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

**E-Meeting, 18th – 28th June 2020 *was* C4-204410, C4-204306**

|  |
| --- |
| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **29.500** | **CR** | **0163** | **rev** | **2** | **Current version:** | **16.4.0** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | Corrections on expressions based on ABNF |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | CT4 |
|  |  |
| ***Work item code:*** | SBIProtoc16 |  | ***Date:*** | 2020-08-11 |
|  |  |  |  |  |
| ***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 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)* |
|  |  |
| ***Reason for change:*** | Some expressions based on ABNF or examples of these expressions are wrong. |
|  |  |
| ***Summary of change:*** | Correct the expressions based on ABNF. |
|  |  |
| ***Consequences if not approved:*** | The errors in the specification are confusing or misleading. |
|  |  |
| ***Clauses affected:*** | 5.2.3.2.2, 5.2.3.2.3, 5.2.3.2.5, 5.2.3.2.6, 5.2.3.2.9, 5.2.3.2.10, 5.2.3.3.2, 5.2.3.3.3 |
|  |  |
|  | **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:*** | This CR won’t introduce any impacts to the OpenAPI specification files. |
|  |  |
| ***This CR's revision history:*** | Rev1:1. Reverted the change in example and changed the expression in the ABNF format in 5.2.3.2.2.
2. Corrected the changes in clasue 5.2.3.2.6, i.e. reverted the removing " scope = "other-service" / "callback" / "subscription-events", and changed parametername = "nfinst" / "nfset" / "nfservinst" / "nfserviceset" / "servname" / "scope" to parametername = "nfinst" / "nfset" / "nfservinst" / "nfserviceset" / "servname" / scope because scope is a parameter not a string.

  Rev2:1. Reverted the change 2 in Rev1.
 |

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*The start of changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.3.2.2 3gpp-Sbi-Message-Priority

The header contains the HTTP/2 message priority value from 0 to 31, as defined in clause 6.8.4.

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

3gpp-Sbi-Message-Priority = "3gpp-Sbi-Message-Priority" ":" OWS (DIGIT / %x31-32 DIGIT / "3" %x30-31)

A message with 3gpp-Sbi-Message-Priority "0" has the highest priority.

An example is: 3gpp-Sbi-Message-Priority: 10.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.3.2.3 3gpp-Sbi-Callback

The header contains the type of notification. The value for the notification type is a string used identifing a particular type of callback (e.g a notification, typically the name of the notify service operation).

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

3gpp-Sbi-Callback header field = "3gpp-Sbi-Callback" ":" OWS cbtype \*1( ";" OWS "apiversion=" majorversion)

cbtype = 1\*cbchar

cbchar = "-" / "\_" / DIGIT / ALPHA

majorversion = \*DIGIT

EXAMPLE 1: 3gpp-Sbi-Callback: Nnrf\_NFManagement\_NFStatusNotify

EXAMPLE 2: 3gpp-Sbi-Callback: Nudm\_SDM\_Notification; apiversion=2

The list of valid values for the cbtype is specified in Annex B.

The apiversion parameter should be present if the major version is higher than 1.

NOTE: The apiversion parameter can be used by the SEPP to identify the protection and modification policies applicable to the API version of a notification or callback request, or by the SCP to select a notification endpoint of a NF Service Consumer that supports the API version when forwarding a notification request issued for a default notification subscription.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.3.2.5 3gpp-Sbi-Routing-Binding

This header contains a Routing Binding Indication used to direct a service request to an HTTP server which has the targeted NF service resource context (see clause 6.12).

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

3gpp-Sbi-Routing-Binding = "3gpp-Sbi-Routing-Binding" ":" OWS "bl=" blvalue 1\*(";" OWS parameter)

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

parameter = parametername "=" token

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

The following parameters are defined:

- bl (binding level): the value of this parameter (blvalue) indicates a preferred binding to a binding entity, i.e. either to an NF Instance, an NF set, an NF Service Instance or an NF Service Set. If the binding level is set to an NF Service Instance (nfservice-instance), then either NF Service Set ID or NF Instance ID shall also be present to unambiguously identify the NF Service Instance.

- nfinst (NF instance): indicates an NF Instance ID, as defined in clause 5.2.2.2.2 in 3GPP TS 29.510 [8]. This parameter shall be present if the binding level is set to "nf-instance", or if the binding level is set to "nfservice-instance" and the nfserviceset parameter is not included.

- nfset (NF set): indicates an NF Set ID, as defined in clause 28.12 in 3GPP TS 23.003 [15]. This parameter shall be present if the binding level is set to "nf-set". It may be present otherwise (see clause 6.12.1).

