



SMF Metrics

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Diameter Endpoint Metrics Reference

diameter-ep statistics Category

diam_base_msg_seconds_total

Description: Cumulative response time in seconds of diameter base message requests processed by diameter endpoint

Sample Query: 'diam_base_msg_seconds_total{message_name="DPR"}'

Labels:

- Label: `message_name`
Label Description: name of interface message
Example: DPR
- Label: `origin_host`
Label Description: name of the origin host
Example: 192.168.169.107
- Label: `origin_realm`
Label Description: name of the origin realm
Example: xyz.com

- Label: `disconnect_cause`
Label Description: reason for the disconnection
Example: REBOOTING, BUSY, DO_NOT_WANT_TO_TALK_TO_YOU
- Label: `result_code`
Label Description: `result_code` describes the error that the diameter node encountered in its processing
Example: 2001, 5012
- Label: `gr_instance`
Label Description: GR Instance ID
Example: 1 or 2

diam_base_msg_total

Description: Count of diameter base message requests processed by diameter endpoint

Sample Query: `'diam_base_msg_total{message_name="DPR"}'`

Labels:

- Label: `message_name`
Label Description: name of interface message
Example: DPR
- Label: `origin_host`
Label Description: name of the origin host
Example: 192.168.169.107
- Label: `origin_realm`
Label Description: name of the origin realm
Example: xyz.com
- Label: `disconnect_cause`
Label Description: reason for the disconnection
Example: REBOOTING, BUSY, DO_NOT_WANT_TO_TALK_TO_YOU
- Label: `result_code`
Label Description: `result_code` describes the error that the diameter node encountered in its processing
Example: 2001, 5012
- Label: `gr_instance`
Label Description: GR Instance ID
Example: 1 or 2

diameter_decode_message_total

Description: Count of decoding done by diameter endpoint

Sample Query: 'diameter_decode_message_total{interface="gx"}'

Labels:

- Label: `interface`
Label Description: name of the interface
Example: `gx, gy`

Labels:

- Label: `message_name`
Label Description: name of interface message
Example: `ccai, ccou, ccat, rar, asr`
- Label: `endpoint_name`
Label Description: name of endpoint profile used during processing
Example: `gxProfl`
- Label: `dict_name`
Label Description: name of the dictionary used
Example: `gx_cust`
- Label: `status`
Label Description: status of the request
Example: `success, failure, partial`
- Label: `unknown_avp`
Label Description: `unknown_avp` indicates if any unknown AVPs were found during encoding where 0 indicates not found and 1 indicates found
Example: `0,1`
- Label: `gr_instance`
Label Description: GR Instance ID
Example: `1 or 2`

diameter_encode_message_total

Description: Count of encoding done by diameter endpoint

Sample Query: 'diameter_encode_message_total{interface="gx"}'

Labels:

- Label: `interface`
Label Description: name of the interface

Example: gx, gy

Labels:

- Label: `message_name`

Label Description: name of interface message

Example: ccrl, ccru, ccrt, raa, asa

Labels:

- Label: `endpoint_name`

Label Description: name of endpoint profile used during processing

Example: gxProf1

- Label: `dict_name`

Label Description: name of the dictionary used

Example: gx_cust

- Label: `status`

Label Description: status of the request

Example: success, failure, partial

- Label: `unknown_avp`

Label Description: unknown_avp indicates if any unknown AVPs were found during encoding where 0 indicates not found and 1 indicates found

Example: 0,1

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

diameter_pod_status

Description: Pod status as active/standby

Sample Query: `'diameter_pod_status{vip="10.0.0.1"}'`

Labels:

- Label: `vip`

Label Description: any ip

Example: 10.0.0.1

diameter_request_message_total

Description: Count of diameter requests processed by diameter endpoint

Sample Query: `'diameter_request_message_total{interface="gx"}'`

Labels:

- Label: `interface`
Label Description: name of the interface
Example: `gx, gy`

Labels:

- Label: `message_name`
Label Description: name of interface message
Example: `ccri, ccru, ccrt, rar, asr`

Labels:

- Label: `peer_address`
Label Description: `peer_address` will be empty for inbound requests, could be empty for outbound requests depending on point of failure
Example: `10.1.2.110:3868`

Labels:

- Label: `status`
Label Description: status of the request
Example: `attempted, peer_down, err_cfg, err_maxout, timeout_ipc, err_ipc, err_unmarshal`

Labels:

- Label: `retry`
Label Description: retry count
Example: `0`
- Label: `gr_instance`
Label Description: GR Instance ID
Example: `1 or 2`
- Label: `transaction_type`
Label Description: transaction type
Example: `origin`
- Label: `endpoint_name`
Label Description: name of endpoint profile used during processing
Example: `gxProfl`
- Label: `message_direction`
Label Description: direction of message from Diameter perspective
Example: `inbound, outbound`

diameter_response_message_seconds_total

Description: Cumulative response time in seconds of diameter requests processed by diameter endpoint

