



Ultra Cloud Core 5G Session Management Function, Release 2021.01 - Metrics Reference

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Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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About this Guide

This preface describes the *5G Session Management Function Guide*, how it is organized and its document conventions.

This guide describes the Cisco Session Management Function (SMF) and includes infrastructure and interfaces, feature descriptions, specification compliance, session flows, configuration instructions, and CLI commands for monitoring and troubleshooting the system.

- [Conventions Used, on page ix](#)

Conventions Used

The following tables describe the conventions used throughout this documentation.

Notice Type	Description
Information Note	Provides information about important features or instructions.
Caution	Alerts you of potential damage to a program, device, or system.
Warning	Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.

Typeface Conventions	Description
Text represented as a screen display	This typeface represents displays that appear on your terminal screen, for example: <code>Login:</code>
Text represented as commands	This typeface represents commands that you enter, for example: show ip access-list This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.

Typeface Conventions	Description
Text represented as a command <i>variable</i>	This typeface represents a variable that is part of a command, for example: show card <i>slot_number</i> <i>slot_number</i> is a variable representing the desired chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the File menu, then click New



CHAPTER 1

SMF Interface for Metrics

- [Feature Description](#), on page 1
- [SMF Rest EP Microservice](#), on page 2
- [SMF Service](#), on page 3
- [SMF Protocol Microservice](#), on page 4

Feature Description

SMF uses Prometheus for gathering statistics or counters from its microservices.

Grafana is used as the user interface to view metrics. It pulls the data from the Prometheus data store. Default graphs for KPI are available using Grafana for rendering a graphical view of the statistics with timelines.

For each microservice, counters and a set of labels are defined. Counters are incremented or decremented with the set of labels depending on the functionality.

The following snapshot is a sample of the Grafana dashboard.

Figure 1: Grafana Dashboard



SMF Rest EP Microservice

This section describes the supported counters and set of labels for the SMF Rest EP microservice.

Counters

The following table lists the counters of the SMF REST EP microservice:

Table 1: SMF REST EP Microservice Counters

Number	Metric	Description
1	smf_restep_http_msg_total	This counter is incremented with every HTTP message received or sent at rest-ep microservice.
2	smf_restep_http_msg	This counter is incremented with every HTTP message received or sent at rest-ep microservice along with the time taken to process the message.

Labels

The SMF REST EP microservice includes the following labels for the counters:

Table 2: SMF REST EP Microservice Labels for Counters

Number	Label	Description
1	NF TYPE	This label can be any 5G Node that interacts with SMF. For example: AMF, PCF, NRF
2	MESSAGE DIRECTION	Displays the direction of the HTTP message with respect to the REST EP microservice. The possible values are: “inbound” “outbound”

Number	Label	Description
3	API NAME	Displays the service name being served. It can be: "register_ue" "deregister_ue" "subscription_req" "nf_registration" "nf_discovery" "slice_selection" "amf_create_sm_context" "amf_update_sm_context" "amf_release_sm_context" "amf_n1_n2_transfer" "pcf_sm_policy_control_create" "pcf_sm_policy_control_update" "pcf_sm_policy_control_delete" "pcf_sm_policy_control_update_notify" "pcf_sm_policy_control_terminate_notify"
4	NF URI	Displays the rest-ep URI used in the HTTP message (can be FQDN).
5	RESPONSE STATUS	Displays the HTTP Response. It can be any 2xx, 4xx or 5xx response.

SMF Service

This section describes the supported counters and set of labels for the SMF service.

Labels

The following table lists the counters of the SMF service labels:

Table 3: SMF Service Labels for Counters

Number	Label	Description
1	PROCEDURE TYPE	This label takes any value depending on the type of procedure queried for the following procedures: pdu_sess_create ue_req_pdu_sess_mod smf_req_pdu_sess_mod pcf_req_pdu_sess_mod ue_req_pdu_sess_rel smf_req_pdu_sess_rel pcf_req_pdu_sess_rel amf_req_pdu_sess_rel
2	STATUS	Displays the status type. Following are the allowed values: attempted success failure
3	PDU CONNECTION TYPE	Displays the PDU connection type. Following are the allowed values: ipv4 ipv6 ipv4v6
4	PDU STATE	Displays the PDU state. Following are the allowed values: idle connected

SMF Protocol Microservice

This section describes the supported counters and set of labels for the SMF Protocol microservice.

Counters

The SMF service includes the following counters:

Table 4: SMF Service Counters

Number	Metric	Description
1	smf_service_stats	This counter is incremented with every query made to the smf-service.
2	smf_service_counters	This counter is a gauge counter and can be incremented or decremented based on the functionality with every query made to the smf-service.

Labels

The SMF Protocol service includes the following labels for the counters:

Table 5: SMF Protocol Service Labels for Counters

Number	Label	Description
1	MESSAGE NAME	This label can take any value depending on the procedure queried for: "session_establishment_req" "session_establishment_res" "session_modification_req" "session_modification_res" "session_report_req" "session_report_res" "session_deletion_req" "session_deletion_res" "association_setup_req" "association_setup_res" "association_update_req" "association_update_res" "association_release_req" "association_release_res" "prime_pfd_management_req" "prime_pfd_management_res" "heartbeat_req" "heartbeat_res" "node_report_req" "node_report_res"

Number	Label	Description
2	MESSAGE DIRECTION	Displays the direction of the HTTP message with respect to the REST EP microservice. The possible values are: “inbound” “outbound”
3	STATUS	Displays the status of the message. The possible values are: “accepted” “denied” “discarded”



CHAPTER 2

SMF Metrics Reference

- [gtpc-ep](#), on page 7
- [nodemgr](#), on page 12
- [protocol](#), on page 20
- [radius](#), on page 27
- [rest](#), on page 30
- [service](#), on page 40
- [udp-proxy](#), on page 94

gtpc-ep

GTPC Short Circuit Map Count Category

gtpc_short_circuit_map_count

Description: GTPC Short Circuit MBReq Map Gauge

Sample Query: 'gtpc_short_circuit_map_count(gtpc_msg_type="RxModifyBearerReq")'

Labels:

- Label: `gtpc_msg_type`
Label Description: Gtpc Message type
Example: RxModifyBearerReq

GTPC Short Circuit Message Stats Category

gtpc_msg_short_circuit_stats

Description: GTPC Short Circuit MBResp Stats

Sample Query: 'gtpc_msg_short_circuit_stats(gtpc_msg_type="TxModifyBearerRes")'

Labels:

- Label: `gtpc_msg_type`

Label Description: Gtpc Message type

Example: TxModifyBearerRes

- Label: `gtpc_short_circuit_category`

Label Description: Category

Example: WithServingNetwork, WithIndication, WithBearerContext

Processing Time of SMF GTPC Messages Category

gtpc_msg_seconds

Description: Time taken for GTPC message processing

Sample Query: `'gtpc_msg_seconds{message_name="S5S8_MSG_CREATE_SESSION_REQUEST"}'`

Labels:

- Label: `message_name`

Label Description: Message Name

Example: `S5S8_MSG_CREATE_SESSION_REQUEST, S5S8_MSG_CREATE_SESSION_RESPONSE, S5S8_MSG_MODIFY_BEARER_REQUEST, S5S8_MSG_MODIFY_BEARER_RESPONSE, S5S8_MSG_DELETE_BEARER_REQUEST, S5S8_MSG_DELETE_BEARER_RESPONSE, S5S8_MSG_DELETE_SESSION_REQUEST, S5S8_MSG_DELETE_SESSION_RESPONSE`

- Label: `message_direction`

Label Description: Direction

Example: inbound, outbound

- Label: `status`

Label Description: Status

Example: `no_rsp_received_tx, accepted`

- Label: `transport_type`

Label Description: Transport Type

Example: origin, retransmitted

SMF GTPC Echo Stats Category

gtpc_echo_msg_stats

Description: GTPC Echo Req Rx and Echo Resp Tx

Sample Query: `'gtpc_echo_msg_stats{gtpc_msg_type="gtpc_echo_req_rx"}'`

Labels:

- Label: `gtpc_peer_ip`

Label Description: Gtpc Peer IP of nodes like SGW,ePDG etc

Example: 1.2.3.4

- Label: `gtpc_msg_type`

Label Description: Gtpc Message type

Example: `gtpc_echo_req_rx`, `gtpc_echo_res_tx`

SMF GTPC Golang Encode Decode Stats Category

`gtpc_golang_enc_dec_stats`

Description: Messages Encoded/Decoded using Golang

Sample Query: `'gtpc_golang_enc_dec_stats{gtpc_msg_type="RxModifyBearerReq}'`

Labels:

- Label: `gtpc_msg_type`

Label Description: Gtpc Message type

Example: `RxModifyBearerReq`, `TxModifyBearerRes`

- Label: `gtpc_msg_len`

Label Description: Message Length

Example: 36, 24, 45

- Label: `gtpc_msg_operation`

Label Description: Operation

Example: `encode`, `decode`

- Label: `gtpc_msg_status`

Label Description: Status

Example: `success`, `error`

- Label: `gtpc_msg_status_cause`

Label Description: Error Cause

Example: `HeaderDecodeFailure`, `ParseIEsFromPayloadFailure`, `MBRFromIEFailure`

SMF GTPC Messages Total Category

`gtpc_msg_total`

Description: Total GTPC Messages

Sample Query: `'gtpc_msg_total{message_name="S5S8_MSG_CREATE_SESSION_REQUEST}'`

Labels:

- Label: `message_name`

Label Description: Message Name

Example: `S5S8_MSG_CREATE_SESSION_REQUEST`, `S5S8_MSG_CREATE_SESSION_RESPONSE`,
`S5S8_MSG_MODIFY_BEARER_REQUEST`, `S5S8_MSG_MODIFY_BEARER_RESPONSE`,
`S5S8_MSG_DELETE_BEARER_REQUEST`, `S5S8_MSG_DELETE_BEARER_RESPONSE`,
`S5S8_MSG_DELETE_SESSION_REQUEST`, `S5S8_MSG_DELETE_SESSION_RESPONSE`

- Label: `message_direction`

Label Description: Direction

Example: inbound, outbound

- Label: `status`

Label Description: Status

Example: `no_rsp_received_tx`, `accepted`

- Label: `transport_type`

Label Description: Transport Type

Example: origin, retransmitted

SMF GTPC Unexpected Messages Category

`gtpc_app_total_unexpected_gtpc_msg_events`

Description: Unexpected GTPC Messages received

Sample Query: `'gtpc_app_total_unexpected_gtpc_msg_events{service_name="gtpc-ep}'`

Labels:

- Label: `message_type`

Label Description: Gtpc Message type

Example: `unexpected_gtpc_message`

- Label: `interface_type`

Label Description: Gtpc Interface type

Example: `sgw_ingress`, `pgw_ingress`

SMF GTPC Validation Fail Stats Category

`gtpc_app_validation_events`

Description: Stats of Message decode failures

Sample Query: `'gtpc_app_validation_events{service_name="gtpc-ep}'`

Labels:

- Label: `message_type`
Label Description: Gtpc Message type
Example: `csreq, csrsp, mbreq, mbrsp, cbreq, cbrsp, ubreq, ubrsp, dbreq, dbrsp, dsreq, dsrsp, mbcmd, mbcfi, dbcnd, dbcfi, ddnfi, ddnack, rabreq, upcreq`
- Label: `interface_type`
Label Description: Interface type
Example: `sgw_ingress, pgw_ingress`
- Label: `failure_type`
Label Description: Failure Type
Example: `msg_validation_fail, hdr_decode_failure`
- Label: `hdr_decode_fail_reason`
Label Description: Header Decode Fail Reason
Example: `incorrect_gtp_version, unsupported_message, incorrect_msg_len, invalid_msg_format, invalid_seq_no`
- Label: `action_type`
Label Description: Action Type
Example: `discarded, rejected`
- Label: `reject_cause`
Label Description: Reject Cause
Example: `invalid_msg_format, version_not_supported, invalid_len, mandatory_ie_missing, conditional_ie_missing, mandatory_ie_incorrect, service_not_supported, imsi_imei_not_known, preferred_pdn_type_unsupported, unknown`

SMF GTPC messages Category

gtpc_app_events

Description: GTPC message counter

Sample Query: `'gtpc_app_events{service_name="gtpc-ep"}'`

Labels:

- Label: `event_type`
Label Description: Gtpc Event type
Example: `NumRxCreateSessionReq, NumTxCreateSessionRes, NumRxDeleteSessionReq, NumTxDeleteSessionRes, NumRxModifyBearerReq, NumTxModifyBearerRes, NumTxDeleteBearerReq, NumRxDeleteBearerRsp, NumTxCreateBearerReq, NumRxCreateBearerRes, NumTxUpdateBearerReq, NumRxUpdateBearerRes, NumTxModifyBearerFailureInd, NumModifyBearerTimeout, NumRxDeleteBearerCmd, NumCreateBearerFailure, NumCreateBearerSuccess, NumCreateSessionSuccess, NumCreateSessionFailure, NumDeleteSessionSuccess,`

NumDeleteSessionFailure, NumCreateBearerReqRetrans, NumUpdateBearerReqRetrans,
NumDeleteBearerReqRetrans

- Label: `interface_type`

Label Description: Gtpc Interface type

Example: S5, S11, S5E, S2B, S8

SMF GTPC priority messages Category

gtpc_app_priority_events

Description: GTPC priority message counter

Sample Query: `'gtpc_app_priority_events{service_name="gtpc-ep}'`

Labels:

- Label: `event_type`

Label Description: Gtpc Event type

Example: NumRxCreateSessionReq, NumTxCreateSessionRes, NumRxDeleteSessionReq,
NumTxDeleteSessionRes, NumRxModifyBearerReq, NumTxModifyBearerRes, NumTxDeleteBearerReq,
NumRxDeleteBearerRsp, NumTxCreateBearerReq, NumRxCreateBearerRes, NumTxUpdateBearerReq,
NumRxUpdateBearerRes, NumTxModifyBearerFailureInd, NumModifyBearerTimeout,
NumRxDeleteBearerCmd, NumCreateBearerFailure, NumCreateBearerSuccess,
NumCreateSessionSuccess, NumCreateSessionFailure, NumDeleteSessionSuccess,
NumDeleteSessionFailure, NumCreateBearerReqRetrans, NumUpdateBearerReqRetrans,
NumDeleteBearerReqRetrans

- Label: `priority_msg`

Label Description: priority

Example: true

- Label: `interface_type`

Label Description: Gtpc Interface type

Example: S5, S11, S5E, S2B, S8

nodemgr

Nodemgr gtpc message statistics Category

nodemgr_gtpc_msg_stats

Description: Node manager gtpc message statistics for updating node status to gtpc peers like SGW, PGW or ePDG

Sample Query: 'nodemgr_gtpc_msg_stats{gtpc_peer_ip="192.168.10.2", gtpc_msg_type="gtpc_echo_res_rx", interface_type="S11"}'

Labels:

- Label: `gtpc_peer_ip`
Label Description: IP address of a gtpc peer like SGW, PGW or ePDG
Example: 192.168.10.2
- Label: `gtpc_msg_type`
Label Description: GTPC message triggered by the current node, or triggered by peer node
Example: `gtpc_echo_res_rx`, `gtpc_echo_res_tx`, `gtpc_echo_req_rx`, `gtpc_echo_req_tx`
- Label: `interface_type`
Label Description: Interfaces on which the gtpc message is recieved or sent PGW, SGW-Egress, SGW-Ingress etc
Example: S11, S5E, S5, S8, S2B

Nodemgr gtpc peer status statistics Category

`nodemgr_gtpc_peer_status`

Description: Node manager gtpc peer status statistics for keeping track of gtpc peers like SGW, PGW or ePDG via keep alive or restart counter tracking

Sample Query: 'nodemgr_gtpc_peer_status{gtpc_peer_ip="192.168.10.2", gtpc_msg_type="gtpc_echo_res_rx", interface_type="S11"}'

Labels:

- Label: `gtpc_peer_ip`
Label Description: IP address of a gtpc peer like SGW, PGW or ePDG
Example: 192.168.10.2
- Label: `gtpc_peer_status`
Label Description: GTPC peer current status as a result of keep alive success/failure or restart counter tracking
Example: `gtpc_peer_path_down`, `gtpc_peer_path_up`, `gtpc_peer_restarted`
- Label: `interface_type`
Label Description: Interfaces on which the gtpc message is recieved or sent PGW, SGW-Egress, SGW-Ingress etc
Example: S11, S5E, S5, S8, S2B

Nodemgr messages Category

nodemgr_msg_stats

Description: Node Manager Resource management message counters

Sample Query: 'nodemgr_msg_stats{nodemgr_id="0", id_req_type="ID_REQ_ALLOC", ip_req_type="IP_REQ_ALLOC", ip_version="IP_TYPE_V4", sent_to_owner="0", service_user="SERVICE_USER_SMF"}'

Labels:

- Label: `nodemgr_id`
Label Description: Node Manager instance for which statistics are to be checked
Example: 0, 1, 2, 3, 4, 5, 6, 7, 8
- Label: `id_req_type`
Label Description: Type of request received at node manager message
Example: ID_REQ_NONE, ID_REQ_ALLOC, ID_REQ_REL, ID_REQ_REALLOC
- Label: `ip_req_type`
Label Description: Type of request received at node manager for IP address
Example: IP_REQ_NONE, IP_REQ_ALLOC, IP_REQ_REL, IP_REQ_REALLOC, IP_REQ_STATIC
- Label: `ip_version`
Label Description: IP address type for which request was received
Example: IP_TYPE_NONE, IP_TYPE_V4, IP_TYPE_V6, IP_TYPE_V4V6
- Label: `sent_to_owner`
Label Description: Current Node Manager instance for which statistics are to be checked
Example: 0, 1, 2, 3, 4, 5, 6, 7, 8
- Label: `service_user`
Label Description: Node Type which has requested the Node Manager services
Example: SERVICE_USER_NONE, SERVICE_USER_SMF, SERVICE_USER_SGW

Nodemgr node report message handling from UPF to current node stats Category

nodemgr_node_report_stats

Description: Node Manager handling of node report from UPF about the status of NR's or gNB's having sessions with the UPF

Sample Query: 'nodemgr_node_report_stats{up_ep_key="192.168.10.2:192.168.20.3", node_report_peer_gtpu="192.168.30.4", node_report_no_of_sess="0", status="success", node_report_type="", session_tmr="10", backlog_tmr="1564555678270689300"}'

Labels:

- Label: `up_ep_key`

Label Description: unique key to identify UPF `XXX.XXX.XXX.XXX:YYY.YYY.YYY.YYY` where `XXX.XXX.XXX.XXX` is Ip address of the NF service like SGW / SMF and `YYY.YYY.YYY.YYY` is the IP address of UPF

Example: `192.168.10.2:192.168.20.3`

- Label: `node_report_peer_gtpu`

Label Description: Peer GTPU IP address of gNB or NR to which UPF has established the userplane session

Example: `192.168.30.4`

- Label: `node_report_no_of_sess`

Label Description: Total number of session established for the Peer GTPU gNB or NR via the UPF

Example: `0`

- Label: `status`

Label Description: Node report message handling status by Node manager

Example: `attempted, success, failure`

- Label: `node_report_type`

Label Description: Type of node report message being handled

Example: `upd_TS_failed, duplicate, origin`

- Label: `session_tmr`

Label Description: Time duration in minutes during which the node report message has to be handled by the SMF/SGW/PGW node

Example: `0, 10`

- Label: `backlog_tmr`

Label Description: Current time stamp in unix epoch value for node report message processing

Example: `1564555678270689300`

Nodemgr node report message handling timer stats Category

`nodemgr_node_rpt_timer_stats`

Description: Timer to handle Node Manager handling of node report from UPF about the status of NR's or gNB's having sessions with the UPF

Sample Query: `'nodemgr_node_rpt_timer_stats{up_ep_key="192.168.10.2:192.168.20.3", node_report_peer_gtpu="192.168.30.4", node_report_no_of_sess="0", status="success", node_report_type="", session_tmr="10", backlog_tmr="1564555678270689300"}'`

Labels:

- Label: `up_ep_key`
 Label Description: unique key to identify UPF XXX.XXX.XXX.XXX:YYY.YYY.YYY.YYY where XXX.XXX.XXX.XXX is Ip address of the NF service like SGW / SMF and YYY.YYY.YYY.YYY is the IP address of UPF
 Example: 192.168.10.2:192.168.20.3
- Label: `node_report_peer_gtpu`
 Label Description: Peer GTPU IP address of gNB or NR to which UPF has established the userplane session
 Example: 192.168.30.4
- Label: `node_report_no_of_sess`
 Label Description: Total number of session established for the Peer GTPU gNB or NR via the UPF
 Example: 0
- Label: `status`
 Label Description: Node report message handling status by Node manager
 Example: attempted, success, failure
- Label: `node_report_type`
 Label Description: Type of node report message being handled
 Example: tmr_start_failed, dbg_tmr, retry_clrBlkSubs
- Label: `session_tmr`
 Label Description: Time duration in minutes during which the node report message has to be handled by the SMF/SGW/PGW node
 Example: 0, 10
- Label: `backlog_tmr`
 Label Description: Current time stamp in unix epoch value for node report message processing
 Example: 1564555678270689300