- nfservinst (NF service instance): indicates an NF Service Instance ID. This parameter shall be present if the binding level is set to "nfservice-instance".

- nfserviceset (NF service set): indicates an NF Service Set ID as defined in clause 28.13 in 3GPP TS 23.003 [15]. This parameter shall be present if the binding level is set to "nfservice-set". It may be present if the binding level is set to "nfservice-instance" (see clause 6.12.1).

- servname (service name): indicates the name of a service, as defined in 3GPP TS 29.510 [8], or a custom service that handles a notification or a callback request. It may be present in a Routing Binding Indication in a notification or a callback request.

See clause 3.2.6 of IETF RFC 7230 [12] for the "token" type definition. A token's value is a string, which contains a binding entity ID or a service name.

EXAMPLE 1: Binding to SMF set 1 of MCC 345 and MNC 012:

3gpp-Sbi-Routing-Binding: bl=nf-set; nfset=set1.smfset.5gc.mnc012.mcc345

EXAMPLE 2: Binding to an SMF instance within SMF set of Example 1:

3gpp-Sbi-Routing-Binding: bl=nf-instance; nfinst=54804518-4191-46b3-955c-ac631f953ed8; nfset=set1.smfset.5gc.mnc012.mcc345

EXAMPLE 3: Binding to a SMF Service Set "xyz" within an SMF instance within SMF set of Example 1:

3gpp-Sbi-Routing-Binding: bl=nfservice-set; nfservset=setxyz.snnsmf-pdusession.nfi54804518-4191-46b3-955c-ac631f953ed8.5gc.mnc012.mcc345; nfset=set1.smfset.5gc.mnc012.mcc345

EXAMPLE 4: Binding to AMF set 1 within AMF region 48 (hexadecimal):
3gpp-Sbi-Routing-Binding: bl=nf-set; nfset=set1.region48.amfset.5gc.mnc012.mcc345

EXAMPLE 5: Binding for a subscription (i.e. notification requests) to AMF set 1 within AMF region 48 (hexadecimal) and Namf\_Communication service:
3gpp-Sbi-Routing-Binding: bl=nf-set; nfset= set1.region48.amfset.5gc.mnc012.mcc345; servname=namf-comm

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next 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)

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

parameter = parametername "=" token

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

recoverytime = "recoverytime=" OWS date-time

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].

- 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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.3.2.9 3gpp-Sbi-Oci

The header contains a comma-delimited list of Overload Control Information (OCI). See clause 6.4.3.

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

3gpp-Sbi-Oci = "3gpp-Sbi-Oci:" 1#(RWS timestamp ";" RWS validityPeriod ";" RWS olcMetric ";" RWS olcScope)

timestamp = "Timestamp:" RWS date-time

Mandatory parameter. The date-time type is specified in IETF RFC 5322 [37] and clause 7.1.1.1 of IETF RFC 7231 [11]. It indicates the timestamp at which the overload control information was generated.

validityPeriod = "Period-of-Validity:" RWS 1\*DIGIT "s"

Mandatory parameter. Period of validity is a timer that is measured in seconds. Once the timer expires, the OCI becomes invalid.

olcMetric = "Overload-Reduction-Metric:" RWS (DIGIT / %x31-39 DIGIT / "100") "%"

Mandatory parameter. Overload-Reduction-Metric up to 3 digits long decimal string and the value range shall be from 0 to 100.

olcScope = nfProducerScope / nfConsumerScope / scpScope

Mandatory structured parameter, which in the actual header is replaced by its sub-parameters.

nfProducerScope = (("NF-Instance:" RWS nfinst)
/ ("NF-Set:" RWS nfset)
/ "(NF-Service-Instance:" RWS nfservinst)
/ ("NF-Service-Set:" RWS nfserviceset)) [";" RWS sNssai ";" RWS dnn]

nfConsumerScope = ("NF-Instance:" RWS nfinst [";" RWS "Service-Name:" RWS servname])
/ ("NF-Set:" RWS nfset [";" RWS "Service-Name:" RWS servname])
/ "(NF-Service-Instance:" RWS nfservinst)
/ ("NF-Service-Set:" RWS nfserviceset)
/ ("Callback-Uri:" RWS URI \*( RWS "&" RWS URI))

scpScope = ("SCP-FQDN:" RWS fqdn)

See clause 6.4.3.4.5. The nfinst, nfset, nfservinst, nfserviceset and servname parameters are defined in clause 5.2.3.2.5. fqdn shall encode an FQDN. URI is defined in clause 3 of IETF RFC 3986 [14].

