



## **Cloud Native BNG Control Plane Metrics Reference, Release 2024.01**

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## About this Guide



**Note** The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. While any existing biased terms are being substituted, exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation, or language that is used by a referenced third-party product.

This preface describes how the *Cisco Cloud Native BNG Control Plane Metrics Reference* is organized and its document conventions.

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

## Conventions Used

The following tables describe the conventions used throughout this documentation.

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

Typeface Conventions	Description
Text represented as a screen display	This typeface represents displays that appear on your terminal screen, for example:  Login:

Typeface Conventions	Description
Text represented as <b>commands</b>	This typeface represents commands that you enter, for example: <b>show ip access-list</b> This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.
Text represented as a <b>command variable</b>	This typeface represents a variable that is part of a command, for example: <b>show card slot_number</b> <i>slot_number</i> is a variable representing the desired chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the <b>File</b> menu, then click <b>New</b>



# CHAPTER 1

## Cloud Native BNG Control Plane Interface for Metrics

- [Summary Data, on page 1](#)
- [Feature Description, on page 1](#)

### Summary Data

*Table 1: Summary Data*

Applicable Product(s) or FunctionalArea	Cloud Native Broadband Network Gateway
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Always-on
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

### Feature Description

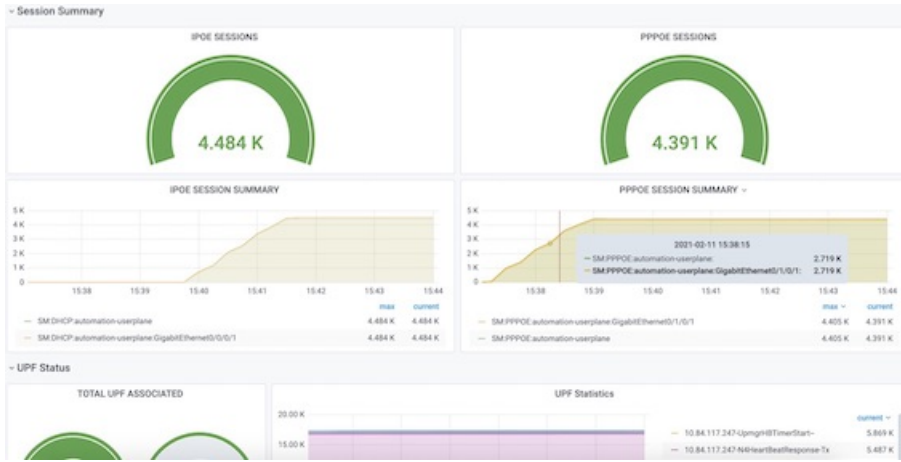
The Cisco Cloud Native Broadband Network Gateway uses Prometheus for gathering statistics/counters from its microservices.

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

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

The following snapshot is a sample of the Grafana dashboard.

Figure 1: Grafana Dashboard





## CHAPTER 2

# cnBNG Control Plane Metrics

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- [cnbng Metrics Reference](#), on page 3

## cnbng Metrics Reference

### CNBNG Accounting Statistics Category

#### **Accounting\_message\_current**

Description: Current number of Start/Stop/Interim Message triggered towards Server and Waiting for Response

Sample Query: 'Accounting\_message\_current{acct\_type="Start",upf="asr9k-1",service\_name="qos1"}'

Labels:

- Label: `acct_type`  
Label Description: Accounting Packet type  
Example: Start, Interim, Stop
- Label: `acct_level`  
Label Description: Accounting category  
Example: Session, Service
- Label: `upf`  
Label Description: UPF Name  
Example: Any string
- Label: `service_name`  
Label Description: Name of service  
Example: Any string

#### **Accounting\_message\_total**

Description: Total number of Start/Stop/Interim Message trigger towards Radius Server

Sample Query: 'Accounting\_message\_total{acct\_type="Start",upf="asr9k-1",service\_name="qos1"}'

Labels:

- Label: `acct_type`  
Label Description: Accounting Packet type  
Example: Start, Interim, Stop
- Label: `acct_level`  
Label Description: Accounting category  
Example: Session, Service
- Label: `upf`  
Label Description: UPF Name  
Example: Any string
- Label: `aaa_profile`  
Label Description: AAA profile used  
Example: Any string
- Label: `service_name`  
Label Description: Name of service  
Example: Any string
- Label: `status`  
Label Description: Status of accounting request  
Example: Attempt, Success, Failure

### **Charging\_subscriber\_total**

Description: Total number of Subscriber regardless of accounting enable or not

Sample Query: 'Charging\_subscriber\_total{upf="asr9k-1"}'

Labels:

- Label: `upf`  
Label Description: UPF Name  
Example: Any string

### **Service\_usage\_report\_total**

Description: Total number of Usage Report Coming from PFCP per service

Sample Query:

'Service\_usage\_report\_total{report\_type="ChargingFinalUsageReport",upf="asr9k-1",service\_name="qos1"}'

