



SMF Metrics

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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

Charging final unit indication statistics Category

chf_recieved_fui_stats

Description: Statistics for final unit indication with final unit action

Sample Query: 'sum (chf_recieved_fui_stats{interface_type="Gy"})'

Labels:

- Label: `chf_type`
Label Description: Type of CHF with which message is exchanged
Example: online, offline
- Label: `interface_type`
Label Description: Type of Interface communicate with PGW
Example: N40, Gy
- Label: `fua_type`
Label Description: Type of final unit action
Example: FinalUnitActionType_TERMINATE", "FinalUnitActionType_REDIRECT", "FinalUnitActionType_RESTRICT_ACCESS

Discover Messages Time statistics Category

nf_discover_total_time

Description: Discover Messages Total time statistics

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

Labels:

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

Discover Messages statistics Category

nf_discover_messages_total

Description: Discover Messages statistics

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

Labels:

- Label: `nf_type`

Label Description: Network Function type

Example: nrf, udm, amf, pcf, 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

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, suspend_notification, resume_notification, change_notification`

- 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_HANOVER_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, cbr_fail_upstate_inactive, ubr_fail_upstate_inactive,
 mbc_retransmit_msg, change_notification_retransmit_msg

- 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

Gy Online charging destination host change statistics Category

ocs_dest_host_change_stats

Description: Statistics for charging destination host change

Sample Query: 'sum (ocs_dest_host_change_stats)'

Gy Online charging reporting reason statistics Category

ocs_reporting_reason_stats

Description: Statistics for reporting reason to OCS

Sample Query: 'sum (ocs_reporting_reason_stats{Reporting_Reason="THRESHOLD"})'

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: Reporting_Reason

Label Description: Type of 3GPP reporting reason from OCS

Example: THRESHOLD, QHT, FINAL, QUOTA_EXHAUSTED, VALIDITY_TIME, OTHER_QUOTA_TYPE, RATING_CONDITION_CHANGE, FORCED_REAUTHORISATION, POOL_EXHAUSTED

Gz Offline CDR drop statistics Category

ofcs_cdr_drop_stats

Description: Statistics for CDR drop with trigger reason

Sample Query: 'sum (ofcs_cdr_drop_stats{TriggerType="final-cdr"})'

Labels:

- Label: procedure_type

Label Description: The procedure name associated with a call flow procedure

Example: Any string

- Label: TriggerType

Label Description: Trigger reason

Example: final-cdr", "external-trigger-cdr", "internal-trigger-cdr

- Label: dnn

Label Description: DNN for which the flow is created

Example: cisco.com

Gz Offline CDR message statistics Category

ofcs_cdr_message_stats

Description: Statistics for CDR message with record closure reason to OFCS

Sample Query: 'sum (ofcs_cdr_message_stats{record_closure_reason="normalRelease"})'

Labels:

- Label: gtp_p_profile

Label Description: gtp profile name used for bearer

Example: Any string

- Label: ruleBase

Label Description: RuleBase name used for bearer

Example: Any string

- Label: record_closure_reason

Label Description: CDR closure reason

Example: normalRelease", "abnormalRelease", "cAMELInitCallRelease", "volumeLimit", "timeLimit", "servingNodeChange", "maxChangeCond", "managementIntervention", "intraSGSNIntersystemChange", "rATChange", "mSTimeZoneChange", "sGSNPLMNIDChange

- Label: dnn

Label Description: DNN for which the flow is created

Example: cisco.com

- Label: triggerType

Label Description: Trigger reason

Example: GZ_SECONDARY_RAT_USAGE_LIMIT_REACHED

Gz Offline SDF Containers statistics Category

ofcs_sdf_container_stats

Description: Statistics for SDF Container with service condition change to OFCS

Sample Query: 'sum (ofcs_sdf_container_stats{service_condition_change="PdpContextRelease"})'

Labels:

- Label: `service_condition_change`

Label Description: Service condition Change for SDF container

Example: QoSChange", "SgsnChange", "SgsnPlmnIdChange", "TariffTimeSwitch", "PdpContextRelease", "RatChange", "ServiceIdleOut", "ConfigurationChange", "ServiceStop", "DccaTimeThresholdReached", "DccaVolumeThresholdReached", "DccaServiceSpecificUnitThresholdReached", "DccaTimeExhausted", "DccaVolumeExhausted", "DccaValidityTimeout", "DccaReauthorisationRequest", "DccaContinueOngoingSession", "DccaRetryAndTerminateOngoingSession", "DccaTerminateOngoingSession", "CgiSaiChange", "RaiChange", "DccaServiceSpecificUnitExhausted", "RecordClosure", "TimeLimit", "VolumeLimit", "ServiceSpecificUnitLimit", "EnvelopeClosure", "EcgiChange", "TaiChange", "UserLocationChange

- Label: `dnn`

Label Description: DNN for which the flow is created

Example: cisco.com

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, 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, 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/nnrf-nfm/v1", direction="outbound", message_type="registration", result="timeouOrRPCError" }'

Labels:

- Label: `host`

Label Description: End Point address

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

- Label: `direction`

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

Example: `inbound`, `outbound`

- Label: `message_type`

Label Description: Type of Message

Example: `registration`, `heartbeat`, `subscription`, `notification`

- Label: `result`

Label Description: result of discover message

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

NF management messages statistics Category

nf_management_stats_total

Description: NF management messages statistics

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

Labels:

- Label: `host`

Label Description: End Point address

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

- Label: `direction`

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

Example: `inbound`, `outbound`

- Label: `message_type`

Label Description: Type of Message

Example: registration, heartbeat, subscription, notification

- Label: `result`

Label Description: result of discover message

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

NRF Discovery Category

nf_discover_events_total

Description: NF Discover Stats

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

Labels:

- Label: `nf_type`

Label Description: Network Function type

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

- Label: `response_type`

Label Description: Discovery response choosen from

Example: local, cache, expired-cache

PDU UE Sync Procedure Category

pdu_ue_sync_proc

Description: PDU UE Sync Procedure counter

Sample Query: `'pdu_ue_sync_proc{status="attempted"}'`

Labels:

- Label: `status`

Label Description: call flow procedure status counter

Example: attempted, success, failures, suspend, resume, abort

Policy control ADC pcc rule statistics Category

policy_adc_total

Description: PCC Rule total statistics for ADC

Sample Query: `'sum (policy_adc_total{app_id="abc"})'`

Labels:

- Label: `app_id`
Label Description: ADC Application ID for pcc rule
Example: Any string
- Label: `mute`
Label Description: Mute for ADC rule
Example: true, false
- Label: `operation`
Label Description: Operation performed on the ADC pcc rule
Example: install, modify, remove
- Label: `event`
Label Description: Event associated with the operation performed on the ADC pcc rule
Example: attempted, success, failure, abort
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: Any string
- Label: `interface_type`
Label Description: Type of Interface communicate with PGW
Example: pcf, pcrf

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

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: `pcf`, `pcrf`

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`

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: `pcf`, `pcrf`

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

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: pcf, pcrf

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`

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: `pcf`, `pcrf`

- Label: `mapped_flow`

Label Description: flow has mapped 5Qi or not

Example: `true` , `false`

- Label: `policy_type`

Label Description: policy type for the subscriber session

Example: `pcrf`,`pcf`,`optimized`,`local_policy`

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`

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: `pcf`, `pcrf`

- Label: `rule_fail_reason`

Label Description: PCC Rule Fail Reason

Example: Rulebase is inactive, Rulebase is not configured, Predefined rule is inactive, Predefined rule is not configured, Pcc Rule recvd w/o RefQos, Pcc Rule recvd with invalid RefQos, Delete Pcc Rule recvd with policy create, Pcc Rule Does not exist, Pcc Rule recvd with reserved precedence, Pcc Rule name and id mismatch, Pcc Rule id is invalid, Pcc Rule recvd with invalid flow direction, Pcc Rule recvd without expected RefQos, Pcc Rule recvd Max filters(16) overflow, Max supported filters reached, Pcc Rule recvd with mismatch RefQoS, Pcc Rule recvd with unexpeted qos desc, Skipped due to Charging Description validation, Pcc Rule recvd with missing charging descriptor, Pcc Rule recvd with invalid

charging desc, Qos Desc unexpected content, Pcc Rule recvd with multiple RefQos, Pcc Rule recvd without Flow Information, Pcc Rule recvd with RefQos having invalid, binding params, Sess Rule recvd w/o sess rule id, Sess Rule recvd w/o uplink AMBR, Sess Rule recvd w/o downlink AMBR, Sess Rule recvd with non standard 5QI, Sess Rule Auth def Qos recvd w/o ARP, Sess Rule and Auth def Qos mismatch, Sess Rule Auth def Qos recvd from non default flow, Sess Rule Auth def Qos QCI present in other Qos Desc, Sess Rule name and id mismatch, ARP recvd with invalid params, Flow desc recvd with invalid format(Invalid ipaddr class), Expected format: permit <direction> <protocol> from <Srouce IP> <Srouce Port> to <Dest IP> <Dest Port>, Flow desc recvd with action not supported, Flow desc recvd with direction not supported, Flow desc recvd with protocol not supported, Flow desc recvd with protocol missing, Flow desc recvd with remote IP or mask invalid, Flow desc recvd with source IP or mask invalid, Flow desc invert modifier not allowed, Flow desc assigned not supported for remote IP, Qos Desc Qos ID mismatch, Qos Desc recvd with Non Std 5QI, Qos Desc recvd with Non invalid bitrate, Qos Desc MBR value should be more than GBR value, Qos Desc recvd with invalid QoSID, Qos Desc recvd w/o ARP, Received existing Qos Desc with different binding parameters, Policy Trig lastreq data unavailable, Charging Desc not referred by any PCC Rule Or referred by invalid PCC Rule, Received Charging Id different from charging desc map key, Charging Desc not referred by any PCC Rule Or referred by invalid PCC Rule, Received Charging Id not referred by any PCC Rule, Existing Charging Desc unsupported modify, Invalid Input, Missing Charging ID information from Charging Descriptor, Missing RatingGroup information for Charging Id, Neither Online nor Offline charging method is enabled for charging descriptor Missing Service ID inforamtion for Charging Desc, Missing Service ID inforamtion for Charging Desc, URR ID not found for rating group, URR ID not found for rating group and service ID, Received Charging Desc conflicts with another charging descriptor, Charging Desc skipped due to Pcc Rule, Conflicting with dynamic chargng descriptor, Duplicate report function data invalid, IsMatching function data invalid, Conflicting RG service ID, PCC Rule Dropped due to charging association, Last Rule data not available, PCC Rule Invalid due to Ref TC Data, TC ID - Name mismatch, Missing Redirect Server address, Invalid Address Type, Session Rule recvd with Invalid 5QI, Qos Desc recvd with Invalid 5QI, Pcc Rule recvd with RefQos having invalid Flow for Non-Std QCI, Received Qos Desc with different Flow parameters between same flow for Non-Std QCI, Received existing Qos Desc with different Flow parameters for Non-Std QCI, Received Std-QCI Non-Gbr Flow with GBR value, Received Std-QCI Gbr Flow without GBR value, Predefine Pcc Rule recvd without AppID but its configs as ADC Rule, Predefine Pcc Rule recvd with AppID but its configs as Non-ADC Rule, Application Id change is not supported for Predefine Pcc Rule, PCC Rule revd with missing rule name, PCC Rule revd with invlaid Flow Description, PCC Rule revd with Invalid ToS Traffic Class, PCC Rule revd with Invalid SecurityParameterIndex, PCC Rule revd with Invalid Flow Label, PCC Rule revd with missing precedence, PCC Rule revd with missing QoS Information, PCC Rule revd with missing QCI in QoS Information, PCC Rule revd with invalid or unsupported QCI in QoS Information, PCC Rule revd with missing ARP priority level in QoS Information, PCC Rule revd with invalid ARP priority level, PCC Rule revd with invalid reporting level, PCC Rule revd with invalid flow status, Def Bearer Qos received with missing QCI, Def Bearer Qos received with invalid or unsupported QCI, Def Bearer Qos received with invalid ARP priority level, Invalid BCM received, Failure due Result Code AVP, Failure due to Experimental Result Code AVP, Invalid or Missing Supported Feature AVP, Usage Monitoring data instance is not defined, Invalid Usage Monitoring data referenced in Sess or PCC rule, Pcc Rule recvd with invalid refUmData, Sess Rule recvd with invalid refUmData, Gx Session release cause received