Sample Query: 'diameter_response_message_seconds_total{interface="gx"}'

Labels:

- Label: `interface`

Label Description: name of the interface

Example: `gx, gy`

Labels:

- Label: `message_name`

Label Description: name of interface message

Example: `ccai, ccaw, ccat, raa, asa`

Labels:

- Label: `peer_address`

Label Description: `peer_address` will be empty for inbound requests, could be empty for outbound requests depending on point of failure

Example: `10.1.2.110:3868`

Labels:

- Label: `status`

Label Description: status of the request

Example: `success, err_cfg, err_maxout, err_send, timeout_res, timeout_ipc, err_ipc, err_unmarshal, err_rc, err_exp_rc`

Labels:

- Label: `result_code`

Label Description: `result_code` describes the error that the diameter node encountered in its processing

Example: `1001, 2001, 3001, 4001, 5001`

Labels:

- Label: `action`

Label Description: action

Example: `continue, terminate`

Labels:

- Label: `sub_action`

Label Description: sub action

Example: discard-traffic, local-fallback, retry-server-on-event, send-ccrt-on-call-termination, with-term-req, without-term-req

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

- Label: `endpoint_name`

Label Description: name of endpoint profile used during processing

Example: gxProfl

- Label: `message_direction`

Label Description: direction of message from Diameter perspective

Example: inbound, outbound

diameter_response_message_total

Description: Count of diameter responses processed by diameter endpoint

Sample Query: 'diameter_response_message_total{interface="gx"}'

Labels:

- Label: `interface`

Label Description: name of the interface

Example: gx, gy

Labels:

- Label: `message_name`

Label Description: name of interface message

Example: ccai, ccau, ccat, raa, asa

Labels:

- Label: `peer_address`

Label Description: `peer_address` will be empty for inbound requests, could be empty for outbound requests depending on point of failure

Example: 10.1.2.110:3868

Labels:

- Label: `status`

Label Description: status of the request

Example: success, err_cfg, err_maxout, err_send, timeout_res, timeout_ipc, err_ipc, err_unmarshal, err_rc, err_exp_rc

Labels:

- Label: `result_code`

Label Description: `result_code` describes the error that the diameter node encountered in its processing

Example: 1001, 2001, 3001, 4001, 5001

Labels:

- Label: `action`

Label Description: `action`

Example: `continue`, `terminate`

Labels:

- Label: `sub_action`

Label Description: `sub action`

Example: `discard-traffic`, `local-fallback`, `retry-server-on-event`, `send-ccrt-on-call-termination`, `with-term-req`, `without-term-req`

Labels:

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

Labels:

- Label: `endpoint_name`

Label Description: name of endpoint profile used during processing

Example: `gxProfl`

Labels:

- Label: `message_direction`

Label Description: direction of message from Diameter perspective

Example: `inbound`, `outbound`

diameter_route_expires_total

Description: Count of all dynamic routes expired

Sample Query: `'diameter_route_expires_total{gr_instance="1"}'`

Labels:

- Label: `route`

Label Description: route identified by host, realm and peer

Example: `OCS1:OCS.COM:DRA1`

Labels:

- Label: `peer_name`
Label Description: peer name used by the route
Example: DRA1

Labels:

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

diameter_route_hits_total

Description: Count of all route hits for messages processed by diameter endpoint

Sample Query: `'diameter_route_hits_total{route_type="S"}'`

Labels:

- Label: `route`
Label Description: route identified by host, realm and peer
Example: OCS1:OCS.COM:DRA1

Labels:

- Label: `route_type`
Label Description: type of the route
Example: S or D

Labels:

- Label: `peer_name`
Label Description: peer name used by the route
Example: DRA1

Labels:

- Label: `wild_carded_route`
Label Description: route with wild carded host or realm
Example: *:OCS.COM:DRA1

Labels:

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

diameter_route_misses_total

Description: Count of all route misses for messages processed by diameter endpoint

Sample Query: 'diameter_route_misses_total{route="OCS1:OCS.COM:DRA1"}'

Labels:

- Label: `route`

Label Description: route identified by host, realm and peer

Example: OCS1:OCS.COM:DRA1

Labels:

- Label: `route_type`

Label Description: type of the route

Example: S or D

Labels:

- Label: `peer_name`

Label Description: peer name used by the route

Example: DRA1

Labels:

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

diameter_route_status

Description: Status of a route

Sample Query: 'diameter_route_status{route="OCS1:OCS.COM:DRA1"}'

Labels:

- Label: `route`

Label Description: route identified by host, realm and peer

Example: OCS1:OCS.COM:DRA1

Labels:

- Label: `route_type`

Label Description: type of the route

Example: S or D

Labels:

- Label: `peer_name`

Label Description: peer name used by the route

Example: DRA1

Labels:

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

Labels:

- Label: `route_status`

Label Description: status of the route

Example: Pending or Active or Inactive or Failed or Deleted or Expired or Cloned

{{- end}}

diameter_routes_total

Description: Count of all diameter routes added by diameter endpoint

Sample Query: 'diameter_routes_total{gr_instance="1"}'

Labels:

- Label: `route_type`

Label Description: type of the route

Example: S or D

Labels:

- Label: `peer_name`

Label Description: peer name used by the route

Example: DRA1

Labels:

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

dispatch_error_seconds_total

Description: Cumulative time in seconds spent during dispatching of inbound requests to service that had error or timeout

Sample Query: 'dispatch_error_seconds_total{gr_instance="1"}'

Labels:

- Label: `application`

Label Description: name of the application

Example: diameter

Labels:

- Label: `command_code`

Label Description: command code

Example: RAR

Labels:

- Label: `error_code`

Label Description: error code

Example: 3002

Labels:

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

dispatch_error_total

Description: Count of inbound requests that had error or timeout during dispatch to service

Sample Query: `'dispatch_error_total{gr_instance="1"}'`

Labels:

- Label: `application`

Label Description: name of the application

Example: diameter

Labels:

- Label: `command_code`

Label Description: command code

Example: RAR

Labels:

- Label: `error_code`

Label Description: error code

Example: 3002

Labels:

- Label: `gr_instance`

Label Description: GR Instance ID

Example: 1 or 2

policy_engine_message_seconds_total

Description: Cumulative time in seconds spent during processing of message sent to service

Sample Query: 'policy_engine_message_seconds_total{gr_instance="1"}'

Labels:

- Label: application
Label Description: name of the application
Example: diameter

Labels:

- Label: command_code
Label Description: command code
Example: RAR

Labels:

- Label: gr_instance
Label Description: GR Instance ID
Example: 1 or 2

policy_engine_message_total

Description: Count of messages sent to service for which response is received

Sample Query: 'policy_engine_message_total{gr_instance="1"}'

Labels:

- Label: application
Label Description: name of the application
Example: diameter

Labels:

- Label: command_code
Label Description: command code
Example: RAR

Labels:

- Label: gr_instance
Label Description: GR Instance ID
Example: 1 or 2

gtpc-ep Metrics Reference

GTPC BGP Routed Count Stats Category

gtpc_app_bgp_routes_count

Description: BGP routes add counter

Sample Query: 'gtpc_app_bgp_routes_count{status="success"}'

Labels:

- Label: `status`
Label Description: status
Example: success, failed
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

GTPC Roaming Peer Path Management Stats Category

gtpc_roaming_peer_path_mgmt

Description: GTPC Roaming Peer Path Management Statistics.

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, HOMER, VISITOR
- Label: `interface_type`
Label Description: Gtpc Interface type
Example: S5, S11, S5E, S2B, S8
- Label: `gtpc_msg_type`
description: Gtpc Message type
Example: NumEchoMsg, NumControlMsg
- Label: `status`
Label Description: Status
Example: suppressed

- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

GTPC Short Circuit Map Count Category

gtpc_short_circuit_map_count

Description: GTPC Short Circuit Map operation counter

Sample Query: `'gtpc_short_circuit_map_count{message_name="TxModifyBearerRes"}'`

Labels:

- Label: `message_name`
Label Description: Message Name
Example: TxCreateBearerReq, TxUpdateBearerReq, TxDeleteBearerReq, TxModifyBearerRes, TxDeleteSessRsp, TxCreateSessionRsp, RecordExpired
- Label: `gtpc_short_circuit_map_operation`
Label Description: Gtpc short circuit counter type
Example: increment, decrement
- Label: `gtpc_short_circuit_map_teid_changed`
Label Description: Gtpc short circuit teid cache operation type
Example: added, updated, deleted
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

GTPC Short Circuit Message Stats Category

gtpc_msg_short_circuit_stats

Description: GTPC Short Circuit Modify Bearer Response Statistics.

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

Labels:

- Label: `gtpc_msg_type`
Label Description: Gtpc Message type
Example: RxModifyBearerReq, SkippingShortCircuit
- Label: `gtpc_short_circuit_category`
Label Description: Category

Example: WithServingNetwork, WithIndication, WithBearerContext, MBREventExpired, SendSCMBResp, GetSCMBRespFailed, LastSequenceNumberSame

- Label: `interface_type`

Label Description: Gtpc Interface type

Example: S5, S11, S5E, S2B, S8

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

- Label: `interface_type`

Label Description: Gtpc Interface type

Example: S5, S11, S5E, S2B, S8

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

Processing time of GTPC messages Category

gtpc_app_events_seconds

Description: Total time taken by GTPC messages

Sample Query: 'gtpc_app_events_seconds{event_type="csreq"}'

Labels:

- Label: `event_type`
Label Description: Gtpc Event type
Example: csreq, mbreq, cbreq, ubreq, dbreq, dsreq, rabreq, cidftreq, didftreq, changenotfreq, mbreqlist
- Label: `interface_type`
Label Description: Gtpc Interface type
Example: S5, S11, S5E, S2B, S8
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