dnn = "DNN:" RWS 1\*tchar \*(RWS "&" RWS 1\*tchar)

Optional parameter used for S-NSSAI/DNN based overload control by SMF, see clause 6.4.3.4.5.2.2, that refers to one or more specific DNN(s). DNN format is defined in 3GPP TS 23.003 [15].

sNssai= "S-NSSAI:" RWS snssai \*(RWS "&" RWS snssai)

Optional parameter used for S-NSSAI/DNN based overload control by SMF, see clause 6.4.3.4.5.2.2, that refers to one or more specific S-NSSAI(s)..

snssai = 1\*tchar

S-NSSAI format is defined in clause 5.4.4.2 of 3GPP TS 29.571 [13].

EXAMPLE 1: Overload Control Information for an NF Instance:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 75s; Overload-Reduction-Metric: 50%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8

EXAMPLE 2: Overload Control Information for an NF Service Set:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 120s; Overload-Reduction-Metric: 50%; NF-Service-Set: setxyz.snnsmf-pdusession.nfi54804518-4191-46b3-955c-ac631f953ed8.5gc.mnc012.mcc345

EXAMPLE 3: Overload Control Information for an SMF instance related to a particular DNN of an S-NSSAI:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 600s; Overload-Reduction-Metric: 50%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8; S-NSSAI: {"sst": 1, "sd": "A08923"}; DNN: internet.mnc012.mcc345.gprs

EXAMPLE 4: Overload Control Information for an SMF instance related to a particular DNN shared by two S-NSSAIs:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 240s; Overload-Reduction-Metric: 50%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8; S-NSSAI: {"sst": 1, "sd": "A08923"} & {"sst": 1, "sd": "A08924"}; DNN: internet.mnc012.mcc345.gprs

EXAMPLE 5: Overload Control Information sent by a NF service consumer with a scope set to a Callback-Uri:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 120s; Overload-Reduction-Metric: 25%; Callback-Uri: <https://pcf12.operator.com/serviceY>

EXAMPLE 6: Overload Control Information sent by a NF service consumer with a scope set to a specific NF Instance and service:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 120s; Overload-Reduction-Metric: 25%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8; Service-Name: nsmf-pdusession

EXAMPLE 7: Overload Control Information sent by an SCP:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 120s; Overload-Reduction-Metric: 25%; SCP-FQDN: scp1.example.com

EXAMPLE 8: Example with two OCI values, one for an SMF Instance and another one for a specific DNN of an S-NSSAI for the same SMF Instance:

3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 75s; Overload-Reduction-Metric: 50%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8
3gpp-Sbi-Oci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Period-of-Validity: 600s; Overload-Reduction-Metric: 40%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8; S-NSSAI: {"sst": 1, "sd": "A08923"}; DNN: internet.mnc012.mcc345.gprs

NOTE: Example 8 is formatted as two distinct headers (which improves the readability), but it can also be formatted as a single header with two OCI values separated by a comma.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.3.2.10 3gpp-Sbi-Lci

The header contains a comma-delimited list (see IETF RFC 7230 [12]) of Load Control Information (LCI). See clause 6.3.3.

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

3gpp-Sbi-Lci = "3gpp-Sbi-Lci:" 1#(RWS timestamp ";" RWS lcMetric ";" RWS lcScope)

timestamp = "Timestamp:" SP date-time

Mandatory parameter. The date-time type is specified in IETF RFC 5322 [37] and clause 7.1.1.1 of IETF RFC 7231 [11]. It indicates the timestamp associated with the load control information.

lcMetric = "Load-Metric:" RWS (DIGIT / %x31-39 DIGIT / "100") "%"

Mandatory parameter. Load-Metric is up to 3 digits long decimal string and the value range shall be from 0 to 100.

lcScope = nfProducerScope / scpScope

Mandatory structured parameter, which in the actual header is replaced by its sub-parameters.

nfProducerScope = (("NF-Instance:" RWS nfinst)
/ ("NF-Set:" RWS nfset)
/ "(NF-Service-Instance:" RWS nfservinst)
/ ("NF-Service-Set:" RWS nfserviceset)) [; RWS sNssai ";" RWS dnn; RWS relativeCapacity]

scpScope = ("SCP-FQDN:" RWS fqdn)

See clause 6.3.3.4.4. The nfinst, nfset, nfservinst and nfserviceset parameters are defined in clause 5.2.3.2.5. fqdn shall encode an FQDN.

dnn = "DNN:" RWS 1\*tchar \*(RWS "&" RWS 1\*tchar)

