**3GPP TSG-CT WG4 Meeting #98eC4-203xyz**

**E-Meeting, 02nd – 12th June 2020** (Revision of C4-203266)

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **29.500** | **CR** | **0141** | **rev** | **1** | **Current version:** | **16.3.0** |  |
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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:***  | Definition of error "NOTIFICATION\_RECEIVER\_NOT\_FOUND" |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | C4 |
|  |  |
| ***Work item code:*** | SBIProtoc16 |  | ***Date:*** | 2020-05-15 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** |  |
|  | *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 canbe 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)* |
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| ***Reason for change:*** | In some APIs (e.g. some of the PCC APIs), it is allowed that a NF service consumer uses the same callback URI when creating different resources in the NF service producer. When a change occurs in a resource, the NF service producer triggers a notification to the NF service consumer, and includes, together with the changes, the identifier of the updated resource. This way the NF service consumer is able to identify the receiver of the changes included in the notification request body.In these implementations, the resource represented by the callback URI can be understood as a collection of resources, where each individual resource would correspond with one of the individual resources created in the NF service producer.The NF service consumer returns: * 404 error when the collection of resources, identified by the callback URI, is not found.
* 400 when an individual resource within the collection, identified by the resource identifier included in the notification request body, is not found.

Since 400 is a generic error, that may be sent in other error circumstances, the NF service producer cannot be aware of the non existance of the individual resource, the one receiving the resource changes. This CR proposes to define the application error "NOTIFICATION\_RECEIVER\_NOT\_FOUND", with HTTP status code "400 Bad Request" to enable a NF service producer knows the NF service consumer cannot apply the notified changes because the receiver the notification does not exist. |
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| ***Summary of change:*** | Definition of application error "NOTIFICATION\_RECEIVER\_NOT\_FOUND", that is returned by the NF service consumer when the Notification URI is correct, but the resource identified in the notification request does not exist in the NF service consumer. |
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| ***Consequences if not approved:*** | It remains missing the appropriate application error to identify the receiver of a notification request, identified by the resource identifier, does not exist in the NF service consumer. |
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| ***Clauses affected:*** | 5.2.7.2 |
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|  | **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 ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\* 1st Change \*\*\*

#### 5.2.7.2 NF as HTTP Server

A NF acting as an HTTP server shall be able to generate HTTP status codes specified in clause 5.2.7.1 per indicated HTTP method.

A request using an HTTP method which is not supported by any resource of a given 5GC SBI API shall be rejected with the HTTP status code "501 Not Implemented".

NOTE 1: In this case, the NF does not need to include in the HTTP response the "cause" attribute indicating corresponding error since the HTTP status code "501 Not Implemented" itself provides enough information of the error, i.e. the NF does not recognize the HTTP method.

If the specified target resource does not exist, the NF shall reject the HTTP method with the HTTP status code "404 Not Found".

If the NF supports the HTTP method for several resources in the API, but not for the target resource of a given HTTP request, the NF shall reject the request with the HTTP status code "405 Method Not Allowed" and shall include in the response an Allow header field containing the supported method(s) for that resource.

NOTE 2: In this case, the NF does not need to include in the HTTP response the "cause" attribute indicating corresponding error since the HTTP status code "405 Method Not Allowed" itself provides enough information of the error and hence the Allow header field lists HTTP method(s) supported by the target resource.

If a received HTTP request contains unknown IEs, i.e. Information Elements within the JSON body, the NF may discard such IEs and shall process the rest of the request message, unless the schema definition of the received message prohibits the presence of additional IEs or constrains their types. There are cases (e.g. Nnrf\_NFManagement API) where the receiver of certain HTTP requests needs to process unknown IEs (e.g. to store in NRF an NF Profile containing vendor-specific attributes, and send them in NFDiscovery results).

If a received HTTP request contains IEs or query parameters not compliant with the schema defined in the corresponding OpenAPI specification, the NF should reject the request with the appropriate error code, e.g. "400 Bad Request (INVALID\_MSG\_FORMAT)", even when the failed IEs are defined as optional by the schema.