Labels:

- Label: `report_type`



Label Description: Usage report type

Example: ChargingFinalUsageReport, ChargingInterimUsageReport

Labels:

- Label: `upf`

Label Description: UPF Name

Example: Any string

- Label: `aaa_profile`

Label Description: AAA profile used

Example: Any string

- Label: `service_name`

Label Description: Name of service

Example: Any string

### **Session\_usage\_report\_total**

Description: Total number of Usage Report Coming from PFCP per session

Sample Query:

```
'Session_usage_report_total{report_type="ChargingFinalUsageReport",upf="asr9k-1"}'
```

Labels:

- Label: `report_type`

Label Description: Usage report type

Example: ChargingFinalUsageReport, ChargingInterimUsageReport

Labels:

- Label: `upf`

Label Description: UPF Name

Example: Any string

Labels:

- Label: `aaa_profile`

Label Description: AAA profile used

Example: Any string

### **db\_records\_total**

Description: Current number of Subscriber regardless of accounting enable or not

Sample Query: `'db_records_total{session_type="Charging"}'`

Labels:

- Label: `session_type`  
Label Description: Session type  
Example: Charging, Charging:<upf>

## CNBNG CP Audit Category

### DHCP\_Audit\_Confirmation\_Total

Description: CP audit events in Dhcp

Sample Query: `'sum(DHCP_Audit_Confirmation_Total) by (event)'`

Labels:

- Label: `event`  
Label Description: |  
type of event which can be no-session: Session audited in sm is not present in dhcp session-fetch-error: Session audited in sm is not present in dhcp match: Session audited in sm is present in dhcp with matching audit id. mis-match: Session audited in sm is present in dhcp with wrong audit id.

### DHCP\_ReconCP\_Events\_Total

Description: CP audit events in Dhcp

Sample Query: `'sum(DHCP_ReconCP_Events_Total) by (upf)'`

Labels:

- Label: `upf`  
Label Description: UPF ID  
Example: asr9k-1
- Label: `event`  
Label Description: |  
type of event which can be found: Audited Dhcp session is present in sm. not-found: Audited Dhcp session is not present in sm. NM-Recon-IP-Not-allocated: IP address of audited Dhcp session is not allocated in pool. NM-Recon-IP-allocated: IP address of audited Dhcp session is allocated in pool.

### IPIDReconReq

Description: CP audit events in PPPoE

Sample Query: `'sum(IPIDReconReq) by (Routername)'`

Labels:

- Label: `Routername`  
Label Description: UPF ID  
Example: asr9k-1

Labels:

- Label: `status`

Label Description: |

type of event which can be Success: Audited PPPoE has allocation in ipam. Failure: Audited PPPoE does not have allocation in ipam.

### **PPPoE\_Audit\_Confirmation\_Total**

Description: CP audit events in PPPoE

Sample Query: `'sum(PPPoE_Audit_Confirmation_Total) by (Event)'`

Labels:

- Label: `Event`

Label Description: |

type of event which can be no-session: Session audited in sm is not present in pppoe. session-fetch-failed: Session audited in sm is not present in pppoe. match: Session audited in sm is present in pppoe with matching audit id. mis-match: Session audited in sm is present in pppoe with wrong audit id.

### **PPPoE\_ReconCP\_Events\_Total**

Description: CP audit events in PPPoE

Sample Query: `'sum(PPPoE_ReconCP_Events_Total) by (Routename)'`

Labels:

- Label: `Routename`

Label Description: UPF ID

Example: asr9k-1

Labels:

- Label: `Event`

Label Description: |

type of event which can be found: Audited Dhcp session is present in sm. not-found: Audited Dhcp session is not present in sm."

### **reconCpEventsTotal**

Description: CP audit events

Sample Query: `'sum(reconCpEventsTotal) by (event,instance)'`

Labels:

- Label: `upf`

Label Description: UPF ID

Example: asr9k-1

Labels:

- Label: `event`

Label Description: |

type of event which can be AuditStarted: CP audit Started. FSolAuditStarted: CP audit Started for dhcp and pppoe sessions. SMAuditStarted: CP audit Started for sm sessions. dhcp-AuditCompleted: All audit notifications received for dhcp sessions. pppoe-AuditCompleted: All audit notifications received for pppoe sessions. sessmgr-AuditCompleted: All audit notifications received for sm sessions. AuditCompleted: All audit notifications received for all type of sessions.

