

ETSI TS 129 500 V18.5.0 (2024-05)



**5G;
5G System;
Technical Realization of Service Based Architecture;
Stage 3
(3GPP TS 29.500 version 18.5.0 Release 18)**

[ETSI TS 129 500 V18.5.0 \(2024-05\)](https://standards.iteh.ai/catalog/standards/etsi/dbb7730c-878a-4b02-b258-5dd9eca18bea/etsi-ts-129-500-v18-5-0-2024-05)

<https://standards.iteh.ai/catalog/standards/etsi/dbb7730c-878a-4b02-b258-5dd9eca18bea/etsi-ts-129-500-v18-5-0-2024-05>



ReferenceRTS/TSGC-0429500vi50

Keywords5G

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:

<https://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

If you find a security vulnerability in the present document, please report it through our

Coordinated Vulnerability Disclosure Program:

<https://www.etsi.org/standards/coordinated-vulnerability-disclosure>

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2024.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables. (2024-05)

The cross reference between 3GPP and ETSI identities can be found under <https://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document **"shall"**, **"shall not"**, **"should"**, **"should not"**, **"may"**, **"need not"**, **"will"**, **"will not"**, **"can"** and **"cannot"** are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"must" and **"must not"** are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	8
1 Scope	10
2 References	10
3 Definitions and abbreviations.....	12
3.1 Definitions	12
3.2 Abbreviations	13
3.3 Special characters, operators and delimiters.....	13
3.3.1 General.....	13
3.3.2 ABNF operators.....	13
3.3.3 URI – reserved and special characters	13
3.3.4 SBI specific usage of delimiters	13
4 Service Based Architecture Overview.....	14
4.1 NF Services	14
4.2 Service Based Interfaces	14
4.3 NF Service Framework	14
4.3.1 General.....	14
4.3.2 NF Service Advertisement URI	14
5 Protocols Over Service Based Interfaces	15
5.1 Protocol Stack Overview.....	15
5.2 HTTP/2 Protocol	15
5.2.1 General.....	15
5.2.2 HTTP standard headers.....	15
5.2.2.1 General	15
5.2.2.2 Mandatory to support HTTP standard headers.....	16
5.2.3 HTTP custom headers.....	18
5.2.3.1 General	18
5.2.3.2 Mandatory to support custom headers.....	19
5.2.3.2.1 General	19
5.2.3.2.2 3gpp-Sbi-Message-Priority.....	24
5.2.3.2.3 3gpp-Sbi-Callback.....	24
5.2.3.2.4 3gpp-Sbi-Target-apiRoot.....	25
5.2.3.2.5 3gpp-Sbi-Routing-Binding	25
5.2.3.2.6 3gpp-Sbi-Binding	26
5.2.3.2.7 3gpp-Sbi-Discovery.....	30
5.2.3.2.8 3gpp-Sbi-Producer-Id	31
5.2.3.2.9 3gpp-Sbi-Oci	32
5.2.3.2.10 3gpp-Sbi-Lci.....	34
5.2.3.2.11 3gpp-Sbi-Client-Credentials	36
5.2.3.2.12 3gpp-Sbi-Nrf-Uri	37
5.2.3.2.13 3gpp-Sbi-Target-Nf-Id	38
5.2.3.2.14 3gpp-Sbi-Max-Forward-Hops	38
5.2.3.2.15 3gpp-Sbi-Originating-Network-Id.....	39
5.2.3.2.16 3gpp-Sbi-Access-Scope	39
5.2.3.2.17 3gpp-Sbi-Access-Token	40
5.2.3.2.18 Void	40
5.2.3.2.19 3gpp-Sbi-Target-Nf-Group-Id	40
5.2.3.2.20 3gpp-Sbi-Nrf-Uri-Callback	40
5.2.3.2.21 3gpp-Sbi-NF-Peer-Info.....	41
5.2.3.2.22 3gpp-Sbi-Source-NF-Client-Credentials	41
5.2.3.3 Optional to support custom headers	42