SGW TEID Cache Operation Stats Category

sgw_teid_cache_total

Description: SGW TEID cache operation counter

Sample Query: 'sgw_teid_cache_total{action="create"}'

Labels:

- Label: `action`
Label Description: TEID cache operation type
Example: create, update, delete, cache_found, expired, no_cache, cache_full
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

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`
- Label: `interface_type`
Label Description: Gtpc Interface type
Example: S5, S11, S5E, S2B, S8
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

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: `NumRxEchoReq`, `NumTxEchoReq`, `NumRxEchoRes`, `NumTxEchoRes`,
`NumRxCreateSessionReq`, `NumTxCreateSessionReq`, `NumRxCreateSessionRes`, `NumTxCreateSessionRes`,
`NumRxDeleteSessionReq`, `NumTxDeleteSessionReq`, `NumRxDeleteSessionRes`, `NumTxDeleteSessionRes`,
`NumRxModifyBearerReq`, `NumTxModifyBearerReq`, `NumRxModifyBearerRes`, `NumTxModifyBearerRes`,
`NumRxDeleteBearerReq`, `NumTxDeleteBearerReq`, `NumRxDeleteBearerRes`, `NumTxDeleteBearerRes`,
`NumTxCreateBearerReq`, `NumRxCreateBearerReq`, `NumTxCreateBearerRes`, `NumRxCreateBearerRes`,
`NumTxUpdateBearerReq`, `NumRxUpdateBearerReq`, `NumTxUpdateBearerRes`, `NumRxUpdateBearerRes`,
`NumRxModifyBearerCmd`, `NumTxModifyBearerCmd`, `NumRxModifyBearerFail`,
`NumTxModifyBearerFail`, `NumRxDeleteBearerCmd`, `NumTxDeleteBearerCmd`, `NumRxDeleteBearerFail`,
`NumTxDeleteBearerFail`, `NumTxChangeNotfReq`, `NumRxChangeNotfReq`, `NumRxChangeNotfRes`,
`NumTxChangeNotfRes`, `NumRxSuspendNotf`, `NumTxSuspendNotf`, `NumRxSuspendAck`,
`NumTxSuspendAck`, `NumRxResumeNotf`, `NumTxResumeNotf`, `NumRxResumeAck`, `NumTxResumeAck`,
`NumTxReleaseAccessBearerRsp`, `NumRxReleaseAccessBearerReq`, `NumRxContextReq`,
`NumTxContextReq`, `NumRxContextAck`, `NumTxContextAck`, `NumRxDDN`, `NumTxDDN`, `NumRxIDReq`,
`NumTxIDReq`, `NumRxIDRsp`, `NumTxIDRsp`, `NumRxDDNFail`, `NumTxDDNFail`, `NumRxCreateIDFTRReq`,
`NumTxCreateIDFTRsp`, `NumRxDeletIDFTRReq`, `NumTxDeleteIDFTRsp`, `NumRxBearerResCmd`
- Label: `gtpc_msg_len`

Label Description: Message Length

Example: 36, 24, 45

- Label: `interface_type`

Label Description: Gtpc 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

- 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

- Label: `interface_type`

Label Description: Gtpc Interface type

Example: S5, S11, S5E, S2B, S8

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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: S5, S11, S5E, S2B, S8

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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, dbcmd, dbcfi, ddnfi, ddnack, rabreq, upcreq`

- Label: `interface_type`
Label Description: Gtpc Interface type
Example: `sgw_ingress`, `pgw_ingress`, `S5`, `S11`, `S5E`, `S2B`, `S8`
- 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`, `hdr_decode_fail_reason`
- 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

