**3GPP TSG-CT WG4 Meeting #99eC4-204xxx**

**E-Meeting, 18th – 28th August 2020** *Revision of C4-204189*

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.500** | **CR** | **0152** | **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:*** | Clarifications for Indirect Communications | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | CT4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5G\_eSBA | | | | |  | ***Date:*** | | | 2020-08-06 |
|  |  | | | |  | |  | | |  |
| ***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:*** | | 1) Clause 6.12.1 specifies:  *If an SCP receives a Routing Binding Indication within a service or notification request and decides to forward that request to a next-hop SCP, it shall include the Routing Binding Indication in the forwarded request.*  This suggests that if the SCP forwards the request to the target NF, it does not do so, but there is no explicit statement requiring so.  2) It is not specified how the SCP shall handle the 3gpp-Sbi-Sender-Timestamp and the 3gpp-Sbi-Max-Rsp-Time headers received in an incoming HTTP request.  The 3gpp-Sbi-Sender-Timestamp header is used to indicate the time at which an HTTP request or response is sent, and it allows to measure signalling delays between different network entities. The SCP may interact with the NRF for discovery or access authorization procedures. Accordingly, the SCP may set the 3gpp-Sbi-Sender-Timestamp to reflect the time at which the SCP forwards the HTTP message. | | | | | | | | |
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| ***Summary of change:*** | | 1) The SCP shall remove the Routing Binding Indication if it forwards the request to the target NF.  2) When forwarding a request that includes the 3gpp-Sbi-Sender-Timestamp and the 3gpp-Sbi-Max-Rsp-Time headers, the SCP may forward these headers unmodified; if the SCP modifies and sets the 3gpp-Sbi-Sender-Timestamp to the time when it forwards the request, it shall adjust the 3gpp-Sbi-Max-Rsp-Time accordingly such as to properly reflect the time until which the HTTP client waits for a response. | | | | | | | | |
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| ***Consequences if not approved:*** | | Lack of specification details can result in different implementations and interoperability issues. | | | | | | | | |
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| ***Clauses affected:*** | | 6.11.2.2, 6.12.1, | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | Rev. 1: aspects related to returning the producer identity to the NF service consumer have been merged into CR 29.500 #0151. | | | | | | | | |

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

#### 6.11.2.2 Principles

An HTTP client originating a request may include in the request the 3gpp-Sbi-Sender-Timestamp and the 3gpp-Sbi-Max-Rsp-Time headers indicating respectively the absolute time at which the request is originated and the maximum time period to complete the processing of the request; both headers together indicate the absolute time at which the request times out at the HTTP client.

When forwarding a request that includes the 3gpp-Sbi-Sender-Timestamp and the 3gpp-Sbi-Max-Rsp-Time headers, the SCP may forward these headers unmodified; if the SCP modifies and sets the 3gpp-Sbi-Sender-Timestamp to the time when it forwards the request, it shall adjust the 3gpp-Sbi-Max-Rsp-Time accordingly such as to properly reflect the time until which the HTTP client waits for a response.

Upon receipt of a request which contains the 3gpp-Sbi-Sender-Timestamp and the 3gpp-Sbi-Max-Rsp-Time headers, the HTTP server should check that the request has not already timed out at the originating HTTP client. The HTTP server may perform additional similar checks during the processing of the request, e.g. upon receipt of a response from the next upstream NF service.

Based on local configuration, the HTTP server may reject a request that is known to have timed out with the HTTP status code "504 Gateway Timeout" and the protocol error "TIMED\_OUT\_REQUEST"; it may alternatively drop the request. If so, the HTTP server should initiate the release of any resource it may have successfully created towards an upstream entity, to avoid hanging resources in the network.

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

## 6.12 Binding between an NF Service Consumer and an NF Service Resource

### 6.12.1 General

A Binding Indication for an NF Service Resource may be provided to an NF Service Consumer of the resource as part of the Direct or Indirect Communication procedures, to be used in subsequent related service requests. This allows the NF Service Resource owner to indicate that the NF Service Consumer, for a particular resource, should be bound to an NF service instance, NF instance, NF service set or NF set. See clause 6.3.1.0 of 3GPP TS 23.501 [3] and clause 4.17.12 of 3GPP TS 23.502 [4].