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
- Label: `result`
Label Description: result of policy message processing
Example: cfg_issue, max_outstanding, send_failure, timeout, proc_timeout, rc_with_err, ex_rc_with_err, none
- Label: `policy_fh_action`
Label Description: Policy CHF action
Example: continue, terminate, none
- Label: `policy_fh_subaction`
Label Description: Policy CHF subaction
Example: discard_traffic, local_fallback, retryserver_on_event, sendccrt_call_term, with_term_req, without_term_req, none
- Label: `interface_type`
Label Description: Type of Interface communicate with PGW
Example: pcf, pcrf
- Label: `sess_rel_cause`
Label Description: Session release cause received from policy server in policy response or policy request
Example: unspecified, ue_subscription, insuff_server_res, ip_can_sess_term, ue_ip_addr_rel
- Label: `termination_cause`
Label Description: Termination cause sent in terminate request towards policy server

Example: logout, service_not_provided, bad_answer, administrative, link_broken, auth_expired, user_moved, session_timeout

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

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: pcf, pcrf

- Label: `rule_fail_reason`

Label Description: PCC Rule Fail Reason

Example: Rulebase is inactive, Rulebase is not configured, Predefined rule is inactive, Predefined rule is not configured, Pcc Rule recvd w/o RefQos, Pcc Rule recvd with invalid RefQos, Delete Pcc Rule recvd with policy create, Pcc Rule Does not exist, Pcc Rule recvd with reserved precedence, Pcc Rule name and id mismatch, Pcc Rule id is invalid, Pcc Rule recvd with invalid flow direction, Pcc Rule recvd without expected RefQos, Pcc Rule recvd Max filters(16) overflow, Max supported filters reached, Pcc Rule recvd with mismatch RefQoS, Pcc Rule recvd with unexpeted qos desc, Skipped due to Charging Description validation, Pcc Rule recvd with missing charging descriptor, Pcc Rule recvd with invalid charging desc, Qos Desc unexpected content, Pcc Rule recvd with multiple RefQos, Pcc Rule recvd without Flow Information, Pcc Rule recvd with RefQos having invalid, binding params, Sess Rule recvd w/o sess rule id, Sess Rule recvd w/o uplink AMBR, Sess Rule recvd w/o downlink AMBR, Sess Rule recvd with non standard 5QI, Sess Rule Auth def Qos recvd w/o ARP, Sess Rule and Auth def Qos mismatch, Sess Rule Auth def Qos recvd from non default flow, Sess Rule Auth def Qos QCI present in other Qos Desc, Sess Rule name and id mismatch, ARP recvd with invalid params, Flow desc recvd with invalid format(Invalid ipaddr class), Expected format: permit <direction> <protocol> from <Srouce IP> <Srouce Port> to <Dest IP> <Dest Port>, Flow desc recvd with action not supported, Flow desc recvd with direction not supported, Flow desc recvd with protocol not supported, Flow desc recvd with protocol missing, Flow desc recvd with remote IP or mask invalid, Flow desc recvd with source IP or mask invalid, Flow desc invert modifier not allowed, Flow desc assigned not supported for remote IP, Qos Desc Qos ID mismatch, Qos Desc recvd with Non Std 5QI, Qos Desc recvd with Non invalid bitrate, Qos Desc MBR value should be more than GBR value, Qos Desc recvd with invalid QoSID, Qos Desc recvd w/o ARP, Received existing Qos Desc with different binding parameters, Policy Trig lastreq data unavailable, Charging Desc not referred by any PCC Rule Or referred by invalid PCC Rule, Received Charging Id different from charging desc map key, Charging Desc not referred by any PCC Rule Or referred by invalid PCC Rule, Received Charging Id not referred by any PCC Rule, Existing Charging Desc unsupported modify, Invalid Input, Missing Charging ID information from Charging Descriptor, Missing RatingGroup information for Charging Id, Neither Online nor Offline charging method is enabled for charging descriptor Missing Service ID inforamtion for Charging Desc, Missing Service ID inforamtion for Charging Desc, URR ID not found for rating group, URR ID not found for rating group and service ID, Received Charging Desc conflicts with another charging descriptor, Charging Desc skipped due to Pcc Rule, Conflicting with dynamic chargng descriptor, Duplicate report function data invalid, IsMatching function data invalid, Conflicting RG service ID, PCC Rule Dropped due to charging association, Last Rule data not available, PCC Rule Invalid due to RefTC Data, TC ID - Name mismatch, Missing Redirect Server address, Invalid Address Type, Session Rule recvd with Invalid 5QI, Qos Desc recvd with Invalid 5QI, Pcc Rule recvd with RefQos having invalid Flow for Non-Std QCI, Received Qos Desc with different Flow parameters between same flow for Non-Std QCI, Received existing Qos Desc with different Flow parameters for Non-Std QCI, Received Std-QCI Non-Gbr Flow with GBR value, Received Std-QCI Gbr Flow without GBR value, Predefine Pcc Rule recvd without AppID but its configs as ADC Rule, Predefine Pcc Rule recvd with AppID but its configs as Non-ADC Rule, Application Id change is not supported for Predefine Pcc Rule, PCC Rule rcvd with missing rule name, PCC Rule rcvd with invlaid Flow Description, PCC Rule rcvd with Invalid ToS Traffic Class, PCC Rule rcvd with Invalid SecurityParameterIndex, PCC Rule rcvd with Invalid Flow Label, PCC Rule rcvd with missing precedence,

PCC Rule recvd with missing QoS Information, PCC Rule recvd with missing QCI in QoS Information, PCC Rule recvd with invalid or unsupported QCI in QoS Information, PCC Rule recvd with missing ARP priority level in QoS Information, PCC Rule recvd with invalid ARP priority level, PCC Rule recvd with invalid reporting level, PCC Rule recvd with invalid flow status, Def Bearer Qos received with missing QCI, Def Bearer Qos received with invalid or unsupported QCI, Def Bearer Qos received with invalid ARP priority level, Invalid BCM received, Failure due Result Code AVP, Failure due to Experimental Result Code AVP, Invalid or Missing Supported Feature AVP, Usage Monitoring data instance is not defined, Invalid Usage Monitoring data referenced in Sess or PCC rule, Pcc Rule recvd with invalid refUmData, Sess Rule recvd with invalid refUmData, Gx Session release cause received

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
- Label: `interface_type`
Label Description: Type of Interface communicate with PGW
Example: pcf, pcrf

