



## SMF Metrics

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### **gtpc-ep**

#### **gtpc-ep Metrics Reference**

##### **GTPC Golang Enc Dec Stats Category**

###### **gtpc\_golang\_enc\_dec\_stats**

Description: GTPC Golang Enc Dec Stats

Sample Query: 'gtpc\_golang\_enc\_dec\_stats{namespace="\$namespace"}'

Labels:

- Label: `gtpc_msg_type`  
Label Description: Gtpc Message type  
Example: ModifyBearerReq, ModifyBearerRes etc
- Label: `gtpc_interface_type`  
Label Description: Interface type  
Example: S5, S11, S5E, S2B, S8
- Label: `gtpc_msg_operation`  
Label Description: Operation  
Example: encode, decode

- Label: `gtpc_msg_status`  
Label Description: Status  
Example: success, error

## GTPC Roaming Peer Path Mgmt Stats Category

### **gtpc\_roaming\_peer\_path\_mgmt**

Description: GTPC Roaming Peer Path Mgmt Stats

Sample Query: `'gtpc_roaming_peer_path_mgmt{service_name="gtpc-ep",status="suppressed"}'`

Labels:

- Label: `gtpc_peer_type`  
Label Description: Gtpc Peer type  
Example: ROAMER
- Label: `gtpc_interface_type`  
Label Description: Interface type  
Example: S5, S11, S5E, S2B, S8
- Label: `gtpc_msg_type`  
description: Gtpc Message type  
Example: `gtpc_echo_req`, `gtpc_echo_res`
- label:`gtpc_msg_status`  
Description: Status  
Example: suppressed

## 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 MBRsp 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, upreq`

- 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-metrics

## nodemgr Metrics Reference

### Nodemgr UPF Path failure reasons Category

#### nodemgr\_up\_pathfail\_reasons

Description: Node manager userplane heart beat message failure reasons stats

Sample Query: 'nodemgr\_up\_pathfail\_reasons{app\_name="smf" ,cluster="cn", data\_center="cn",instance\_id="0", service\_name="nodemgr" , up\_pathfail\_reason="up\_pathfail\_ignored\_hb\_retry"} 1'

Labels:

- Label: up\_pathfail\_reasons

Label Description: Node manager UPF Path Failure reasons due to retransmission failure, RTS change and Sx Release from peer node

Example: up\_pathfail\_ignored\_hb\_retry,up\_pathfail\_reason\_hb\_retry,up\_pathfail\_ignored\_hb\_rt\_change, up\_pathfail\_reason\_hb\_rt\_change,up\_pathfail\_reason\_association\_release

### Nodemgr UPF Peer status Category

#### nodemgr\_up\_peer\_status

Description: Node manager userplane heart beat message failure reasons stats

Sample Query: 'nodemgr\_up\_peer\_status{app\_name="smf", cluster="cn" ,data\_center="cn", instance\_id="1",interface\_type="SXA",service\_name="nodemgr", up\_peer\_ip="20.20.20.66:20.20.20.42" ,up\_peer\_status="up\_peer\_path\_up"} 1'

Labels:

- Label: up\_peer\_ip

Label Description: unique key to identify UPF YYY.YYY.YYY.YYY:XXX.XXX.XXX.XXX 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: 20.20.20.66:20.20.20.42

- Label: up\_peer\_status

Label Description: Node manager UPF Peer status

Example: up\_peer\_path\_down,up\_peer\_path\_up

- Label: interface\_type

Label Description: nterface type between Peer Node (UPF)

Example: SXA



## Nodemgr UPF ip address threshold hit stats Category

### **nodemgr\_up\_threshold\_stats**

Description: When particular IP address pool threshold hit for usage of ip addresses, this stats will be recorded

Sample Query: 'nodemgr\_node\_rpt\_timer\_stats{up\_ep\_key="192.168.10.2:192.168.20.3", dnn="sampleDNN", threshold\_hit="yes"}'

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: dnn

Label Description: DNN of which ip pool reached the configured threshold usgae.

Example: sampleDNN

- Label: threshold\_hit

Label Description: Indicates if threshold hit is yes or no.