- Label: `instance`

Label Description: Instance ID of NM Pod

Example: 0, 1

### **reconCpNotificationTotal**

Description: Number of sessions audited

Sample Query: `'sum(reconCpNotificationTotal) by (sessionType)'`

Labels:

- Label: `upf`

Label Description: UPF

Example: asr9k-1

Labels:

- Label: `sessionType`

Label Description: type of session

Example: dhcp, pppoe, sessmgr

### **smc\_audit\_cp\_stats\_total**

Description: CP audit events in SM

Sample Query: `'sum(smc_audit_cp_stats_total) by (Upf)'`

Labels:

- Label: `SessType`

Label Description: Type of session

Example: dhcp

Labels:

- Label: `Upf`

Label Description: Upf ID

Example: asr9k-1

Labels:

- Label: `status`

Label Description: |

status can be following- DhcpFsolMatch: Session Audited by dhcp has matching audit id. PppFsolMatch: Session Audited by pppoe has matching audit id. DhcpFsolMismatch: Session Audited by dhcp has audit id mismatch. PppFsolMismatch: Session Audited by pppoe has audit id mismatch. DhcpMatch: Dhcp Session Audited by sm has matching audit id. PppV4Match: PPPoE v4 Session Audited by sm has matching audit id. PppV6Match: PPPoE v6 Session Audited by sm has matching audit id. DhcpMismatch: Dhcp Session Audited by sm has audit id mismatch. DhcpAuditIdMismatch: Dhcp Session Audited by sm has cdl audit id mismatch. PppAuditIdMismatch: PPPoE Session Audited by sm has cdl audit id mismatch. DhcpAuditConfirmed: Dhcp Confirmed audit id match for session audited in sm. PppV6AuditConfirmed: PPPoE Confirmed audit id match for session audited in sm. PppV6AuditNotConfirmed: PPPoE Confirmed audit id mismatch for session audited in sm. DhcpAuditNotConfirmed: Dhcp Confirmed audit id mismatch for session audited in sm. PppV6DhcpAuditConfirmed: Dhcp Confirmed audit id mismatch for pppoe session audited in sm. PppV6DhcpAuditNotConfirmed: Dhcp Confirmed audit id mismatch for pppoe session audited in sm. PppV4AuditNotConfirmed: PPPoE Confirmed audit id mismatch for session audited in sm. PppV4AuditConfirmed: PPPoE Confirmed audit id match for session audited in sm.

## CNBNG DHCP Statistics Category

### DHCPv4\_packet\_stats

Description: Total DHCPv4 packet statistics

Sample Query:

```
'DHCPv4_packet_stats{pkt_type="Discover",upf="asr9k-1",port_id="Bundle-Ether1.1"}'
```

Labels:

- Label: `pkt_type`

Label Description: Packet type

Example: Discover, Request, Release, Decline, Inform, Offer, Ack, Nak

- Label: `direction`

Label Description: Transmitted or Received packet

Example: In, Out

- Label: `upf`

Label Description: UPF Name

Example: Any string

- Label: `port_id`

Label Description: Access interface Name

Example: Any string

- Label: `vrf`

Label Description: VRF Name

Example: Any string

### DHCPv6\_packet\_stats

Description: Total DHCPv6 packet statistics

Sample Query: 'DHCPv6\_packet\_stats{pkt\_type="Solicit",upf="asr9k-1",port\_id="Bundle-Ether1.1"}'

Labels:

- Label: `pkt_type`  
Label Description: Packet type  
Example: Solicit, Request, Renew, Rebind, Release, Decline, Inform, Advertise, Reply
- Label: `direction`  
Label Description: Transmitted or Received packet  
Example: In, Out
- Label: `upf`  
Label Description: UPF Name  
Example: Any string
- Label: `port_id`  
Label Description: Access interface Name  
Example: Any string
- Label: `vrf`  
Label Description: VRF Name  
Example: Any string

### db\_records\_total

Description: Current number of DHCP sessions

Sample Query: 'db\_records\_total{session\_type="dhcp:ipoe"}'

Labels:

- Label: `session_type`  
Label Description: Session type  
Example: dhcp:ipoe, dhcp:ipoe:<upf>, dhcp:pppoe, dhcp:pppoe:<upf>, dhcp:afi:dual, dhcp:afi:ipv4, dhcp:afi:ipv6, dhcp:ipv4-state:<state>, dhcp:ipv6-addr-state:<state>, dhcp:ipv6-pfx-state:<state>

## CNBNG Flowcontrol Statistics Category

metrics: incoming\_drop\_queued\_total

Description: Total number of incoming queued request dropped

## Sample Query:

```
'incoming_drop_queued_total{interface="n4",local_address="10.1.0.1",protocol="Udp",peer_address="10.1.0.2",cause="DispatcherQueueFull",queue_id="1"}'
```

## Labels:

- Label: `interface`  
Label Description: Interface Name  
Example: N4, GTPU
- Label: `local_address`  
Label Description: Local Address  
Example: Any string
- Label: `protocol`  
Label Description: Protocol Type  
Example: Udp
- Label: `peer_address`  
Label Description: Peer Address  
Example: Any string
- Label: `cause`  
Label Description: Drop Cause  
Example: DispatcherQueueFull, DispatcherQueueNotAvailable, DispatcherRetryRequestDrop, DispatcherThresholdRequestDrop
- Label: `queue_id`  
Label Description: Queue Index  
Example: Integer value represented as string

metrics: `incoming_queued_rate_limit_reached_total`

Description: Total number of incoming rate limit hit count

Sample Query: `'incoming_queued_rate_limit_reached_total{interface="n4",protocol="Udp",queue_id="1"}'`