5.2.3.3.1	General	42
5.2.3.3.2	3gpp-Sbi-Sender-Timestamp	45
5.2.3.3.3	3gpp-Sbi-Max-Rsp-Time	45
5.2.3.3.4	3gpp-Sbi-Correlation-Info	45
5.2.3.3.5	3gpp-Sbi-Alternate-Chf-Id	47
5.2.3.3.6	3gpp-Sbi-Notif-Accepted-Encoding	47
5.2.3.3.7	3gpp-Sbi-Consumer-Info	47
5.2.3.3.8	3gpp-Sbi-Response-Info	49
5.2.3.3.9	Void	50
5.2.3.3.10	3gpp-Sbi-Selection-Info	50
5.2.3.3.11	3gpp-Sbi-Interplmn-Purpose	51
5.2.3.3.12	3gpp-Sbi-Request-Info	51
5.2.3.3.13	3gpp-Sbi-Retry-Info	53
5.2.3.3.14	3gpp-Sbi-Other-Access-Scopes	54
5.2.4	HTTP error handling	54
5.2.5	HTTP/2 server push	54
5.2.6	HTTP/2 connection management	54
5.2.7	HTTP status codes	55
5.2.7.1	General	55
5.2.7.2	NF as HTTP Server	56
5.2.7.3	NF as HTTP Client	61
5.2.7.4	SCP/SEPP	62
5.2.8	HTTP/2 request retries	65
5.2.9	Handling of unsupported query parameters	66
5.2.10	URL Encoding of data	67
5.2.10.1	General	67
5.2.10.2	URL Encoding of URI components	67
5.2.10.3	URL Encoding of HTTP/2 request bodies	68
5.3	Transport Protocol	68
5.4	Serialization Protocol	69
5.5	Interface Definition Language	69
6	General Functionalities in Service Based Architecture	69
6.1	Routing Mechanisms	69
6.1.1	General	69
6.1.2	Identifying a target resource	69
6.1.3	Connecting inbound	69
6.1.4	Pseudo-header setting	70
6.1.4.1	General	70
6.1.4.2	Routing within a PLMN	70
6.1.4.3	Routing across PLMN	70
6.1.4.3.1	General	70
6.1.4.3.2	Use of telescopic FQDN between NFs and SEPP within a PLMN	71
6.1.4.3.3	Use of 3gpp-Sbi-Target-apiRoot between NFs and SEPP within a PLMN	71
6.1.4.3.4	Routing between SEPPs	72
6.1.5	Host header	72
6.1.6	Message forwarding	72
6.2	Server-Initiated Communication	73
6.2.1	General	73
6.2.2	Subscription on behalf of NF Service Consumer	73
6.2.3	Notification error handling	74
6.3	Load Control	74
6.3.1	General	74
6.3.2	Load Control based on load signalled via the NRF	74
6.3.3	Load Control based on LCI Header	75
6.3.3.1	General	75
6.3.3.2	Conveyance of Load Control Information	75
6.3.3.3	Frequency of Conveyance	76
6.3.3.4	Load Control Information	76
6.3.3.4.1	General Description	76
6.3.3.4.2	Load Control Timestamp	76
6.3.3.4.3	Load Metric	77