- Label: `gtpc_msg_fail_cause`

Label Description: Contains Gtpc message fail cause

Example: `send_to_service_error`, `nil_raw_response`, `unmarshal_fail`

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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_lb_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_lb_retry,up_pathfail_reason_lb_retry,up_pathfail_ignored_lb_retry,up_pathfail_reason_lb_retry,up_pathfail_reason_association_release
```

- Label: gr_instance_id

Label Description: GR instance ID

Example: 1, 2

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="Sx",service_name="nodemgr",up_peer_ip="20.20.20.66:20.20.20.42",up_peer_status="up_peer_pathup")
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

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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_up_threshold_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

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

Nodemgr gtpc peer status statistics Category

nodemgr_gtpc_peer_status

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

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

Labels:

- Label: `gtpc_peer_ip`
Label Description: IP address of a gtpc peer like SGW, PGW or ePDG
Example: 192.168.10.2
- Label: `gtpc_peer_status`
Label Description: GTPC peer current status as a result of keep alive success/failure or restart counter tracking
Example: `gtpc_peer_path_down`, `gtpc_peer_path_up`, `gtpc_peer_restarted`
- Label: `interface_type`
Label Description: Interfaces on which the gtpc message is recieved or sent PGW, SGW-Egress, SGW-Ingress etc
Example: S11, S5E, S5, S8, S2B
- Label: `restart_time`
Label Description: Gtpc peer restart time
Example: 2022-09-30 14:32:52 +0000 UTC
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

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`

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

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="", 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: `backlog_tmr`

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

Example: 1564555678270689300

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

Nodemgr Resource Management Batch Reconciliation Counter Category

`nodemgr_rmgr_batch_reconcile_stats`

Description: Node manager resource management batch reconciliation counter

Sample Query: `'nodemgr_rmgr_batch_reconcile_stats{status="success"}'`

Labels:

- Label: `status`

Label Description: reconciliation status

Example: success, failed

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

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

Nodemgr User Plane Heartbeat Message Failure Due to Retransmission Stats Category

nodemgr_up_heartbeat_fail_stats

Description: Node Manager userplane heartbeat 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

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

Nodemgr User Plane Heartbeat Message Failure Stats Category

`nodemgr_up_hb_msg_fail_stats`

Description: Node Manager userplane heartbeat message failure counters between UPF node and SMF, P-GW, S-GW 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
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

Nodemgr User Plane Heartbeat 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
- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

Nodemgr User Plane Stats Category

nodemgr_up_stats

Description: Node Manager to User Plane (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

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

SMF Recovery Value Stats Category

smf_recovery_value

Description: SMF Recovery Value stats

Sample Query: 'smf_recovery_value{smf_ip="192.168.10.2"}'

Labels:

- Label: `smf_ip`

Label Description: smf ip address

Example: 192.168.10.2

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`
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: `1`, `2`

PFCP Encoded Messages Category

proto_pfcg_encode_msg_total

Description: Total number of pfcg encode by type,size

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

Labels:

- Label: `message_name`
Label Description: PFCP Message name
Example: `session_establishment_req`, `session_modification_req`, `session_report_req`, `session_deletion_req`, `heartbeat_req`, `heartbeat_res`, `session_report_res`

- Label: `msgbufsize`
Label Description: PFCP Message buffer size
Example: little, jumbo, optimized
- Label: `status`
Label Description: PFCP Message status - accepted/denied/discarded
Example: accepted, denied, discarded
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

PFCP Message Retransmission from SMF Category

`proto_udp_retrans_msg_total`

Description: Total number of retransmitted message at pfcf

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

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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

- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

PFCP Messages Decode Time Category

proto_decode_msg_seconds_total

Description: Time Taken for pfcfp 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`
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

PFCP Messages Processing Time Category

proto_pfcg_msg_seconds_total

Description: Time Taken for pfcg messages by type

Sample Query: 'proto_pfcg_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`

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: `1`, `2`

PFCP Request Messages Category

proto_udp_req_msg_total

Description: Total number of pfcg 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`
- Label: `sec_pdr_present`