## Labels:

- Label: `interface`  
Label Description: Interface Name  
Example: N4, GTPU
- Label: `protocol`  
Label Description: Protocol Type  
Example: Udp
- Label: `queue_id`

Label Description: Queue Index

Example: Integer value represented as string

metrics: virtual\_message\_drop\_total

Description: Total number of messages dropped in virtual id queue

Sample Query: 'virtual\_message\_drop\_total{interface="n4",  
msg\_type="pfcpresponse",virtual\_msg\_id="1",cause="VirtualMsgQueueFull"}'

Labels:

- Label: interface

Label Description: Interface Name

Example: n4

Labels:

- Label: msg\_type

Label Description: Logical Message Type

Example: pfcpresponse, lcpkeepalive, pfcpkeepalive, sessionreport, all

- Label: virtual\_msg\_id

Label Description: Virtual Message Id of Queue

Example: 1, 2, 3, 4, 5

- Label: cause

Label Description: Drop Cause

Example: VirtualMsgQueueFull, PendingRequestsLimitReached

metrics: virtual\_message\_rate\_limit\_reached\_total

Description: Total number of times the rate limit is reached for virtual id queue

Sample Query:

'virtual\_message\_rate\_limit\_reached\_total{interface="n4",msg\_type="pfcpresponse",virtual\_msg\_id="1"}'

Labels:

- Label: interface

Label Description: Interface Name

Example: n4

Labels:

- Label: msg\_type

Label Description: Logical Message Type

Example: pfcpresponse, lcpkeepalive, pfcpkeepalive, sessionreport, all

Labels:



- Label: `virtual_msg_id`  
Label Description: Virtual Message Id of Queue  
Example: 1, 2, 3, 4, 5

## CNBNG IPAM Statistics Category

### **IPAM\_address\_allocations\_current**

Description: Current state of IPAM Address allocations

Sample Query:

```
'IPAM_address_allocations_current{pool="p1",allocationType="dynamic",addressType="IPv4",upf="dp1"}'
```

Labels:

- 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/IPv6NA/IPv6PD
- Label: `upf`  
Label Description: upf identifier associated with the request  
Example: Any string
- Label: `grInstId`  
Label Description: GR instance ID  
Example: GR instance ID

### **IPAM\_address\_events\_total**

Description: Total number of IPAM Address events

Sample Query:

```
'IPAM_address_events_total{pool="p1",eventType="Allocation",allocationType="dynamic",addressType="IPv4",upf="dp1"}'
```

Labels:

- 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/IPv6NA/IPv6PD
- Label: `upf`  
Label Description: upf identifier associated with the request  
Example: Any string
- Label: `grInstId`  
Label Description: GR instance ID  
Example: GR instance ID

### **IPAM\_chunk\_allocations\_current**

Description: Current state of IPAM Address Chunk allocations

Sample Query: `'IPAM_chunk_allocations_current{pool="p1",addressType="IPv4",upf="dp1"}'`

Labels:

- Label: `pool`  
Label Description: name of the pool associated with the request  
Example: Any string

Labels:

- Label: `addressType`  
Label Description: address type associated with the request  
Example: IPv4/IPv6NA/IPv6PD
- Label: `upf`  
Label Description: upf identifier associated with the request  
Example: Any string
- Label: `grInstId`  
Label Description: GR instance ID  
Example: GR instance ID

### IPAM\_chunk\_events\_total

Description: Total number of IPAM Address Chunk events

Sample Query:

```
'IPAM_chunk_events_total{pool="p1",eventType="Allocation",addressType="IPv4",upf="dp1"}'
```

Labels:

- Label: pool

Label Description: name of the pool associated with the request

Example: Any string

Labels:

- Label: eventType

Label Description: type of event associated with the request

Example: Allocation/Release

Labels:

- Label: addressType

Label Description: address type associated with the request

Example: IPv4/IPv6NA/IPv6PD

- Label: upf

Label Description: upf identifier associated with the request

Example: Any string

- Label: grInstId

Label Description: GR instance ID

Example: GR instance ID

## CNBNG L2TP Statistics Category

### L2TPMgr\_IPC\_Events\_total

Description: Total IPC events

Sample Query:

```
'L2TPMgr_IPC_Events_total{MessageType="SessionIDAllocReq",Routername="lps_lns_asr9k-1",Status="Success"}'
```

Labels:

- Label: Routername

Label Description: Router name

Example: lps\_lns\_asr9k-1

- Label: MessageType

Label Description: Message Type

Example:

BGIPCRequest,BGIPCResponse,SessionDeleteReq,SessionReleaseReq,SessionReleaseRsp,SessionAllocateReq,SessionAllocateRsp,BGIPCNDNResponse

- Label: Status

Label Description: Status

Example: IPC-failure,Success,Failure

### L2TPMgr\_Packet\_Events\_total

Description: Total L2TP packets

Sample Query:

```
'L2TPMgr_Packet_Events_total{Direction="Rx",PacketType="CDN",Routername="lps_lns_asr9k-1}'
```

Labels:

- Label: Routername

Label Description: Router name

Example: lps\_lns\_asr9k-1

- Label: PacketType

Label Description: Packet Type

Example: CDN,HELLO,ICCN,ICRQ,PPP,SCCCN,SCCRQ,StopCCN,ZLB ACK,ICRP,SCCRP,StopCCN

- Label: Direction

Label Description: Direction

Example: Rx,Tx

### L2TPMgr\_Retransmit\_Packet\_Events\_total

Description: Total L2TP Retransmit packets

Sample Query:

```
'L2TPMgr_Retransmit_Packet_Events_total{PacketType="HELLO",Routername="lps_lns_asr9k-1}'
```

Labels:

- Label: Routername

Label Description: Router name

Example: lps\_lns\_asr9k-1

Labels:

- Label: PacketType

Label Description: Packet Type

Example: CDN,HELLO,ICCN,ICRQ,PPP,SCCCN,SCCRQ,StopCCN,ZLB ACK,ICRP,SCCRP,StopCCN

### L2TPMgr\_disconnect\_events\_total

Description: Total L2TP Disconnect Events

Sample Query:

```
'L2TPMgr_disconnect_events_total{MessageType="NoSessionTimeout",Routername="lps_lns_asr9k-1"}'
```

Labels:

- Label: Routername

Label Description: Router name

Example: lps\_lns\_asr9k-1

Labels:

- Label: MessageType

Label Description: Message Type

Example: NoSessionTimeout,RxStopCCNfromLAC

## CNBNG PFCP and GTPU packet statistics Category

### bng\_proto\_dhcp\_total

Description: Total number of GTPU DHCP packets received/transmitted

Sample Query: 'bng\_proto\_dhcp\_total{pkt\_type="Gtpu",message\_name="IPoE", upf="asr9k-1"}'

Labels:

- Label: pkt\_type

Label Description: Type of packet

Example: Gtpu

- Label: message\_direction

Label Description: Transmitted or received packet

Example: inbound, outbound

- Label: status

Label Description: Status of packet processing

Example: accepted, discarded, decode-error, encode-error

- Label: message\_name

Label Description: IPoE message type

Example: IPoE

- Label: upf

Label Description: upf identifier associated with the request

Example: Any string

**bng\_proto\_pppoe\_total**

Description: Total number of GTPU PPPoE packets received/transmitted

Sample Query: `'bng_proto_pppoe_total{pkt_type="Gtpu",message_name="PPPoE", upf="asr9k-1"}'`

Labels:

- Label: `pkt_type`  
Label Description: Type of packet  
Example: Gtpu
- Label: `message_direction`  
Label Description: Transmitted or received packet  
Example: inbound, outbound
- Label: `status`  
Label Description: Status of packet processing  
Example: accepted, discarded, decode-error, encode-error
- Label: `message_name`  
Label Description: PPPoE message type  
Example: PPPoE
- Label: `upf`  
Label Description: upf identifier associated with the request  
Example: Any string

**bng\_proto\_udp\_total**

Description: Total number of PFCP/GTPU packets received/transmitted

Sample Query:

`'bng_proto_udp_total{pkt_type="Pfcip",message_name="n4_session_establishment_req"}'`

Labels:

- Label: `pkt_type`  
Label Description: Type of packet  
Example: Pfcip, Gtpu

Labels:

- Label: `message_direction`  
Label Description: Transmitted or received packet  
Example: inbound, outbound
- Label: `status`  
Label Description: Status of packet processing

Example: accepted, discarded, decode-error, encode-error

- Label: `transport_type`

Label Description: Initial or retransmitted request

Example: original, retransmitted

- Label: `message_name`

Label Description: pfcg/gtpu message type

Example: `n4_session_establishment_req`, `n4_session_establishment_res`, `n4_session_modification_req`, `gtpu_bng_control_packet`, `gtpu_bng_control_packet_dhcp`, `gtpu_bng_control_packet_pppoe`

- Label: `upf`

Label Description: upf identifier associated with the request

Example: Any string

## CNBNG PPPOE or PPP Statistics Category

### PPPOE\_L2TP\_ipc\_events\_total

Description: PPPoE L2TP ipc total

Sample Query:

```
'PPPOE_L2TP_ipc_events_total(MessageType="L2TPIDAllocReq",PortID="Bundle-Ether1.2",Routename="lps_lns_asr9k-2",Status="Success")'
```

Labels:

- Label: `MessageType`

Label Description: Message Type

Example: `L2TPIDAllocReq`,`L2TPIDReleaseReq`

- Label: `PortID`

Label Description: Access interface Name

Example: Any string

- Label: `Routename`

Label Description: UPF Name

Example: Any string

- Label: `Status`

Label Description: Status of IPC processing

Example: `Success`,`Failure`

### PPPOE\_packet\_events\_total

Description: Total number of PPPoE packets transmitted and received

**Sample Query:**

```
'PPPOE_packet_events_total{PacketType="PADI",Routername="asr9k-1",PortID="Bundle-Ether1.1"}'
```

**Labels:**

- Label: `PacketType`  
Label Description: Packet type  
Example: PADI, PADO, PADR, PADS, PADT
- Label: `Direction`  
Label Description: Transmitted or Received packet  
Example: Tx, Rx
- Label: `Routername`  
Label Description: UPF Name  
Example: Any string
- Label: `PortID`  
Label Description: Access interface Name  
Example: Any string
- Label: `Status`  
Label Description: Status of packet processing  
Example: Processed | Dropped

**PPP\_IPCP\_packet\_events\_total**

Description: Total number of PPP IPCP packets transmitted and received

**Sample Query:**

```
'PPP_IPCP_packet_events_total{PacketType="Conf-Req",Routername="asr9k-1",PortID="Bundle-Ether1.1"}'
```

**Labels:**

- Label: `PacketType`  
Label Description: Packet type  
Example: Conf-Req, Conf-Ack, Conf-Nak, Term-Req, Term-Ack, Proto-Rej, Code-Rej, Conf-Rej

**Labels:**

- Label: `Direction`  
Label Description: Transmitted or Received packet  
Example: Tx, Rx
- Label: `Routername`  
Label Description: UPF Name  
Example: Any string



- Label: `PortID`

Label Description: Access interface Name

Example: Any string

### PPP\_IPV6CP\_packet\_events\_total

Description: Total number of PPP IPv6CP packets transmitted and received

Sample Query:

```
'PPP_IPV6CP_packet_events_total{PacketType="Conf-Req",Routername="asr9k-1",PortID="Bundle-Ether1.1"}'
```

Labels:

- Label: `PacketType`

Label Description: Packet type

Example: Conf-Req, Conf-Ack, Conf-Nak, Term-Req, Term-Ack, Proto-Rej, Code-Rej, Conf-Rej

Labels:

- Label: `Direction`

Label Description: Transmitted or Received packet

Example: Tx, Rx

Labels:

- Label: `Routername`

Label Description: UPF Name

Example: Any string

- Label: `PortID`

Label Description: Access interface Name

Example: Any string

### PPP\_LCP\_CHAP\_packet\_events\_total

Description: Total number of PPP LCP CHAP packets transmitted and received

Sample Query:

```
'PPP_LCP_CHAP_packet_events_total{PacketType="Challenge",Routername="asr9k-1",PortID="Bundle-Ether1.1"}'
```

Labels:

- Label: `PacketType`

Label Description: Packet type

Example: Challenge, Response, Rep-Success, Rep-Fail

Labels:

- Label: `Direction`

Label Description: Transmitted or Received packet

Example: Tx, Rx

Labels:

- Label: `Routrname`

Label Description: UPF Name

Example: Any string

Labels:

- Label: `PortID`

Label Description: Access interface Name

Example: Any string

### **PPP\_LCP\_PAP\_packet\_events\_total**

Description: Total number of PPP LCP PAP packets transmitted and received

Sample Query:

```
'PPP_LCP_PAP_packet_events_total{PacketType="Request",Routrname="asr9k-1",PortID="Bundle-Ether1.1"}'
```

Labels:

- Label: `PacketType`

Label Description: Packet type

Example: Request, Ack, Nack

Labels:

- Label: `Direction`

Label Description: Transmitted or Received packet

Example: Tx, Rx

Labels:

- Label: `Routrname`

Label Description: UPF Name

Example: Any string

Labels:

- Label: `PortID`

Label Description: Access interface Name

Example: Any string

### PPP\_LCP\_packet\_events\_total

Description: Total number of PPP LCP packets transmitted and received

Sample Query:

```
'PPP_LCP_packet_events_total{PacketType="Conf-Req",Routername="asr9k-1",PortID="Bundle-Ether1.1"}'
```

Labels:

- Label: `PacketType`

Label Description: Packet type

Example: Conf-Req, Conf-Ack, Conf-Nak, Conf-Rej, Term-Req, Term-Ack, Proto-Rej, Code-Rej, Echo-Req, Echo-Rep

Labels:

- Label: `Direction`

Label Description: Transmitted or Received packet

Example: Tx, Rx

Labels:

- Label: `Routername`

Label Description: UPF Name

Example: Any string

Labels:

- Label: `PortID`

Label Description: Access interface Name

Example: Any string

### PPPoE\_session\_limits\_total

Description: Total number of PPPoE session limit hits

Sample Query: 'PPPoE\_session\_limits\_total{profile="pppoe-prof1",limit="circuit-id"}'