A binding may be established or updated as part of a:

1) service response creating or modifying a resource, to be used for subsequent requests targeting this resource (see clause 4.17.12.2 of 3GPP TS 23.502 [4]), for any API that defines resources;

2) service request, if the NF Service Consumer can also act as an NF Service Producer for later communication from the contacted NF Service Producer, to be used for subsequent service requests initiated by the contacted NF Service Producer (see clause 4.17.12.3 of 3GPP TS 23.502 [4]);

3) service request creating or modifying an explicit or an implicit subscription, or as part of a notification response, to be used for subsequent notification requests initiated by the NF Service Producer (see clause 4.17.12.3 of 3GPP TS 23.502 [4]);

4) service response creating an implicit or explicit subscription or updating a subscription, or as part of a notification request, to be used for subsequent operations on the subscription (see clause 4.17.12.4 of 3GPP TS 23.502 [4]);

5) service request creating a callback (other than notification) resource (e.g. V-SMF or I-SMF callback URI sent to the H-SMF or SMF), or as part of a callback response, to be used for subsequent callback requests initiated by the NF Service Producer (e.g. H-SMF or SMF initiated PDU session modification).

Two types of binding information are defined to manage the binding between an NF Service Consumer and an NF Service Resource:

1) A Binding Indication conveys binding information for a resource which must be stored by the consumer (client) of that resource and used by the client to direct future requests to the resource. When contained in a service request, the binding information is associated with a resource owned by the NF Service Consumer for the current transaction. When contained in a service response, the binding information is associated with a resource owned by the NF Service Producer for the current transaction.

2) A Routing Binding Indication conveys binding information to direct a request from a client to a server which has the resource context. A Routing Binding Indication shall only be contained in a service request.

A same service request may convey more than one Binding Indication, e.g.:

- to provide bindings for notification or callback (i.e. bullets 3 or 5) and for other services that the NF service consumer can provide later as a NF Service Producer (i.e. bullet 2); or

- to provide binding information for different event notifications, when creating a subscription on behalf of another NF (see clause 6.12.4).

The scope parameter in a Binding Indication in a service request identifies the applicability of (i.e. scenario associated with) the binding information.

A service request may convey one or more Binding Indications as described above using a 3gpp-Sbi-Binding header and/or include a Binding Routing Indication to influence routing of the request e.g. to an appropriate set of NF Service Producers or to an appropriate service set of the NF Service Producer using a 3gpp-Sbi-Routing-Binding header. A service response may convey a Binding Indication for a resource using a 3gpp-Sbi-Binding header.

NOTE 1: An HTTP request can contain for instance one 3gpp-Sbi-Binding header containing two Binding Indications for other services and for callbacks, and one 3gpp-Sbi-Routing-Binding header conveying a Routing Binding Indication.

If an SCP receives a Routing Binding Indication within a service or notification request and decides to forward that request to a next-hop SCP, it shall include the Routing Binding Indication in the forwarded request. The SCP shall remove the Routing Binding Indication if it forwards the request to the target NF.

Binding Indications and Routing Binding Indications shall include the Binding level and one or more Binding entity IDs representing all NF service instances that are capable to serve service requests targeting the resource, i.e. that share the same resource contexts.

The Binding Level indicates a preferred binding to either a NF Instance, a NF set, a NF Service Instance or a NF Service Set. When sending a request targeting the resource, the binding entity corresponding to the binding level shall be selected whenever possible. If this is not possible, e.g. because the preferred binding entity is not reachable, the request should be sent to any other Binding entity signalled in the Binding Indication or Routing Binding Indication, in the following decreasing order of priority:

- select an NF service instance in the same NF service set, if a NF service Set ID was signalled in the Binding Indication or Routing Binding Indication;

- select an equivalent NF service instance in the same NF instance, if an NF instance ID was signalled in the Binding Indication or Routing Binding Indication;

- select an NF service instance in an equivalent NF service set of another NF instance of the NF set, if an NF Service Set ID and an NF Set ID were signalled in the Binding Indication or Routing Binding Indication;

- select an equivalent NF service instance in another NF instance of the NF Set, if an NF Set ID was signalled in the Binding Indication or Routing Binding Indication.

NOTE 2: NF service instances from different NF instances are equivalent NF service instances if they share the same MCC, MNC, NID (for SNPN), ServiceName, API version, and, if applicable, NF Service Set ID (see clause 28.13 of 3GPP TS 23.003 [15]).

Binding Indications shall not be used if a particular resource can only be served by a specific NF service instance of an NF instance, i.e. if NF service instances of a same NF service are not capable to share resource inside the NF Instance. A resource for which no Binding Indication or Routing Binding Indication is signalled shall be considered to be bound exclusively to one NF service instance, unless the NF Service resource owner instance is part of an NF set (or AMF set) or an NF service set, or unless its NF profile in the NRF indicates that its supports NF service persistence within the NF instance (see clause 6.5 of 3GPP TS 23.527 [38]).

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