif-receiver])

blvalue = "nf-instance" / "nf-set" / "nfservice-instance" / "nfservice-set"

parameter = parametername "=" token

parametername = "nfinst" / "nfset" / "nfservinst" / "nfserviceset" / "servname" / "scope"

recoverytime = "recoverytime=" OWS date-time

notif-receiver = "nr=" URI ; URI production rule from IETF RFC 3986 [14], Appendix A

The following parameters are defined:

- scope: indicates the applicability of a Binding Indication in a service request. This may take one of the following values:

- "other-service": the binding information applies to other service(s) that the NF Service Consumer may later on provide as an NF Service Producer (see clause 6.12.3);

- "subscription-events": the binding information applies to subscription change event notifications (see clause 6.12.4);

- "callback": the binding information applies to notification or callback requests (see clauses 6.12.4 and 6.12.5).

The absence of this parameter in a Binding Indication in a service request shall be interpreted as "callback".  
  
Two scope parameters may be present in a Binding Indication if the binding information applies to notification/callback requests and to other services.

- servname (service name): indicates the name of a service, as defined in 3GPP TS 29.510 [8], or a custom service, i.e.:

- the name of the service that handles a notification or a callback request, when present in a Binding Indication for a subscription or a callback, i.e. with a scope parameter absent or set to "callback"; or

- the name of the other service(s) for which the binding applies, when present in a Binding Indication in a service request for the other services the NF Service Consumer can provide later on as an NF Service Producer, i.e. with the scope parameter set to "other-service". More than one servname parameter may be present to represent multiple such services. The absence of this parameter in a Binding Indication with the scope parameter set to "other-service" shall be interpreted as binding information that applies to all the services that the NF Service Consumer may provide later as an NF Service Producer.

- recoverytime: indicates the recovery timestamp of the entity corresponding to the highest resiliency level supported for the resource, that is, the higher level binding entity indicated in the Binding Indication. See Table 6.3.1.0-1 of 3GPP TS 23.501 [3] and clause 6.1 of 3GPP TS 23.527 [38]. The date-time type is specified in IETF RFC 5322 [37] and clause 7.1.1.1 of IETF RFC 7231 [11].

- nr: indicates the URI of the notification endpoint when this binding information is applicable; it applies to callback requests (see clause 6.12.4); if the notification URI does not contain a correlationID in the path (i.e. it is a common notification URI for multiple subscriptions), the correlationID shall be added as a fragment component of the URI (i.e. following the "#" character) at the end of the URI.

- for the definition and encoding of the blvalue, nfinst, nfset, nfservinst and nfserviceset see clause 5.2.3.2.5.

EXAMPLES 1 to 5: Same as EXAMPLES 1 to 5 defined in clause 5.2.3.2.5, with the header name "3gpp-Sbi-Binding" instead of "3gpp-Sbi-Routing-Binding".

EXAMPLE 6: Subscription request from one NF on behalf of another NF, with 2 binding indications:  
  
3gpp-Sbi-Binding: bl= nf-set; nfset=set1.udmset.5gc.mnc012.mcc345; servname=nudm-ee;scope=subscription-events  
3gpp-Sbi-Binding: bl= nf-set; nfset=set1.nefset.5gc.mnc012.mcc345; servname=nnef-event-exposure

EXAMPLE 7: Service request with 2 binding indications, for callback requests and for other services the NF Service Consumer may provide later as an NF Service Producer:  
  
3gpp-Sbi-Binding: bl=nf-instance; nfinst=54804518-4191-46b3-955c-ac631f953ed8; nfset=set1.smfset.5gc.mnc012.mcc345; servname=nsmf-pdusession  
3gpp-Sbi-Binding: bl=nf-instance; nfinst=54804518-4191-46b3-955c-ac631f953ed8; nfset=set1.smfset.5gc.mnc012.mcc345; scope=other-service; servname=nsmf-event-exposure

EXAMPLE 8: Service request with one binding indication applying to notification/callback requests and to any other services the NF Service Consumer may provide later as an NF Service Producer:  
  