Example: yes

- Label: threshold\_clear

Label Description: Indicates if threshold hit is cleared or not

Example: yes

- Label: nodemgr\_id

Label Description: Indicates which instance of nodemgr hit the threshold

Example: 1

## 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, gtpc\_false\_peer\_restart\_cfg\_echo\_rc\_change, gtpc\_false\_peer\_restart\_ignore\_echo\_rc\_cfg, gtpc\_false\_peer\_restart\_cfg\_ctrl\_rc\_change, gtpc\_false\_peer\_restart\_ignore\_ctrl\_rc\_cfg, gtpc\_ignore\_echo\_timeout, pathfail\_echo\_rc\_change, pathfail\_no\_echo\_rcv, pathfail\_ctrl\_rc\_change

- Label: interface\_type

Label Description: Interfaces on which the gtpc message is received 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 received 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_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 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-metrics

### protocol Metrics Reference

#### 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\_pfc\_encode\_msg\_total**

Description: Total number of pfc encode by type,size

Sample Query: `'proto_pfc_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\_pfcmsg\_total**

Description: Total number of pfcmsg messages by type

Sample Query: `'proto_pfcmsg_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 pcfp 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_pfcpl_msg_seconds_total`

Description: Time Taken for pfcpl messages by type

Sample Query: `'proto_pfcpl_msg_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 pfcf 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: 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 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: 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`

## 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-ep

### radius-ep Metrics Reference

#### 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",grInstId="1"}'
```

## Labels:

- Label: `radSvrIp`  
Label Description: Radius Server IP address  
Example: Any string
- Label: `radMsgCode`  
Label Description: Message type  
Example: DisconnectRequest, CoARequest
- Label: `grInstId`  
Label Description: GR Instance Id  
Example: 1 or 2

**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",grInstId="1"}'
```

## 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
- Label: `grInstId`  
Label Description: GR Instance Id  
Example: 1 or 2



## 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",grInstId="1"}'
```

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
- Label: `grInstId`  
Label Description: GR Instance Id  
Example: 1 or 2

### 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",grInstId="1"}'
```

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

- Label: `grInstId`

Label Description: GR Instance Id

Example: 1 or 2

## rest-ep-metrics

### rest-ep Metrics Reference

#### 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, UdmSdmGetUESMSubscriptionData

### **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, UdmSdmGetUESMSubscriptionData

- 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-metrics

### smf-service Metrics Reference

#### CHF Notification Statistics Category

##### **smf\_chf\_notification\_stats**

Description: SMF Charging CHF Notification stats

Sample Query: 'smf\_chf\_notification\_stats{notification\_type="reauthorization"}'

Labels:

- Label: `notification_type`  
Label Description: Type of notification request  
Example: reauthorization, abort\_charging
- Label: `dnn`  
Label Description: DNN for which the flow is created  
Example: cisco.com
- Label: `status`  
Label Description: Status of notify message processing  
Example: attempted, success, failures
- Label: `rat_type`  
Label Description: RAT type on which the flow is created  
Example: EUTRA, NR, WLAN, VIRTUAL, rat\_type\_unknown
- Label: `reason`  
Label Description: Reason for notify message failure  
Example: pdu\_session\_not\_established, charging\_failed, offline\_converted

## 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/nrf-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/nrf-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/nrf-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/nrf-nfm/v1
- Label: `result`  
Label Description: result of discover message  
Example: 200, 201, 204, success, timeout\_rpc\_error, response\_parse\_failure

## Dropped Charging Data Requests Statistics Category

### cdr\_dropped\_stats

Description: The current count for charging data requests dropped due to zero usage

Sample Query: 'cdr\_dropped\_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

## 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\_PMIPv6\_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`

## Incoming Message Throttling Statistics Category

### `smf_inc_msg_throttling_stats`

Description: Stats of throttled incoming messages

Sample Query: `'smf_inc_msg_throttling_stats(message_type="S5S8CreateSessReq")'`

Labels:

- Label: `interface`

Label Description: Interface Type

Example: S5, S8, S2B

- Label: `message_type`

Label Description: Message type corresponding to given interface

Example: `S5S8CreateSessReq`, `S5S8DeleteSessReq`, `S5S8ModifyBearerReq`, `S5S8ModifyBearerCmd`, `S5S8BearerResourceCmd`, `S5S8DeleteBearerCmd`

- Label: `Cause`

Label Description: Cause of Message Throttling

Example: `EGTP_CAUSE_GTPC_ENTITY_CONGESTION`

## 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/nnrf-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/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`, `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 chosen 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 ADC URR Statistics Category

### **smf\_pfcpc\_adc\_report\_stats**

Description: The current count of PFCPC adc reports towards PCF

Sample Query: `'smf_pfcpc_adc_report_stats{adc_report_type="async"}'`

Labels:

- Label: `adc_report_type`

Label Description: Synchronous adc report or Asynchronous adc report

Example: async, sync

- Label: `status`

Label Description: ADC report status

Example: dropped, processed

## 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`,

pdu\_mod\_cmd\_nw\_init\_always\_on\_allowed, pdu\_utwif\_i\_to\_nr\_always\_on\_requested,  
pdu\_utwif\_i\_to\_nr\_always\_on\_allowed, pdu\_utwif\_i\_to\_nr\_always\_on\_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: `chf_type`

Label Description: Type of CHF with which message is exchanged

Example: online, offline

- 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\_pfcf\_usage\_report\_stats

Description: The current count of PFCP usage reports towards CHF

Sample Query: 'smf\_pfcf\_usage\_report\_stats{usage\_report\_type="async"}'

Labels:

- Label: `usage_report_type`

Label Description: Synchronous 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_pdu_rel_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_pdtype_unsupported`,  
`disc_pdusetup_pdtype_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_nill`, `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, disc\_originatingEntity\_request\_timed\_out,  
 disc\_new\_pdn\_type\_due\_to\_single\_addr\_bearer\_only, disc\_new\_pdn\_type\_due\_to\_network\_preference,  
 disc\_pdnsetup\_dnn\_missing\_or\_unknown, disc\_request\_timeout\_at\_originating\_entry

## 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='area1',nssai='slice1',pool='p1',allocationType='dynamic',addressType='IPv4',upf='upf1',grInstId='1')
```

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
- Label: `grInstId`  
Label Description: GR Instance ID  
Example: 1 or 2

## 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{dnn="dnn1",servingArea="area1",nssai="slice1",pool="p1",eventType="Allocation",allocationType="dynamic",addressType="IPv4",upf="dp1",grInstId="1"}'
```

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
- Label: `grInstId`  
Label Description: GR Instance ID  
Example: 1 or 2

## 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='area1',nssai='slice1',pool='bl',addressType='IPv4',upf='upf1',grInstId='1',forRemoteSmf='true')
```

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
- Label: `grInstId`  
Label Description: GR Instance ID  
Example: 1 or 2
- Label: `forRemoteSmf`  
Label Description: Indicates if chunk is reserved for Remote SMF  
Example: true/false

## 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(chr='chrl',servingArea='areal',nssai='slicel',pool='pl',eventType='Allocation',addressType='IPv4',upf='qpl',grInstId='1',forRemoteSmf='true')
```

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
- Label: `grInstId`  
Label Description: GR Instance ID  
Example: 1 or 2
- Label: `forRemoteSmf`  
Label Description: Indicates if chunk is reserved for Remote SMF  
Example: true/false

## 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, ip-static-subscription, ip-static-radius
- 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\_faiiure, 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\_ctrtrive\_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, Cleanedup, 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, ip-static-subscription, ip-static-radius

- 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, SessionErirDelayTimeout

## 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, Cleanedup, 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, Cleanedup, 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, Cleanedup, 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 Metrics Reference

#### UDP-Proxy BGP Routes Count Category

##### `upd_proxy_bgp_routes_count`

Description: UDP Proxy BGP routes added count

Sample Query: `'upd_proxy_bgp_routes_count{service_name="udp-proxy", status="success"}'`

Labels:

- Label: `status`

Label Description: Status of message while sending or receiving

Example: success, failed

## 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`