If a received HTTP PATCH request contains a body with modification instruction(s) for unknown attribute(s) in addition to modification instruction(s) for known attribute(s), the NF shall:

a) implement all the modification(s) for known attribute(s) and unknown attribute(s) if explicitly specified in the corresponding specification of the API; or

b) otherwise, implement the modification(s) for known attribute(s) and discard those modification instruction(s) for unknown attribute(s). The NF may additionally indicate in the response the result of the execution of the PATCH request, i.e. which modification(s) are implemented and/or which modification(s) are discarded, using the "PatchResult" JSON object as defined in 3GPP TS 29.571 [13].

If the NF supports the HTTP method by a target resource but the NF cannot successfully fulfil the received request, the following requirements apply.

A NF as HTTP Server should map application errors to the most similar 3xx/4xx/5xx HTTP status code specified in table 5.2.7.1-1. If no such code is applicable, it should use "400 Bad Request" status code for errors caused by client side or "500 Server Internal Error" status code for errors caused on server side.

If the received HTTP request contains unsupported payload format, the NF shall reject the HTTP request with the HTTP status code "415 Unsupported Media Type". If the HTTP PATCH method is rejected due to unsupported patch document, the NF shall include the Accept-Patch header field set to the value of supported patch document media types for a target resource i.e. to "application/merge-patch+json" if the NF supports "JSON Merge Patch" and to "application/json-patch+json" if the NF supports "JSON Patch". If the received HTTP PATCH request contains both "JSON Merge Patch" and "JSON Patch" documents and the NF supports only one of them, the NF shall ignore unsupported patch document.

NOTE 3: The format problem might be due to the request's indicated Content-Type or Content-Encoding header fields, or as a result of inspecting the payload body directly.

If the received HTTP request contains payload body larger than the NF is able to process, the NF shall reject the HTTP request with the HTTP status code "413 Payload Too Large".

If the result of the received HTTP POST request used for a resource creation would be equivalent to the existing resource, the NF shall reject the HTTP request with the HTTP status code "303 See Other" and shall include in the HTTP response a Location header field set to the URI of the existing resource.

Protocol and application errors common to several 5GC SBI API specifications for which the NF shall include in the HTTP response a payload body ("ProblemDetails" data structure or application specific error data structure) with the "cause" attribute indicating corresponding error are listed in table 5.2.7.2-1.

Table 5.2.7.2-1: Protocol and application errors common to several 5GC SBI API specifications