Nodemgr resource management response statistics Category

`nodemgr_resource_mgmt_resp_stats`

Description: Node Manager resource management response statistics

Sample Query: `'nodemgr_resource_mgmt_resp_stats{req_type="1", ip_ver_type="1", status="attempted", error=""}'`

Labels:

- Label: `req_type`

Label Description: The request for which this response is being sent, Request with no operation = 0, Request with IP allocation = 1, Request with IP release = 2, Request with IP reallocation = 3, Request with Static IP allocation = 4

Example: 0, 1, 2, 3, 4

- Label: `ip_ver_type`

Label Description: Type of IP addresses requested in the message, IP type requested NONE = 0, IP type requested V4 = 1, IP type requested V6 = 2, IP type requested V4V6 = 3

Example: 0, 1, 2, 3

- Label: `status`

Label Description: Status of the request

Example: attempted, success, failed

- Label: `error`

Label Description: A non unique error String in case of Status is failure, for other cases use this value as empty string

Example: Unable to get UpfKey for upf

Nodemgr userplane heart beat message failure due to retransmission stats Category

`nodemgr_up_heartbeat_fail_stats`

Description: Node Manager userplane heart beat message failure counters between UPF node and SMF/PGW/SGW node as retransmission requests exhausted to UPF

Sample Query: `'nodemgr_up_heartbeat_fail_stats{up_ep_key="192.168.10.2:192.168.20.3", primary_nodemgr_id="0", current_nodemgr_id="0", up_msg_type="up_heartbeat_req_tx", interface_type="SXB"}'`

Labels:

- Label: `up_ep_key`

Label Description: unique key to identify UPF XXX.XXX.XXX.XXX:YYY.YYY.YYY.YYY where XXX.XXX.XXX.XXX is Ip address of the NF service like SGW / SMF and YYY.YYY.YYY.YYY is the IP address of UPF

Example: 192.168.10.2:192.168.20.3

- Label: `interface_type`

Label Description: Interface type between current node (SMF/SGW) and Peer Node (UPF)

Example: SXA, SXB, SXAB, SXC, N4

Nodemgr userplane heart beat message failure stats Category

nodemgr_up_hb_msg_fail_stats

Description: Node Manager userplane heart beat message failure counters between UPF node and SMF/PGW/SGW node as unable to send request to UPF

Sample Query: 'nodemgr_up_hb_msg_fail_stats{up_ep_key="192.168.10.2:192.168.20.3", primary_nodemgr_id="0", current_nodemgr_id="0", up_msg_type="up_heartbeat_req_tx", interface_type="SXB"}'

Labels:

- Label: up_ep_key

Label Description: unique key to identify UPF XXX.XXX.XXX.XXX:YYY.YYY.YYY.YYY where XXX.XXX.XXX.XXX is Ip address of the NF service like SGW / SMF and YYY.YYY.YYY.YYY is the IP address of UPF

Example: 192.168.10.2:192.168.20.3

- Label: primary_nodemgr_id

Label Description: Node Manager instance Identifier of SGW/SMF service which originally established interaction with UPF

Example: 0, 1, 2, 3, 4, 5, 6, 7, 8

- Label: current_nodemgr_id

Label Description: Current Node Manager instance Identifier of SGW/SMF service which is currently established and interacting with UPF

Example: 0, 1, 2, 3, 4, 5, 6, 7, 8

- Label: up_msg_type

Label Description: Message type which is received or sent for heartbeat messaging

Example: up_heartbeat_req_tx, up_heartbeat_req_retx, up_heartbeat_rsp_rx

- Label: interface_type

Label Description: Interface type between current node (SMF/SGW) and Peer Node (UPF)

Example: SXA, SXB, SXAB, SXC, N4

Nodemgr userplane heart beat message stats Category

nodemgr_up_hb_msg_stats

Description: Node Manager userplane heart beat message counters between UPF node and SMF/PGW/SGW node

Sample Query: 'nodemgr_up_hb_msg_stats{up_ep_key="192.168.10.2:192.168.20.3", primary_nodemgr_id="0", current_nodemgr_id="0", up_msg_type="up_heartbeat_req_tx", interface_type="SXB"}'

Labels:

- Label: `up_ep_key`
Label Description: unique key to identify UPF XXX.XXX.XXX.XXX:YYY.YYY.YYY.YYY where XXX.XXX.XXX.XXX is Ip address of the NF service like SGW / SMF and YYY.YYY.YYY.YYY is the IP address of UPF
Example: 192.168.10.2:192.168.20.3
- Label: `primary_nodemgr_id`
Label Description: Node Manager instance Identifier of SGW/SMF service which originally established interaction with UPF
Example: 0, 1, 2, 3, 4, 5, 6, 7, 8
- Label: `current_nodemgr_id`
Label Description: Current Node Manager instance Identifier of SGW/SMF service which is currently established and interacting with UPF
Example: 0, 1, 2, 3, 4, 5, 6, 7, 8
- Label: `up_msg_type`
Label Description: Message type which is received or sent for heartbeat messaging
Example: `up_heartbeat_req_tx`, `up_heartbeat_req_ret`, `up_heartbeat_rsp_rx`
- Label: `interface_type`
Label Description: Interface type between current node (SMF/SGW) and Peer Node (UPF)
Example: SXA, SXB, SXAB, SXC, N4

Nodemgr userplane stats Category

`nodemgr_up_stats`

Description: Node Manager to userplane (UPF) link status up guage counters

Sample Query: `'nodemgr_up_stats{up_ep_key="192.168.10.2:192.168.20.3", primary_nodemgr_id="0", peer_nodemgr_id="0", interface_type="SXB"}'`

Labels:

- Label: `up_ep_key`
Label Description: unique key to identify UPF XXX.XXX.XXX.XXX:YYY.YYY.YYY.YYY where XXX.XXX.XXX.XXX is Ip address of the NF service like SGW / SMF and YYY.YYY.YYY.YYY is the IP address of UPF
Example: 192.168.10.2:192.168.20.3
- Label: `primary_nodemgr_id`
Label Description: Current Node Manager instance Identifier of SGW/SMF service
Example: 0, 1, 2, 3, 4, 5, 6, 7, 8
- Label: `peer_nodemgr_id`

Label Description: Peer Node Manager instance Identifier of UPF service

Example: 0, 1, 2, 3, 4, 5, 6, 7, 8

- Label: `interface_type`

Label Description: Interface type between current node (SMF/SGW) and Peer Node (UPF)

Example: SXA, SXB, SXAB, SXC, N4

protocol

PFCP Decoded Messages Category

proto_pfcg_decode_msg_total

Description: Total number of pfcg decode by type,size

Sample Query: 'proto_pfcg_decode_msg_total{message_name="session_modification_res"}'

Labels:

- Label: `message_name`

Label Description: PFCP Message name

Example: session_modification_res, session_report_req, session_deletion_res, heartbeat_res, heartbeat_req

- Label: `optimised`

Label Description: PFCP Message decode optimised

Example: true, false

- Label: `status`

Label Description: PFCP Message status - accepted/denied/discarded

Example: accepted, denied, discarded

PFCP Encoded Messages Category

proto_pfcg_encode_msg_total

Description: Total number of pfcg encode by type,size

Sample Query: 'proto_pfcg_encode_msg_total{message_name="session_modification_req"}'

Labels:

- Label: `message_name`

Label Description: PFCP Message name

Example: session_establishment_req, session_modification_req, session_report_req, session_deletion_req, heartbeat_req, heartbeat_res, session_report_res

- Label: `msgbufsize`
Label Description: PFCP Message buffer size
Example: little, jumbo, optimized
- Label: `status`
Label Description: PFCP Message status - accepted/denied/discarded
Example: accepted, denied, discarded

PFCP Message Retransmission from SMF Category

`proto_udp_retrans_msg_total`

Description: Total number of retransmitted message at pfc

Sample Query: `'proto_udp_retrans_msg_total{message_name="association_setup_req"}'`

Labels:

- Label: `message_name`
Label Description: PFCP Message name
Example: `association_setup_req`, `association_update_req`, `association_release_req`, `prime_pfd_management_req`, `heartbeat_req`, `node_report_req`, `session_report_res`, `association_setup_res`, `association_update_res`, `association_release_res`, `heartbeat_res`, `node_report_res`, `gtpu_router_advertisement_req`, `gtpu_router_solicitation_req`
- Label: `message_direction`
Label Description: PFCP Message direction
Example: inbound, outbound
- Label: `status`
Label Description: PFCP Message status - accepted/denied/discarded
Example: accepted, denied, discarded
- Label: `transport_type`
Label Description: PFCP Message original or retransmission
Example: origin, retransmitted
- Label: `msgpriority`
Label Description: PFCP Message priority
Example: true
- Label: `interface_type`
Label Description: PFCP Message Interface Type
Example: SXA, SXB, SXAB, SXC, N4
- Label: `peer_info`

Label Description: PFCP Message Peer Info

Example: SMFIP:1.2.3.4:UPFIP:5.6.7.8

PFCP Messages Category

proto_pfcip_msg_total

Description: Total number of pfcip messages by type

Sample Query: 'proto_pfcip_msg_total{message_name="session_establishment_req"}'

Labels:

- Label: `message_name`

Label Description: PFCP Message name

Example: session_establishment_req, session_modification_req, session_report_req, session_deletion_req, association_setup_req, association_update_req, association_release_req, prime_pfd_management_req, heartbeat_req, node_report_req, gtpu_router_advertisement_req, gtpu_router_solicitation_req

- Label: `message_direction`

Label Description: PFCP Message direction

Example: inbound, outbound

- Label: `status`

Label Description: PFCP Message status - accepted/denied/discarded

Example: accepted, denied, discarded

- Label: `transport_type`

Label Description: PFCP Message original or retransmission

Example: origin, retransmitted

- Label: `msgpriority`

Label Description: PFCP Message priority

Example: true

- Label: `interface_type`

Label Description: PFCP Message Interface Type

Example: SXA, SXB, SXAB, SXC, N4

PFCP Messages Decode Time Category

proto_decode_msg_seconds_total

Description: Time Taken for pfcip decode by message type

Sample Query: 'proto_decode_msg_seconds_total{message_name="session_establishment_res"}'

Labels:

- Label: `message_name`

Label Description: PFCP Message name

Example: `session_establishment_req`, `session_modification_req`, `session_report_req`, `session_deletion_req`, `association_setup_req`, `association_update_req`, `association_release_req`, `prime_pfd_management_req`, `heartbeat_req`, `node_report_req`, `gtpu_router_advertisement_req`, `gtpu_router_solicitation_req`

- Label: `message_direction`

Label Description: PFCP Message direction

Example: `inbound`, `outbound`

- Label: `status`

Label Description: PFCP Message status - `accepted/denied/discarded`

Example: `accepted`, `denied`, `discarded`

- Label: `transport_type`

Label Description: PFCP Message original or retransmission

Example: `origin`, `retransmitted`

- Label: `msgpriority`

Label Description: PFCP Message priority

Example: `true`

- Label: `interface_type`

Label Description: PFCP Message Interface Type

Example: `SXA`, `SXB`, `SXAB`, `SXC`, `N4`

PFCP Messages processing time Category

`proto_pfc_pmsg_seconds_total`

Description: Time Taken for pcfp messages by type

Sample Query: `'proto_pfc_pmsg_seconds_total{message_name="session_establishment_req}'`

Labels:

- Label: `message_name`

Label Description: PFCP Message name

Example: `session_establishment_req`, `session_modification_req`, `session_report_req`, `session_deletion_req`, `association_setup_req`, `association_update_req`, `association_release_req`, `prime_pfd_management_req`, `heartbeat_req`, `node_report_req`, `gtpu_router_advertisement_req`, `gtpu_router_solicitation_req`

- Label: `message_direction`

Label Description: PFCP Message direction

Example: inbound, outbound

- Label: `status`

Label Description: PFCP Message status - accepted/denied/discarded

Example: accepted, denied, discarded

- Label: `transport_type`

Label Description: PFCP Message original or retransmission

Example: origin, retransmitted

- Label: `msgpriority`

Label Description: PFCP Message priority

Example: true

- Label: `interface_type`

Label Description: PFCP Message Interface Type

Example: SXA, SXB, SXAB, SXC, N4

PFCP Request Messages Category

proto_udp_req_msg_total

Description: Total number of pfcpl request messages processed

Sample Query: 'proto_udp_req_msg_total{message_name="session_establishment_req"}'

Labels:

- Label: `message_name`

Label Description: PFCP Message name

Example: session_establishment_req, session_modification_req, session_report_req, session_deletion_req, association_setup_req, association_update_req, association_release_req, prime_pfd_management_req, heartbeat_req, node_report_req, gtpu_router_advertisement_req, gtpu_router_solicitation_req

- Label: `message_direction`

Label Description: PFCP Message direction

Example: inbound, outbound

- Label: `status`

Label Description: PFCP Message status - accepted/denied/discarded

Example: accepted, denied, discarded

- Label: `transport_type`

Label Description: PFCP Message original or retransmission

Example: origin, retransmitted

- Label: `msgpriority`
Label Description: PCFP Message priority
Example: `true`
- Label: `interface_type`
Label Description: PCFP Message Interface Type
Example: `SXA, SXB, SXAB, SXC, N4`
- Label: `peer_info`
Label Description: PCFP Message Peer Info
Example: `SMFIP:1.2.3.4:UPFIP:5.6.7.8`

PCFP Response Messages Category

`proto_udp_res_msg_total`

Description: Total number of pfcf response messages processed

Sample Query: `'proto_udp_res_msg_total(message_name="session_establishment_res")'`

Labels:

- Label: `message_name`
Label Description: PCFP Message name
Example: `session_establishment_res, session_modification_res, session_report_res, session_deletion_res, association_setup_res, association_update_res, association_release_res, prime_pfd_management_res, heartbeat_res, node_report_res`
- Label: `message_direction`
Label Description: PCFP Message direction
Example: `inbound, outbound`
- Label: `status`
Label Description: PCFP Message status - accepted/denied/discarded
Example: `accepted, denied, discarded`
- Label: `transport_type`
Label Description: PCFP Message original or retransmission
Example: `origin, retransmitted`
- Label: `cause`
Label Description: PCFP Message Response cause
Example: `1, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 101`
- Label: `msgpriority`
Label Description: PCFP Message priority

Example: true

- Label: `interface_type`

Label Description: PFCP Message Interface Type

Example: SXA, SXB, SXAB, SXC, N4

- Label: `peer_info`

Label Description: PFCP Message Peer Info

Example: SMFIP:1.2.3.4:UPFIP:5.6.7.8

PFCP Response Messages processing time Category

`proto_udp_msg_seconds_total`

Description: Total number of seconds taken by message

Sample Query: `'proto_udp_msg_seconds_total{message_name="session_establishment_res"}'`

Labels:

- Label: `message_name`

Label Description: PFCP Message name

Example: `session_establishment_res`, `session_modification_res`, `session_report_res`, `session_deletion_res`, `association_setup_res`, `association_update_res`, `association_release_res`, `prime_pfd_management_res`, `heartbeat_res`, `node_report_res`

- Label: `message_direction`

Label Description: PFCP Message direction

Example: inbound, outbound

- Label: `status`

Label Description: PFCP Message status - accepted/denied/discarded

Example: accepted, denied, discarded

- Label: `transport_type`

Label Description: PFCP Message original or retransmission

Example: origin, retransmitted

- Label: `cause`

Label Description: PFCP Message Response cause

Example: 1, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 101

- Label: `msgpriority`

Label Description: PFCP Message priority

Example: true

- Label: `interface_type`
Label Description: PFCP Message Interface Type
Example: SXA, SXB, SXAB, SXC, N4
- Label: `peer_info`
Label Description: PFCP Message Peer Info
Example: SMFIP:1.2.3.4:UPFIP:5.6.7.8

radius

Radius COA DM packet statistics Category

Radius_CoaDM_Requests_Current

Description: Current outstanding radius COA/DM requests

Sample Query: 'Radius_CoaDM_Requests_Current{radSvrIp="1.1.1.1",radMsgCode="CoaReq"}'

Labels:

- Label: `radSvrIp`
Label Description: Radius Server IP address
Example: Any string
- Label: `radMsgCode`
Label Description: Message type
Example: DisconnectRequest, CoARequest

Radius_CoaDM_Requests_Statistics

Description: Total number of radius COA DM packets sent received

Sample Query: 'Radius_CoaDM_Requests_Statistics{radSvrIp="1.1.1.1",radMsgCode="CoaRequest"}'

Labels:

- Label: `radSvrIp`
Label Description: Radius Server IP address
Example: Any string
- Label: `radMsgCode`
Label Description: Message type
Example: DisconnectRequest, DisconnectACK, DisconnectNAK, CoARequest, CoaDMReq, CoAACK
- Label: `radPacketType`
Label Description: Direction

Example: Tx, Rx

- Label: `radResult`

Label Description: Result

Example: Success, Failure_Invalid_Request

Radius Server status Category

Radius_Server_Status

Description: Display active/inactive status of radius-server

Sample Query:

```
'Radius_Server_Status{radSvrIp="1.1.1.1",radSvrPort="1812",radSvrPortType="Auth"}'
```

Labels:

- Label: `radSvrIP`

Label Description: Radius Server IP address

Example: Any string

- Label: `radSvrPort`

Label Description: Radius Server Port

Example: Any string

- Label: `radSvrPortType`

Label Description: Type of server

Example: Auth, Acct

--

Radius packet statistics Category

Radius_requests_current

Description: Current outstanding radius requests

Sample Query:

```
'Radius_requests_current{radSvrIp="1.1.1.1",radSvrPort="1812",radSvrPortType="Auth"}'
```

Labels:

- Label: `radSvrIp`

Label Description: Radius Server IP address

Example: Any string

- Label: `radSvrPort`

Label Description: Radius Server Port

Example: Any string

- Label: `radSvrPortType`

Label Description: Type of server

Example: Auth, Acct

- Label: `radMsgCode`

Label Description: Message type

Example: SecondaryAuthenReq, RadiusAcctReq, TestAuth, TestAcct

- Label: `radPacketType`

Label Description: Direction

Example: Tx, Rx

- Label: `dnn`

Label Description: DNN of session

Example: Any string

- Label: `procType`

Label Description: Procedure type

Example: Any string

- Label: `ratType`

Label Description: RAT Type

Example: Any string

- Label: `sessType`

Label Description: Session type

Example: Any string

Radius_requests_statistics

Description: Total number of radius packets sent received

Sample Query:

```
'Radius_requests_statistics(radSvrIp="1.1.1.1", radSvrPort="1812", radSvrPortType="Auth")'
```

Labels:

- Label: `radSvrIp`

Label Description: Radius Server IP address

Example: Any string

- Label: `radSvrPort`

Label Description: Radius Server Port

Example: Any string

- Label: `radSvrPortType`
Label Description: Type of server
Example: Auth, Acct
- Label: `radMsgCode`
Label Description: Message type
Example: SecondaryAuthenReq, RadiusAcctReq, TestAuth, TestAcct
- Label: `radPacketType`
Label Description: Direction
Example: Tx, Retry_Tx, Rx
- Label: `radResult`
Label Description: Result
Example: Success, Timeout, Failure_Reject, Failure_NoServer
- Label: `dnn`
Label Description: DNN of session
Example: Any string
- Label: `procType`
Label Description: Procedure type
Example: Any string
- Label: `ratType`
Label Description: RAT Type
Example: Any string
- Label: `sessType`
Label Description: Session type
Example: Any string

rest

Discover Messages Time statistics Category

nf_discover_total_time

Description: Discover Messages Total time statistics

Sample Query: `nf_discover_total_time(nf_type=\"udm\", host=\"10.105.227.109:8082\", svc_name=\"nudm-sdm\", version=\"v1\", result=\"timeouOrRPCError\")`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `host`
Label Description: End Point address
Example: 10.105.227.109:8082
- Label: `svc_name`
Label Description: Network function service name
Example: nudm-sdm, namf-comm
- Label: `version`
Label Description: Api version info
Example: v1, v2,
- Label: `result`
Label Description: result of discover message
Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure

Discover Messages statistics Category

`nf_discover_messages_total`

Description: Discover Messages statistics

Sample Query: `nf_discover_messages_total{nf_type="udm", host="10.105.227.109:8082", svc_name="nudm-sdm", version="v1", result="timeouOrRPCError"}`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `host`
Label Description: End Point address
Example: 10.105.227.109:8082
- Label: `svc_name`
Label Description: Network function service name
Example: nudm-sdm, namf-comm
- Label: `version`
Label Description: Api version info