Optional parameter used for S-NSSAI/DNN based load control by SMF, see clause 6.3.3.4.4.2.2, that refers to one or more specific DNN(s). DNN format is defined in 3GPP TS 23.003 [15].

sNssai= "S-NSSAI:" RWS snssai \*(RWS "&" RWS snssai)

Optional parameter used for S-NSSAI/DNN based load control by SMF, see clause 6.3.3.4.4.2.2, that refers to one or more specific S-NSSAI(s).

snssai = 1\*tchar

S-NSSAI format is defined in clause 5.4.4.2 of 3GPP TS 29.571 [13].

relativeCapacity = "Relative-Capacity:" RWS (1\*2DIGIT / "100") "%"

Optional parameter used for S-NSSAI/DNN based load control by SMF, see clause 6.3.3.4.5. Up to 3 digits long decimal string with value range from 0 to 100. The value applies to all combinations of S-NSSAIs and DNNs indicated in the LCI.

EXAMPLE 1: Load Control Information for an NF Instance:

3gpp-Sbi-Lci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Load-Metric: 25%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8

EXAMPLE 2: Load Control Information for an NF Service Set:

3gpp-Sbi-Lci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Load-Metric: 25%; NF-Service-Set : setxyz.snnsmf-pdusession.nfi54804518-4191-46b3-955c-ac631f953ed8.5gc.mnc012.mcc345

EXAMPLE 3: Load Control Information for an SMF instance related to a particular DNN of an S-NSSAI:

3gpp-Sbi-Lci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Load-Metric: 25%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8; S-Nssai: {"sst": 1, "sd": "A08923"}; DNN: internet.mnc012.mcc345.gprs; Relative-Capacity: 20%

EXAMPLE 4: Load Control Information for an SMF instance related to a particular S-NSSAI:

3gpp-Sbi-Lci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Load-Metric: 25%; NF-Instance: 54804518-4191-46b3-955c-ac631f953ed8; S-Nssai: {"sst": 1, "sd": "A08923"} & {"sst": 1, "sd": "A08924"}; DNN: internet.mnc012.mcc345.gprs; Relative-Capacity: 20%

EXAMPLE 5: Load Control Information for SCP:

3gpp-Sbi-Lci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Load-Metric: 25%; SCP-FQDN: scp1.example.com

EXAMPLE 6: Example with two LCI values, for different DNNs of a same S-NSSAI:

3gpp-Sbi-Lci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Load-Metric: 40%; NF-Instance=54804518-4191-46b3-955c-ac631f953ed8; S-Nssai: {"sst": 1, "sd": "A08923"}; DNN: internet.mnc012.mcc345.gprs; Relative-Capacity: 30%
3gpp-Sbi-Lci: Timestamp: Tue, 04 Feb 2020 08:49:37 GMT; Load-Metric: 70%; NF-Instance=54804518-4191-46b3-955c-ac631f953ed8; S-Nssai: {"sst": 1, "sd": "A08923"}; DNN: ciot.mnc012.mcc345.gprs; Relative-Capacity: 20%

NOTE: Example 6 is formatted as two distinct headers (which improves the readability), but it can also be formatted as a single header with two LCI values separated by a comma.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.3.3.2 3gpp-Sbi-Sender-Timestamp

The header contains the date and time (with a millisecond granularity) at which an HTTP request or response is originated.

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

3gpp-Sbi-Sender-Timestamp = "3gpp-Sbi-Sender-Timestamp" ":" OWS day-name "," SP date1 SP time-of-day "." milliseconds SP GMT

milliseconds = 3DIGIT

day-name, date1, time-of-day shall comply with the definition in clause 7.1.1.1 of IETF RFC 7231 [11].

When a 3gpp-Sbi-Sender-Timestamp header field is generated, the sender should generate its field value as the best available approximation of the date and time of message generation.

NOTE: This is the same format as the Date header of clause 7.1.1.2 of IETF RFC 7231 [11], but with the time expressed with a millisecond granularity.

EXAMPLE: 3gpp-Sbi-Sender-Timestamp: Sun, 04 Aug 2019 08:49:37.845 GMT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

##### 5.2.3.3.3 3gpp-Sbi-Max-Rsp-Time

The header indicates the duration, expressed in milliseconds since the request was originated, during which the HTTP client waits for a response. See clause 6.8.2.

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

3gpp-Sbi-Max-Rsp-Time = "3gpp-Sbi-Max-Rsp-Time" ":" OWS 1\*5DIGIT

EXAMPLE: 3gpp-Sbi-Max-Rsp-Time: 10000

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*The end of changes\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*