6.3.3.4.4	Scope of LCI	77
6.3.3.4.5	S-NSSAI/DNN Relative Capacity	79
6.3.3.5	LC-H feature support	79
6.3.3.5.1	Indicating supports for the LC-H feature	79
6.3.3.5.2	Utilizing the LC-H feature support indication	79
6.4	Overload Control	79
6.4.1	General	79
6.4.2	Overload Control based on HTTP status codes	80
6.4.2.1	General	80
6.4.2.2	HTTP Status Code "503 Service Unavailable"	80
6.4.2.3	HTTP Status Code "429 Too Many Requests"	81
6.4.2.4	HTTP Status Code "307 Temporary Redirect"	81
6.4.3	Overload Control based on OCI Header	81
6.4.3.1	General	81
6.4.3.2	Conveyance of Overload Control Information	82
6.4.3.3	Frequency of Conveyance	82
6.4.3.4	Overload Control Information	82
6.4.3.4.1	General Description	82
6.4.3.4.2	Overload Control Timestamp	83
6.4.3.4.3	Overload Reduction Metric	84
6.4.3.4.4	Overload Control Period of Validity	84
6.4.3.4.5	Scope of OCI	84
6.4.3.5	Overload Control Enforcement	88
6.4.3.5.1	Message Throttling	88
6.4.3.5.2	Loss Algorithm	89
6.4.3.6	OLC-H feature support	89
6.4.3.6.1	Indicating supports for the OLC-H feature	89
6.5	Support of Stateless NFs	89
6.5.1	General	89
6.5.2	Stateless AMFs	89
6.5.2.1	General	89
6.5.2.2	AMF as service consumer	89
6.5.2.3	AMF as service producer	90
6.5.3	Stateless NFs (for any 5GC NF type)	91
6.5.3.1	General	91
6.5.3.2	Stateless NF as service consumer	91
6.5.3.3	Stateless NF as service producer	93
6.6	Extensibility Mechanisms	94
6.6.1	General	94
6.6.2	Feature negotiation	94
6.6.3	Vendor-specific extensions	95
6.6.4	Extensibility for Query parameters	96
6.7	Security Mechanisms	97
6.7.1	General	97
6.7.2	Transport layer security protection of messages	97
6.7.3	Authorization of NF service access	97
6.7.4	Application layer security across PLMN	98
6.7.4.1	General	98
6.7.4.2	N32 Procedures	98
6.7.5	Client credentials assertion and authentication	99
6.7.5.1	General	99
6.7.5.2	Authorization of NF Service Consumers for data access via DCCF	99
6.8	SBI Message Priority Mechanism	100
6.8.1	General	100
6.8.2	Message level priority	100
6.8.3	Stream priority	100
6.8.4	Recommendations when defining SBI Message Priorities	101
6.8.5	HTTP/2 client behaviour	102
6.8.6	HTTP/2 server behaviour	102
6.8.7	HTTP/2 proxy behaviour	102
6.8.8	DSCP marking of messages	102
6.9	Discovering the supported communication options	103

6.9.1	General.....	103
6.9.2	Discoverable communication options.....	103
6.9.2.1	Content-encodings supported in HTTP requests.....	103
6.9.2.2	Content-encodings supported in HTTP responses	103
6.10	Support of Indirect Communication.....	104
6.10.1	General.....	104
6.10.2	Routing Mechanisms with SCP Known to the NF.....	104
6.10.2.1	General	104
6.10.2.2	HTTP/2 connection management.....	104
6.10.2.3	Connecting inbound	104
6.10.2.4	Pseudo-header setting.....	105
6.10.2.5	3gpp-Sbi-Target-apiRoot header setting	106
6.10.2.6	Cache key (ck) query parameter.....	107
6.10.2A	Routing Mechanism with SCP Unknown to the NF	107
6.10.2A.1	Connecting inbound	107
6.10.2A.2	HTTP/2 connection management.....	107
6.10.2A.3	Pseudo-header setting.....	107
6.10.3	NF Discovery and Selection for indirect communication with Delegated Discovery	108
6.10.3.1	General	108
6.10.3.2	Conveyance of NF Discovery Factors.....	108
6.10.3.3	Notifications corresponding to default notification subscriptions.....	109
6.10.3.4	Returning the Producer's NF Instance ID and NF Group ID to the NF Service Consumer	110
6.10.3.5	Returning an Alternate CHF instance ID to the NF Service Consumer	111
6.10.4	Authority and/or deployment-specific string in apiRoot of resource URI.....	111
6.10.5	NF / NF service instance selection for Indirect Communication without Delegated Discovery.....	112
6.10.5.1	General.....	112
6.10.5.2	Notifications corresponding to default notification subscriptions.....	113
6.10.6	Feature negotiation for Indirect Communication with Delegated Discovery	114
6.10.7	Notification and callback requests sent with Indirect Communication.....	114
6.10.8	Error Handling	114
6.10.8.1	General	114
6.10.8.2	Requirements for the originator of an HTTP error response.....	115
6.10.8.3	Requirements for an SCP or SEPP relaying an HTTP error response	116
6.10.9	HTTP redirection	116
6.10.9.1	General	116
6.10.10	Detection and handling of loop path when relaying message with indirect communication.....	118
6.10.10.1	General	118
6.10.10.2	Message Forwarding Depth Control	118
6.10.10.3	Loop Detection with Via header	118
6.10.11	Authorization of NF service access	118
6.10.11.1	General.....	118
6.10.11.2	Authorization for indirect communication with delegated discovery	118
6.10.11.2.1	General	118
6.10.11.2.2	Error handling when the SCP fails to obtain an access token.....	120
6.10.11.2.2A	Error handling when the SCP obtains an access token without all the scopes required for access authorization of the incoming service request	120
6.10.11.2.3	Error handling when SCP receives a "401 Unauthorized" response or a "403 Forbidden" response with a "WWW-Authenticate" header.....	121
6.10.11.3	Authorization for indirect communication without delegated discovery	121
6.11	Detection and handling of late arriving requests	121
6.11.1	General.....	121
6.11.2	Detection and handling of requests which have timed out at the HTTP client	121
6.11.2.1	General	121
6.11.2.2	Principles.....	122
6.12	Binding between an NF Service Consumer and an NF Service Resource.....	122
6.12.1	General.....	122
6.12.2	Binding created as part of a service response	125
6.12.3	Binding created as part of a service request.....	125
6.12.4	Binding for explicit or implicit subscription requests.....	126
6.12.5	Binding for service requests creating a callback resource	128
6.13	SBI messages correlation for network troubleshooting.....	128
6.13.1	General.....	128