Example: v1, v2,

- Label: `result`

Label Description: result of discover message

Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure

NF End point selections Category

`nf_endpoint_selections_total`

Description: NF End Point Selection Statistics

Sample Query: `nf_endpoint_selections_total{nf_type="udm", host="10.105.227.109:8097", svc_name="nudm-sdm", version="v1", req="initial"}`

Labels:

- Label: `nf_type`

Label Description: Network Function type

Example: nrf, udm, amf, pcf, chf, ciscocontrol

- Label: `host`

Label Description: End Point address

Example: 10.105.227.109:8097

- Label: `svc_name`

Label Description: Network function service name

Example: nudm-sdm, namf-comm

- Label: `version`

Label Description: Api version info

Example: v1, v2,

- Label: `req`

Label Description: req type

Example: initial, fallback,

NF Send messages statistics Category

`nf_req_recieved_messages_total`

Description: NF recieved messages to NRF client library

Sample Query: `nf_req_recieved_messages_total{nf_type="udm", svc_name="nudm-sdm", message_type="UdmUecmRegisterSMF"}`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: `udm`, `amf`, `pcf`, `chf`, `ciscocontrol`
- Label: `svc_name`
Label Description: Network function service name
Example: `nudm-sdm`, `namf-comm`
- Label: `message_type`
Label Description: Message Type
Example: `UdmUecmRegisterSMF`, `UdmSdmGetUESMSSubscriptionData`

nf_resp_sent_messages_total

Description: NF message responses sent from NRF client library

Sample Query: `nf_resp_sent_messages_total{nf_type=\"udm\", svc_name=\"nudm-sdm\", message_type=\"UdmUecmRegisterSMF\", result=\"SendSuccess\", status_code=\"200\"}`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: `nrf`, `udm`, `amf`, `pcf`, `chf`, `ciscocontrol`
- Label: `svc_name`
Label Description: Network function service name
Example: `nudm-sdm`, `namf-comm`
- Label: `message_type`
Label Description: Message Type
Example: `UdmUecmRegisterSMF`, `UdmSdmGetUESMSSubscriptionData`
- Label: `result`
Label Description: result of discover message
Example: `SendSuccess`, `SendFailure`
- Label: `status_code`
Label Description: result of NF send message
Example: `200`, `201`, `204`,

nf_send_message_total_time

Description: NF send message total time taken

Sample Query: `nf_send_message_total_time{nf_type=\"udm\", svc_name=\"nudm-sdm\", message_type=\"UdmUecmRegisterSMF\", result=\"SendSuccess\", status_code=\"200\"}`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol

Labels:

- Label: `svc_name`
Label Description: Network function service name
Example: nudm-sdm, namf-comm
- Label: `message_type`
Label Description: Message Type
Example: UdmUecmRegisterSMF, UdmSdmGetUESMSSubscriptionData
- Label: `result`
Label Description: result of discover message
Example: SendSuccess, SendFailure
- Label: `status_code`
Label Description: result of NF send message
Example: 200, 201, 204,

NF failure handling stats Category

`nf_failure_handling_stats_total`

Description: NF Failure handling stats

Sample Query: `nf_failure_handling_stats_total{nf_type="udm", host="10.105.227.109:8097", svc_name="nudm-sdm", version="v1", message_type="UdmUecmRegisterSMF", req="initial", response="202", status="final"}`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `host`
Label Description: End Point address
Example: 10.105.227.109:8097
- Label: `svc_name`
Label Description: Network function service name

Example: nudm-sdm, namf-comm

- Label: `version`

Label Description: Api version info

Example: v1, v2,

- Label: `message_type`

Label Description: Message Type

Example: UdmUecmRegisterSMF, UdmSdmGetUESMSSubscriptionData

- Label: `req`

Label Description: Request type

Example: initial, fallback,

- Label: `response`

Label Description: Response from the server

Example: 200, 201, 204, timeout_rpc_error,

- Label: `status`

Label Description: Status from the server

Example: retry, final

NF management message time statistics Category

`nf_management_total_time`

Description: NF management messages total time taken

Sample Query: `nf_management_total_time{host="10.105.227.109:8082", svc_name="nudm-sdm", version="v1", direction="outbound", message_type="registration", result="timeouOrRPCError" }`

Labels:

- Label: `host`

Label Description: End Point address

Example: 10.105.227.109:8082

- Label: `svc_name`

Label Description: Network function service name

Example: nudm-sdm, namf-comm

- Label: `version`

Label Description: Api version info

Example: v1, v2,

- Label: `direction`

Label Description: Direction indicates about the message going out or coming in

Example: inbound, outbound

- Label: `message_type`

Label Description: Type of Message

Example: registration, heartbeat, subscription, notification

- Label: `result`

Label Description: result of discover message

Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure, request_parse_failure, invalid_notify_event, invalid_nf_instance_uri, internal_error

NF management messages statistics Category

`nf_management_stats_total`

Description: NF management messages statistics

Sample Query: `nf_management_stats_total{host="10.105.227.109:8082", svc_name="nudm-sdm", version="v1", direction="outbound", message_type="registration", result="timeouOrRPCError" }`

Labels:

- Label: `host`

Label Description: End Point address

Example: 10.105.227.109:8082

- Label: `svc_name`

Label Description: Network function service name

Example: nudm-sdm, namf-comm

- Label: `version`

Label Description: Api version info

Example: v1, v2,

- Label: `direction`

Label Description: Direction indicates about the message going out or coming in

Example: inbound, outbound

- Label: `message_type`

Label Description: Type of Message

Example: registration, heartbeat, subscription, notification

- Label: `result`

Label Description: result of discover message

Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure

NRF Discovery Category

nf_discover_events_total

Description: NF Discover Stats

Sample Query: `nf_discover_events_total{nf_type=\"pcf\", response_type=\"local\"}`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `response_type`
Label Description: Discovery response chosen from
Example: local, cache, expired-cache

NRF subscription messages statistics Category

nrf_subscription_send_messages_total

Description: NRF Subscription send messages total

Sample Query: `nrf_subscription_send_messages_total{host=\"10.105.227.109:8082\", message_type=\"subscription\", req=\"initial\"}`

Labels:

- Label: `host`
Label Description: End Point address
Example: 10.105.227.109:8082
- Label: `message_type`
Label Description: subscription message typwe
Example: unsubscription,subscription,updateSubscription
- Label: `req`
Label Description: req type
Example: resourceUri, initial,retry_2

REST EP message Exchange Time Category

smf_restep_http_msg_seconds

Description: SMF REST time between request and response messages

Sample Query: 'smf_restep_http_msg_seconds{message_direction="inbound",nf_type="amf"}'

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `message_direction`
Label Description: direction of message from SMF perspective
Example: inbound, outbound
- Label: `api_name`
Label Description: API name
Example: register_ue, deregister_ue, subscription_req, sdm_subscription_req, sdm_data_change_notify, nf_registration, nf_discovery, slice_selection, amf_create_sm_context, amf_update_sm_context, amf_release_sm_context, amf_n1_n2_transfer, amf_n1_n2_transfer_notify_failure, amf_assign_ebi, amf_status_notify, pcf_sm_policy_control_create, chf_charging_data_request, pcf_sm_policy_control_update, pcf_sm_policy_control_delete, pcf_sm_policy_control_update_notify, cisco_control_clear_subscriber, cisco_control_show_subscriber, pcf_sm_policy_control_terminate_notify, chf_abort_notify
- Label: `nf_uri`
Label Description: Network Function URI
Example: actual HTTP URI of the message
- Label: `response_status`
Label Description: HTTP response status code
Example: 200, 201, 204
- Label: `response_cause`
Label Description: HTTP response cause code
Example: cause string as received from peer nf

REST EP messages Category

smf_restep_http_msg_total

Description: SMF REST message counter

Sample Query: 'smf_restep_http_msg_total{message_direction="inbound",nf_type="amf"}'

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `message_direction`
Label Description: direction of message from SMF perspective
Example: inbound, outbound
- Label: `api_name`
Label Description: API name
Example: register_ue, deregister_ue, subscription_req, sdm_subscription_req, sdm_data_change_notify, nf_registration, nf_discovery, slice_selection, amf_create_sm_context, amf_update_sm_context, amf_release_sm_context, amf_n1_n2_transfer, amf_n1_n2_transfer_notify_failure, amf_assign_ebi, amf_status_notify, pcf_sm_policy_control_create, chf_charging_data_request, pcf_sm_policy_control_update, pcf_sm_policy_control_delete, pcf_sm_policy_control_update_notify, cisco_control_clear_subscriber, cisco_control_show_subscriber, pcf_sm_policy_control_terminate_notify, chf_abort_notify
- Label: `nf_uri`
Label Description: Network Function URI
Example: actual HTTP URI of the message
- Label: `response_status`
Label Description: HTTP response status code
Example: 200, 201, 204

REST EP messages Decode Status Category

`smf_restep_http_msg_decode`

Description: SMF REST number of decoding failures

Sample Query:

```
'smf_restep_http_msg_decode{nf_type="amf",api_name="register_ue",decoding_status="decoding_failure"}'
```

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `api_name`
Label Description: API name

Example: register_ue, deregister_ue, subscription_req, sdm_subscription_req, sdm_data_change_notify, nf_registration, nf_discovery, slice_selection, amf_create_sm_context, amf_update_sm_context, amf_release_sm_context, amf_n1_n2_transfer, amf_n1_n2_transfer_notify_failure, amf_assign_ebi, amf_status_notify, pcf_sm_policy_control_create, chf_charging_data_request, pcf_sm_policy_control_update, pcf_sm_policy_control_delete, pcf_sm_policy_control_update_notify, cisco_control_clear_subscriber, cisco_control_show_subscriber, pcf_sm_policy_control_terminate_notify, chf_abort_notify

- Label: `decoding_status`
Label Description: Decoding status
Example: `decoding_failure`
- Label: `interface_type`
Label Description: Interface Type
Example: N11, N1, N2
- Label: `response_status`
Label Description: HTTP response status code
Example: 200, 201, 204
- Label: `application_error`
Label Description: Application error

service

Discover Messages Time statistics Category

`nf_discover_total_time`

Description: Discover Messages Total time statistics

Sample Query: `'nf_discover_total_time{nf_type="amf", host="http://10.105.227.109:8082/nnrf-nfm/v1", result="timeouOrRPCError"}'`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `host`
Label Description: End Point address
Example: `http://10.105.227.109:8082/nnrf-nfm/v1`
- Label: `result`

Label Description: result of discover message

Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure

Discover Messages statistics Category

nf_discover_messages_total

Description: Discover Messages statistics

Sample Query: 'nf_discover_messages_total{nf_type="amf", host="http://10.105.227.109:8082/nnrf-nfm/v1", result="timeouOrRPCError"}'

Labels:

- Label: `nf_type`

Label Description: Network Function type

Example: nrf, udm, amf, pcf, ciscocontrol

- Label: `host`

Label Description: End Point address

Example: http://10.105.227.109:8082/nnrf-nfm/v1

- Label: `result`

Label Description: result of discover message

Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure

GTPC Message stats Category

smf_gtpc_msg_stats

Description: Stats for GTPC interface messages

Sample Query: 'smf_gtpc_msg_stats{message_type="create_bearer_request"}'

Labels:

- Label: `message_type`

Label Description: GTPC Message Type

Example: delete_bearer_request, create_bearer_request, delete_bearer_request_async

- Label: `status`

Label Description: GTPC message status

Example: attempted, success, failures

- Label: `reason`

Label Description: The reason associated with failure

Example: ipc_failed, sgw_failure, EGTP_CAUSE_LOCAL_DETACH,
 EGTP_CAUSE_RAT_CHANGED_FROM_3GPP_TO_NON_3GPP,
 EGTP_CAUSE_COMPLETE_DETACH, EGTP_CAUSE_ISR_DEACTIVATION,
 EGTP_CAUSE_ERROR_IND_RCVD_RNC_ENODE, EGTP_CAUSE_IMSI_DETACH_ONLY,
 EGTP_CAUSE_REACTIVATION_REQUESTED,
 EGTP_CAUSE_PDN_RECONNECTION_TO_THIS_APN_DISALLOWED,
 EGTP_CAUSE_ACCESS_CHANGED_FROM_NON_3GPP_TO_3GPP,
 EGTP_CAUSE_PDN_CONN_INACTIVITY_TIMER_EXPIRED,
 EGTP_CAUSE_PGW_NOT_RESPONDING, EGTP_CAUSE_NETWORK_FAILURE,
 EGTP_CAUSE_QOS_PARAMETER_MISMATCH, EGTP_CAUSE_REQ_ACCEPTED,
 EGTP_CAUSE_REQ_ACCEPTED_PARTIALLY,
 EGTP_CAUSE_NEW_PDN_TYPE_NETWORK_PREFERENCE,
 EGTP_CAUSE_NEW_PDN_TYPE_SINGLE_ADDR_BEARER_ONLY,
 EGTP_CAUSE_CONTEXT_NOT_FOUND, EGTP_CAUSE_INVALID_MESSAGE_FORMAT,
 EGTP_CAUSE_VERSION_NOT_SUPPORTED_BY_NEXT_PEER,
 EGTP_CAUSE_INVALID_LENGTH, EGTP_CAUSE_SERVICE_NOT_SUPPORTED,
 EGTP_CAUSE_MANDATORY_IE_INCORRECT, EGTP_CAUSE_MANDATORY_IE_MISSING,
 EGTP_CAUSE_SYSTEM_FAILURE, EGTP_CAUSE_NO_RESOURCES_AVAILABLE,
 EGTP_CAUSE_SEMANTIC_ERROR_IN_TFT_OPERATION,
 EGTP_CAUSE_SYNTACTIC_ERROR_IN_TFT_OPERATION,
 EGTP_CAUSE_SEMANTIC_ERROR_IN_PKT_FILTERS,
 EGTP_CAUSE_SYNTACTIC_ERROR_IN_PKT_FILTERS,
 EGTP_CAUSE_MISSING_OR_UNKNOWN_APN, EGTP_CAUSE_UNEXPECTED_REPEATED_IE,
 EGTP_CAUSE_GRE_KEY_NOT_FOUND, EGTP_CAUSE_REALLOCATION_FAILURE,
 EGTP_CAUSE_DENIED_IN_RAT, EGTP_CAUSE_PREFERRED_PDN_TYPE_UNSUPPORTED,
 EGTP_CAUSE_ALL_DYNAMIC_ADDR_OCCUPIED,
 EGTP_CAUSE_UE_CTX_WO_TFT_ALREADY_ACTIVATED,
 EGTP_CAUSE_PROTOCOL_TYPE_NOT_SUPPORTED, EGTP_CAUSE_UE_NOT_RESPONDING,
 EGTP_CAUSE_UE_REFUSES, EGTP_CAUSE_SERVICE_DENIED,
 EGTP_CAUSE_UNABLE_TO_PAGE_UE, EGTP_CAUSE_NO_MEMORY_AVAILABLE,
 EGTP_CAUSE_USER_AUTHENTICATION_FAILED,
 EGTP_CAUSE_APN_DENIED_NO_SUBSCRIPTION, EGTP_CAUSE_REQUEST_REJECTED,
 EGTP_CAUSE_PTMSI_SIGNATURE_MISMATCH, EGTP_CAUSE_IMSI_IMEI_NOT_KNOWN,
 EGTP_CAUSE_SEMANTIC_ERROR_IN_TAD_OPERATION,
 EGTP_CAUSE_SYNTACTIC_ERROR_IN_TAD_OPERATION,
 EGTP_CAUSE_RESERVED_MESSAGE_VALUE_RECEIVED,
 EGTP_CAUSE_PEER_NOT_RESPONDING,
 EGTP_CAUSE_COLLISION_WITH_NETWORK_INIT_REQUEST,
 EGTP_CAUSE_UNABLE_TO_PAGE_UE_DUE_TO_SUSPENSION,
 EGTP_CAUSE_CONDITIONAL_IE_MISSING, EGTP_CAUSE_INCOMPATIBLE_APN_REST_TYPE,
 EGTP_CAUSE_INVALID_LENGTH_WITH_PIGGYBACK_MSG,
 EGTP_CAUSE_DATA_FORWARDING_NOT_SUPPORTED,
 EGTP_CAUSE_INVALID_REPLY_FROM_REMOTE_PEER,
 EGTP_CAUSE_FALLBACK_TO_GTPV1, EGTP_CAUSE_INVALID_PEER,
 EGTP_CAUSE_TEMP_REJECTED_DUE_TO_HANDOVER_IN_PROGRESS,
 EGTP_CAUSE_REQ_REJECTED_FOR_PMPV6_REASON, EGTP_CAUSE_APN_CONGESTION,
 EGTP_CAUSE_BEARER_HANDLING_NOT_SUPPORTED,
 EGTP_CAUSE_UE_ALREADY_REATTACHED,
 EGTP_CAUSE_MULTI_PDN_CONNECTION_FOR_APN_NOT_ALLOWED,
 EGTP_CAUSE_MME_SGSN_REFUSES_DUE_TO_VPLMN_POLICY,
 EGTP_CAUSE_GTPC_ENTITY_CONGESTION,

EGTP_CAUSE_TARGET_ACCESS_RESTRICTED_FOR_THE_SUBSCRIBER,
 EGTP_CAUSE_UE_TEMP_NOT_REACHABLE_DUE_TO_POWER_SAVING,
 EGTP_CAUSE_RELOC_FAILURE_DUE_TO_NAS_MSG_REDIRECTION,
 EGTP_CAUSE_MISSING_TIMESTAMP_OPTION,
 EGTP_CAUSE_MULTIPLE_HNP_NOT_ALLOWED, EGTP_CAUSE_SN_MALFORMED_MSG,
 EGTP_CAUSE_INT_TIMEOUT

- Label: qos_5qi

Label Description: 5Qi applicable for the QoS flow

Example: 1, 2, 5

- Label: rat_type

Label Description: Type of the radio access associated with the request

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: smf_current_procedure

Label Description: Current Procedure Name for Message Level Stats

Example: nr_to_untrusted_wifi_handover, eps_fb_ded_brr, PdnDisconnectProcedure,
 enb_to_untrusted_wifi_handover, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod,
 smf_initiated_pdn_detach, untrusted_wifi_to_enb_handover, upf_sess_report_srir_sess_rel,
 utn3gpp_to_5g_handover

NF End point selections Category

nf_endpoint_selections_total

Description: NF End Point Selection Statistics

Sample Query: 'nf_endpoint_selections_total{nf_type="amf",
 host="http://10.105.227.109:8082/nrf-nfm/v1", req="initial"}'

Labels:

- Label: nf_type

Label Description: Network Function type

Example: nrf, udm, amf, pcf, chf, ciscocontrol

- Label: host

Label Description: End Point address

Example: http://10.105.227.109:8082/nrf-nfm/v1

- Label: req

Label Description: req type

Example: initial, fallback,

NF failure handling stats Category

nf_failure_handling_stats_total

Description: NF Failure handling stats

Sample Query: `'nf_failure_handling_stats_total{nf_type="amf", host="http://10.105.227.109:8082/nnrf-nfm/v1", req="initial", response="202", status="final"}'`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `host`
Label Description: End Point address
Example: `http://10.105.227.109:8082/nnrf-nfm/v1`
- Label: `req`
Label Description: Request type
Example: initial, fallback,
- Label: `response`
Label Description: Response from the server
Example: 200, 201, 204, `timeout_rpc_error`,
- Label: `status`
Label Description: Status from the server
Example: retry, final

NF management message time statistics Category

nf_management_total_time

Description: NF management messages total time taken

Sample Query: `'nf_management_total_time{host="http://10.105.227.109:8082/nnrf-nfm/v1", direction="outbound", message_type="registration", result="timeouOrRPCError" }'`

Labels:

- Label: `host`
Label Description: End Point address
Example: `http://10.105.227.109:8082/nnrf-nfm/v1`
- Label: `direction`
Label Description: Direction indicates about the message going out or coming in

Example: inbound, outbound

- Label: `message_type`

Label Description: Type of Message

Example: registration, heartbeat, subscription, notification

- Label: `result`

Label Description: result of discover message

Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure, request_parse_failure, invalid_notify_event, invalid_nf_instance_uri, internal_error

NF management messages statistics Category

`nf_management_stats_total`

Description: NF management messages statistics

Sample Query: `'nf_management_stats_total{host="http://10.105.227.109:8082/nrf-nfm/v1", direction="outbound", message_type="registration", result="timeouOrRPCError" }'`

Labels:

- Label: `host`

Label Description: End Point address

Example: `http://10.105.227.109:8082/nrf-nfm/v1`

- Label: `direction`

Label Description: Direction indicates about the message going out or coming in

Example: inbound, outbound

- Label: `message_type`

Label Description: Type of Message

Example: registration, heartbeat, subscription, notification

- Label: `result`

Label Description: result of discover message

Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure

NRF Discovery Category

`nf_discover_events_total`

Description: NF Discover Stats

Sample Query: `'nf_discover_events_total{nf_type="pcf", response_type="local"}'`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `response_type`
Label Description: Discovery response choosen from
Example: local, cache, expired-cache