Label Description: Indicate whether secondary PDR present
Example: `true`, `false`
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: `1`, `2`

PFCP Response Messages Category

proto_udp_res_msg_total

Description: Total number of pfcpl 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`

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: 1, 2

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`

- Label: `gr_instance_id`
Label Description: GR instance ID
Example: 1, 2

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 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, UdmSdmGetUESMSSubscriptionData

nf_resp_sent_messages_total

Description: NF message responses sent from NRF client library

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

Labels:

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

Label Description: result of discover message

Example: SendSuccess, SendFailure

- Label: `status_code`

Label Description: result of NF send message

Example: 200, 201, 204,

nf_send_message_total_time

Description: NF send message total time taken

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

Labels:

- Label: `nf_type`

Label Description: Network Function type

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

Labels:

- Label: `svc_name`

Label Description: Network function service name

Example: nudm-sdm, namf-comm

- Label: `message_type`

Label Description: Message Type

Example: UdmUecmRegisterSMF, 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 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, UdmSdmGetUESMSubscriptionData
- 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

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/nnrf-nfm/v1", result="timeouOrRPCError"}'`

Labels:

- Label: `nf_type`
Label Description: Network Function type
Example: nrf, udm, amf, pcf, chf, ciscocontrol
- Label: `host`
Label Description: End Point address
Example: http://10.105.227.109:8082/nnrf-nfm/v1
- Label: `result`
Label Description: result of discover message
Example: 200, 201, 204, success, timeout_rpc_error, response_parse_failure

Discover Messages statistics Category

`nf_discover_messages_total`

Description: Discover Messages statistics

Sample Query: 'nf_discover_messages_total{nf_type="amf", host="http://10.105.227.109:8082/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/nrf-nfm/v1

- Label: req

Label Description: req type

Example: initial, fallback,

NF failure handling stats Category

nf_failure_handling_stats_total

Description: NF Failure handling stats

Sample Query: 'nf_failure_handling_stats_total{nf_type="amf", host="http://10.105.227.109:8082/nrf-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/nrf-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, PDN Session Modify - PCRF 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`, `pdumod_cmd_nw_init_alwayson_allowed`, `pdu_utwifit_to_nr_alwayson_requested`, `pdu_utwifit_to_nr_alwayson_allowed`, `pdu_utwifit_to_nr_alwayson_not_allowed`

- Label: `rat_type`

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

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

- Label: `pdu_type`

Label Description: pdu connection type

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

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `ssc_mode`

Label Description: Type of ssc mode associated with the request

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

SMF Charging Descriptor Delete Stats Category

`smf_chrg_desc_del_stats`

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

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

Labels:

- Label: `charging_id`

Label Description: Charging Descriptor Identifier

Example: Any string

- Label: `rating_group`

Label Description: Rating Group for which charging descriptors is dropped

Example: Any string

- Label: `configured`

Label Description: Configured signifies if a Rule Id is configured or is dynamic

Example: `true`, `false`

- Label: `reason`

Label Description: Reason for the charging descriptor delete

Example: Error string value

SMF Charging Descriptor Drop Stats Category

`smf_chrg_desc_drop_stats`

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

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

Labels:

- Label: `rating_group`

Label Description: Rating Group for which charging descriptors is dropped

Example: Any string

- Label: `service_identifier`

Label Description: Service Identifier for which charging descriptors is dropped

Example: Any string

- Label: `action`

Label Description: Action with respect to Rule Id

Example: add, mod, del

- Label: `configured`

Label Description: Configured signifies if Rule Id is configured or is dynamic

Example: true, false

- Label: `reason`

Label Description: Reason for the charging descriptor drop

Example: Error string value

SMF Charging Failure Handling Stats Category

`chf_failure_handling_stats`

Description: Statistics for application error received from CHF

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

Labels:

- Label: `http2_err_code`

Label Description: HTTP2 error code received from CHF

Example: `HTTP_STATUS_CODE_403_FORBIDDEN`

- Label: `appl_err_code`

Label Description: Application error code received from CHF

Example: `END_USER_REQUEST_REJECTED, QUOTA_LIMIT_REACHED, CHARGING_FAILED, USER_UNKNOWN, END_USER_REQUEST_DENIED, QUOTA_LIMIT_REACHED, CHARGING_NOT_APPLICABLE`

- Label: `fh_action`

Label Description: Action taken on failure from CHF

Example: Terminate, Drop Traffic, Disable Charging

- Label: `fh_exchg_type`

Label Description: CHF Exchange in which failure occurred