Labels:

- Label: `profile`

Label Description: pppoe profile name

Example: Any string

Labels:

- Label: `limit_type`

Label Description: Type of pppoe limit

Example: Any string

Labels:

- Label: `status`

Label Description: Status of pppoe limit

Example: accepted, warned, rejected

### **db\_records\_total**

Description: Current PPPoE session count

Sample Query: `'db_records_total{session_type="PPPOE:dual"}'`

Labels:

- Label: `session_type`

Label Description: Session type

Example: PPPOE, PPPOE:<upf>, PPPOE:dual, PPPOE:ipv4, PPPOE:ipv6

## **CNBNG Radius Statistics Category**

### **Radius\_CoaDM\_Requests\_Current**

Description: Current outstanding radius COA/DM requests

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

Labels:

- Label: `radSvrIp`

Label Description: Radius Server IP address

Example: Any string

- Label: `radMsgCode`

Label Description: Message type

Example: CoaReq, DMReq, CoaAck, CoaNak

- Label: `grInstId`

Label Description: GR instance ID

Example: GR instance ID

### **Radius\_CoaDM\_Requests\_Statistics**

Description: Total number of radius COA and DM packets sent and received

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

Labels:

- Label: `radSvrIp`

Label Description: Radius Server IP address

Example: Any string

- Label: `radMsgCode`  
Label Description: Message type  
Example: CoaReq, DMReq, CoaAck, CoaNak
- Label: `radPacketType`  
Label Description: Direction  
Example: Tx, Rx
- Label: `radResult`  
Label Description: Result  
Example: Success, Failure\_Invalid\_Request
- Label: `grInstId`  
Label Description: GR instance ID  
Example: GR instance ID

### Radius\_Server\_Status

Description: Display active/inactive status of radius-server

Sample Query:

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

Labels:

- Label: `radSvrIP`  
Label Description: Radius Server IP address  
Example: Any string

Labels:

- Label: `radSvrPort`  
Label Description: Radius Server Port  
Example: Any string
- Label: `radSvrPortType`  
Label Description: Type of server  
Example: Auth, Acct

### Radius\_requests\_current

Description: Current outstanding radius requests

Sample Query:

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

Labels:

- Label: `radSvrIp`

Label Description: Radius Server IP address

Example: Any string

Labels:

- Label: `radSvrPort`

Label Description: Radius Server Port

Example: Any string

Labels:

- Label: `radSvrPortType`

Label Description: Type of server

Example: Auth, Acct

- Label: `radMsgCode`

Label Description: Message type

Example: AaaAuthReq, AaaAcctReq

- Label: `radPacketType`

Label Description: Direction

Example: Tx, Rx

- Label: `grInstId`

Label Description: GR instance ID

Example: GR instance ID

### **Radius\_requests\_statistics**

Description: Total number of radius packets sent and received

Sample Query:

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

Labels:

- Label: `radSvrIp`

Label Description: Radius Server IP address

Example: Any string

Labels:

- Label: `radSvrPort`

Label Description: Radius Server Port

Example: Any string

Labels:

- Label: `radSvrPortType`  
Label Description: Type of server  
Example: Auth, Acct

Labels:

- Label: `radMsgCode`  
Label Description: Message type  
Example: AaaAuthReq, AaaAcctReq
- Label: `radPacketType`  
Label Description: Direction  
Example: Tx, Retry\_Tx, Rx
- Label: `radResult`  
Label Description: Result  
Example: Success, Timeout, Failure\_Reject, Failure\_NoServer
- Label: `grInstId`  
Label Description: GR instance ID  
Example: GR instance ID

## CNBNG SRG Statistics Category

metrics: `SRGEventsTotal`

Description: Total number of Srg Add/Remove Events

Sample Query: `'SRGEventsTotal{peerID="Peer1",upfID="asr9k-1",event="Add"}'`

Labels:

- Label: `peerID`  
Label Description: Peer ID  
Example: Any String
- Label: `groupID`  
Label Description: ID of Group  
Example: Any String
- Label: `upfID`  
Label Description: ID of UPF  
Example: Any String
- Label: `event`  
Label Description: event Add/Remove

Example: Add", "Remove

metrics: SRGRoleReqTotal

Description: Total number of Role change Request

Sample Query: 'SRGRoleReqTotal{peerID="Peer1", upfID="asr9k-1", groupID="group1", role="Active"}'

Labels:

- Label: `peerID`  
Label Description: Peer ID  
Example: Any String
- Label: `upfID`  
Label Description: ID of UPF  
Example: Any String
- Label: `groupID`  
Label Description: ID of group  
Example: Any String
- Label: `role`  
Label Description: SRG Role  
Example: Active", "Standby", "Invalid", "NotReady
- Label: `create`  
Label Description: is first role change request  
Example: yes", "no

metrics: SRGRoleRspTotal

Description: Total number of Role change Response

Sample Query: 'SRGRoleRspTotal{peerID="Peer1", upfID="asr9k-1", groupID="group1", role="Active", state="Up", result="Success"}'