PDU UE Sync Procedure Category

`pdu_ue_sync_proc`

Description: PDU UE Sync Procedure counter

Sample Query: `'pdu_ue_sync_proc(status="attempted")'`

Labels:

- Label: `status`
Label Description: call flow procedure status counter
Example: attempted, success, failures, suspend, resume, abort

Policy control NRF fail action statistics Category

`policy_msg_nrf_fail_action`

Description: NRF fail action stats for policy messages

Sample Query: `'sum (policy_msg_nrf_fail_action(policy_control_msg="SmPolicyCreate"))'`

Labels:

- Label: `policy_control_msg`
Label Description: Type of policy control message
Example: SmPolicyCreate, SmPolicyUpdate, SmPolicyDelete
- Label: `policy_nrf_action`
Label Description: NRF failure action
Example: ignore, continue, terminate
- Label: `pcf_end_point`
Label Description: PCF IP Address
Example: 10.84.17.11

Policy control PCF update statistics Category

policy_pcf_updates_total

Description: Statistics for triggers sent to PCF in SmPolicyUpdate Request to PCF

Sample Query: 'sum (policy_pcf_updates_total{trigger="rat_change"})'

Labels:

- Label: `trigger`

Label Description: Trigger sent in the policy update request sent to PCF

Example: `ue_ip_change`, `plmn_change`, `res_mod_req`, `access_type_change`, `ue_ip_change`, `credit_mon_sess_fail`, `def_qos_change`, `sess_ambr_change`, `no_credit`, `serving_area_change`, `revalidation_timeout`, `resoure_release`, `resource_alloc`, `rat_change`

- Label: `smf_current_procedure`

Label Description: Current procedure associated with the operation performed on the pcc rule

Example: `pdn_sess_create`, `pdu_sess_create`, `smf_initiated_pdn_detach`, `disc_pdurel_smf_init_release`, `pcf_req_pdu_sess_mod`, `pcf_req_ded_brr_mod`, `enb_to_untrusted_wifi_handover`, `untrusted_wifi_to_enb_handover`, `nr_to_untrusted_wifi_handover`, `utn3gpp_to_5g_handover`, `xn_handover`, `n26_4g_to_5g_handover`, `pdn_5g_4g_handover`, `n26_4g_to_5g_im_mobility`

Policy control active PCF statistics Category

session_policy_type_total

Description: Stats for PCF active Sessions

Sample Query: 'sum (session_policy_type_total{policy_type="local"})'

Labels:

- Label: `policy_type`

Label Description: Policy type

Example: `local`, `pcf`

- Label: `pcf_address`

Label Description: PCF IP Address

Example: `10.84.17.11`

- Label: `access_type`

Label Description: Access type

Example: `Ipv4PduSession`, `Ipv6PduSession`, `Ipv4V6PduSession`

Policy control current flow Category

policy_pdu_flows_current

Description: QoS flow current counts

Sample Query: 'sum (policy_pdu_flows_current{flow_type="gbr"}) by(qos_5qi, arp)'

Labels:

- Label: `rat_type`
Label Description: RAT type on which the flow is created
Example: nr, WLAN, EUTRA
- Label: `ssc_mode`
Label Description: SSC mode for the session which created the QoS flow
Example: one, two, three
- Label: `pdn_type`
Label Description: PDN type of the session which created the QoS flow
Example: v4, v6, v4v6
- Label: `dnn`
Label Description: DNN for which the flow is created
Example: cisco.com
- Label: `flow_type`
Label Description: Flow type for the QoS flow
Example: gbr, non_gbr
- Label: `qos_5qi`
Label Description: 5Qi applicable for the QoS flow
Example: 1, 2, 5
- Label: `arp`
Label Description: Priority level of ARP applicable for the QoS flow
Example: 10, 20
- Label: `smf_current_procedure`
Label Description: Current procedure associated with the operation performed on the pcc rule
Example: pdn_sess_create, pdu_sess_create, pcf_req_pdu_sess_mod, pcf_req_ded_brr_mod, enb_to_untrusted_wifi_handover, untrusted_wifi_to_enb_handover, nr_to_untrusted_wifi_handover, utn3gpp_to_5g_handover, xn_handover, n26_4g_to_5g_handover, pdn_5g_4g_handover, n26_4g_to_5g_im_mobility

Policy control dynamic pcc rule statistics Category

policy_dynamic_pcc_rules_total

Description: PCC Rule total statistics for dynamic rules pushed from PCF

Sample Query: 'sum (policy_dynamic_pcc_rules_total{rule_id="Rule-1"}) by(qos_5qi, arp)'

Labels:

- Label: `rule_id`
Label Description: Rule Id for the received dynamic pcc rule
Example: PccRule-1
- Label: `operation`
Label Description: Operation performed on the dynamic pcc rule
Example: install, modify, remove
- Label: `event`
Label Description: Event associated with the operation performed on the pcc rule
Example: attempted, success, failure, abort
- Label: `qos_5qi`
Label Description: 5Qi applied on the dynamic pcc rule
Example: 1, 2, 5
- Label: `arp`
Label Description: Priority level of ARP applied on the dynamic pcc rule
Example: 10, 20
- Label: `tc_event`
Label Description: Traffic Control event applied on the dynamic pcc rule
Example: enabled_ul, enabled_dl, enabled, disabled, removed
- Label: `charging_type`
Label Description: Charging type applied on the dynamic pcc rule
Example: online, offline, online-offline
- Label: `charging_method`
Label Description: Charging method applied on the dynamic pcc rule
Example: volume, time, vol_time
- Label: `details`
Label Description: Details on the operation applied on the dynamic pcc rule
Example: success, failed, validation_failed
- Label: `smf_current_procedure`

Label Description: Current procedure associated with the operation performed on the pcc rule

Example: pdn_sess_create, pdu_sess_create, pcf_req_pdu_sess_mod, pcf_req_ded_brr_mod, enb_to_untrusted_wifi_handover, untrusted_wifi_to_enb_handover, nr_to_untrusted_wifi_handover, utn3gpp_to_5g_handover, xn_handover, n26_4g_to_5g_handover, pdn_5g_4g_handover, n26_4g_to_5g_im_mobility

- Label: pccrule_change_type

Label Description: pcc rule parameter change type

Example: NA, binding_param_change, no_binding_param_change

Policy control message statistics Category

policy_msg_processing_status

Description: Policy message handling Stats

Sample Query: 'sum

```
(policy_msg_processing_status{policy_notification_msg="SmPolicyUpdateNotify"})'
```

Labels:

- Label: policy_notification_msg

Label Description: Policy message type

Example: SmPolicyUpdateNotify, SmPolicyTerminate, SmPolicyCreate, SmPolicyUpdate, SmPolicyDelete

- Label: msg_status

Label Description: Policy processing message status

Example: accepted, rejected, skipped, attempted, failed, exp_attempted, exp_accepted, exp_rejected, exp_failed

- Label: pcf_end_point

Label Description: PCF IP Address

Example: 10.84.17.11

- Label: rat_type

Label Description: RAT type of the flow

Example: nr, WLAN, EUTRA

Policy control pre-defined pcc rule statistics Category

policy_predefined_pcc_rules_total

Description: PCC Rule total statistics for pre-defined rules activated by PCF

Sample Query: 'sum (policy_predefined_pcc_rules_total{rule_id="Rule-1"}) by(event, operation)'

Labels:

- Label: `rulebase`
Label Description: Rulebase to which this pre-defined rule belongs
Example: Rulebase-1
- Label: `operation`
Label Description: Operation performed on the pre-defined pcc rule
Example: install, modify, remove
- Label: `event`
Label Description: Event associated with the operation performed on the pre-defined rule
Example: attempted, success, failure
- Label: `qos_5qi`
Label Description: 5Qi applied on the pre-defined pcc rule
Example: 1, 2, 5
- Label: `arp`
Label Description: Priority level of ARP applied on the pre-defined pcc rule
Example: 10, 20
- Label: `charging_type`
Label Description: Charging type applied on the pre-defined pcc rule
Example: online, offline, online-offline
- Label: `charging_method`
Label Description: Charging method applied on the pre-defined pcc rule
Example: volume, time, vol_time
- Label: `smf_current_procedure`
Label Description: Current procedure associated with the operation performed on the pcc rule
Example: pdn_sess_create, pdu_sess_create, smf_initiated_pdn_detach, disc_pdurel_smf_init_release, pcf_req_pdu_sess_mod, pcf_req_ded_brr_mod, enb_to_untrusted_wifi_handover, untrusted_wifi_to_enb_handover, nr_to_untrusted_wifi_handover, utn3gpp_to_5g_handover, xn_handover, n26_4g_to_5g_handover, pdn_5g_4g_handover, n26_4g_to_5g_im_mobility

Policy control rule report statistics Category

pcf_rule_report_stats

Description: Statistics for Rule Report sent to PCF

Sample Query: 'sum (pcf_rule_report_stats{pcf_rule_report_fail_code="INCOR_FLOW_INFO"}) '

Labels:

- Label: `pcf_rule_report_fail_code`

Label Description: Failure code sent in RuleReport

Example: INCOR_FLOW_INFO

Policy control session rule statistics Category

policy_session_rules_total

Description: Session total statistics for session rules applied

Sample Query: 'sum (policy_session_rules_total{rule_id="SessRule-1"})'

Labels:

- Label: `rule_id`
Label Description: Rule Id for the received session rule from PCF
Example: SessRule-1
- Label: `operation`
Label Description: Operation performed on the session rule
Example: install, modify, remove
- Label: `event`
Label Description: Event associated with the operation performed on the rulebase
Example: attempted, success, failure
- Label: `smf_current_procedure`
Label Description: Current procedure associated with the operation performed on the pcc rule
Example: pdn_sess_create, pdu_sess_create, smf_initiated_pdn_detach, disc_pdurel_smf_init_release, pcf_req_pdu_sess_mod, pcf_req_ded_brr_mod, enb_to_untrusted_wifi_handover, untrusted_wifi_to_enb_handover, nr_to_untrusted_wifi_handover, utn3gpp_to_5g_handover, xn_handover, n26_4g_to_5g_handover, pdn_5g_4g_handover, n26_4g_to_5g_im_mobility

Policy control static pcc rule statistics Category

policy_static_pcc_rules_total

Description: PCC Rule total statistics for static rules activated via rulebase

Sample Query: 'sum (policy_static_pcc_rules_total{rulebase="Rulebase-1"})'

Labels:

- Label: `rulebase`
Label Description: Rulebase to which the static rules belong
Example: Rulebase-1
- Label: `operation`

Label Description: Operation performed on the rulebase

Example: install, remove

- Label: `event`

Label Description: Event associated with the operation performed on the rulebase

Example: attempted, success, failure

- Label: `smf_current_procedure`

Label Description: Current procedure associated with the operation performed on the pcc rule

Example: `pdn_sess_create`, `pdu_sess_create`, `smf_initiated_pdn_detach`, `disc_pdurel_smf_init_release`, `pcf_req_pdu_sess_mod`, `pcf_req_ded_brr_mod`, `enb_to_untrusted_wifi_handover`, `untrusted_wifi_to_enb_handover`, `nr_to_untrusted_wifi_handover`, `utn3gpp_to_5g_handover`, `xn_handover`, `n26_4g_to_5g_handover`, `pdn_5g_4g_handover`, `n26_4g_to_5g_im_mobility`

Policy control total flow statistics Category

policy_pdu_flows_total

Description: QoS flow total statistics

Sample Query: `'sum (policy_pdu_flows_total{flow_type="gbr"}) by (qos_5qi, arp)'`

Labels:

- Label: `operation`

Label Description: Operation performed on the QoS flow

Example: install, modify, remove

- Label: `event`

Label Description: Event associated with the operation performed on QoS flow

Example: attempted, success, failure, abort

- Label: `rat_type`

Label Description: RAT type on which the flow is created

Example: nr, WLAN, EUTRA

- Label: `ssc_mode`

Label Description: SSC mode for the session which created the QoS flow

Example: one, two, three

- Label: `pdn_type`

Label Description: PDN type of the session which created the QoS flow

Example: v4, v6, v4v6

- Label: `dnn`

Label Description: DNN for which the flow is created

Example: cisco.com

- Label: `flow_type`

Label Description: Flow type for the QoS flow

Example: `gbr`, `non_gbr`

- Label: `init_or_ho`

Label Description: Flow operation phase

Example: `initial`, `ho`

- Label: `qos_5qi`

Label Description: 5Qi applicable for the QoS flow

Example: 1, 2, 5

- Label: `arp`

Label Description: Priority level of ARP applicable for the QoS flow

Example: 10, 20

Radius Authentication Message Stats Category

`radius_authentication_message_stats`

Description: Stats for Radius Authentication messages

Sample Query:

```
'radius_authentication_message_stats{radius_auth_algorithm="radius_auth_algorithm_pap}'
```

Labels:

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `radius_auth_algorithm`

Label Description: Radius Authentication Algorithm used

Example: `radius_auth_algorithm_pap`, `radius_auth_algorithm_chap`, `radius_auth_algorithm_mschap`, `radius_auth_algorithm_default`

- Label: `status`

Label Description: Radius Auth message status

Example: `attempted`, `success`, `encode_failed`, `decode_failed`, `failed`

- Label: `reason`

Label Description: The reason associated with failure

Example: `timeout`, `parse_error`, `invalid_code`, `invalid_pco`, `invalid_apco`, `invalid_epco`, `write_error`

- Label: `rat_type`

Label Description: Type of the radio access associated with the request

Example: EUTRA, NR, WLAN, `rat_type_unknown`

Radius Message stats Category

smf_radius_message_stats

Description: Stats for Radius interface messages

Sample Query: `'smf_radius_message_stats{message_type="radius_access_request"}'`

Labels:

- Label: `direction`

Label Description: Direction indicates about the message going out or coming in

Example: inbound, outbound

- Label: `message_type`

Label Description: Radius Message Type

Example: `radius_access_request`, `radius_access_accept`

- Label: `radius_avp_type`

Label Description: Radius AVP Type

Example: `radius_avp_pap_username`, `radius_avp_pap_user_password`, `radius_avp_chap_challenge`, `radius_avp_chap_response`, `radius_avp_mschap_challenge`, `radius_avp_mschap_response`, `radius_avp_idle_timeout`, `radius_avp_session_timeout`

- Label: `rat_type`

Label Description: Type of the radio access associated with the request

Example: EUTRA, NR, WLAN, `rat_type_unknown`

SLA Transaction Category

smf_sla_transaction_stats

Description: Transaction SLA stats

Sample Query: `sum(smf_sla_transaction_stats) by (smf_sla_transaction_stats,smf_proc_type,status, message_type)`

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `status`

Label Description: gives status of the procedure

Example: Queued, Running, Aborted, Suspended, Invalid, Cleanedup, RequireSuspend, RequireCleanup, RequireAbort, Unknown

- Label: `message_type`

Label Description: gives the message type received during sla transaction

Example: IntSelfTxnSla

SMF ALWAYS ON PDU SESSION Category

smf_always_on_session_stats

Description: Always On Pdu Session Statistics

Sample Query: `'smf_always_on_session_stats{status="pdusetup_req_alwayson_requested"}'`

Labels:

- Label: `status`

Label Description: always on status statistics

Example: `pdusetup_req_alwayson_requested`, `pdusetup_acc_alwayson_allowed`, `pdusetup_acc_alwayson_not_allowed`, `pdumod_req_alwayson_requested`, `pdumod_cmd_alwayson_allowed`, `pdumod_cmd_alwayson_not_allowed`, `pdumod_cmd_nw_init_alwayson_allowed`, `pdu_utwifit_to_nr_alwayson_requested`, `pdu_utwifit_to_nr_alwayson_allowed`, `pdu_utwifit_to_nr_alwayson_not_allowed`

- Label: `rat_type`

Label Description: Type of the radio access associated with the request

Example: EUTRA, NR, WLAN, VIRTUAL, `rat_type_unknown`

- Label: `pdu_type`

Label Description: pdu connection type

Example: ipv4, ipv6, ipv4v6, unknown

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `ssc_mode`

Label Description: Type of ssc mode associated with the request

Example: `ssc_mode_1`, `ssc_mode_2`, `ssc_mode_3`, `ssc_mode_unknown`

SMF Charging Descriptor Delete Stats Category

`smf_chrg_desc_del_stats`

Description: The current count of charging descriptors deleted because of all associate Rule Ids are deleted

Sample Query: `'smf_chrg_desc_del_stats{rating_group="10"}'`

Labels:

- Label: `charging_id`
Label Description: Charging Descriptor Identifier
Example: Any string
- Label: `rating_group`
Label Description: Rating Group for which charging descriptors is dropped
Example: Any string
- Label: `configured`
Label Description: Configured signifies if a Rule Id is configured or is dynamic
Example: true, false
- Label: `reason`
Label Description: Reason for the charging descriptor delete
Example: Error string value

SMF Charging Descriptor Drop Stats Category

`smf_chrg_desc_drop_stats`

Description: The current count of charging descriptors dropped due to validation error on Rule Id

Sample Query: `'smf_chrg_desc_drop_stats{rating_group="10"}'`

Labels:

- Label: `rating_group`
Label Description: Rating Group for which charging descriptors is dropped
Example: Any string
- Label: `service_identifier`
Label Description: Service Identifier for which charging descriptors is dropped
Example: Any string
- Label: `action`
Label Description: Action with respect to Rule Id
Example: add, mod, del

- Label: `configured`
Label Description: Configured signifies if Rule Id is configured or is dynamic
Example: `true, false`
- Label: `reason`
Label Description: Reason for the charging descriptor drop
Example: Error string value

SMF Charging Failure Handling Stats Category

chf_failure_handling_stats

Description: Statistics for application error received from CHF

Sample Query: `'chf_failure_handling_stats{appl_err_code="HTTP_STATUS_CODE_403_FORBIDDEN"}'`

Labels:

- Label: `http2_err_code`
Label Description: HTTP2 error code received from CHF
Example: `HTTP_STATUS_CODE_403_FORBIDDEN`
- Label: `appl_err_code`
Label Description: Application error code received from CHF
Example: `END_USER_REQUEST_REJECTED, QUOTA_LIMIT_REACHED, CHARGING_FAILED, USER_UNKNOWN, END_USER_REQUEST_DENIED, QUOTA_LIMIT_REACHED, CHARGING_NOT_APPLICABLE`
- Label: `fh_action`
Label Description: Action taken on failure from CHF
Example: `Terminate, Drop Traffic, Disable Charging`
- Label: `fh_exchg_type`
Label Description: CHF Exchange in which failure occurred
Example: `update, initial`
- Label: `disposition`
Label Description: SMF action on failure
Example: `disable-charging, drop-traffic, terminate, convert-offline`
- Label: `procedure_type`
Label Description: The procedure type associated with an call flow procedure
Example: `pdu_sess_create, ue_req_pdu_sess_mod, smf_req_pdu_sess_mod, pcf_req_pdu_sess_mod, udm_req_pdu_sess_mod, gnb_req_pdu_sess_mod, ue_req_pdu_sess_rel, smf_req_pdu_sess_rel, pcf_req_pdu_sess_rel, amf_req_pdu_sess_rel, udm_req_pdu_sess_rel, gnb_req_pdu_sess_rel, chf_req_pdu_sess_rel, admin_req_pdu_sess_rel, ue_req_active_to_idle, ue_req_idle_to_active,`

nw_req_service_active, upf_notify_downlink_data,
 xn_path_switch, pdn_sess_create, pdn_5g_4g_handover, pcf_req_ded_brr_create, pcf_req_ded_brr_delete,
 pcf_req_ded_brr_mod, n2_handover, xn_handover, n26_4g_to_5g_handover, n26_4g_to_5g_im_mobility,
 pdu_im, pdn_sess_create, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod,
 pcf_initiated_pdn_detach, smf_initiated_pdn_detach, upf_initiated_pdn_detach

SMF Charging Message Stats Category

chf_message_stats

Description: Charging Message Statistics

Sample Query: 'chf_message_stats{procedure_type="charging_initial"}'

Labels:

- Label: `procedure_type`

Label Description: Charging message type

Example: `charging_initial`, `charging_update`, `charging_terminate`

- Label: `dnn`

Label Description: DNN for which the flow is created

Example: `cisco.com`

- Label: `status`

Label Description: Status of OOO usage report processing

Example: `attempted`, `success`, `timeout`

- Label: `rat_type`

Label Description: RAT type on which the flow is created

Example: `EUTRA`, `NR`, `WLAN`, `VIRTUAL`, `rat_type_unknown`

- Label: `smf_current_procedure`

Label Description: The procedure type associated with an call flow procedure

Example: `pdu_sess_create`, `ue_req_pdu_sess_mod`, `smf_req_pdu_sess_mod`, `pcf_req_pdu_sess_mod`,
`udm_req_pdu_sess_mod`, `gnb_req_pdu_sess_mod`, `ue_req_pdu_sess_rel`, `smf_req_pdu_sess_rel`,
`pcf_req_pdu_sess_rel`, `amf_req_pdu_sess_rel`, `udm_req_pdu_sess_rel`, `gnb_req_pdu_sess_rel`,
`chf_req_pdu_sess_rel`, `admin_req_pdu_sess_rel`, `ue_req_active_to_idle`, `ue_req_idle_to_active`,
`nw_req_service_active`, `upf_notify_downlink_data`,
`xn_path_switch`, `pdn_sess_create`, `pdn_5g_4g_handover`, `pcf_req_ded_brr_create`, `pcf_req_ded_brr_delete`,
`pcf_req_ded_brr_mod`, `n2_handover`, `xn_handover`, `n26_4g_to_5g_handover`, `n26_4g_to_5g_im_mobility`,
`pdu_im`, `pdn_sess_create`, `pcf_req_ded_brr_create`, `pcf_req_ded_brr_delete`, `pcf_req_ded_brr_mod`,
`pcf_initiated_pdn_detach`, `smf_initiated_pdn_detach`, `upf_initiated_pdn_detach`

SMF Charging OOO Usage Report Stats Category

smf_ooo_usage_report

Description: The current count for OOO usage report

Sample Query: 'smf_ooo_usage_report{procedure_type="pdu_sess_create"}'

Labels:

- Label: `procedure_type`

Label Description: The procedure type associated with an call flow procedure

Example: pdu_sess_create, ue_req_pdu_sess_mod, smf_req_pdu_sess_mod, pcf_req_pdu_sess_mod, udm_req_pdu_sess_mod, gnb_req_pdu_sess_mod, ue_req_pdu_sess_rel, smf_req_pdu_sess_rel, pcf_req_pdu_sess_rel, amf_req_pdu_sess_rel, udm_req_pdu_sess_rel, gnb_req_pdu_sess_rel, chf_req_pdu_sess_rel, admin_req_pdu_sess_rel, ue_req_active_to_idle, ue_req_idle_to_active, nw_req_service_active, upf_notify_downlink_data, xn_path_switch, pdn_sess_create, pdn_5g_4g_handover, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, n2_handover, xn_handover, n26_4g_to_5g_handover, n26_4g_to_5g_im_mobility, pdu_im, pdn_sess_create, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, pcf_initiated_pdn_detach, smf_initiated_pdn_detach, upf_initiated_pdn_detach

- Label: `dnn`

Label Description: DNN for which the flow is created

Example: cisco.com

- Label: `status`

Label Description: Status of OOO usage report processing

Example: attempted, success, timeout

SMF Charging PFCP usage Report Stats Category

smf_pfcp_usage_report_stats

Description: The current count of PFCP usage reports towards CHF

Sample Query: 'smf_pfcp_usage_report_stats{usage_report_type="async"}'

Labels:

- Label: `usage_report_type`

Label Description: Synchronus usage report or Asynchronous usage report

Example: async, sync

- Label: `status`

Label Description: Usage report status

Example: recieved, dropped, ignored, processed

- Label: `procedure_type`

Label Description: The procedure type associated with an call flow procedure

Example: pdu_sess_create, ue_req_pdu_sess_mod, smf_req_pdu_sess_mod, pcf_req_pdu_sess_mod, udm_req_pdu_sess_mod, gnb_req_pdu_sess_mod, ue_req_pdu_sess_rel, smf_req_pdu_sess_rel, pcf_req_pdu_sess_rel, amf_req_pdu_sess_rel, udm_req_pdu_sess_rel, gnb_req_pdu_sess_rel, chf_req_pdu_sess_rel, admin_req_pdu_sess_rel, ue_req_active_to_idle, ue_req_idle_to_active, nw_req_service_active, upf_notify_downlink_data, xn_path_switch, pdn_sess_create, pdn_5g_4g_handover, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, n2_handover, xn_handover, n26_4g_to_5g_handover, n26_4g_to_5g_im_mobility, pdu_im, pdn_sess_create, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, pcf_initiated_pdn_detach, smf_initiated_pdn_detach, upf_initiated_pdn_detach

- Label: usage_report_discard_reason

Label Description: Reason for usage report rejection

Example: uuc_endc_cond_not_met, charg_parm_not_found, start_of_traffic_rcvd, ignore_rule_base_urr, no_valid_trgr_present, ignore_immd_trgr, urr_not_present, no_term_and_drop_traffic, onlinertp_false_or_drop_traffic, mandatory_ie_incorrect, session_ctxt_not_found, radius_accounting, radius_accounting_not_enabled, urr_or_radius_accounting_missing

SMF Charging Quota Event Stats Category

chf_quota_event_stats

Description: The current count for quota event received from CHF

Sample Query: 'chf_quota_event_stats{quota_type="initial"}'

Labels:

- Label: rating_group

Label Description: Rating group for which quota is received from CHF

Example: Any string

- Label: quota_type

Label Description: Quota type as received from CHF

Example: initial, update, initial_final, update_final, fail

- Label: quota_method

Label Description: Quota method received from CHF

Example: time, volume, time_volume

- Label: quota_status

Label Description: Result for the quota received from CHF

Example: SUCCESS, END_USER_SERVICE_DENIED, QUOTA_MANAGEMENT_NOT_APPLICABLE, QUOTA_LIMIT_REACHED, END_USER_SERVICE_REJECTED, RATING_FAILED

- Label: quota_fail_action

Label Description: Action on quota failure

Example: No Action , Disable charging, Drop Traffic, Offline Converted

SMF Charging Radius Accounting Message Stats Category

radius_accounting_message_stats

Description: SMF Radius accounting message stats

Sample Query: 'radius_accounting_message_stats(procedure_type="radius_initial")'

Labels:

- Label: `procedure_type`
Label Description: Charging Radius message type
Example: radius_initial, radius_update, radius_terminate
- Label: `dnn`
Label Description: DNN for which the flow is created
Example: cisco.com
- Label: `status`
Label Description: Status of Radius charging message processing
Example: attempted, success, failures
- Label: `reason`
Label Description: Reason for Radius message failure
Example: error, reject, timeout, invalid_arg
- Label: `rat_type`
Label Description: RAT type on which the flow is created
Example: EUTRA, NR, WLAN, VIRTUAL, rat_type_unknown

SMF Charging Session Limit Dynamic Stats Category

chf_sess_limit_dynamic_stats

Description: SMF Charging Session Limit stats

Sample Query:

'chf_sess_limit_dynamic_stats(chf_sess_limit_dyn_reason="chf_sess_limit_dyn_del_all_trig_disabled")'

Labels:

- Label: `chf_sess_limit_dyn_reason`
Label Description: Reason for Charging session limit stats

Example: `chf_sess_limit_dyn_del_all_trig_disabled`, `chf_sess_limit_dyn_del_vol_time_nil`,
`chf_sess_limit_dyn_add_in_cdru`

SMF Charging Usage Report Stats Category

`chf_usage_report_stats`

Description: The current count for usage reports towards CHF

Sample Query: `'chf_usage_report_stats{charging_method="offline"}'`

Labels:

- Label: `rating_group`

Label Description: Rating Group for which usage is being reported

Example: Any string

- Label: `service_identifier`

Label Description: Service Identifier for which usage is being reported

Example: Any string

- Label: `charging_method`

Label Description: Metering method for the PDU Session

Example: `online`, `offline`, `online_offline`

- Label: `charging_trigger_type`

Label Description: Trigger for usage report

Example: `QUOTA_THRESHOLD`, `QHT`, `FINAL`, `QUOTA_EXHAUSTED`, `VALIDITY_TIME`,
`OTHER_QUOTA_TYPE`, `FORCED_REAUTHORISATION`, `UNIT_COUNT_INACTIVITY_TIMER`,
`ABNORMAL_RELEASE`, `QOS_CHANGE`, `VOLUME_LIMIT`, `TIME_LIMIT`, `EVENT_LIMIT`,
`PLMN_CHANGE`, `USER_LOCATION_CHANGE`, `RAT_CHANGE`, `UE_TIMEZONE_CHANGE`,
`TARIFF_TIME_CHANGE`, `MAX_NUMBER_OF_CHANGES_IN_CHARGING_CONDITIONS`,
`MANAGEMENT_INTERVENTION`,
`CHANGE_OF_UE_PRESENCE_IN_PRESENCE_REPORTING_AREA`,
`CHANGE_OF_3GPP_PS_DATA_OFF_STATUS`, `SERVING_NODE_CHANGE`, `REMOVAL_OF_UPF`,
`ADDITION_OF_UPF`, `START_OF_SERVICE_DATA_FLOW`, `AMBR_CHANGE`

- Label: `procedure_type`

Label Description: The procedure type associated with an call flow procedure

Example: `pdu_sess_create`, `ue_req_pdu_sess_mod`, `smf_req_pdu_sess_mod`, `pcf_req_pdu_sess_mod`,
`udm_req_pdu_sess_mod`, `gnb_req_pdu_sess_mod`, `ue_req_pdu_sess_rel`, `smf_req_pdu_sess_rel`,
`pcf_req_pdu_sess_rel`, `amf_req_pdu_sess_rel`, `udm_req_pdu_sess_rel`, `gnb_req_pdu_sess_rel`,
`chf_req_pdu_sess_rel`, `admin_req_pdu_sess_rel`, `ue_req_active_to_idle`, `ue_req_idle_to_active`,
`nw_req_service_active`, `upf_notify_downlink_data`,
`xn_path_switch`, `pdn_sess_create`, `pdn_5g_4g_handover`, `pcf_req_ded_brr_create`, `pcf_req_ded_brr_delete`,
`pcf_req_ded_brr_mod`, `n2_handover`, `xn_handover`, `n26_4g_to_5g_handover`, `n26_4g_to_5g_im_mobility`,
`pdu_im`, `pdn_sess_create`, `pcf_req_ded_brr_create`, `pcf_req_ded_brr_delete`, `pcf_req_ded_brr_mod`,
`pcf_initiated_pdn_detach`, `smf_initiated_pdn_detach`, `upf_initiated_pdn_detach`

SMF Charging Zero Usage Report Stats Category

chf_zero_usage_report_stats

Description: The current count for usage reports dropped due to zero usage

Sample Query: 'chf_zero_usage_report_stats{measurement_type="volume"}'

Labels:

- Label: measurement_type

Label Description: Measurement type

Example: volume, duration, duration-volume

- Label: charging_trigger_type

Label Description: Trigger for usage report

Example: QUOTA_THRESHOLD, QHT, FINAL, QUOTA_EXHAUSTED, VALIDITY_TIME, OTHER_QUOTA_TYPE, FORCED_REAUTHORISATION, UNIT_COUNT_INACTIVITY_TIMER, ABNORMAL_RELEASE, QOS_CHANGE, VOLUME_LIMIT, TIME_LIMIT, EVENT_LIMIT, PLMN_CHANGE, USER_LOCATION_CHANGE, RAT_CHANGE, UE_TIMEZONE_CHANGE, TARIFF_TIME_CHANGE, MAX_NUMBER_OF_CHANGES_IN_CHARGING_CONDITIONS, MANAGEMENT_INTERVENTION, CHANGE_OF_UE_PRESENCE_IN_PRESENCE_REPORTING_AREA, CHANGE_OF_3GPP_PS_DATA_OFF_STATUS, SERVING_NODE_CHANGE, REMOVAL_OF_UPF, ADDITION_OF_UPF, START_OF_SERVICE_DATA_FLOW, AMBR_CHANGE

SMF DB Marshal Category

smf_db_marshall_stats

Description: SMF DB marshal stats

Sample Query: sum(smf_db_marshall_stats) by (module)

Labels:

- Label: module

Label Description: module type counter

Example: policy, charging, upserv, access, generic

SMF Data Consistency Check Category

smf_datacheck_stats

Description: Total number of sessions checked for consistency

Sample Query: 'smf_datacheck_stats{rat_type="NR", status="failed"}'

Labels:

- Label: `procedure_type`
Label Description: Procedure Name
Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated
- Label: `rat_type`
Label Description: Type of the radio access associated
Example: EUTRA, NR, WLAN, VIRTUAL, `rat_type_unknown`
- Label: `pdu_type`
Label Description: Type of PDU session
Example: `ipv4`, `ipv6`, `ipv4v6`, `unknown`
- Label: `status`
Label Description: Procedure status after data consistency check
Example: `success`, `failed`
- Label: `reason`
Label Description: Failure reason of data inconsistency
Example: `invalid_n4_data_in_txn_start`, `invalid_n4_data_in_txn_end`, `invalid_n7_data_in_txn_start`, `invalid_n7_data_in_txn_end`, `invalid_n40_data_in_txn_start`, `invalid_n40_data_in_txn_end`

SMF Disconnect stats Category

`smf_disconnect_stats`

Description: SMF Disconnect stats counters

Sample Query: `'smf_disconnect_stats{reason="disc_pdurel_amf_init_detach"}'`

Labels:

- Label: `rat_type`
Label Description: RAT Type of the Session
Example: EUTRA, NR, WLAN, `rat_type_unknown`
- Label: `reason`
Label Description: The reason associated with an call disconnect
Example: `disc_pdusetup_create_over_create`, `disc_pdusetup_release_over_create`, `disc_pdusetup_admin_clear`, `disc_pdusetup_n1_decode_failure`, `disc_pdusetup_n1_content_not_found`, `disc_pdusetup_sess_abs_timeout`, `disc_pdusetup_sess_idle_timeout`, `disc_pdusetup_sess_cp_idle_timeout`, `disc_pdusetup_sess_default_flow_only_timeout`, `disc_pdusetup_ssc_mode_not_supported`, `disc_pdusetup_ssc_mode_denied`, `disc_pdusetup_identity_conflict`, `disc_pdusetup_pdutype_unsupported`, `disc_pdusetup_pdutype_denied`, `disc_pdusetup_snsai_denied`, `disc_pdusetup_dnn_denied`, `disc_pdusetup_iwf_denied`, `disc_pdusetup_subscription_denied`, `disc_pdusetup_dnn_not_supported`, `disc_pdusetup_dnn_not_supported_in_slice`, `disc_pdusetup_network_failure`,

disc_pdusetup_pdu_sess_does_not_exist, disc_init_chg_data_err, disc_pdusetup_ip_alloc_failed,
 disc_pdusetup_static_ip_alloc_failed, disc_pdusetup_pdu_fetch_failure, disc_pdusetup_udm_reg_failed,
 disc_pdusetup_udm_sub_fetch_failure, disc_pdusetup_udm_sub_fetch_resp_failed,
 disc_pdusetup_udm_sub_notify_failed, disc_pdusetup_upf_setup_cause_not_accepted,
 disc_pdusetup_secondary_auth_failed, disc_pdusetup_secondary_auth_resp_failed,
 disc_pdusetup_sm_cxt_invalid, disc_pdusetup_sm_cxt_invalid_ie, disc_pdusetup_sm_cxt_sess_id_err,
 disc_pdusetup_sm_cxt_invalid_json, disc_pdusetup_sm_cxt_n1_process_failed,
 disc_pdusetup_sm_cxt_man_param_missing, disc_pdusetup_pcf_create_exchg_failure,
 disc_pdusetup_pcf_create_rsp_failure, disc_pdusetup_rm_exchg_failure, disc_pdusetup_rm_rsp_failure,
 disc_pdusetup_pcf_update_exchg_failure, disc_pdusetup_pcf_update_rsp_failure,
 disc_chf_data_exchg_failure, disc_chf_data_rsp_failure, disc_pdusetup_upf_setup_exchg_failure,
 disc_pdusetup_upf_setup_rsp_failure, disc_pdusetup_n1n2_transfer_exchg_failure,
 disc_pdusetup_n1n2_transfer_rsp_failure, disc_pdusetup_n2_setup_failed, disc_pdusetup_ue_init_release,
 disc_pdusetup_amf_assign_ebi_failure, disc_pdusetup_upf_modify_exchg_failure,
 disc_pdusetup_upf_modify_rsp_failure, disc_pdusetup_upf_modify_failed,
 disc_pdusetup_upf_serv_data_nil, disc_pdusetup_upf_dl_tunnel_info_not_found,
 disc_pdusetup_upf_tunnel_id_not_found, disc_pdusetup_upf_mod_gnb_tun_params_failed,
 disc_pdusetup_upf_mod_rsra_tun_params_failed, disc_pdusetup_upf_mod_tun_param_tos-failed,
 disc_pdusetup_smf_mop_offline, disc_pdusetup_sm_context_nssai_not_supported,
 disc_pdusetup_sm_context_network_failure, disc_pdusetup_lbo_rejected,
 disc_pdusetup_home_route_not_supported, disc_pdusetup_internal_error,
 disc_pdusetup_plmn_not_supported, disc_pdurel_amf_sends_ue_not_found, disc_pdusetup_dnn_missing,
 disc_pdusetup_udm_dnn_missing, disc_pdusetup_resource_mgr_rsp_failed,
 disc_pdusetup_apply_wps_failed, disc_pdurel_ue_init_release, disc_pdurel_amf_init_release,
 disc_pdurel_amf_init_release_404, disc_pdurel_amf_init_release_mod_req,
 disc_pdurel_pcf_reconciliation, disc_rel_chf_err, disc_pdurel_pcf_init_release,
 disc_pdurel_udm_init_release, disc_pdurel_gnb_init_release, disc_pdurel_smf_init_release,
 disc_pdurel_upf_init_association_release, disc_pdurel_radius_init_release,
 disc_pdurel_upf_init_path_failure, disc_pdurel_upf_recovered, disc_pdurel_config_change,
 disc_db_conflict_release, disc_pdurel_pcf_reconciliation, disc_n2ho_n4_modify_failed, disc_n2ho_failure,
 disc_n2ho_guard_timer_expiry, disc_n2ho_idft_timer_expiry, disc_n26_4g_5g_ho_n4_modify_failed,
 disc_n26_4g_5g_im_mobility_n4_modify_failed, disc_pdumodify_context_not_found,
 disc_pdumodify_invalid_pdu_sess_identity, disc_pdurelease_invalid_pdu_sess_identity,
 disc_pduim_context_not_found, disc_n26_4g_5g_ho, disc_n26_5g_4g_ho,
 disc_n26_5g_4g_ho_timer_expired_post_exec, disc_n26_4g_5g_ho_udm_reg_failed,
 disc_n26_5g_4g_ho_mbr_failed, disc_pdusetup_upf_rule_creation_mod_failure,
 disc_non3gpp_utn_5g_ho, disc_5gtonon3gpp_utn_ho, disc_4g_non3gpp_utn_ho,
 disc_non3gpp_utn_4g_ho, disc_enb_wifi_ho_failed, disc_utn3gpp_5g_ho_failed,
 disc_sess_report_srsr_pdu_sess_rel, disc_pdn_ue_init_release, disc_pdn_mme_init_release,
 disc_pdn_chf_reconciliation, disc_pdn_pcf_reconciliation, disc_pdn_pcf_init_release,
 disc_pdn_pcf_fallback, disc_pdn_udm_init_release, disc_pdn_chf_init_release, disc_pdn_upf_init_release,
 disc_admin_init_release, disc_sess_time_exp_release, disc_sess_cp_idle_time_exp_release,
 disc_session_recreate, disc_gtpc_peer_pathfail, disc_gtpc_peer_restart, disc_upf_init_path_failure,
 disc_transaction_timedout, disc_upf_recovered, disc_sgw_ctx_failure, disc_pdn_internal_release,
 disc_reason_unknown,, disc_pdnsetup_iwk_5gs_flag_false, disc_pdnsetup_pduid_init_failed,
 disc_pdnsetup_csr_invalid, disc_pdnsetup_udm_reg_failed, disc_pdnsetup_udm_reg_req_create_failed,
 disc_pdnsetup_udm_rpc_failed, disc_pdnsetup_udm_dnn_missing, disc_pdnsetup_udm_reg_resp_failed,
 disc_pdnsetup_udm_sub_fetch_failed, disc_pdnsetup_udm_sub_fetch_resp_failed,
 disc_pdnsetup_udm_sub_notify_failed, disc_pdnsetup_udm_sub_notify_resp_failed,
 disc_pdnsetup_udm_sgw_u_teid_missing, disc_pdnsetup_secondary_auth_failed,
 disc_pdnsetup_secondary_auth_resp_failed, disc_pdnsetup_pcf_create_failed,

disc_pdnsetup_pcf_create_resp_failed, disc_pdnsetup_pcf_update_req_create_failed,
 disc_pdnsetup_pcf_update_exchg_failed, disc_pdnsetup_pcf_update_resp_failed,
 disc_pdnsetup_resource_mgr_exchg_failed, disc_pdnsetup_resource_mgr_resp_failed,
 disc_pdnsetup_upf_sess_setup_exchg_failed, disc_pdnsetup_upf_sess_setup_resp_failed,
 disc_pdnsetup_upf_sgw_tunnelid_error, disc_pdnsetup_upf_local_fteid_error,
 disc_pdnsetup_ssc_mode_denied, disc_pdnsetup_pdu_type_denied,
 disc_pdnsetup_pdu_type_not_supported, disc_pdnsetup_ssc_mode_not_supported,
 disc_pdnsetup_subscription_denied, disc_pdnsetup_smf_mop_offline, disc_pdnsetup_plmn_not_supported,
 disc_pdnsetup_non5gcapableue_not_allowed, disc_pdnsetup_default_flow_only_timeout,
 disc_affinity_add_error, disc_pdnsetup_sgwctx_brr_data_invalid, disc_ue_int_n1_5g_sm_status,
 disc_pdu_ctx_not_found, disc_internal_affinity_add_error, upf_sess_report_gter_pdn_sess_rel,
 upf_sess_report_srir_pdn_sess_rel, upf_sess_report_spter_pdn_sess_rel,
 upf_sess_report_srsr_pdn_sess_rel, upf_sess_report_erir_pdn_sess_rel, upf_sess_report_upir_pdn_sess_rel,
 disc_sess_report_srsr_pdn_sess_rel