Example: update, initial

- Label: `disposition`

Label Description: SMF action on failure

Example: disable-charging, drop-traffic, terminate, convert-offline

- Label: `procedure_type`

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

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

SMF Charging Message Stats Category

chf_message_stats

Description: Charging Message Statistics

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

Labels:

- Label: `procedure_type`

Label Description: Charging message type

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

- Label: `dnn`

Label Description: DNN for which the flow is created

Example: `cisco.com`

- Label: `status`

Label Description: Status of OOO usage report processing

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

- Label: `rat_type`

Label Description: RAT type on which the flow is created

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

- Label: `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_pfcp_usage_report_stats

Description: The current count of PFCP usage reports towards CHF

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

Labels:

- Label: usage_report_type

Label Description: 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_encd_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`

- Label: `trigger_reason`

Label Value: `nat_binding_update`

Label Description: Radius Accounting message handling corresponds to PFCP Session Report with NAT Binding updates (NBU).

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, PDN Session Modify - PCRF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated

- Label: `rat_type`

Label Description: Type of the radio access associated

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

- Label: `pdu_type`

Label Description: Type of PDU session

Example: ipv4, ipv6, ipv4v6, unknown

- Label: `status`

Label Description: Procedure status after data consistency check

Example: success, failed

- Label: `reason`

Label Description: Failure reason of data inconsistency

Example: `invalid_n4_data_in_txn_start`, `invalid_n4_data_in_txn_end`, `invalid_n7_data_in_txn_start`, `invalid_n7_data_in_txn_end`, `invalid_n40_data_in_txn_start`, `invalid_n40_data_in_txn_end`

SMF Disconnect stats Category

smf_disconnect_stats

Description: SMF Disconnect stats counters

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

Labels:

- Label: `rat_type`

Label Description: RAT Type of the Session

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: reason

Label Description: The reason associated with an call disconnect

Example: disc_pdusetup_create_over_create, disc_pdusetup_release_over_create, disc_pdusetup_admin_clear, disc_pdusetup_n1_decode_failure, disc_pdusetup_n1_content_not_found, disc_pdusetup_sess_abs_timeout, disc_pdusetup_sess_idle_timeout, disc_pdusetup_sess_cp_idle_timeout, disc_pdusetup_sess_default_flow_only_timeout, disc_pdusetup_ssc_mode_not_supported, disc_pdusetup_ssc_mode_denied, disc_pdusetup_identity_conflict, disc_pdusetup_pdu_type_unsupported, disc_pdusetup_pdu_type_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(dm='dm1',servingArea='areal',nssai='slicel',pool='pl',allocationType='dynamic',addressType='IPv4',upf='upl',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="areal",nssai="slicel",pool="pl",
eventType="Allocation",allocationType="dynamic",addressType="IPv4",upf="dpl",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='areal',nssai='slicel',pool='pl',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: `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(dn='dn1',servingArea='area1',nssai='slice1',pool='p1',eventType='Allocation',addressType='IPv4',upf='up1',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_TXnRELOCOoverall_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_TNGRELOCOoverall_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_failiure, n2ho_chf_update_failure, n2ho_invalid_response,
 xnho_tobe_switched_flag_not_set, xnho_dl_tunnel_info_not_found, xnho_invalid_accepted_qfi_list,
 xnho_n4_modification_failed, xnho_n1n2_transfer_failure//NotUsedtoberemoved,
 xnho_n2_decode_failiure, xnho_pdu_state_error, n26ho_4g_5g_n1n2_transfer_failure,
 n26ho_4g_5g_invalid_state, n26ho_4g_5g_n4_failed_prepared_state,
 n26ho_4g_5g_resource_alloc_unsuccess_transfer, n26ho_4g_5g_timedout_in_post_exec_state,
 n26ho_4g_5g_n4_failed_completed_state, n26ho_4g_5g_handover_cancelled,
 n26ho_4g_5g_send_n4mod_failed_preparing_state, n26ho_4g_5g_n4mod_rsp_failed_preparing_state,
 n26ho_4g_5g_n4mod_rsp_timeout_preparing_state, n26ho_4g_5g_im_mobility_send_n4mod_failed,
 n26ho_4g_5g_im_mobility_n4mod_rsp_failed, n26ho_4g_5g_im_mobility_n4mod_rsp_timeout,
 n26ho_4g_5g_invalid_eps_pdn_connlist, n26ho_4g_5g_udm_reg_failed, n26ho_4g_5g_dft,
 n26ho_4g_5g_idft, n26ho_5g_4g_dft, n26ho_5g_4g_idft, n26ho_5g_4g_ctxrtrive_rec_for_4g_session,
 n26ho_5g_4g_handover_cancel, n26ho_4g_5g_no_eps_5gs_continuity, n26ho_default_flow_failed,
 n26ho_n2_decode_failiure, n26ho_chf_update_failure, n26im_mobility_4g_5g_no_eps_5gs_continuity,
 n26im_mobility_4g_5g_default_eps_bearer_inactive, pduim_n1n2_transfer_failure,
 pduim_n2_setup_response_failure, pduim_n1n2_txfr_failure_notification, pduim_n4_modification_failed,
 pduim_misc_error, pduim_n1n2ack_decode_error, pduim_n1n2ack_unhndl_cause,
 pduim_n1n2ack_unhndl_rsp_code, pduim_n1n2ack_unhndl_prb_cause, pduim_suspended_procedure,
 pduim_amf_ctx_not_found, pduim_internal_error, pduim_upstate_not_in_deactivated_state,
 pduim_pdu_access_type_mismatch, pduim_pdu_gnb_tunnel_not_available,