Labels:

- Label: `peerID`  
Label Description: Peer ID  
Example: Any String

Labels:

- Label: `upfID`  
Label Description: ID of UPF  
Example: Any String
- Label: `groupID`



Label Description: ID of group

Example: Any String

- Label: `role`

Label Description: SRG Role

Example: "Active", "Standby", "Invalid", "NotReady"

- Label: `state`

Label Description: SRG state of UPF

Example: "Up", "Down", "NotReady"

- Label: `result`

Label Description: result of role change request

Example: "Success", "Failure"

- Label: `inprogress`

Label Description: SRG Role change state of UPF

Example: "yes", "no"

metrics: `SRGStateChangeTotal`

Description: Total number of Srg Node Report received

Sample Query: `'SRGStateChangeTotal{peerID="Peer1", upfID="asr9k-1", groupID="group1", role="Active", state="Up"}'`

Labels:

- Label: `peerID`

Label Description: Peer ID

Example: Any String

Labels:

- Label: `upfID`

Label Description: ID of UPF

Example: Any String

Labels:

- Label: `groupID`

Label Description: ID of group

Example: Any String

- Label: `role`

Label Description: SRG Role

Example: "Active", "Standby", "Invalid", "NotReady"

- Label: `state`

Label Description: SRG state of UPF

Example: Up", "Down", "NotReady

- Label: `inprogress`

Label Description: SRG Role change state of UPF

Example: yes", "no

metrics: `SRGUpfN4StateChangeTotal`

Description: Total number of Upf n4 state change

Sample Query: `'SRGUpfN4StateChangeTotal{peerID="Peer1", groupID="group1", upfID="asr9k-1", active="yes"}'`

Labels:

- Label: `peerID`

Label Description: Peer ID

Example: Any String

Labels:

- Label: `groupID`

Label Description: ID of group

Example: Any String

Labels:

- Label: `upfID`

Label Description: ID of UPF

Example: Any String

Labels:

- Label: `active`

Label Description: N4 state

Example: yes", "no

metrics: `db_records_total`

Description: Total number of Groups and their Srg Role, Srg State and N4 Connection State

Sample Query:

`'avg(db_records_total{session_type=~\"SRG:${srgUpfID}:(Active:Connected:Up|Standby:Connected:(Up|Down))\"})'`

Labels:

- Label: `session_type`

Label Description: Type of session

Example: SRG:ASR9K-1:Active:Connected:Up

## CNBNG Session Manager Statistics Category

### **db\_records\_total**

Description: Current number of IPOE/PPPOE sessions

Sample Query: 'db\_records\_total{session\_type="SM:DHCP"}'

Labels:

- Label: `session_type`

Label Description: Type of session

Example: SM:DHCP, SM:DHCP:<upf>, SM:PPPOE, SM:PPPOE:<upf>

### **smc\_pre\_events\_status\_total**

Description: Total number of execution status of PRE-events.

Sample Query: 'smc\_pre\_events\_status\_total{session\_type="DHCP", Upf="asr9k-1", preEvent="session-start", status="success"}'

Labels:

- Label: `SessType`

Label Description: Type of session

Example: DHCP, PPPOE

- Label: `Upf`

Label Description: UPF Name

Example: Any string

- Label: `PortID`

Label Description: Port Identifier

Example: Any string

- Label: `preEvent`

Label Description: PRE event name

Example: session-start, session-activate, session-update, session-disconnect, account-update

- Label: `status`

Label Description: PRE event status

Example: success, error

- Label: `status_code`

Label Description: PRE event status code

Example: policySuccess, policySvmApplyFailed, policySubsProfNotFound, policyActionAuthenFailure, policyActionAuthorFailure

### smc\_pre\_events\_total

Description: Total number of PRE-events started.

Sample Query: 'smc\_pre\_events\_total{session\_type="DHCP", Upf="asr9k-1", preEvent="session-start"}'

Labels:

- Label: `SessType`  
Label Description: Type of session  
Example: DHCP, PPPOE

Labels:

- Label: `Upf`  
Label Description: UPF Name  
Example: Any string
- Label: `PortID`  
Label Description: Port Identifier  
Example: Any string
- Label: `preEvent`  
Label Description: PRE event name  
Example: session-start, session-activate, session-update, session-disconnect, account-update

## CNBNG UPF Status Category

### UPF\_Status

Description: UPF status

Sample Query: 'UPF\_Status{Status="Active", UpIp="asr9k-1"}'

Labels:

- Label: `Status`  
Label Description: Status value  
Example: Active, InActive, Deleting, Deleted
- Label: `UpIp`  
Label Description: upf identifier associated with the request  
Example: Any string