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`

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: `pcf`, `pcrf`

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`

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: `pcf`, `pcrf`

- Label: `rule_fail_reason`

Label Description: PCC Rule Fail Reason

Example: Rulebase is inactive, Rulebase is not configured, Predefined rule is inactive, Predefined rule is not configured, Pcc Rule recvd w/o RefQos, Pcc Rule recvd with invalid RefQos, Delete Pcc Rule recvd with policy create, Pcc Rule Does not exist, Pcc Rule recvd with reserved precedence, Pcc Rule name and id mismatch, Pcc Rule id is invalid, Pcc Rule recvd with invalid flow direction, Pcc Rule recvd without expected RefQos, Pcc Rule recvd Max filters(16) overflow, Max supported filters reached, Pcc Rule recvd with mismatch RefQoS, Pcc Rule recvd with unexpeted qos desc, Skipped due to Charging Description validation, Pcc Rule recvd with missing charging descriptor, Pcc Rule recvd with invalid charging desc, Qos Desc unexpected content, Pcc Rule recvd with multiple RefQos, Pcc Rule recvd without Flow Information, Pcc Rule recvd with RefQos having invalid, binding params, Sess Rule recvd w/o sess rule id, Sess Rule recvd w/o uplink AMBR, Sess Rule recvd w/o downlink AMBR, Sess Rule recvd with non standard 5QI, Sess Rule Auth def Qos recvd w/o ARP, Sess Rule and Auth def Qos mismatch, Sess Rule Auth def Qos recvd from non default flow, Sess Rule Auth def Qos QCI present in other Qos Desc, Sess Rule name and id mismatch, ARP recvd with invalid params, Flow desc recvd with invalid format(Invalid ipaddr class), Expected format: permit <direction> <protocol> from <Srouce IP> <Srouce Port> to <Dest IP> <Dest Port>, Flow desc recvd with action not supported, Flow desc recvd with direction not supported, Flow desc recvd with protocol not supported, Flow desc recvd with protocol missing, Flow desc recvd with remote IP or mask invalid, Flow desc recvd with source IP or mask invalid, Flow desc invert modifier not allowed, Flow desc assigned not supported for remote IP, Qos Desc Qos ID mismatch, Qos Desc recvd with Non Std 5QI, Qos Desc recvd with Non invalid bitrate, Qos Desc MBR value should be more than GBR value, Qos Desc recvd with invalid QoSID, Qos Desc recvd w/o ARP, Received existing Qos Desc with different binding parameters, Policy Trig lastreq data unavailable, Charging Desc not referred by any PCC Rule Or referred by invalid PCC Rule, Received Charging Id different from charging desc map key, Charging Desc not referred by any PCC Rule Or referred by invalid PCC Rule, Received Charging Id not referred by any PCC Rule, Existing Charging Desc unsupported modify, Invalid Input, Missing Charging ID information from Charging Descriptor, Missing RatingGroup information for Charging Id, Neither Online nor Offline charging method is enabled for charging descriptor Missing Service ID inforamtion for Charging Desc, Missing Service ID inforamtion for Charging Desc, URR ID not found for rating group, URR ID not found for rating group and service ID, Received Charging Desc conflicts with another charging descriptor, Charging Desc skipped due to Pcc Rule, Conflicting with dynamic chargng descriptor, Duplicate report function data invalid, IsMatching function data invalid, Conflicting RG service ID, PCC Rule Dropped due to charging association, Last Rule data not available, PCC Rule Invalid due to Ref TC Data, TC ID - Name mismatch, Missing Redirect Server address, Invalid Address Type, Session Rule recvd with Invalid 5QI, Qos Desc recvd with Invalid 5QI, Pcc Rule recvd with RefQos having invalid Flow for Non-Std QCI, Received Qos Desc with different Flow parameters between same flow for Non-Std QCI, Received existing Qos Desc with different Flow parameters for Non-Std QCI, Received Std-QCI Non-Gbr Flow with GBR value, Received Std-QCI Gbr Flow without GBR value, Predefine Pcc Rule recvd without AppID but its configs as ADC Rule, Predefine Pcc Rule recvd with AppID but its configs as Non-ADC Rule, Application Id change is not supported for Predefine Pcc Rule, PCC Rule recvd with missing rule name, PCC Rule recvd with invlaid Flow Description, PCC Rule recvd with Invalid ToS Traffic Class, PCC Rule recvd with Invalid SecurityParameterIndex, PCC Rule recvd with Invalid Flow Label, PCC Rule recvd with missing precedence, PCC Rule recvd with missing QoS Information, PCC Rule recvd with missing QCI in QoS Information, PCC Rule recvd with invalid or unsupported QCI in QoS Information, PCC Rule recvd with missing ARP priority level in QoS Information, PCC Rule recvd with invalid ARP priority level, PCC Rule recvd with invalid reporting level, PCC Rule recvd with invalid flow status, Def Bearer Qos received with missing QCI, Def Bearer Qos received with invalid or unsupported QCI, Def Bearer Qos received with invalid ARP priority level, Invalid BCM received, Failure due Result Code AVP, Failure due to Experimental Result Code AVP, Invalid or Missing Supported Feature AVP, Usage Monitoring data instance is not defined, Invalid Usage Monitoring data referenced in Sess or PCC rule, Pcc Rule recvd with invalid refUmData, Sess Rule recvd with invalid refUmData, Gx Session release cause received

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

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: pcf, pcrf

- Label: `mapped_flow`

Label Description: flow has mapped 5Qi or not

Example: true , false

- Label: `policy_type`

Label Description: policy type for the subscriber session

Example: pcrf,pcf,optimized,local_policy

Policy destination host change statistics Category

policy_pcrf_dest_host_change

Description: Statistics for Policy destination host change

Sample Query: `'sum (policy_pcrf_dest_host_change{gr_instance_id="1"})'`

Labels:

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: Any string

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: pcf, pcrf

Radius Authentication Message Stats Category

radius_authentication_message_stats

Description: Stats for Radius Authentication messages

Sample Query:

`'radius_authentication_message_stats{radius_auth_algorithm="radius_auth_algorithm_pap}'`

Labels:

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `radius_auth_algorithm`

Label Description: Radius Authentication Algorithm used

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

- Label: `status`

Label Description: Radius Auth message status

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

- Label: `reason`

Label Description: The reason associated with failure

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

- Label: `rat_type`

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

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

Radius Message stats Category

smf_radius_message_stats

Description: Stats for Radius interface messages

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

Labels:

- Label: `direction`

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

Example: `inbound`, `outbound`

- Label: `message_type`

Label Description: Radius Message Type

Example: `radius_access_request`, `radius_access_accept`

- Label: `radius_avp_type`

Label Description: Radius AVP Type

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

- Label: `rat_type`

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

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

SLA Transaction Category

smf_sla_transaction_stats

Description: Transaction SLA stats

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

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated, PDN Session Modify - PCRF 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, allocate-max-quota
- 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`

- Label: `interface_type`

Label Description: Type of Interface communicate with PGW

Example: `N40`, `Gy`

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_pfcip_usage_report_stats

Description: The current count of PFCP usage reports towards CHF

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

Labels:

- Label: `usage_report_type`

Label Description: Synchronous usage report or Asynchronous usage report

Example: async, sync

- Label: `status`

Label Description: Usage report status

Example: recieved, dropped, ignored, processed

- Label: `procedure_type`

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

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

- Label: usage_report_discard_reason

Label Description: Reason for usage report rejection

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

SMF Charging Quota Event Stats Category

chf_quota_event_stats

Description: The current count for quota event received from CHF

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

Labels:

- Label: rating_group

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

Example: Any string

- Label: quota_type

Label Description: Quota type as received from CHF

Example: initial, update, initial_final, update_final, fail

- Label: quota_method

Label Description: Quota method received from CHF

Example: time, volume, time_volume

- Label: quota_status

Label Description: Result for the quota received from CHF

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

- Label: quota_fail_action

Label Description: Action on quota failure

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

- Label: `service_identifier`

Label Description: Service Identifier for CHF quota event

Example: Any string

SMF Charging Radius Accounting Message Stats Category

radius_accounting_message_stats

Description: SMF Radius accounting message stats

Sample Query: `'radius_accounting_message_stats{procedure_type="radius_initial"}'`

Labels:

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

SMF Charging Session Limit Dynamic Stats Category

chf_sess_limit_dynamic_stats

Description: SMF Charging Session Limit stats

Sample Query:

`'chf_sess_limit_dynamic_stats{chf_sess_limit_dyn_reason="chf_sess_limit_dyn_del_all_trig_disabled"}'`

Labels:

- Label: `chf_sess_limit_dyn_reason`

Label Description: Reason for Charging session limit stats

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

SMF Charging Usage Report Stats Category

`chf_usage_report_stats`

Description: The current count for usage reports towards CHF

Sample Query: `'chf_usage_report_stats(charging_method="offline")'`

Labels:

- Label: `rating_group`

Label Description: Rating Group for which usage is being reported

Example: Any string

- Label: `service_identifier`

Label Description: Service Identifier for which usage is being reported

Example: Any string

- Label: `charging_method`

Label Description: Metering method for the PDU Session

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

- Label: `charging_trigger_type`

Label Description: Trigger for usage report

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

- Label: `procedure_type`

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

Example: `pdu_sess_create`, `ue_req_pdu_sess_mod`, `smf_req_pdu_sess_mod`, `pcf_req_pdu_sess_mod`, `udm_req_pdu_sess_mod`, `gnb_req_pdu_sess_mod`, `ue_req_pdu_sess_rel`, `smf_req_pdu_sess_rel`, `pcf_req_pdu_sess_rel`, `amf_req_pdu_sess_rel`, `udm_req_pdu_sess_rel`, `gnb_req_pdu_sess_rel`, `chf_req_pdu_sess_rel`, `admin_req_pdu_sess_rel`, `ue_req_active_to_idle`, `ue_req_idle_to_active`,

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

SMF Charging Zero Usage Report Stats Category

chf_zero_usage_report_stats

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

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

Labels:

- Label: measurement_type

Label Description: Measurement type

Example: volume, duration, duration-volume

- Label: charging_trigger_type

Label Description: Trigger for usage report

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

SMF DB Marshal Category

smf_db_marshall_stats

Description: SMF DB marshal stats

Sample Query: sum(smf_db_marshall_stats) by (module)

Labels:

- Label: module

Label Description: module type counter

Example: policy, charging, upserv, access, generic

SMF Data Consistency Check Category

smf_datacheck_stats

Description: Total number of sessions checked for consistency

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

Labels:

- Label: `procedure_type`

Label Description: Procedure Name

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

- Label: `rat_type`

Label Description: Type of the radio access associated

Example: EUTRA, NR, WLAN, VIRTUAL, rat_type_unknown

- Label: `pdu_type`

Label Description: Type of PDU session

Example: ipv4, ipv6, ipv4v6, unknown

- Label: `status`

Label Description: Procedure status after data consistency check

Example: success, failed

- Label: `reason`

Label Description: Failure reason of data inconsistency

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

SMF Disconnect stats Category

smf_disconnect_stats

Description: SMF Disconnect stats counters

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

Labels:

- Label: `rat_type`

Label Description: RAT Type of the Session

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: `reason`

Label Description: The reason associated with an call disconnect

Example: disc_pdusetup_create_over_create, disc_pdusetup_release_over_create, disc_pdusetup_admin_clear, disc_pdusetup_n1_decode_failure, disc_pdusetup_n1_content_not_found, disc_pdusetup_sess_abs_timeout, disc_pdusetup_sess_idle_timeout, disc_pdusetup_sess_cp_idle_timeout, disc_pdusetup_sess_default_flow_only_timeout, disc_pdusetup_ssc_mode_not_supported, disc_pdusetup_ssc_mode_denied, disc_pdusetup_identity_conflict, disc_pdusetup_pdtype_unsupported, disc_pdusetup_pdtype_denied, disc_pdusetup_snsai_denied, disc_pdusetup_dnn_denied, disc_pdusetup_iwf_denied, disc_pdusetup_subscription_denied, disc_pdusetup_dnn_not_supported, disc_pdusetup_dnn_not_supported_in_slice, disc_pdusetup_network_failure, disc_pdusetup_pdu_sess_does_not_exist, disc_init_chg_data_err, disc_pdusetup_ip_alloc_failed, disc_pdusetup_static_ip_alloc_failed, disc_pdusetup_pdu_fetch_failure, disc_pdusetup_udm_reg_failed, disc_pdusetup_udm_sub_fetch_failure, disc_pdusetup_udm_sub_fetch_resp_failed, disc_pdusetup_udm_sub_notify_failed, disc_pdusetup_upf_setup_cause_not_accepted, disc_pdusetup_secondary_auth_failed, disc_pdusetup_secondary_auth_resp_failed, disc_pdusetup_sm_cxt_invalid, disc_pdusetup_sm_cxt_invalid_ie, disc_pdusetup_sm_cxt_sess_id_err, disc_pdusetup_sm_cxt_invalid_json, disc_pdusetup_sm_cxt_n1_process_failed, disc_pdusetup_sm_cxt_man_param_missing, disc_pdusetup_pcf_create_exchg_failure, disc_pdusetup_pcf_create_rsp_failure, disc_pdusetup_rm_exchg_failure, disc_pdusetup_rm_rsp_failure, disc_pdusetup_pcf_update_exchg_failure, disc_pdusetup_pcf_update_rsp_failure, disc_chf_data_exchg_failure, disc_chf_data_rsp_failure, disc_pdusetup_upf_setup_exchg_failure, disc_pdusetup_upf_setup_rsp_failure, disc_pdusetup_n1n2_transfer_exchg_failure, disc_pdusetup_n1n2_transfer_rsp_failure, disc_pdusetup_n2_setup_failed, disc_pdusetup_ue_init_release, disc_pdusetup_amf_assign_ebi_failure, disc_pdusetup_upf_modify_exchg_failure, disc_pdusetup_upf_modify_rsp_failure, disc_pdusetup_upf_modify_failed, disc_pdusetup_upf_serv_data_nill, disc_pdusetup_upf_dl_tunnel_info_not_found, disc_pdusetup_upf_tunnel_id_not_found, disc_pdusetup_upf_mod_gnb_tun_params_failed, disc_pdusetup_upf_mod_rsra_tun_params_failed, disc_pdusetup_upf_mod_tun_param_tos-failed, disc_pdusetup_smf_mop_offline, disc_pdusetup_sm_context_nssai_not_supported, disc_pdusetup_sm_context_network_failure, disc_pdusetup_lbo_rejected, disc_pdusetup_home_route_not_supported, disc_pdusetup_internal_error, disc_pdusetup_plmn_not_supported, disc_pdurel_amf_sends_ue_not_found, disc_pdusetup_dnn_missing, disc_pdusetup_udm_dnn_missing, disc_pdusetup_resource_mgr_rsp_failed, disc_pdusetup_apply_wps_failed, disc_pdurel_ue_init_release, disc_pdurel_amf_init_release, disc_pdurel_amf_init_release_404, disc_pdurel_amf_init_release_mod_req, disc_pdurel_pcf_reconciliation, disc_rel_chf_err, disc_pdurel_pcf_init_release, disc_pdurel_udm_init_release, disc_pdurel_gnb_init_release, disc_pdurel_smf_init_release, disc_pdurel_upf_init_association_release, disc_pdurel_radius_init_release, disc_pdurel_upf_init_path_failure, disc_pdurel_upf_recovered, disc_pdurel_config_change, disc_db_conflict_release, disc_pdurel_pcf_reconciliation, disc_n2ho_n4_modify_failed, disc_n2ho_failure, disc_n2ho_guard_timer_expiry, disc_n2ho_idft_timer_expiry, disc_n26_4g_5g_ho_n4_modify_failed, disc_n26_4g_5g_im_mobility_n4_modify_failed, disc_pdumodify_context_not_found, disc_pdumodify_invalid_pdu_sess_identity, disc_pdurelease_invalid_pdu_sess_identity, disc_pduim_context_not_found, disc_n26_4g_5g_ho, disc_n26_5g_4g_ho, disc_n26_5g_4g_ho_timer_expired_post_exec, disc_n26_4g_5g_ho_udm_reg_failed, disc_n26_5g_4g_ho_mbr_failed, disc_pdusetup_upf_rule_creation_mod_failure, disc_non3gpp_utn_5g_ho, disc_5gtonon3gpp_utn_ho, disc_4g_non3gpp_utn_ho, disc_non3gpp_utn_4g_ho, disc_enb_wifi_ho_failed, disc_utn3gpp_5g_ho_failed, disc_sess_report_srsr_pdu_sess_rel, disc_pdn_ue_init_release, disc_pdn_mme_init_release, disc_pdn_chf_reconciliation, disc_pdn_pcf_reconciliation, disc_pdn_pcf_init_release, disc_pdn_pcf_fallback, disc_pdn_udm_init_release, disc_pdn_chf_init_release, disc_pdn_upf_init_release, disc_admin_init_release, disc_sess_time_exp_release, disc_sess_cp_idle_time_exp_release,

disc_session_recreate, disc_gtpc_peer_pathfail, disc_gtpc_peer_restart, disc_upf_init_path_failure, disc_transaction_timedout, disc_upf_recovered, disc_sgw_ctx_failure, disc_pdn_internal_release, disc_reason_unknown,, disc_pdnsetup_iwk_5gs_flag_false, disc_pdnsetup_pduid_init_failed, disc_pdnsetup_csr_invalid, disc_pdnsetup_udm_reg_failed, disc_pdnsetup_udm_reg_req_create_failed, disc_pdnsetup_udm_rpc_failed, disc_pdnsetup_udm_dnn_missing, disc_pdnsetup_udm_reg_resp_failed, disc_pdnsetup_udm_sub_fetch_failed, disc_pdnsetup_udm_sub_fetch_resp_failed, disc_pdnsetup_udm_sub_notify_failed, disc_pdnsetup_udm_sub_notify_resp_failed, disc_pdnsetup_udm_sgw_u_teid_missing, disc_pdnsetup_secondary_auth_failed, disc_pdnsetup_secondary_auth_resp_failed, disc_pdnsetup_secondary_auth_ip_addr_conflict, 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, disc_pdusetup_integrity_protected_mdr_not_acceptable, disc_pdnsetup_upip_status_req_denied_in_rat, disc_pdn_pcrf_init_release, disc_pdnsetup_pcrf_create_resp_failed, disc_pdnsetup_charging_create_resp_failed, disc_vsmf_insert_dtssa_acscr_not_configured, disc_vsmf_insert_interplmn_ho_not_configured, disc_vsm_insert_hsmf_retrieve_failure, disc_ro2ho_n2ho_interplmn_ho_not_configured, disc_ro2ho_n4_modify_failed, disc_ho2ro_n4_modify_failed, disc_ho2ro_failure disc_ro2ho_failure, disc_ro2ho_guard_timer_expiry, disc_ho2ro_guard_timer_expiry