 pduim_pdu_n4_deactivated_state, pduim_sla_timer_expired, pduim_temp_reject_max_retry, upf_failure,
 pcf_failure, idft_release_failure, access_4g_already, idft_setup_failure, mbr_setup_failure, sgw_failure,
 udm_registration_failure, udm_subscription_fetch_failure, udm_subscribe_notify_failure,
 udm_update_notify_failure, aaa_subscribe_auth_failure, pcf_create_failure, pcf_update_failure,
 charging_data_failure, no_rule_matched, invalid_protocol, invalid_dst_mask, invalid_src_mask,
 invalid_5qi, invalid_arp, invalid_other, internal_error, invalid_ebi, invalid_framed_ipv6_pfx_length,
 invalid_acct_sess_id_radius_dm, reason_unknown, invalid_rat_type, session_associated_to_online_chf,
 session_not_in_state, unknown, n4_release_failed, gtpu_peer_path_failed,
 rel_received_for_non_5g_session, qfi_failed_to_setup, utn3gppto5gho_n4_failed_completed_state,
 utn3gppto5gho_n4_failed_prepared_state, utn3gppto5gho_resource_alloc_unsuccess_transfer,
 utn3gppto5gho_invalid_state, utn3gppto5gho_policy_update_failure,
 utn3gppto5gho_charging_update_failure, utn3gppto5gho_n1n2_transfer_failure,
 utn3gppto5gho_pcf_update_failed_post_ho, utn3gppto5gho_chf_update_failed_post_ho,
 utn3gppto5gho_n4_failed_post_ho, utn3gppto5gho_del_bearer_failed,
 utn3gppto5gho_partial_flow_failure, utn3gppto5gho_default_flow_failed, utn3gppto5gho_eps_fallback,
 utn3gppto5gho_setup_unsuccess_transfer, utn3gppto5gho_fail_due_n2msg_rsp_not_rcvd,
 utn3gppto5gho_ctxt_create_res_failure, utn3gppto5gho_invalid_ctxt_create_req,
 utn3gpp_epsfallback_failed_during_5g_4g_ho, utn3gpp_epsfallback_failed_guard_timer_expiry,
 nr_to_untrusted_wifi_invalid_sess_state, nr_to_untrusted_wifi_invalid_json,
 nr_to_untrusted_wifi_invalid_paa, nr_to_untrusted_wifi_invalid_msg, nr_to_untrusted_wifi_pcf_failed,
 nr_to_untrusted_wifi_n40_failed, nr_to_untrusted_wifi_n4_failed,
 nr_to_untrusted_wifi_pcf_failed_post_cb, nr_to_untrusted_wifi_n40_failed_post_cb,
 nr_to_untrusted_wifi_n4_failed_post_cb, nr_to_untrusted_wifi_cbr_failed,
 nr_to_untrusted_wifi_ubr_failed, nr_to_untrusted_wifi_cb_res_failed,
 nr_to_untrusted_wifi_n1n2_release_failed, nr_to_untrusted_wifi_n4_failed_post_ho,
 nr_to_untrusted_wifi_pcf_update_failed_post_ho, nr_to_untrusted_wifi_chf_update_failed_post_ho,
 nr_to_untrusted_wifi_sla_timer_expired, nr_to_untrusted_wifi_dbr_failed,
 enb_to_untrusted_wifi_to_enb_ho_reject, enb_to_untrusted_wifi_to_enb_invalid_sess_state,

enb_to_untrusted_wifi_to_enb_invalid_json, enb_to_untrusted_wifi_to_enb_invalid_paa,
enb_to_untrusted_wifi_to_enb_invalid_msg, enb_to_untrusted_wifi_to_enb_udm_failed,
enb_to_untrusted_wifi_to_enb_pcf_failed, enb_to_untrusted_wifi_to_enb_n40_failed,
enb_to_untrusted_wifi_to_enb_n4_failed, enb_to_untrusted_wifi_to_enb_pcf_failed_post_cb,
enb_to_untrusted_wifi_to_enb_mbr_failed, enb_to_untrusted_wifi_to_enb_n4_failed_post_mbr,
enb_to_untrusted_wifi_to_enb_n40_failed_post_cb, enb_to_untrusted_wifi_to_enb_n4_failed_post_cb,
enb_to_untrusted_wifi_to_enb_n40_failed_post_db, enb_to_untrusted_wifi_to_enb_pcf_failed_post_db,
enb_to_untrusted_wifi_to_enb_cbr_failed, enb_to_untrusted_wifi_to_enb_dbr_failed,
enb_to_untrusted_wifi_to_enb_ubr_failed, dsr_target_rat_rejected

- Label: emergency_call

Label Description: Flag indicating if it is an emergency call

Example: true, false

- Label: rat_type

Label Description: RAT Type of the Session

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: roaming_status

Label Description: Roaming status of the subscriber session

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

- Label: up_state

Label Description: Userplane connection status of the session

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

- Label: qos_5qi

Label Description: 5QI applicable for the QoS flow

Example: 1, 2, 5

- Label: always_on

Label Description: always on status

Example: enable, disable

- Label: dcnr

Label Description: UE DCNR status

Example: enable, disable

- Label: smf_current_procedure

Label Description: Current Procedure Name for Message Level Stats

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

- Label: fourg_only_ue

Label Description: Only 4g capable UE flag

Example: true, false

- Label: pra

Label Description: Presence Reporting Area Information

Example: enable, none

SMF Procedure Collision Category

smf_procedure_collision

Description: Total number of procedures collided

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

Labels:

- Label: smf_current_procedure

Label Description: Current Procedure Name

Example: PDU Session Release - SMF initiated, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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, SessionNrToUnTrustWifiHOTOTimeout, Session4GWifi4GHOTOTimeout, SessionWifiTo4GHoMBReqTimeout, SessionRouterSolicitTimeout, SessionUsageReportTimeout, SessionPathSwitchTimeout, SessionN1N2RetryAfter, SessionPDUIMN1N2RetryAfter, SessionN2HoIdftTimeout, SessionN26HoIdftTimeout, SessionAbsoluteTimeout, SessionIwfn26IdftTimeout, SessionDedBrrReEstTimer, SessionDedBrrDelayTimer, Session4G5GN26Timeout, SessionN1N2RetryTimeout, SessionN1N2RetransTimeout, SessionPDUIMResumeTimeout, SessionUrrOutOfOrderWaitTimeout, SessionPduRelCmdRetryTimeout, SessionUnTrustWifiToNrHOTOTimeout, 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, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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, PDN Session Modify - PCRF 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: `snsai`

Label Description: SNSSAI of the session having sd and sst

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

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