3gpp-Sbi-Binding: bl=nf-set; nfset=set1.region48.amfset.5gc.mnc012.mcc345; scope=callback; scope=other-service

EXAMPLE 9: Service request with one binding indication applying to notification/callback requests together with a recovery time stamp associated with the NF Set indicated in the binding indication and with the binding level set to "nfset":  
3gpp-Sbi-Binding: bl=nfset; nfset=set1.region48.amfset.5gc.mnc012.mcc345; scope=callback; recoverytime= Tue, 04 Feb 2020 08:49:37 GMT

EXAMPLE 10: Service response with one binding indication applying to the session context with a recovery time stamp associated with the NF Set indicated in "nfset" in the binding indication and with the binding level set to "nfinstance":  
  
3gpp-Sbi-Binding: bl= nfinstance; nfinst=54804518-4191-46b3-955c-ac631f953ed8; nfset=set1.smfset.5gc.mnc012.mcc345; recoverytime= Tue, 04 Feb 2020 08:49:37 GMT

EXAMPLE 11: Service response with one binding indication applying to the session context with a recovery time stamp associated with the NF Instance included the binding indication and with the binding level set to nfserviceinstance:  
  
3gpp-Sbi-Binding: bl=nfserviceinstance; nfservinst=xyz; nfinst=54804518-4191-46b3-955c-ac631f953ed8; recoverytime= Tue, 04 Feb 2020 08:49:37 GMT

NOTE: Examples 6 and 7 are formatted as two distinct headers (which improves the readability), but they can also be formatted as a single header with two Binding Indication values separated by a comma.

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

### 6.12.4 Binding for explicit or implicit subscription requests

A NF Service Consumer may provide a Binding Indication in a service request creating an explicit or an implicit subscription by including a 3gpp-Sbi-Binding header (see clause 5.2.3.2.6) in an HTTP request, or provide a Binding Indication value for a default notification subscription in its NF profile in NRF (see clause 6.1.6.2.4 of 3GPP TS 29.510 [8]), with:

- the binding level (bl) parameter indicating a preferred binding to either a NF Service Instance, a NF Service Set, a NF Instance or a NF set;

- at least one of the NF Service Instance (nfservinst), NF Service Set (nfservset), NF instance (nfinst) and NF Set (nfset) parameters, set to a NF Service Instance ID, NF Service Set ID, NF Instance ID and NF Set ID respectively, as described in Table 6.3.1.0-1 of 3GPP TS 23.501 [3];

- the scope parameter indicating "subscription-events" if the binding information is applicable to subscription change event notification (see clause 4.17.12.4 of 3GPP TS 23.502 [4]);

- optionally, the scope parameter indicating "callback" if the binding information is applicable to notification and callback requests; the absence of this parameter shall also be interpreted as binding information is applicable to callback (i.e. notification) requests;

- optionally the service name parameter indicating the service that will handle the notification.

When binding information is applicable to notification/callback requests, corresponding notifications are bound to:

- the NF instance or NF set (according to the binding level), if no service name was received;

- the specific service (indicated by the service name parameter) of the NF instance or NF set (according to the binding level), if a service name was received; or

- the NF service instance or NF service set (according to the binding level).

NOTE 1: The NF Service Consumer in a NF Instance or NF Set can be identified by the NF Instance Id or NF Set Id, with or without a service name parameter, or a NF Service Instance Id (together with the NF Instance Id or the NF Service Set Id) or a NF Service Set Id, where the service can be either a standardised service or a custom service.

NOTE 2: A notification can be sent to a service instance of any binding entity included in the Binding Indication, i.e. the binding entity may be other than the one(s) indicated by the binding level, if the latter(s) are not reachable. For instance, if the Binding Indication contains an NF Set ID, an NF Instance ID and a binding level is set to NF Instance, the notification can be sent to any NF instance of the NF set if the NF instance identified by the NF Instance ID is not reachable. See clause 6.3.1.0 of 3GPP TS 23.501 [3].