SMF EBI stats Category

smf_ebi_stats

Description: Stats for the EBI Assignment

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

Labels:

- Label: procedure_type

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

Example: pdusetup_ebi_assignment

- Label: status

Label Description: status of EBI Assignment

Example: attempted, success, failures

SMF IPAM Address Events Current Counter Category

IPAM_address_allocations_current

Description: Current state of SMF IPAM Address allocations

Sample Query:

```
'IPAM_address_allocations_current(dnn='dnn1',servingArea='area1',nssai='slice1',pool='p1',allocationType='dynamic',addressType='IPv4',upf='up1',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(dn='dn1',servingArea='area1',nssai='slice1',pool='p1',eventType='Allocation',allocationType='dynamic',addressType='IPv4',upf='up1',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(dn='dn1',servingArea='areal',nssai='slicel',pool='pl',addressType='IPv4',upf='upl',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 Address Events Total Counter Category

IPAM_address_events_total

Description: Total number of SMF IPAM Address events

Sample Query:

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

MAXIMUM_DATA_RATE_PER_UE_FOR_USER_PLANE_INTEGRITY_PROTECTION_IS_TOO_LOW,
 SEMANTIC_ERROR_IN_THE_QOS_OPERATION,
 SYNTACTICAL_ERROR_IN_THE_QOS_OPERATION,
 INVALID_MAPPED_EPS_BEARER_IDENTITY, SEMANTICALLY_INCORRECT_MESSAGE,
 INVALID_MANDATORY_INFORMATION,
 MESSAGE_TYPE_NON_EXISTENT_OR_NOT_IMPLEMENTED,
 MESSAGE_TYPE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STATE,
 INFORMATION_ELEMENT_NON_EXISTENT_OR_NOT_IMPLEMENTED,
 CONDITIONAL_IE_ERROR, MESSAGE_NOT_COMPATIBLE_WITH_THE_PROTOCOL_STATE,
 PROTOCOL_ERROR_UNSPECIFIED

SMF N2 Message stats Category

smf_n2_message_stats

Description: Stats for N2 Messages

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

Labels:

- Label: `procedure_type`

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

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

- Label: `direction`

Label Description: Direction of N2 message

Example: `outbound, inbound`

- Label: `n2_Ngap_ie_type`

Label Description: The N2 Ngap IE type

Example: `N2_PDU_SESSION_RESOURCE_RELEASE_COMMAND_TRANSFER, N2_PDU_SESSION_PATH_SWITCH_REQUEST_TRANSFER, N2_INVALID_OR_UNSUPPORTED_NGAP_IE_TYPE, N2_PDU_SESSION_PATH_SWITCH_REQUEST_SETUP_FAILED_TRANSFER, N2_PDU_SESSION_RESOURCE_SETUP_UNSUCCESS_TRANSFER, N2_PDU_SESSION_RESOURCE_NOTIFY_RELEASED_TRANSFER, N2_PDU_SESSION_RESOURCE_MODIFY_UNSUCCESS_TRANSFER, N2_PDU_SESSION_HANDOVER_REQUEST_ACK_TRANSFER, N2_PDU_SESSION_HANDOVER_RESOURCE_ALLOC_UNSUCCESS_TRANSFER,`

N2_INVALID_OR_UNSUPPORTED_NGAP_TYPE,
N2_PDU_SESSION_RESOURCE_SETUP_RESPONSE_TRANSFER

- Label: n2_cause_group

Label Description: The N2 Cause Group

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

- Label: n2_cause

Label Description: N2 cause associated with the message

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

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

- 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`, `pcrf_req_ded_brr_mod`, `pcrf_req_ded_brr_create`, `pcrf_req_ded_brr_delete`, `suspend_notification`, `resume_notification`, `change_notification`, `gx_validation_failure_pdn_sess_rel`, `smf_inter_plmn_ro2ho_n2ho`, `smf_inter_plmn_ho2ro_n2ho`, `smf_idft_inter_plmn_ro2ho_n2ho`, `smf_dft_inter_plmn_ro2ho_n2ho`, `smf_idft_inter_plmn_ho2ro_n2ho`, `smf_dft_inter_plmn_ho2ro_n2ho`

- Label: `status`

Label Description: call flow procedure counter

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

- 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_ctrtrive_rec_for_4g_session, n26ho_5g_4g_handover_cancel, n26ho_4g_5g_no_eps_5gs_continuity, n26ho_default_flow_failed, n26ho_n2_decode_failiure, n26ho_chf_update_failure, n26im_mobility_4g_5g_no_eps_5gs_continuity, n26im_mobility_4g_5g_default_eps_bearer_inactive, pduim_n1n2_transfer_failure, pduim_n2_setup_response_failure, pduim_n1n2_txfr_failure_notification, pduim_n4_modification_failed, pduim_misc_error, pduim_n1n2ack_decode_error, pduim_n1n2ack_unhndl_cause, pduim_n1n2ack_unhndl_rsp_code, pduim_n1n2ack_unhndl_prb_cause, pduim_suspended_procedure, pduim_amf_ctx_not_found, pduim_internal_error, pduim_upstate_not_in_deactivated_state, pduim_pdu_access_type_mismatch, pduim_pdu_gnb_tunnel_not_available, pduim_pdu_n4_deactivated_state, pduim_sla_timer_expired, pduim_temp_reject_max_retry, upf_failure, pcf_failure, idft_release_failure, access_4g_already, idft_setup_failure, mbr_setup_failure, sgw_failure, udm_registration_failure, udm_subscription_fetch_failure, udm_subscribe_notify_failure, udm_update_notify_failure, aaa_subscribe_auth_failure, aaa_framed_ip_addr_conflict, 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, upip_req_denied_in_rat,
 nr_to_untrusted_wifi_upip_status_req_denied_in_rat, pcrf_create_failure, cbr_fail_upstate_inactive,
 ubr_fail_upstate_inactive, pdnrel_conditional_ie_missing, pdn_create_over_created_pdn,
 interplmn_ho_not_configured, dtssa_acscr_not_supported, ho2ro_invalid_state, ro2ho_invalid_state,
 mbc_retransmit_msg, change_notification_retransmit_msg

- 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

- Label: `uipip_active`

Label Description: UPIP activated for the session or not

Example: true, false

- Label: `local_policy`

Label Description: Flows or Bearers created based on local policy config

Example: true, false

SMF Procedure Collision Category

smf_procedure_collision

Description: Total number of procedures collided

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

Labels:

- Label: `smf_current_procedure`

Label Description: Current Procedure Name

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

- Label: `smf_current_state`

Label Description: Current Procedure State

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

- Label: `smf_new_procedure`

Label Description: New Procedure Name

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

- Label: `smf_current_procedure_action`

Label Description: Current Procedure Action on Collision

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

SMF Procedure Total Time Statistics Category

smf_procedure_seconds

Description: Total number of seconds taken to complete the procedure

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

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated, PDN Session Modify - PCRF 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 Service gtpc cache statistics Category

smf_service_gtpc_cache_stats

Description: SMF Service gtpc cache counters

Sample Query: 'smf_service_gtpc_cache_stats{gr_instance_id="1"}'

Labels:

- Label: `smf_proc_type`

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