6.13.2	SBI messages correlation using UE identifier	128
6.13.2.1	General	128
6.13.2.2	Principles.....	128
6.13.3	SBI messages correlation using NF Peer Information	129
6.13.3.1	General	129
6.13.3.2	Principles.....	129
6.14	Indicating the purpose of Inter-PLMN signaling.....	129
6.14.1	General.....	129
6.14.2	Inclusion of the intended purpose	130
6.14.3	Evaluating the intended purpose	130
Annex A (informative):	Client-side Adaptive Throttling for Overload Control	132
Annex B (normative):	3gpp-Sbi-Callback Types	133
Annex C (informative):	Internal NF Routing of HTTP Requests.....	134
Annex D (Normative):	ABNF grammar for 3GPP SBI HTTP custom headers.....	135
D.1	General	135
D.2	ABNF definitions (Filename: "TS29500_CustomHeaders.abnf")	136
Annex E (informative):	Change history	146
History		153

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ETSI TS 129 500 V18.5.0 \(2024-05\)](https://standards.iteh.ai/catalog/standards/etsi/dbb7730c-878a-4b02-b258-5dd9eca18bea/etsi-ts-129-500-v18-5-0-2024-05)
<https://standards.iteh.ai/catalog/standards/etsi/dbb7730c-878a-4b02-b258-5dd9eca18bea/etsi-ts-129-500-v18-5-0-2024-05>

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

- shall** indicates a mandatory requirement to do something
- shall not** indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

- should** indicates a recommendation to do something
- should not** indicates a recommendation not to do something
- may** indicates permission to do something
- need not** indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

- can** indicates that something is possible
- cannot** indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

- will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document
- will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document
- might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ETSI TS 129 500 V18.5.0 \(2024-05\)](https://standards.iteh.ai/catalog/standards/etsi/dbb7730c-878a-4b02-b258-5dd9eca18bea/etsi-ts-129-500-v18-5-0-2024-05)

<https://standards.iteh.ai/catalog/standards/etsi/dbb7730c-878a-4b02-b258-5dd9eca18bea/etsi-ts-129-500-v18-5-0-2024-05>

1 Scope

The present document specifies the technical realization of the 5GC Service Based Architecture, protocols supported over the Service Based Interfaces, and the functionalities supported in the Service Based Architecture.

The service requirements for the 5G system are defined in 3GPP TS 22.261 [2]. The system architecture requirements are defined in 3GPP TS 23.501 [3] and the procedures and flows in 3GPP TS 23.502 [4].

The design principles and documentation guidelines for 5GC SBI APIs are specified in 3GPP TS 29.501 [5].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.261: "Service requirements for the 5G system; Stage 1".
- [3] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".
- [4] 3GPP TS 23.502: "Procedures for the 5G System; Stage 2".
- [5] 3GPP TS 29.501: "5G System; Principles and Guidelines for Services Definition; Stage 3".
- [6] IETF RFC 793: "Transmission Control Protocol". (2024-05)
- [7] IETF RFC 9113: "HTTP/2".
- [8] 3GPP TS 29.510: "5G System; Network Function Repository Services; Stage 3".
- [9] OpenAPI: "OpenAPI Specification Version 3.0.0", <https://spec.openapis.org/oas/v3.0.0>.
- [10] IETF RFC 8259: "The JavaScript Object Notation (JSON) Data Interchange Format".
- [11] IETF RFC 9110: "HTTP Semantics".
- [12] Void.
- [13] 3GPP TS 29.571: "5G System; Common Data Types for Service Based Interfaces Stage 3".
- [14] IETF RFC 3986: "Uniform Resource Identifier (URI): Generic Syntax".
- [15] 3GPP TS 23.003: "Numbering, addressing and identification".
- [16] IETF RFC 5681: "TCP Congestion Control".
- [17] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".
- [18] IANA: "SMI Network Management Private Enterprise Codes", <http://www.iana.org/assignments/enterprise-numbers>.
- [19] IETF RFC 7944: "Diameter Routing Message Priority".
- [20] IETF RFC 9111: " HTTP Caching".