SMF EBI stats Category

smf_ebi_stats

Description: Stats for the EBI Assignment

Sample Query: 'smf_ebi_stats(status="success")'

Labels:

- Label: procedure_type

Label Description: The procedure type associated with an call flow procedure

Example: pdusetup_ebi_assignment

- Label: status

Label Description: status of EBI Assignment

Example: attempted, success, failures

SMF IPAM Address Events Current Counter Category

IPAM_address_allocations_current

Description: Current state of SMF IPAM Address allocations

Sample Query:

```
'IPAM_address_allocations_current(dnn="dnn1",servingArea="areal",nssai="sliced",pool="pl",allocationType="dynamic",addressType="IPv4",upf="up1")'
```

Labels:

- Label: dnn

Label Description: name of the dnn associated with the request

Example: Any string

- Label: servingArea

Label Description: name of the serving area associated with the request

Example: Any string

- Label: `nssai`

Label Description: name of the nssai associated with the request

Example: Any string

- Label: `pool`

Label Description: name of the pool associated with the request

Example: Any string

- Label: `allocationType`

Label Description: type of allocation associated with the request

Example: static/dynamic

- Label: `addressType`

Label Description: address type associated with the request

Example: IPv4/IPv6PD

- Label: `upf`

Label Description: upf identifier associated with the request

Example: Any string

SMF IPAM Address Events Total Counter Category

IPAM_address_events_total

Description: Total number of SMF IPAM Address events

Sample Query:

```
'IPAM_address_events_total{dn="dn1",servingArea="area1",nssai="slice1",pool="pl",eventType="Allocation",allocationType="dynamic",addressType="IPv4",upf="up1"}'
```

Labels:

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `servingArea`

Label Description: name of the serving area associated with the request

Example: Any string

- Label: `nssai`

Label Description: name of the nssai associated with the request

Example: Any string

- Label: `pool`
Label Description: name of the pool associated with the request
Example: Any string
- Label: `eventType`
Label Description: type of event associated with the request
Example: Allocation/Release
- Label: `allocationType`
Label Description: type of allocation associated with the request
Example: static/dynamic
- Label: `addressType`
Label Description: address type associated with the request
Example: IPv4/IPv6PD
- Label: `upf`
Label Description: upf identifier associated with the request
Example: Any string

SMF IPAM Chunk Events Current Counter Category

IPAM_chunk_allocations_current

Description: Current state of SMF IPAM Address Chunk allocations

Sample Query:

```
'IPAM_chunk_allocations_current{dnn="dnn1",servingArea="areal",nssai="slice1",pool="p1",addressType="IPv4",upf="dp1"}'
```

Labels:

- Label: `dnn`
Label Description: name of the dnn associated with the request
Example: Any string
- Label: `servingArea`
Label Description: name of the serving Area associated with the request
Example: Any string
- Label: `nssai`
Label Description: name of the nssai associated with the request
Example: Any string
- Label: `pool`
Label Description: name of the pool associated with the request

Example: Any string

- Label: `addressType`

Label Description: address type associated with the request

Example: IPv4/IPv6PD

- Label: `upf`

Label Description: upf identifier associated with the request

Example: Any string

SMF IPAM Chunk Events Total Counter Category

IPAM_chunk_events_total

Description: Total number of SMF IPAM Address Chunk events

Sample Query:

```
'IPAM_chunk_events_total(dnn="dnn1",servingArea="areal",nssai="slice1",pool="pl",eventType="Allocation",addressType="IPv4",upf="dpl)'
```

Labels:

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `servingArea`

Label Description: name of the serving area associated with the request

Example: Any string

- Label: `nssai`

Label Description: name of the nssai associated with the request

Example: Any string

- Label: `pool`

Label Description: name of the pool associated with the request

Example: Any string

- Label: `eventType`

Label Description: type of event associated with the request

Example: Allocation/Release

- Label: `addressType`

Label Description: address type associated with the request

Example: IPv4/IPv6PD

- Label: `upf`

Label Description: upf identifier associated with the request

Example: Any string

SMF N1 Message stats Category

smf_n1_message_stats

Description: Stats for N1 Messages

Sample Query: 'smf_n1_message_stats{procedure_type="pcf_req_pdu_sess_mod"}'

Labels:

- Label: `procedure_type`

Label Description: The procedure type associated with an call flow procedure

Example: pdu_sess_create, ue_req_pdu_sess_mod, smf_req_pdu_sess_mod, pcf_req_pdu_sess_mod, udm_req_pdu_sess_mod, gnb_req_pdu_sess_mod, ue_req_pdu_sess_rel, smf_req_pdu_sess_rel, pcf_req_pdu_sess_rel, amf_req_pdu_sess_rel, udm_req_pdu_sess_rel, gnb_req_pdu_sess_rel, chf_req_pdu_sess_rel, admin_req_pdu_sess_rel, ue_req_active_to_idle, ue_req_idle_to_active, nw_req_service_active, upf_notify_downlink_data, xn_path_switch, pdn_sess_create, pdn_5g_4g_handover, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, n2_handover, xn_handover, n26_4g_to_5g_handover, n26_4g_to_5g_im_mobility, pdu_im, pdn_sess_create, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, pcf_initiated_pdn_detach, smf_initiated_pdn_detach, upf_initiated_pdn_detach, smf_eps_fb

- Label: `direction`

Label Description: Direction of N1 message

Example: outbound, inbound

- Label: `message_type`

Label Description: The N1 message type

Example: pdu_session_establishment_reject, pdu_session_release_request, pdu_session_modification_command_reject, pdu_session_modification_reject, pdu_session_release_reject, 5g_sm_status_msg_release, 5g_sm_status_msg_no_action, 5g_sm_status_msg_invalid_pti

- Label: `n1_cause`

Label Description: N1 cause associated with the message

Example: OPERATOR_DETERMINED_BARRING, INSUFFICIENT_RESOURCES, MISSING_OR_UNKNOWN_DNN, UNKNOWN_PDU_SESSION_TYPE, USER_AUTHENTICATION_OR_AUTHORIZATION_FAILED, REQUEST_REJECTED_UNSPECIFIED, SERVICE_OPTION_NOT_SUPPORTED, REQUESTED_SERVICE_OPTION_NOT_SUBSCRIBED, SERVICE_OPTION_TEMPORARILY_OUT_OF_ORDER, PTI_ALREADY_IN_USE, REGULAR_DEACTIVATION, NETWORK_FAILURE, REACTIVATION_REQUESTED, SEMANTIC_ERROR_IN_THE_TFT_OPERATION, SYNTACTICAL_ERROR_IN_THE_TFT_OPERATION, INVALID_PDU_SESSION_IDENTITY, SEMANTIC_ERRORS_IN_PACKET_FILTER, SYNTACTICAL_ERROR_IN_PACKET_FILTER, OUT_OF_LADN_SERVICE_AREA, PTI_MISMATCH,

PDU_SESSION_TYPE_IPV4_ONLY_ALLOWED, PDU_SESSION_TYPE_IPV6_ONLY_ALLOWED,
 PDU_SESSION_DOES_NOT_EXIST,
 INSUFFICIENT_RESOURCES_FOR_SPECIFIC_SLICE_AND_DNN,
 NOT_SUPPORTED_SSC_MODE, INSUFFICIENT_RESOURCES_FOR_SPECIFIC_SLICE,
 MISSING_OR_UNKNOWN_DNN_IN_A_SLICE, INVALID_PTI_VALUE,
 MAXIMUM_DATA_RATE_PER_UE_FOR_USER_PLANE_INTEGRITY_PROTECTION_IS_TOO_LOW,
 SEMANTIC_ERROR_IN_THE_QOS_OPERATION,
 SYNTACTICAL_ERROR_IN_THE_QOS_OPERATION,
 INVALID_MAPPED_EPS_BEARER_IDENTITY, SEMANTICALLY_INCORRECT_MESSAGE,
 INVALID_MANDATORY_INFORMATION,
 MESSAGE_TYPE_NON_EXISTENT_OR_NOT_IMPLEMENTED,
 MESSAGE_TYPE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STATE,
 INFORMATION_ELEMENT_NON_EXISTENT_OR_NOT_IMPLEMENTED,
 CONDITIONAL_IE_ERROR, MESSAGE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STATE,
 PROTOCOL_ERROR_UNSPECIFIED

SMF N2 Message stats Category

smf_n2_message_stats

Description: Stats for N2 Messages

Sample Query: 'smf_n2_message_stats{procedure_type="pcf_req_pdu_sess_mod"}'

Labels:

- Label: procedure_type

Label Description: The procedure type associated with an call flow procedure

Example: pdu_sess_create, ue_req_pdu_sess_mod, smf_req_pdu_sess_mod, pcf_req_pdu_sess_mod,
 udm_req_pdu_sess_mod, gnb_req_pdu_sess_mod, ue_req_pdu_sess_rel, smf_req_pdu_sess_rel,
 pcf_req_pdu_sess_rel, amf_req_pdu_sess_rel, udm_req_pdu_sess_rel, gnb_req_pdu_sess_rel,
 chf_req_pdu_sess_rel, admin_req_pdu_sess_rel, ue_req_active_to_idle, ue_req_idle_to_active,
 nw_req_service_active, upf_notify_downlink_data,
 xn_path_switch, pdn_sess_create, pdn_5g_4g_handover, pcf_req_ded_brr_create, pcf_req_ded_brr_delete,
 pcf_req_ded_brr_mod, n2_handover, xn_handover, n26_4g_to_5g_handover, n26_4g_to_5g_im_mobility,
 pdu_im, pdn_sess_create, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod,
 pcf_initiated_pdn_detach, smf_initiated_pdn_detach, upf_initiated_pdn_detach, smf_eps_fb

- Label: direction

Label Description: Direction of N2 message

Example: outbound, inbound

- Label: n2_Ngap_ie_type

Label Description: The N2 Ngap IE type

Example: N2_PDU_SESSION_RESOURCE_RELEASE_COMMAND_TRANSFER,
 N2_PDU_SESSION_PATH_SWITCH_REQUEST_TRANSFER,
 N2_INVALID_OR_UNSUPPORTED_NGAP_IE_TYPE,
 N2_PDU_SESSION_PATH_SWITCH_REQUEST_SETUP_FAILED_TRANSFER,
 N2_PDU_SESSION_RESOURCE_SETUP_UNSUCCESS_TRANSFER,

N2_PDU_SESSION_RESOURCE_NOTIFY_RELEASED_TRANSFER,
 N2_PDU_SESSION_RESOURCE_MODIFY_UNSUCCESS_TRANSFER,
 N2_PDU_SESSION_HANDOVER_REQUEST_ACK_TRANSFER,
 N2_PDU_SESSION_HANDOVER_RESOURCE_ALLOC_UNSUCCESS_TRANSFER,
 N2_INVALID_OR_UNSUPPORTED_NGAP_TYPE,
 N2_PDU_SESSION_RESOURCE_SETUP_RESPONSE_TRANSFER

- Label: n2_cause_group

Label Description: The N2 Cause Group

Example: NgapCauseGroupEnum_RadioNetworkCause, NgapCauseGroupEnum_TransportLayerCause,
 NgapCauseGroupEnum_NASCause, NgapCauseGroupEnum_ProtocolCause,
 NgapCauseGroupEnum_MiscCause, NgapCauseGroupEnum_NgapCauseGroupDummy

- Label: n2_cause

Label Description: N2 cause associated with the message

Example: NgapCauseEnum_RadioNetwork_DummyEnum, NgapCauseEnum_RadioNetwork_Unspecified,
 NgapCauseEnum_RadioNetwork_TXnRELOCOverall_expiry,
 NgapCauseEnum_RadioNetwork_Successful_handover,
 NgapCauseEnum_RadioNetwork_Release_due_to_NG_RAN_generated_reason,
 NgapCauseEnum_RadioNetwork_Release_due_to_5GC_generated_reason,
 NgapCauseEnum_RadioNetwork_Handover_cancelled,
 NgapCauseEnum_RadioNetwork_Partial_handover,
 NgapCauseEnum_RadioNetwork_Handover_failure_in_target_5GC_NG_RAN_node_or_target_system,
 NgapCauseEnum_RadioNetwork_Handover_target_not_allowed,
 NgapCauseEnum_RadioNetwork_TNGRELOCOverall_expiry,
 NgapCauseEnum_RadioNetwork_TNGRELOCprep_expiry,
 NgapCauseEnum_RadioNetwork_Cell_not_available,
 NgapCauseEnum_RadioNetwork_Unknown_target_ID,
 NgapCauseEnum_RadioNetwork_No_radio_resources_available_in_target_cell,
 NgapCauseEnum_RadioNetwork_Unknown_local_UE_NGAP_ID,
 NgapCauseEnum_RadioNetwork_Inconsistent_remote_UE_NGAP_ID,
 NgapCauseEnum_RadioNetwork_Handover_desirable_for_radio_reasons,
 NgapCauseEnum_RadioNetwork_Time_critical_handover,
 NgapCauseEnum_RadioNetwork_Resource_optimisation_handover,
 NgapCauseEnum_RadioNetwork_Reduce_load_in_serving_cell,
 NgapCauseEnum_RadioNetwork_User_inactivity,
 NgapCauseEnum_RadioNetwork_Radio_connection_with_UE_lost,
 NgapCauseEnum_RadioNetwork_Radio_resources_not_available,
 NgapCauseEnum_RadioNetwork_Invalid_QoS_combination,
 NgapCauseEnum_RadioNetwork_Failure_in_the_radio_interface_procedure,
 NgapCauseEnum_RadioNetwork_Interaction_with_other_procedure,
 NgapCauseEnum_RadioNetwork_Unknown_PDU_Session_ID,
 NgapCauseEnum_RadioNetwork_Unknown_QoS_Flow_ID,
 NgapCauseEnum_RadioNetwork_Multiple_PDU_Session_ID_Instances,
 NgapCauseEnum_RadioNetwork_Multiple_QoS_Flow_ID_Instances,
 NgapCauseEnum_RadioNetwork_Encryption_and_or_integrity_protection_algorithms_not_supported,
 NgapCauseEnum_RadioNetwork_NG_intra_system_handover_triggered,
 NgapCauseEnum_RadioNetwork_NG_inter_system_handover_triggered,
 NgapCauseEnum_RadioNetwork_Xn_handover_triggered,
 NgapCauseEnum_RadioNetwork_Not_supported_5QI_value,

NgapCauseEnum_RadioNetwork_UE_context_transfer,
 NgapCauseEnum_RadioNetwork_IMS_voice_EPS_fallback_or_RAT_fallback_triggered,
 NgapCauseEnum_RadioNetwork_UP_integrity_protection_not_possible,
 NgapCauseEnum_RadioNetwork_UP_confidentiality_protection_not_possible,
 NgapCauseEnum_RadioNetwork_Slice_not_supported,
 NgapCauseEnum_RadioNetwork_UE_in_RRC_INACTIVE_state_not_reachable,
 NgapCauseEnum_RadioNetwork_Redirection,
 NgapCauseEnum_RadioNetwork_Resources_not_available_for_the_slice,
 NgapCauseEnum_RadioNetwork_UE_maximum_integrity_protected_data_rate_reason,
 NgapCauseEnum_RadioNetwork_Release_due_to_CN_detected_mobility,
 NgapCauseEnum_RadioNetwork_N26_Interface_Not_Available,
 NgapCauseEnum_RadioNetwork_Release_Due_To_Pre_Emption,
 NgapCauseEnum_Transport_resource_unavailable, NgapCauseEnum_Transport_Unspecified,
 NgapCauseEnum_Nas_Normal_release, NgapCauseEnum_Nas_Authentication_failure,
 NgapCauseEnum_Nas_Deregister, NgapCauseEnum_Nas_Nas_Unspecified,
 NgapCauseEnum_Protocol_Transfer_syntax_error,
 NgapCauseEnum_Protocol_Abstract_syntax_error_reject,
 NgapCauseEnum_Protocol_Abstract_syntax_error_ignore_and_notify,
 NgapCauseEnum_Protocol_Message_not_compatible_with_receiver_state,
 NgapCauseEnum_Protocol_Semantic_error,
 NgapCauseEnum_Protocol_Abstract_syntax_error_falsely_constructed_message,
 NgapCauseEnum_Protocol_Proto_Unspecified, NgapCauseEnum_Misc_Control_processing_overload,
 NgapCauseEnum_Misc_Not_enough_user_plane_processing_resources,
 NgapCauseEnum_Misc_Hardware_failure, NgapCauseEnum_Misc_O_M_intervention,
 NgapCauseEnum_Misc_Unknown_PLMN, NgapCauseEnum_Misc_Unspecified

- Label: n2_fail_reason

Label Description: N2 failure reason

Example: None, N2 Decode Failed, Invalid N2 Container, upfServData is Nil, DL TunnelInfo is Not Found, UPF Tunnel ID lookup Failed, UPF MOD GNB Tunnel Params Failed, UPF MOD RSRA Tunnel Params Failed, UPF MOD Apply WPS Failed, MOD Tunnel LI Params Failed, Qos Mod Info Failed, Missing N2 SM Info, PDU Context Not Found, Default QFI (1) present in failed QosFlowList, RSRA Tunnel Recreation Failed For HO, Update QER Rule Map Failed, Rollback N2 Failed, Invalid Cause N2 SM Info, Mandatory IE incorrect in N2 SM Info, Xn HO Tobe Switch Flag Is Not Set in SmContextUpdateData, Invalid QFI List in PathSwitchRequest, QoS Flow Accepted List not found in XnHO, at least one Qfi to be accepted, PDU Session is Not Established, Missing T-gNB DL UP TunnelInfo, Missing S-gNB DL UP TunnelInfo, Default QFI is present in the Failed QFI List, N4 Session Modification failed, SLA Timeout

SMF Node Manager stats Category

smf_service_node_mgr_stats

Description: Stats for SMF Node Manager

Sample Query: 'smf_service_node_mgr_stats{ip_req_type="ip-alloc"}'

Labels:

- Label: upf_ep_key

Label Description: UPF Endpoint Key

Example: IP String Value

- Label: `first_nodemgr_inst`

Label Description: First Nodemgr instance ID

Example: unsigned integer

- Label: `second_nodemgr_inst`

Label Description: Second Nodemgr instance ID

Example: unsigned integer

- Label: `error`

Label Description: Error in case of Node Mgr failure

Example: None, Both associated nodemgr instances are down, Second nodeMgr down and First NodeMgr responded with SmfRspFailure, Second nodeMgr down and First NodeMgr failed with IpcError, First NodeMgr responded with SmfRspFailure, First NodeMgr failed with IpcError, Second NodeMgr failed with IpcError, Second NodeMgr responded with SmfRspFailure

- Label: `retransmit`

Label Description: Is retransmit message

Example: true, false

- Label: `ip_req_type`

Label Description: Type of IP request

Example: ip-alloc, ip-dealloc, ip-static

- Label: `pdu_type`

Label Description: pdu connection type

Example: ipv4, ipv6, ipv4v6, unknown

SMF PCSCF Server Stats Category

smf_pcscf_server_stats

Description: Stats for SMF PCSCF Server

Sample Query: `'smf_pcscf_server_stats{PrimaryIPv4="1.2.3.4"}'`

Labels:

- Label: `PrimaryIPv4`

Label Description: Primary PCSCF IPV4 address

Example: 1.2.3.4

- Label: `SecondaryIPv4`

Label Description: Secondary PCSCF IPV4 address

Example: 1.2.3.4

- Label: `TertiaryIPv4`

Label Description: Tertiary PCSCF IPV4 address

Example: 1.2.3.4

- Label: `PrimaryIPv6`

Label Description: Primary PCSCF IPV6 address

Example: IPv6 IP

- Label: `SecondaryIPv6`

Label Description: Secondary PCSCF IPV6 address

Example: IPv6 IP

- Label: `TertiaryIPv6`

Label Description: Tertiary PCSCF IPV6 address

Example: IPv6 IP

- Label: `ResolvedFrom`

Label Description: Info used to resolve PCSCF Address

Example: DNS, LocalConfig

SMF PDU Status Category

smf_service_counters

Description: The current count of SMF pdu sessions

Sample Query: `'smf_service_counters{pdu_state="all_pdu"}'`

Labels:

- Label: `pdu_state`

Label Description: PDU session status indicated by N3 UPF tunnel status

Example: `all_pdu`, `idle`, `connected`

- Label: `rat_type`

Label Description: RAT Type of the Session

Example: `EUTRA`, `NR`, `WLAN`, `rat_type_unknown`

- Label: `dnn`

Label Description: Dnn configured in `dnn-policy`, also can have `virtual_dnn` if configured, separated by `#`

Example: `intershat`, `intershat#cisco.com`

- Label: `roaming_status`

Label Description: Roaming status of the subscriber session

Example: visitor-lbo, visitor-hr, roamer, homer, none

- Label: `ssc_mode`

Label Description: SSC Mode of the session

Example: `ssc_mode_1`, `ssc_mode_2`, `ssc_mode_3`, `ssc_mode_unknown`

- Label: `flow_type`

Label Description: Indicates whether it's total bearer or dedicated bearer

Example: `dedicated_bearer`, `total_bearer`

SMF Procedure Category

smf_service_stats

Description: SMF call flow procedure counters

Sample Query: `'smf_service_stats{procedure_type="pdu_sess_create"}'`

Labels:

- Label: `procedure_type`

Label Description: The procedure type associated with an call flow procedure

Example: `pdu_sess_create`, `ue_req_pdu_sess_mod`, `smf_req_pdu_sess_mod`, `pcf_req_pdu_sess_mod`, `udm_req_pdu_sess_mod`, `gnb_req_pdu_sess_mod`, `ue_req_pdu_sess_rel`, `smf_req_pdu_sess_rel`, `pcf_req_pdu_sess_rel`, `amf_req_pdu_sess_rel`, `udm_req_pdu_sess_rel`, `gnb_req_pdu_sess_rel`, `chf_req_pdu_sess_rel`, `admin_req_pdu_sess_rel`, `ue_req_active_to_idle`, `ue_req_idle_to_active`, `nw_req_service_active`, `upf_notify_downlink_data`, `xn_path_switch`, `pdn_sess_create`, `pdn_5g_4g_handover`, `pcf_req_ded_brr_create`, `pcf_req_ded_brr_delete`, `pcf_req_ded_brr_mod`, `n2_handover`, `xn_handover`, `n26_4g_to_5g_handover`, `n26_4g_to_5g_im_mobility`, `pdu_im`, `pdn_sess_create`, `pcf_req_ded_brr_create`, `pcf_req_ded_brr_delete`, `pcf_req_ded_brr_mod`, `pcf_initiated_pdn_detach`, `smf_initiated_pdn_detach`, `upf_initiated_pdn_detach`, `smf_eps_fb`, `misc_pdu_sess_rel`

- Label: `status`

Label Description: call flow procedure counter

Example: `attempted`, `success`, `failures`

- Label: `pdu_type`

Label Description: pdu connection type

Example: `ipv4`, `ipv6`, `ipv4v6`, `unknown`

- Label: `dnn`

Label Description: Dnn configured in `dnn-policy`, also can have `virtual_dnn` if configured, separated by `#`

Example: `intershat`, `intershat#cisco.com`

- Label: `reason`

Label Description: Reason for failure status. For success and attempted it will be Empty

Example: `proc_pdu_not_established, proc_pdu_ctx_not_found, n2ho_ie_validation_failed, n2ho_n4_ho_preparing_failed, n2ho_n4_ho_prepared_failed, n2ho_n4_ho_completed_failed, n2ho_ho_cancelled, n2ho_resource_alloc_unsuccess_transfer, n2ho_invalid_state, n2ho_preparation_unsuccess_transfer, n2ho_n1n2_transfer_failure, n2ho_dft_intra_amf, n2ho_dft_inter_amf, n2ho_idft_intra_amf, n2ho_idft_inter_amf, n2ho_default_flow_failed, n2ho_n2_decode_failiure, n2ho_chf_update_failure, n2ho_invalid_response, xnho_tobe_switched_flag_not_set, xnho_dl_tunnel_info_not_found, xnho_invalid_accepted_qfi_list, xnho_n4_modification_failed, xnho_n1n2_transfer_failure//NotUsedtoberemoved, xnho_n2_decode_failiure, xnho_pdu_state_error, n26ho_4g_5g_n1n2_transfer_failure, n26ho_4g_5g_invalid_state, n26ho_4g_5g_n4_failed_prepared_state, n26ho_4g_5g_resource_alloc_unsuccess_transfer, n26ho_4g_5g_timedout_in_post_exec_state, n26ho_4g_5g_n4_failed_completed_state, n26ho_4g_5g_handover_cancelled, n26ho_4g_5g_send_n4mod_failed_preparing_state, n26ho_4g_5g_n4mod_rsp_failed_preparing_state, n26ho_4g_5g_n4mod_rsp_timeout_preparing_state, n26ho_4g_5g_im_mobility_send_n4mod_failed, n26ho_4g_5g_im_mobility_n4mod_rsp_failed, n26ho_4g_5g_im_mobility_n4mod_rsp_timeout, n26ho_4g_5g_invalid_eps_pdn_connlist, n26ho_4g_5g_udm_reg_failed, n26ho_4g_5g_dft, n26ho_4g_5g_idft, n26ho_5g_4g_dft, n26ho_5g_4g_idft, n26ho_5g_4g_ctxrtrive_rec_for_4g_session, n26ho_5g_4g_handover_cancel, n26ho_4g_5g_no_eps_5gs_continuity, n26ho_default_flow_failed, n26ho_n2_decode_failiure, n26ho_chf_update_failure, n26im_mobility_4g_5g_no_eps_5gs_continuity, n26im_mobility_4g_5g_default_eps_bearer_inactive, pduim_n1n2_transfer_failure, pduim_n2_setup_response_failure, pduim_n1n2_txfr_failure_notification, pduim_n4_modification_failed, pduim_misc_error, pduim_n1n2ack_decode_error, pduim_n1n2ack_unhndl_cause, pduim_n1n2ack_unhndl_rsp_code, pduim_n1n2ack_unhndl_prb_cause, pduim_suspended_procedure, pduim_amf_ctx_not_found, pduim_internal_error, pduim_upstate_not_in_deactivated_state, pduim_pdu_access_type_mismatch, pduim_pdu_gnb_tunnel_not_available, pduim_pdu_n4_deactivated_state, pduim_sla_timer_expired, pduim_temp_reject_max_retry, upf_failure, pcf_failure, idft_release_failure, access_4g_already, idft_setup_failure, mbr_setup_failure, sgw_failure, udm_registration_failure, udm_subscription_fetch_failure, udm_subscribe_notify_failure, udm_update_notify_failure, aaa_subscribe_auth_failure, pcf_create_failure, pcf_update_failure, charging_data_failure, no_rule_matched, invalid_protocol, invalid_dst_mask, invalid_src_mask, invalid_5qi, invalid_arp, invalid_other, internal_error, invalid_ebi, invalid_framed_ipv6_pfx_length, invalid_acct_sess_id_radius_dm, reason_unknown, invalid_rat_type, session_associated_to_online_chf, session_not_in_state, unknown, n4_release_failed, gtpu_peer_path_failed, rel_received_for_non_5g_session, qfi_failed_to_setup, utn3gppto5gho_n4_failed_completed_state, utn3gppto5gho_n4_failed_prepared_state, utn3gppto5gho_resource_alloc_unsuccess_transfer, utn3gppto5gho_invalid_state, utn3gppto5gho_policy_update_failure, utn3gppto5gho_charging_update_failure, utn3gppto5gho_n1n2_transfer_failure, utn3gppto5gho_pcf_update_failed_post_ho, utn3gppto5gho_chf_update_failed_post_ho, utn3gppto5gho_n4_failed_post_ho, utn3gppto5gho_del_bearer_failed, utn3gppto5gho_partial_flow_failure, utn3gppto5gho_default_flow_failed, utn3gppto5gho_eps_fallback, utn3gppto5gho_setup_unsuccess_transfer, utn3gppto5gho_fail_due_n2msg_rsp_not_rcvd, utn3gppto5gho_ctxt_create_res_failure, utn3gppto5gho_invalid_ctxt_create_req, utn3gpp_epsfallback_failed_during_5g_4g_ho, utn3gpp_epsfallback_failed_guard_timer_expiry, nr_to_untrusted_wifi_invalid_sess_state, nr_to_untrusted_wifi_invalid_json, nr_to_untrusted_wifi_invalid_paa, nr_to_untrusted_wifi_invalid_msg, nr_to_untrusted_wifi_pcf_failed, nr_to_untrusted_wifi_n40_failed, nr_to_untrusted_wifi_n4_failed, nr_to_untrusted_wifi_pcf_failed_post_cb, nr_to_untrusted_wifi_n40_failed_post_cb, nr_to_untrusted_wifi_n4_failed_post_cb, nr_to_untrusted_wifi_cbr_failed,`

nr_to_untrusted_wifi_ubr_failed, nr_to_untrusted_wifi_cb_res_failed,
 nr_to_untrusted_wifi_n1n2_release_failed, nr_to_untrusted_wifi_n4_failed_post_ho,
 nr_to_untrusted_wifi_pcf_update_failed_post_ho, nr_to_untrusted_wifi_chf_update_failed_post_ho,
 nr_to_untrusted_wifi_sla_timer_expired, nr_to_untrusted_wifi_dbr_failed,
 enb_to_untrusted_wifi_to_enb_ho_reject, enb_to_untrusted_wifi_to_enb_invalid_sess_state,
 enb_to_untrusted_wifi_to_enb_invalid_json, enb_to_untrusted_wifi_to_enb_invalid_paa,
 enb_to_untrusted_wifi_to_enb_invalid_msg, enb_to_untrusted_wifi_to_enb_udm_failed,
 enb_to_untrusted_wifi_to_enb_pcf_failed, enb_to_untrusted_wifi_to_enb_n40_failed,
 enb_to_untrusted_wifi_to_enb_n4_failed, enb_to_untrusted_wifi_to_enb_pcf_failed_post_cb,
 enb_to_untrusted_wifi_to_enb_mbr_failed, enb_to_untrusted_wifi_to_enb_n4_failed_post_mbr,
 enb_to_untrusted_wifi_to_enb_n40_failed_post_cb, enb_to_untrusted_wifi_to_enb_n4_failed_post_cb,
 enb_to_untrusted_wifi_to_enb_n40_failed_post_db, enb_to_untrusted_wifi_to_enb_pcf_failed_post_db,
 enb_to_untrusted_wifi_to_enb_cbr_failed, enb_to_untrusted_wifi_to_enb_dbr_failed,
 enb_to_untrusted_wifi_to_enb_ubr_failed, dsr_target_rat_rejected

- Label: emergency_call

Label Description: Flag indicating if it is an emergency call

Example: true, false

- Label: rat_type

Label Description: RAT Type of the Session

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: roaming_status

Label Description: Roaming status of the subscriber session

Example: visitor-lbo, visitor-hr, roamer, homer, none

- Label: up_state

Label Description: Userplane connection status of the session

Example: UpState_None, UpState_Establishing, UpState_Activating, UpState_Activated,
 UpState_Deactivating, UpState_Deactivated, UpState_Modifying, UpState_Deleting, UpState_Deleted

- Label: qos_5qi

Label Description: 5QI applicable for the QoS flow

Example: 1, 2, 5

- Label: always_on

Label Description: always on status

Example: enable, disable

- Label: dcnr

Label Description: UE DCNR status

Example: enable, disable

- Label: smf_current_procedure

Label Description: Current Procedure Name for Message Level Stats

Example: DedBearerProc, eps_fb_ded_brr, ue_req_ded_brr_mod, udm_req_ded_brr_mod, smf_req_ded_brr_del, upf_req_ded_brr_del, mme_req_ded_brr_del, mme_req_ded_brr_mod, pcf_req_ded_brr_mod, pcf_req_ded_brr_create, pcf_req_ded_brr_delete

- Label: `fourg_only_ue`

Label Description: Only 4g capable UE flag

Example: true, false

- Label: `pra`

Label Description: Presence Reporting Area Information

Example: enable, none

SMF Procedure Collision Category

`smf_procedure_collision`

Description: Total number of procedures collided

Sample Query: `sum(smf_procedure_collision) by (smf_current_procedure, smf_current_state, smf_new_procedure, smf_current_procedure_action)`

Labels:

- Label: `smf_current_procedure`

Label Description: Current Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `smf_current_state`

Label Description: Current Procedure State

Example: DEDICATED BEARER: Await N7 Policy Update, PDN5G4GHO: Await UPF Modify Response, 4G RELEASE: Idle, MODIFY: Await N2 Update, RELEASE: Await PCF Delete, SETUP: Post UPF Modify

- Label: `smf_new_procedure`

Label Description: New Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `smf_current_procedure_action`

Label Description: Current Procedure Action on Collision

Example: Ignore, Suspend, Resume, Abort, Cleanup, Continue, Ready, INVALID ACTION

SMF Procedure Total Time Statistics Category

smf_procedure_seconds

Description: Total number of seconds taken to complete the procedure

Sample Query: 'smf_procedure_seconds{smf_proc_status="Aborted"}'

Labels:

- Label: smf_proc_type

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: smf_proc_status

Label Description: Procedure Status

Example: Queued, Running, Aborted, Suspended, Invalid, Cleanup, RequireSuspend, RequireCleanup, RequireAbort, ProcStatusComplete, Unknown

SMF Protocol message counters Category

smf_proto_udp_msg_total

Description: SMF Protocol message statistics

Sample Query: 'smf_proto_udp_msg_total{message_direction="inbound",nf_type="amf"}'

Labels:

- Label: message_name

Label Description: name of N4 interface message

Example: n4_session_establishment_req, n4_session_establishment_res, n4_session_modification_req, n4_session_modification_res, n4_session_report_req, n4_session_report_res, n4_session_deletion_req, n4_session_deletion_res, n4_association_setup_req, n4_association_setup_res, n4_association_update_req, n4_association_update_res, n4_association_release_req, n4_association_release_res, n4_prime_pfd_management_req, n4_prime_pfd_management_res, n4_heartbeat_req, n4_heartbeat_res, n4_node_report_req, n4_node_report_res

- Label: message_direction

Label Description: direction of message from SMF perspective

Example: inbound, outbound

- Label: status

Label Description: status of message processing

Example: accepted, denied, discarded

SMF RAN failed stats Category

smf_ran_failed_flows

Description: Stats for the failed QFIs sent in UE Sync

Sample Query: 'smf_ran_failed_flows{procedure_type="pdu_ue_sync_proc}'

Labels:

- Label: `procedure_type`
Label Description: The procedure type associated with an call flow procedure
Example: `pdu_ue_sync_proc`
- Label: `reason`
Label Description: The reason associated with failure
Example: `qfi_failed_to_setup`

SMF RSRA stats Category

smf_service_rsra_stats

Description: Stats for SMF Service RSRA

Sample Query: 'smf_service_rsra_stats{rat_type="NR}'

Labels:

- Label: `procedure_type`
Label Description: The RSRA procedure type
Example: `router_advt_solicit_request`, `router_advt_unsolicit_request`, `router_solicit_request`
- Label: `status`
Label Description: status of RSRA
Example: `failed`, `sent`, `retransmit`, `received`
- Label: `rat_type`
Label Description: Type of the radio access associated with the request
Example: `EUTRA`, `NR`, `WLAN`, `rat_type_unknown`
- Label: `upf_ep_key`
Label Description: UPF Endpoint Key
Example: IP String Value
- Label: `reason`
Label Description: reason for the failed status
Example: `userplane_error`, `ho_in_progress`, `ipc_failed`, `userplane_error`, `encode_failed`, `decode_failed`

SMF Secondary RAT Usage Report Stats Category

smf_secondary_rat_usage_report_stats

Description: Stats for SMF Secondary RAT Usage Report

Sample Query: 'smf_secondary_rat_usage_report_stats{rat_type="NR"}'

Labels:

- Label: `status`
Label Description: Status of Sec RAT Usage Report
Example: ReceivedFromSgw
- Label: `reason`
Label Description: The reason associated with status
Example: success
- Label: `rat_type`
Label Description: Type of the radio access associated with the request
Example: NR
- Label: `ebi`
Label Description: ebi number as string
Example: unsigned int as string or NA
- Label: `qfi`
Label Description: qfi number as string
Example: unsigned int as string or NA

SMF Service Node Report Stats Category

smf_service_node_report_stats

Description: Stats for SMF Service Node Report

Sample Query: 'smf_service_node_report_stats{procedure_type="upf_node_report_pdu_sess_rel"}'

Labels:

- Label: `procedure_type`
Label Description: The SMF procedure type
Example: upf_node_report_pdu_sess_rel, upf_node_report_pdn_sess_rel
- Label: `status`
Label Description: Status of SMF Service Node Report
Example: attempted, failures, success

- Label: pdu_type
Label Description: pdu connection type
Example: ipv4, ipv6, ipv4v6, unknown
- Label: rat_type
Label Description: Type of the radio access associated with the request
Example: EUTRA, NR, WLAN, rat_type_unknown
- Label: up_state
Label Description: Userplane connection status of the session
Example: UpState_None, UpState_Establishing, UpState_Activating, UpState_Activated, UpState_Deactivating, UpState_Deactivated, UpState_Modifying, UpState_Deleting, UpState_Deleted
- Label: peer_gtpu_ep_key
Label Description: GTP Peer
Example: IP String
- Label: upf_endpoint
Label Description: UPF Endpoint
Example: IP String Value

SMF Service Resource Management Stats Category

smf_service_resource_mgmt_stats

Description: SMF Service Resource Management Stats

Sample Query:

```
'smf_service_resource_mgmt_stats{ip_req_type="ip-alloc",pdu_type="ipv4",dnn="dnn1"}'
```

Labels:

- Label: ip_req_type
Label Description: Type of IP request
Example: ip-alloc, ip-dealloc, ip-static
- Label: procedure_type
Label Description: The procedure type associated with an call flow procedure
Example: pdu_sess_create, ue_req_pdu_sess_mod, smf_req_pdu_sess_mod, pcf_req_pdu_sess_mod, udm_req_pdu_sess_mod, gnb_req_pdu_sess_mod, ue_req_pdu_sess_rel, smf_req_pdu_sess_rel, pcf_req_pdu_sess_rel, amf_req_pdu_sess_rel, udm_req_pdu_sess_rel, gnb_req_pdu_sess_rel, chf_req_pdu_sess_rel, admin_req_pdu_sess_rel, ue_req_active_to_idle, ue_req_idle_to_active, nw_req_service_active, upf_notify_downlink_data, xn_path_switch, pdn_sess_create, pdn_5g_4g_handover, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, n2_handover, xn_handover, n26_4g_to_5g_handover, n26_4g_to_5g_im_mobility,

pdu_im, pdn_sess_create, pcf_req_ded_brr_create, pcf_req_ded_brr_delete, pcf_req_ded_brr_mod, pcf_initiated_pdn_detach, smf_initiated_pdn_detach, upf_initiated_pdn_detach, smf_eps_fb, Cleanuplocal

- Label: `status`
Label Description: status of resource management request
Example: attempted, success, failures
- Label: `pdu_type`
Label Description: pdu connection type
Example: ipv4, ipv6, ipv4v6, unknown
- Label: `dnn`
Label Description: name of the dnn associated with the request
Example: Any string
- Label: `emergency_call`
Label Description: Flag indicating if it is an emergency call
Example: true, false
- Label: `rat_type`
Label Description: Type of the radio access associated with the request
Example: EUTRA, NR, WLAN, rat_type_unknown

SMF Session counters Category

smf_session_counters

Description: SMF current active Session counters

Sample Query:

```
'smf_session_counters{rat_type="NR",pdu_type="ipv4",dnn="dnn1",ssc_mode="ssc_mode_1"}'
```

Labels:

- Label: `rat_type`
Label Description: Type of the radio access associated with the request
Example: EUTRA, NR, WLAN, rat_type_unknown
- Label: `pdu_type`
Label Description: pdu connection type
Example: ipv4, ipv6, ipv4v6, unknown
- Label: `dnn`
Label Description: Dnn configured in dnn-policy, also can have virtual_dnn if configured, separated by #
Example: intershat, intershat#cisco.com

- Label: `ssc_mode`
Label Description: Type of ssc mode associated with the request
Example: `ssc_mode_1`, `ssc_mode_2`, `ssc_mode_3`, `ssc_mode_unknown`
- Label: `always_on`
Label Description: always on status
Example: `enable`, `disable`
- Label: `dcnr`
Label Description: UE DCNR status
Example: `enable`, `disable`
- Label: `emergency_call`
Label Description: Flag indicating if it is an emergency call
Example: `true`, `false`
- Label: `fourg_only_ue`
Label Description: Only 4g capable UE flag
Example: `true`, `false`
- Label: `unauthenticated_supi`
Label Description: indicates if SUPI is unauthenticated
Example: `true`, `false`
- Label: `pra`
Label Description: Presence Reporting Area Information
Example: `enable`, `none`
- Label: `roaming_status`
Label Description: Roaming status of the subscriber session
Example: `visitor-lbo`, `visitor-hr`, `roamer`, `homer`, `none`