Example: `eps_fb_ded_brr`, `ue_req_ded_brr_mod`, `udm_req_ded_brr_mod`, `smf_req_ded_brr_del`, `mme_req_ded_brr_del`, `mme_req_ded_brr_mod`, `mme_req_ded_brr_del`, `pcrf_req_ded_brr_create`, `pcf_req_ded_brr_create`, `pcrf_req_ded_brr_delete`, `pcf_req_ded_brr_delete`, `pcrf_req_ded_brr_mod`, `pcf_req_ded_brr_mod`, `ProcessNoStateMBR`, `suspend_acknowledgement`

- Label: `message_type`

Label Description: GTPC Message Type

Example: `CreateBearerReq`, `UpdateBearerReq`, `DeleteBearerReq`, `ModifyBearerResp`, `DeleteSessionResp`, `ModifyBearerResp`, `CreateSessionResp`, `SuspendAck`,

- Label: `gtpc_cache_operation`

Label Description: GTPC cache operation

Example: `add`, `delete`

- Label: `gr_instance_id`

Label Description: GR instance ID

Example: Any string

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_supl`
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
- Label: `policy_type`
Label Description: Policy type of the subscriber session
Example: pcf, pcrf, none
- Label: `local_policy`
Label Description: Flows or Bearers created based on local policy config
Example: true, false

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
- Label: `policy_type`
Label Description: Policy type of the subscriber session
Example: pcf, pcrf, none

SMF Start Procedure Statistics Category

smf_procedure_start

Description: Total number of procedures started

Sample Query: `'smf_procedure_start(smf_proc_type="PDN Connect")'`

Labels:

- Label: `smf_proc_type`
Label Description: Procedure Name

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

SMF Stop Procedure Statistics Category

smf_procedure_stop

Description: Total number of procedures stopped

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

Labels:

- Label: smf_proc_type

Label Description: Procedure Name

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

- Label: smf_proc_status

Label Description: Procedure Status

Example: Queued, Running, Aborted, Suspended, Invalid, Cleanup, 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 Timeout Procedure Count Category

smf_procedure_timeout

Description: Total number of procedures executed more than 10sec

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

Labels:

- Label: smf_proc_type

Label Description: Procedure Name

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

- Label: smf_proc_status

Label Description: Procedure Status

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

SMF Total Timeout Procedure Count Category

smf_procedure_timeout

Description: Total number of procedures executed more than 10sec

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

Labels:

- Label: smf_proc_type

Label Description: Procedure Name

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

- Label: smf_proc_status

Label Description: Procedure Status

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

SMF Total Timedout Procedure Time Category

smf_procedure_timeout_seconds

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

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

Labels:

- Label: smf_proc_type

Label Description: Procedure Name

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

- Label: smf_proc_status

Label Description: Procedure Status

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

SMF Total Unhandled Event Statistics Category

smf_procedure_unhndl_event

Description: Total number of unhandled events per procedure type

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

Labels:

- Label: smf_proc_type

Label Description: Procedure Name

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

- Label: message_type

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

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

- Label: smf_current_state

Label Description: Current Procedure State

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

- Label: guard_timer

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

Example: TRUE, FALSE

SMF Total Unhandled Transaction Statistics Category

smf_procedure_unhndl_trans

Description: Total number of unhandled transactions per procedure type

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

Labels:

- Label: `smf_proc_type`

Label Description: Procedure Name

Example: PDU Session Release - SMF initiated, PDU 5G to 4G Handover, PDU Session Modify - PCF initiated, PDU UE Sync Procedure, PDU Idle Mode Entry - RAN initiated, PDN Session Modify - PCRF 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 RPC message statistics Category

udp_rpc_msg_stats

Description: Statistics for UDP RPC

Sample Query: 'sum (udp_rpc_msg_stats{gr_instance_id="1"})'

Labels:

- Label: msgtype
Label Description: message Type

Example: MessageNone, PfcPProxyMsg, UdpProxyMsg, UnknownMsg

- Label: `direction`
Label Description: Direction of UDP RPC message
Example: inbound, outbound
- Label: `status`
Label Description: status of message processing
Example: success, failures
- Label: `transport_type`
Label Description: Transport type of message
Example: original, asyncmessage, retransmitted,
- Label: `gr_instance_id`
Label Description: GR instance ID
Example: Any string
- Label: `interface_type`
Label Description: Type of Interface communicate with PGW
Example: pcf, pcrf

UDP Request Total Message Stats Category

smf_service_udp_req_msg_total

Description: Stats for Total UDP Request Messages

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

Labels:

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

Example: trans_type_origin, trans_type_reselected

- Label: `cause_code`

Label Description: Causecode of UDP Message

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

UPF selection stats Category

upf_selection_stats

Description: Stats for the UPF Selection

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

Labels:

- Label: `upf_selection_type`

Label Description: Type of UPF Selection

Example: preferred

- Label: `upf_fqdn`

Label Description: FQDN of the UPF selected

Example: string

- Label: `status`

Label Description: Status the UPF selected

Example: attempted, failed

- Label: `reason`

Label Description: Reason for status of the UPF selected

Example: upf_not_associated, upf_profile_not_found, upf_not_active

- Label: `dnn`

Label Description: name of the dnn associated with the request

Example: Any string

- Label: `rat_type`

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

Example: EUTRA, NR, WLAN, rat_type_unknown

- Label: `pdu_session_type`

Label Description: PDU Session type

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

- Label: pdu_subscription_type

Label Description: PDU Subscription type

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

- Label: snssai

Label Description: SNSSAI of the session having sd and sst

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