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| --- | --- | --- |
| Protocol or application Error | HTTP status code | Description |
| INVALID\_API | 400 Bad Request | The HTTP request contains an unsupported API name or API version in the URI. |
| INVALID\_MSG\_FORMAT | 400 Bad Request | The HTTP request has an invalid format. |
| INVALID\_QUERY\_PARAM | 400 Bad Request | The HTTP request contains an unsupported query parameter in the URI. (NOTE 1) |
| MANDATORY\_QUERY\_PARAM\_INCORRECT | 400 Bad Request | A mandatory query parameter, or a conditional query parameter but mandatory required, for an HTTP method was received in the URI with semantically incorrect value. (NOTE 1) |
| OPTIONAL\_QUERY\_PARAM\_INCORRECT | 400 Bad Request | An optional query parameter for an HTTP method was received in the URI with a semantically incorrect value that prevents successful processing of the service request. (NOTE 1) |
| MANDATORY\_QUERY\_PARAM\_MISSING | 400 Bad Request | Query parameter which is defined as mandatory, or as conditional but mandatory required, for an HTTP method is not included in the URI of the request. (NOTE 1) |
| MANDATORY\_IE\_INCORRECT | 400 Bad Request | A mandatory IE (within the JSON body or within a variable part of an "apiSpecificResourceUriPart" or within an HTTP header), or conditional IE but mandatory required, for an HTTP method was received with a semantically incorrect value. (NOTE 1)  |
| OPTIONAL\_IE\_INCORRECT | 400 Bad Request | An optional IE (within the JSON body or within an HTTP header) for an HTTP method was received with a semantically incorrect value that prevents successful processing of the service request. (NOTE 1) |
| MANDATORY\_IE\_MISSING | 400 Bad Request | A mandatory IE (within the JSON body or within the variable part of an "apiSpecificResourceUriPart" or within an HTTP header), or conditional IE but mandatory required, for an HTTP method is not included in the request. (NOTE 1) |
| UNSPECIFIED\_MSG\_FAILURE | 400 Bad Request | The request is rejected due to unspecified client error. (NOTE 2) |
| NF\_DISCOVERY\_FAILURE | 400 Bad Request | The request is rejected by the SCP because no NF Service Producer can be found matching the NF service discovery factors.  |
| INVALID\_DISCOVERY\_PARAM | 400 Bad Request | The request is rejected by the SCP because it contains an unsupported discovery parameter (i.e. unknown 3gpp-Sbi-Discovery-\* header).(NOTE 1)  |
| NOTIFICATION\_RECEIVER\_NOT\_FOUND | 400 Bad Request | The notification request is rejected because the contained receiver of the notification does not exist in the NF service consumer. |
| MODIFICATION\_NOT\_ALLOWED | 403 Forbidden | The request is rejected because the contained modification instructions attempt to modify IE which is not allowed to be modified. |
| SUBSCRIPTION\_NOT\_FOUND | 404 Not Found | The request for modification or deletion of subscription is rejected because the subscription is not found in the NF. |
| RESOURCE\_URI\_STRUCTURE\_NOT\_FOUND | 404 Not Found | The request is rejected because a fixed part after the first variable part of an "apiSpecificResourceUriPart" (as defined in clause 4.4.1 of 3GPP TS 29.501 [5]) is not found in the NF.This fixed part of the URI may represent a sub-resource collection (e.g. contexts, subscriptions, policies) or a custom operation. (NOTE 5) |
| INCORRECT\_LENGTH | 411 Length Required | The request is rejected due to incorrect value of a Content-length header field. |
| NF\_CONGESTION\_RISK | 429 Too Many Requests | The request is rejected due to excessive traffic which, if continued over time, may lead to (or may increase) an overload situation. |
| INSUFFICIENT\_RESOURCES | 500 Internal Server Error | The request is rejected due to insufficient resources. |
| UNSPECIFIED\_NF\_FAILURE | 500 Internal Server Error | The request is rejected due to unspecified reason at the NF. (NOTE 3) |
| SYSTEM\_FAILURE | 500 Internal Server Error | The request is rejected due to generic error condition in the NF. |
| NF\_FAILOVER | 500 Internal Server Error | The request is rejected due to the unavailability of the NF, and the requester may trigger an immediate re-selection of an alternative NF based on this information.The SCP may also use it, as indication for re-selection.  |
| NF\_SERVICE\_FAILOVER | 500 Internal Server Error | The request is rejected due to the unavailability of the NF service, and the requester may trigger an immediate re-selection of an alternative NF service based on this information.The SCP may also use it, as indication for re-selection. |
| NF\_CONGESTION | 503 Service Unavailable | The NF experiences congestion and performs overload control, which does not allow the request to be processed. (NOTE 4) |
| TIMED\_OUT\_REQUEST | 504 Gateway Timeout | The request is rejected due a request that has timed out at the HTTP client (see clause 6.11.2).  |
| NOTE 1: "invalidParams" attribute shall be included in the "ProblemDetails" data structure indicating unsupported, missing or incorrect IE(s) or query parameter(s) or 3gpp-Sbi-Discovery-\* header(s).NOTE 2: This application error indicates error in the HTTP request and there is no other application error value that can be used instead.NOTE 3: This application error indicates error condition in the NF and there is no other application error value that can be used instead.NOTE 4: If the reason for rejection is a temporary overload, the NF may include in the response a Retry-After header field to indicate how long the service is expected to be unavailable.NOTE 5: If the request is rejected because of an error in an URI before the first variable part of an "apiSpecificResourceUriPart", the "404 Not Found" HTTP status code may be sent without "ProblemDetails" data structure indicating protocol or application error. |

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