- [21] Void.
- [22] IETF RFC 6749: "The OAuth 2.0 Authorization Framework".
- [23] IETF RFC 6750: "The OAuth 2.0 Authorization Framework: Bearer Token Usage".
- [24] Void.
- [25] IETF RFC 7516: "JSON Web Encryption (JWE)".
- [26] IETF RFC 7515: "JSON Web Signature (JWS)".
- [27] 3GPP TS 29.573: "5G System: Public Land Mobile Network (PLMN) Interconnection; Stage 3".
- [28] 3GPP TS 29.502: "5G System; Session Management Services; Stage 3".
- [29] 3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".
- [30] Void.
- [31] 3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".
- [32] 3GPP TS 29.531: "5G System; Network Slice Selection Services; Stage 3".
- [33] Void.
- [34] IETF RFC 1952: "GZIP file format specification version 4.3".
- [35] 3GPP TS 29.525: "5G System; UE Policy Control Service; Stage 3".
- [36] IETF RFC 3040: "Internet Web Replication and Caching Taxonomy".
- [37] IETF RFC 5322: "Internet Message Format".
- [38] 3GPP TS 23.527: "5G System; Restoration Procedures".
- [39] 3GPP TS 29.303: "Domain Name System Procedures; Stage 3".
- [40] 3GPP TS 29.515: "5G System; GMLC Services; Stage 3".
- [41] IETF RFC 7519: "JSON Web Token (JWT)".
- [42] 3GPP TS 32.291: "5G System; charging service; Stage 3".
- [43] IETF RFC 5234: "Augmented BNF for Syntax Specifications: ABNF".
- [44] 3GPP TS 29.526: "5G System; Network Slice-Specific Authentication and Authorization (NSSAA) Services; Stage 3".
- [45] 3GPP TS 29.562: "5G System; Home Subscriber Server (HSS) Services for interworking with the IP Multimedia Subsystem (IMS); Stage 3".
- [46] 3GPP TS 29.555: "5G System; 5G Direct Discovery Name Management Services; Stage 3".
- [47] IETF RFC 4122: "A Universally Unique Identifier (UUID) URN Namespace".
- [48] IETF RFC 1866: "Hypertext Markup Language - 2.0".
- [49] IETF RFC 1738: "Uniform Resource Locators (URL)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1], 3GPP TS 23.501 [3] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

Binding indication (consumer): Binding can be used by the NF Service Consumer to indicate suitable NF Service Consumer instance(s) for notification target instance selection, reselection and routing of subsequent notification requests associated with a specific notification subscription. Binding indication needs to be stored by the NF Service Producer. Binding indication may also be used later if the NF Service Consumer starts acting as NF Service Producer, so that service requests can be sent to this NF Service Producer. See clauses 3.1 and 6.3.1.0 in 3GPP TS 23.501 [3]. See also Routing binding indication.

Binding indication (producer): Binding can be used to indicate suitable target NF Service Producer instance(s) for an NF service instance selection, reselection and routing of subsequent requests associated with a specific NF Service Producer resource (context) and NF service. Binding allows the NF Service Producer to indicate to the NF Service Consumer if a particular context should be bound to an NF service instance, NF instance, NF service set or NF set. Binding indication needs to be stored by the NF Service Consumer. See clauses 3.1 and 6.3.1.0 in 3GPP TS 23.501 [3]. See also Routing binding indication.

Binding entity: Either of the following identifiers: NF Service Instance, NF Service Set, NF Instance or an NF Set. The relation between these are explained below.