The NF Service Producer shall store the Binding Indication received from the NF Service Consumer and include it in a 3gpp-Sbi-Routing-Binding header in subsequent notification requests it sends to the NF Service Consumer (that acts as an HTTP server) related to this subscription. For a default notification subscription, the NF Service Producer shall fetch the Binding Indication value (if available) from the NF profile of the NF Service Consumer and include it in a 3gpp-Sbi-Routing-Binding header in related notification requests. For notifications corresponding to default notification subscriptions using Indirect Communication with Delegated Discovery (see clause 6.10.3.3), when the notification is targeting a specific NF instance/NF service instance, the SCP shall fetch the Binding Indication value (if available) for the default notification subscription from the NF profile of the NF Service Consumer. The NF Service Producer or the SCP shall use this information for selecting or reselecting an NF Service Consumer (HTTP server) which has access to the original consumer's NF Service Resource context, for direct or indirect communication respectively, as specified in clause 6.3.1.0 of 3GPP TS 23.501 [3]. If the notification endpoint provided in the subscription is not reachable, the NF Service Producer or SCP shall look up for an alternative notification endpoint address at the service level (i.e. NF Service registered in NRF) if the Binding Indication contains a service name or a binding to an NF Service Instance or NF Service Set, or at the NF instance level (i.e. NF Profile registered in NRF) otherwise. The NF Service Producer or SCP shall exchange the authority part of the notification URI (or callback URI) with the new notification endpoint address and shall use that URI in subsequent notifications.

The NF Service Consumer may provide an updated Binding Indication to the NF Service Producer in a service request modifying the subscription or in a notification response.

The NF Service Producer may also provide a Binding Indication in a service response creating or modifying an explicit or an implicit subscription by including a 3gpp-Sbi-Binding header (see clause 5.2.3.2.5) in the HTTP response as specified in clause 6.12.2. If the service request creates a resource and a subscription, the Binding Indication returned in the HTTP response shall apply to both the NF Service Resource and the subscription, i.e. the created resource and subscription shall be bound to the same (service) set of producers or producer instance. The NF Service Consumer shall store the Binding Indication received from the NF Service Producer and include it in a 3gpp-Sbi-Routing-Binding header in subsequent related service requests as specified in clause 6.12.2.

For a default notification subscription, a NF Service Consumer shall update the Binding Indication value in NF profile when binding information of the default notification subscription has changed.

A subscription request may also contain a Routing Binding Indication that can be used in case of indirect communication by the SCP to route the message to the NF Service Producer.

A service request may create an explicit subscription on behalf of another NF (e.g. UDM subscribing to an AMF event on behalf of the NEF); typically, this may happen when a "source" NF (e.g. NEF) issues a service request to an "intermediate" NF (e.g. UDM) who sends a subsequence service request to a "target" NF (e.g. AMF). The "intermediate" NF may include two Binding Indications: a first Binding Indication for subscription change event notification sent from the "target" NF to the "intermediate" NF (e.g. notifications to UDM upon AMF change) and a second Binding Indication for the event notifications sent from the "target" NF to the "source" NF (e.g. AMF notification to the NEF).

In the former Binding Indication, the scope parameter shall be set to "subscription-events"; in the latter Binding Indication (corresponding to the event notifications to the "target" NF to the "source" NF), the scope parameter shall be set to "callback" or be absent, and the other binding parameters ("bl", "nfset", etc.) shall be taken from the original service request from the "source" to the "intermediate" NF (e.g. binding parameters in the service request from NEF to UDM).

The "source" NF (e.g. NEF) or "intermediate" NF (e.g. UDM) may also include an "nr" (notification receiver) parameter in its Binding Indication conveying the notification URI used by the "target" NF (e.g. AMF) in subsequent event notifications. This "nr" parameter allows the "target" NF to match binding information with different types of notification events in scenarios in which the "intermediate" NF combines multiple subscriptions to the "target" NF, in a single subscription request.

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