SMF Session stats Category

smf_session_stats

Description: SMF Session stats counters

Sample Query:

```
'smf_session_stats{rat_type="NR",pdu_type="ipv4",dnn="dnn1",ssc_mode="ssc_mode_1",status="attempted"}'
```

Labels:

- Label: `rat_type`
Label Description: Type of the radio access associated with the request

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: pdu_type

Label Description: pdu connection type

Example: ipv4, ipv6, ipv4v6, unknown

- Label: dnn

Label Description: Dnn configured in dnn-policy, also can have virtual_dnn if configured, separated by #

Example: intershat, intershat#cisco.com

- Label: ssc_mode

Label Description: Type of ssc mode associated with the request

Example: ssc_mode_1, ssc_mode_2, ssc_mode_3, ssc_mode_unknown

- Label: status

Label Description: PDU session status indicated at SMF

Example: attempted, success, setup

- Label: roaming_status

Label Description: Roaming status of the subscriber session

Example: visitor-lbo, visitor-hr, roamer, homer, none

SMF Start Procedure Statistics Category

smf_procedure_start

Description: Total number of procedures started

Sample Query: 'smf_procedure_start{smf_proc_type="PDN Connect"}'

Labels:

- Label: smf_proc_type

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

SMF Stop Procedure Statistics Category

smf_procedure_stop

Description: Total number of procedures stopped

Sample Query: 'smf_procedure_stop{smf_proc_type="PDU Session Establishment"}'

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `smf_proc_status`

Label Description: Procedure Status

Example: Queued, Running, Aborted, Suspended, Invalid, Cleanedup, RequireSuspend, RequireCleanup, RequireAbort, ProcStatusComplete

SMF Timeout stats Category

`smf_timeout_stats`

Description: SMF Timeout stats

Sample Query: `'smf_timeout_stats{timeout_type="SessionSetupTimeout}'`

Labels:

- Label: `timeout_type`

Label Description: SMF Timeout type

Example: SessionSetupTimeout, SessionCallflowTimeout, SessionEpsFbTimeout, SessionPolicyRevalTimeout, SessionRsRaAdvTime, SessionModifyTimeout, SessionReleaseTimeout, SessionN2HoTimeout, SessionImTimeout, SessionDedBearerTimeout, SessionPdnSetupTimeout, SessionPdnDisconnectTimeout, SessionPdnModifyTimeout, SessionPduIdftTimeout, SessionPdu5G4GHandover, SessionNrToUnTrustWifiHOTimeout, Session4GWifi4GHOTimeout, SessionWifiTo4GHoMBReqTimeout, SessionRouterSolicitTimeout, SessionUsageReportTimeout, SessionPathSwitchTimeout, SessionN1N2RetryAfter, SessionPDUIMN1N2RetryAfter, SessionN2HoIdftTimeout, SessionN26HoIdftTimeout, SessionAbsoluteTimeout, SessionIwfN26IdftTimeout, SessionDedBrrReEstTimer, SessionDedBrrDelayTimer, Session4G5GN26Timeout, SessionN1N2RetryTimeout, SessionN1N2RetransTimeout, SessionPDUIMResumeTimeout, SessionUrrOutOfOrderWaitTimeout, SessionPduRelCmdRetryTimeout, SessionUnTrustWiFiToNrHOTimeout, SessionUbrRetryTimer, SessionDbrRetryTimer, SessionPduUeSyncTimeout, SessionAmfChangeGuardTimeout, SessionPduSetupProcSLA, SessionPduImProcSLA, ProcedureSlaTimeout, SessionN2HOProcSLA, SessionCatchAllTimeout, SessionIdleTimeout, SessionCpIdleTimeout, SessionTempRejectHoTimeout, SessionDefaultFlowOnlyTimeout, SessionEirDelayTimeout

SMF Total Procedure Count Category

`smf_procedure_total`

Description: Total number of procedures executed

Sample Query: `'smf_procedure_total{smf_proc_status="Running}'`

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `smf_proc_status`

Label Description: Procedure Status

Example: Queued, Running, Aborted, Suspended, Invalid, Cleanup, RequireSuspend, RequireCleanup, RequireAbort, ProcStatusComplete, Unknown

SMF Total Timedout Procedure Count Category

`smf_procedure_timeout`

Description: Total number of procedures executed more than 10sec

Sample Query: `'smf_procedure_timeout{smf_proc_status="Running"}'`

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `smf_proc_status`

Label Description: Procedure Status

Example: Queued, Running, Aborted, Suspended, Invalid, Cleanup, RequireSuspend, RequireCleanup, RequireAbort, ProcStatusComplete, Unknown

SMF Total Timedout Procedure Time Category

`smf_procedure_timeout_seconds`

Description: Total number of seconds taken by procedures executed more than 10sec

Sample Query: `'smf_procedure_timeout_seconds{smf_proc_status="Running"}'`

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `smf_proc_status`

Label Description: Procedure Status

Example: Queued, Running, Aborted, Suspended, Invalid, Cleanup, RequireSuspend, RequireCleanup, RequireAbort, ProcStatusComplete, Unknown

SMF Total Unhandled Event Statistics Category

smf_procedure_unhndl_event

Description: Total number of unhandled events per procedure type

Sample Query: 'smf_procedure_unhndl_event{smf_proc_type="PDU Session Release - SMF initiated"}'

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `message_type`

Label Description: Type of Request/Response Message associated with Unhandled Event

Example: N11SmContextUpdateSuccess, N11EbiAssignmentReq, N4HeartBeatFailure, S5CreateSessRsp, NLiSubscriberQueryReq, RadiusCoaDisconnectReq, N7SmPolicyUpdateSuccess

- Label: `smf_current_state`

Label Description: Current Procedure State

Example: DEDICATED BEARER: Await N7 Policy Update, PDN5G4GHO: Await UPF Modify Response, 4G RELEASE: Idle, MODIFY: Await N2 Update, RELEASE: Await PCF Delete, SETUP: Post UPF Modify

- Label: `guard_timer`

Label Description: This is a check for Guard Timeout. TRUE if Guard Timer has expired, else FALSE

Example: TRUE, FALSE

SMF Total Unhandled Transaction Statistics Category

smf_procedure_unhndl_trans

Description: Total number of unhandled transactions per procedure type

Sample Query: 'smf_procedure_unhndl_trans{message_type="RadiusCoaDisconnectReq"}'

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `message_type`

Label Description: Type of Request/Response Message associated with Unhandled Transaction

Example: N11SmContextUpdateSuccess, N11EbiAssignmentReq, N4HeartBeatFailure, S5CreateSessRsp, NLiSubscriberQueryReq, RadiusCoaDisconnectReq, N7SmPolicyUpdateSuccess

- Label: `smf_current_state`

Label Description: Current Procedure State

Example: DEDICATED BEARER: Await N7 Policy Update, PDN5G4GHO: Await UPF Modify Response, 4G RELEASE: Idle, MODIFY: Await N2 Update, RELEASE: Await PCF Delete, SETUP: Post UPF Modify

- Label: `guard_timer`

Label Description: This is a check for Guard Timeout. TRUE if Guard Timer has expired, else FALSE

Example: TRUE, FALSE

SMF User Plane Session counters Category

`smf_up_session_counters`

Description: SMF current active User Plane Sessions

Sample Query: `'smf_up_session_counters{pdu_type="ipv4",dnn="dnn1",ssc_mode="ssc_mode_1"}'`

Labels:

- Label: `rat_type`

Label Description: Type of the radio access associated with the request

Example: EUTRA, NR, WLAN, `rat_type_unknown`

- Label: `pdu_type`

Label Description: pdu connection type

Example: ipv4, ipv6, ipv4v6, unknown

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `ssc_mode`

Label Description: Type of ssc mode associated with the request

Example: `ssc_mode_1`, `ssc_mode_2`, `ssc_mode_3`, `ssc_mode_unknown`

UDM Message Failure Action Stats Category

smf_udm_msg_fail_action

Description: Stats for UDM Message Failure Action

Sample Query: 'smf_udm_msg_fail_action{udm_msg="UdmRegistration"}'

Labels:

- Label: `udm_msg`
Label Description: Type of UDM Message
Example: UdmRegistration, UdmDeregistration, UdmSmSubscription, UdmSubscribeToNotify, UdmUnSubscribeToNotify
- Label: `udm_failure_action`
Label Description: Action taken on UDM Message failure
Example: ignore, continue, terminate
- Label: `udm_end_point`
Label Description: UDM Endpoint
Example: IP String

UDP Request Total Message Stats Category

smf_service_udp_req_msg_total

Description: Stats for Total UDP Request Messages

Sample Query: 'smf_service_udp_req_msg_total{status="attempted"}'

Labels:

- Label: `message_type`
Label Description: Type of UDP Message
Example: N4SessionEstablishmentReq
- Label: `upf_endpoint`
Label Description: UPF Endpoint
Example: IP String Value
- Label: `status`
Label Description: Status of UDP Message
Example: attempted, success, failures
- Label: `trans_type`
Label Description: Transmission type of UDP Message

Example: trans_type_origin, trans_type_reselected

- Label: `cause_code`

Label Description: Causecode of UDP Message

Example: Reserved, Request_Accepted, Request_Rejected_Unspecified, Session_Ctx_Not_Found, Mandatory_IE_Missing, Cond_IE_Missing, Invalid_Length, Mandatory_IE_Incorrect, Invalid_FW_Policy, Invalid_FTEID_Alloc_Opt, No_Established_PFCP_Assc, Rule_Creation_Mod_Failure, PFCP_Entity_In_Congestion, No_Resource_Available, Service_Not_Supported, System_failure, No_Response, Duplicate_Userplane_Id, OutOfRange_Userplane_Id

UPF selection stats Category

upf_selection_stats

Description: Stats for the UPF Selection

Sample Query: 'upf_selection_stats{upf_selection_type="preferred"}'

Labels:

- Label: `upf_selection_type`

Label Description: Type of UPF Selection

Example: preferred

- Label: `upf_fqdn`

Label Description: FQDN of the UPF selected

Example: string

- Label: `status`

Label Description: Status the UPF selected

Example: attempted, failed

- Label: `reason`

Label Description: Reason for status of the UPF selected

Example: upf_not_associated, upf_profile_not_found, upf_not_active

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `rat_type`

Label Description: Type of the radio access associated with the request

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: `pdu_session_type`

Label Description: PDU Session type

Example: ip-alloc, ip-dealloc, ip-static

- Label: pdu_subscription_type

Label Description: PDU Subscription type

Example: ip-alloc, ip-dealloc, ip-static

- Label: snssai

Label Description: SNSSAI of the session having sd and sst

Example: sd:<string> sst:<uint>

udp-proxy

UDP-Proxy messages Category

udp_proxy_msg_total

Description: UDP Proxy message counters being recieved or sent

Sample Query: 'udp_proxy_msg_total{message_name="radius_request", message_direction="inbound", status="success"}'

Labels:

- Label: message_name

Label Description: UDP messages coming via udp-proxy service

Example: radius_request, radius_response, heartbeat_request, heartbeat_response

- Label: message_direction

Label Description: Message being sent or being received

Example: inbound, outbound

- Label: status

Label Description: Status of message while sending or receiving

Example: success, failed



CHAPTER 3

Failure Disconnect Reasons Reference

- [SMF Disconnect Reasons](#), on page 95

SMF Disconnect Reasons

This section describes the procedure failure disconnect reasons supported on SMF.

The following table provides the descriptions for the key failure disconnect reasons.

Table 6: Failure Disconnect Reasons

Disconnect Reason	Description
disc_chf_reconciliation	The total number of sessions released by the SMF due to CHF reconciliation.
disc_sess_report_erir_pdn_sess_rel	The total number of 4G or Wi-Fi sessions released by the SMF due to N4 Session Report Request from UPF with ERIR report type. If the ERIR delay timer is configured under access profile, the configured value delays the N4 Session Report Request handling.
disc_pdusetup_create_over_create	The total number of ongoing 5G sessions rejected by the SMF when 5G session establishment is received while handling N11SmContextCreateRequest for 5G session establishment (Create over Create case).
disc_pdurel_amf_init_release_404	The total number of 5G sessions released by the SMF due to 404 response from AMF for N1N2Transfer Request during 5G session modification.
disc_sess_report_erir_pdn_sess_rel	The total number of 4G or Wi-Fi sessions released by the SMF due to N4 Session Report Request from UPF with ERIR report type. If the ERIR delay timer is configured under access profile, the configured value delays the N4 Session Report Request handling.

Disconnect Reason	Description
disc_pdusetup_create_over_create	The total number of ongoing 5G sessions rejected by the SMF when 5G session establishment is received while handling N11SmContextCreateRequest for 5G session establishment (Create over Create case).
disc_pdurel_amf_init_release_404	The total number of 5G sessions released by the SMF due to 404 response from AMF for N1N2Transfer Request during 5G session modification.
disc_pduim_context_not_found	The total number of 5G sessions released by the SMF due to 404 response from AMF for N1N2Transfer Request during idle to active mobility and vice versa.
disc_pdnsetup_smf_mop_offline	The total number of 4G or Wi-Fi sessions rejected by the SMF due to Session Create received when SMF is in maintenance mode and when the offline mode configuration is set in the SMF profile or specifically for a DNN in the DNN profile.
disc_pdusetup_n2_setup_failed	The total number of 5G sessions rejected by the SMF when N2_PDU_SESSION_RESOURCE_SETUP_UNSUCCESS_TRANSFER is received from AMF indicating the N2 failure during 5G session establishment.
disc_pdusetup_n1n2_transfer_rsp_failure	The total number of 5G sessions rejected by the SMF due to N11N1N2MessageTransferFailure response from AMF during 5G session setup.
disc_pdnsetup_non5gcapableue_not_allowed	The total number of 4G or Wi-Fi sessions rejected by the SMF due to Session Create received without 5G InterWorking (IWK_5GS) indication and when the DNN profile is configured to support only NR capable UE by setting only-nr-capable-ue to true.
disc_pdnsetup_udm_sub_fetch_failed	<p>The total number of sessions rejected by the SMF due to failure in fetching the session management subscription data (sm-data) from UDM during 4G or Wi-Fi session establishment time.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF request to UDM for fetching the session management subscription data (sm-data) fails. • SMF receives failure response from UDM for SM data request. • Validation of request from UE (SSC mode, PDU session type and Snsai) fails against the subscription allowed based on UDM response.

Disconnect Reason	Description
disc_pdnsetup_udm_sub_fetch_resp_failed	<p>The total number of sessions rejected by the SMF due to failure in fetching the session management subscription data (sm-data) from UDM during 4G or Wi-Fi session establishment time.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF receives failure response from UDM for session management subscription data (sm-data) request. • Validation of request from UE (SSC mode, PDU session type, and Snsai) fails against the subscription allowed based on UDM response.
disc_pdusetup_release_over_create	The total number of 5G sessions rejected by the SMF due to 5G session release event during ongoing 5G session establishment.
disc_pdusetup_pdu_sess_does_not_exist	The total number of 5G sessions rejected by the SMF when SmContextCreateRequest is received with RequestType as EXISTING_PDU_SESSION during Wi-Fi to 5G handover, but the session doesn't exist with SMF.
disc_sess_cp_idle_time_exp_release	The total number of 4G or Wi-Fi sessions released by the SMF due to Control Plane (CP) idle timeout that started on successful session establishment. The idle timeout is configured in the DNN profile.
disc_sgw_ctx_failure	The total number of 4G or Wi-Fi sessions rejected by the SMF due to default flow failure caused by S-GW.
disc_pdnsetup_pcf_create_resp_failed	The total number of 4G or Wi-Fi sessions rejected by the SMF due to PCF Create Failure during 4G or Wi-Fi session establishment.
disc_gtpc_peer_pathfail	The total number of 4G or Wi-Fi sessions released by the SMF due to GTPC path failure in the network.
disc_pdusetup_rm_exchg_failure	The total number of 5G sessions rejected by the SMF due to IP allocation failure for the PDU session during 5G session setup.
disc_rel_chf_err	The total number of sessions released by the SMF due to CHF-initiated session release.
disc_pdnsetup_udm_reg_resp_failed	<p>The total number of sessions rejected by the SMF due to SMF registration failure with UDM during 4G or Wi-Fi session establishment time. The SMF sends registration request to UDM for storing UE context management information.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF registration request to UDM fails. • SMF receives failure response from UDM for registration request.

Disconnect Reason	Description
disc_pdumodify_context_not_found	The total number of 5G sessions released by the SMF due to 404 response from AMF for N1N2Transfer Request during 5G session modification.
disc_pdusetup_sm_cxt_sess_id_err	<p>The total number of sessions rejected by the SMF when pduSessionId in 5G PDU Session Establishment Request (N11SmContextCreate Request) is either zero or not in the expected format.</p> <p>This disconnect reason is also pegged when there is no subscriber ID (SUPI or PEI) but the ueEpsPdnConnection parameter is present in the request.</p>
disc_pdusetup_upf_setup_rsp_failure	The total number of sessions rejected by the SMF when N4 session establishment with UPF fails during 5G session establishment time.
disc_pdusetup_sess_cp_idle_timeout	The total number of PDN sessions released by the SMF due to Control Plane (CP) idle timer expiry. The CP idle timer expires when there is no control plane activity within the CP idle timeout.
disc_pdusetup_ip_alloc_failed	<p>The total number of sessions rejected by the SMF or PGW-C when IP address allocation fails.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF service (node manager) which handles IP address allocation is down. • SMF service (node manager) couldn't allocate the IP address of the requested PDU session type.
disc_pdusetup_n1n2_transfer_exchg_failure	The total number of sessions rejected by the SMF when there is failure in N1N2 Transfer Request with AMF during 5G PDU session establishment.
disc_pdnsetup_resource_mgr_exchg_failed	The total number of sessions rejected by the SMF or PGW-C when resource manager exchange fails due to IP address allocation failure during 4G or Wi-Fi PDN connection time.
disc_pdusetup_pcf_create_rsp_failure	<p>The total number of sessions rejected by the SMF due to Policy Create Failure.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF receives failure from PCF for Policy Create Request during 5G session establishment. • No response from PCF for Policy Create Failure.

Disconnect Reason	Description
disc_pdnsetup_csr_invalid	<p>The total number of Create Session Requests rejected by the SMF when Create Session Request includes invalid parameters.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • Create Session Request with invalid parameters for new PDN connection (4G or Wi-Fi). • Create Session Request with invalid parameters in handover requests—5G to Wi-Fi HO, 4G to Wi-Fi HO, and Wi-Fi to 4G HO.
disc_n26_4g_5g_ho_n4_modify_failed	<p>The total number of sessions released by the SMF or PGW-C when N4 modification with UPF fails in the execution phase of 4G to 5G N26 handover.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • N4 Modification Request failure in the execution phase of N26 HO. • SMF receives failure response from UPF for N4 modification in the execution phase of N26 HO. • SLA timeout at SMF during N4 modification in the execution phase of N26 HO.
disc_sess_cp_idle_time_exp_release	<p>The total number of PDN sessions released by the SMF or PGW-C due to Control Plane (CP) idle timer expiry. The CP idle timer expires when there is no control plane activity within the CP idle timeout.</p>
disc_pdusetup_dnn_not_supported_in_slice	<p>The total number of sessions rejected by the SMF where the 5G PDU Session Establishment Request (N11smContextCreate) received from AMF contains DNN which is not supported in the requested network slice.</p>
disc_pdusetup_udm_reg_failed	<p>The total number of sessions rejected by the SMF due to SMF registration failure with UDM during 5G session establishment time. The SMF sends registration request to UDM for storing UE context management information.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF registration request to UDM fails. • SMF receives failure response from UDM for registration request.
disc_pdurel_db_conflict	<p>The total number of sessions released by the SMF due to internal issue related to the database conflict.</p>

Disconnect Reason	Description
disc_pdusetup_udm_sub_fetch_resp_failed	<p>The total number of sessions rejected by the SMF due to failure in fetching the session management subscription data (sm-data) from UDM during 5G session establishment time.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF receives failure response from UDM for session management subscription data (sm-data) request. • Validation of request from UE (SSC mode, PDU session type and Snsai) fails against the subscription allowed based on UDM response.
disc_pdusetup_udm_sub_fetch_failure	<p>The total number of sessions rejected by the SMF due to failure in fetching the session management subscription data (sm-data) from UDM during 5G session establishment time.</p> <p>This disconnect reason is pegged in the following scenarios:</p> <ul style="list-style-type: none"> • SMF request to UDM for fetching the session management subscription data (sm-data) fails. • SMF receives failure response from UDM for SM data request. • Validation of request from UE (SSC mode, PDU session type, and Snsai) fails against the subscription allowed based on UDM response.