Binding entity ID: An identification of a binding entity, i.e. NF Service Instance ID, NF Service Set ID, NF Instance ID or an NF set ID.

Binding level: A parameter (bl) in "3gpp-Sbi-Routing-Binding" and "3gpp-Sbi-Binding" HTTP custom headers, which indicates the binding entity towards which a preferred binding exists (i.e. either to NF Service Instance, NF Service Set, NF Instance or an NF Set). Other binding entities in these headers, which do not correspond to the binding level indicate alternative binding entities that can be reselected and that share the same resource contexts (see Table 6.3.1.0-1 in 3GPP TS 23.501 [3]).

Callback URI: URI to be used by an NF Service Producer to send notification or callback requests.

Endpoint address: An address in the format of an IP address, transport and port information, or FQDN, which is used to determine the host/authority part of the target URI. This Target URI is used to access an NF service (i.e. to invoke service operations) of an NF service producer or for notifications to an NF service consumer. See clauses 3.1 and 6.3.1.0 of 3GPP TS 23.501 [3].

NF Instance: An identifiable instance of the NF. An NF Instance may provide services offered by one or more NF Service instances.

NF Service Instance: An identifiable instance of the NF service.

NF Service Set: A group of interchangeable NF service instances of the same service type within an NF instance. The NF service instances in the same NF Service Set have access to the same context data.

NF Set: A group of interchangeable NF instances of the same type, supporting the same services and the same Network Slice(s). The NF instances in the same NF Set may be geographically distributed but have access to the same context data.

Notification endpoint: Notification endpoint is a destination URI of the network entity where the notification is sent. See clause 6.3.1.0 in 3GPP TS 23.501 [3].

Routing binding indication: Information included in a request or notification and that can be used by the SCP for discovery and associated selection to of a suitable target. See clauses 3.1, 6.3.1.0 and 7.1.2 in 3GPP TS 23.501 [3]. Routing binding indication has similar syntax as a binding indication, but it has different purpose. Routing binding indication provides the receiver (i.e. SCP) with information enabling to route an HTTP request to an HTTP server that can serve the request. Routing binding indication is not stored by the receiver.

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

GZIP	GNU ZIP
LC-H	Load Control based on LCI Header
LCI	Load Control Information
MCX	Mission Critical Service
MPS	Multimedia Priority Service
OCI	Overload Control Information
OLC-H	Overload Control based on OCI Header
SCP	Service Communication Proxy
SEPP	Security and Edge Protection Proxy
SMP	SBI Message Priority

3.3 Special characters, operators and delimiters

3.3.1 General

A number of characters have special meaning and are used as delimiters in this document and also in other stage 3 SBI specifications. Below clauses specify the usage of a selected set of the special characters. Full set of these special characters are specified in the respective IETF specifications.

3.3.2 ABNF operators

/	Operator. The forward slash character separates alternatives. See clause 3.2 in IETF RFC 5234 [43].
#	Operator. The number sign character allows for compact definition of comma-separated lists, similar to the "*" operator. See clause 2.1 in IETF RFC 9110 [11].
=	Special character. The equal sign character separates an ABNF rule name from the rule elements. See clause 2.2 in IETF RFC 5234 [43].
[]	Operator. The square bracket characters enclose an optional element sequence. See clause 3.8 in IETF RFC 5234 [43].
< >	Special characters. The angle bracket characters typically enclose an ABNF rule element (they are optional). See clause 2.1 in IETF RFC 5234 [43].
*	Operator. The star character precedes an element and indicates the elements repetition. See clause 3.6 in IETF RFC 5234 [43].
;	Operator. Semicolon character indicates the start of a comment that continues to the end of line. See clause 3.9 in IETF RFC 5234 [43].

NOTE: The same characters, like "/", "#", etc. lead to different processing in ABNF and URI grammars. For instance, in URI syntax, ";" character separates parameter and its value, while in ABNF ";" starts a comment. Besides, unlike URI syntax, neither "?", nor ":" operators are specified for ABNF.

3.3.3 URI – reserved and special characters

Special characters that are used as delimiters in URI syntax have somewhat different purpose from the same characters when used by ABNF syntax. See clause 3.3.3 in 3GPP TS 29.501 [5].

3.3.4 SBI specific usage of delimiters

See clause 3.3.4 in 3GPP TS 29.501 [5].