Monitoring and Troubleshooting User Plane in CUPS

This section provides information about the CLI commands available to monitor and/or troubleshoot User Plane in CUPS.

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SNMP Traps

The following traps are available after session recovery in the User Plane node:

- **starManagerFailure**: This trap is generated when there is failure in the Software manager.
- **starTaskFailed**: This trap is generated when a noncritical task has failed and the appropriate recovery steps begin.
- **starTaskRestart**: This trap is generated when a noncritical task has restarted after an earlier failure.
- **starSessMgrRecoveryComplete**: This trap is generated when Session Manager recovery completes. This is typically caused by the failure of Session Manager task and successful completion of recovery.
- **starManagerRestart**: This trap is generated when the identified manager task has been restarted.

Show Commands

show configuration

This command displays the following fields:

```
saegw-service
associate sgw-service
associate pgw-service
associate gtpu-service up-tunnel
associate sx-service
```

show-gtpu-statistics

Executing this show command displays the following output:

- Session Stats:
  - Current
  - Current (IMS-media)
  - Total Setup
  - Total Setup (IMS-media)
  - Current gtpu v0 sessions
  - Current gtpu v1 sessions
- Total Data Stats:
  - Uplink Packets
  - Uplink Bytes
  - Downlink Packets
  - Downlink Bytes
  - Packets Discarded
  - Bytes Discarded
  - Uplink Packets (IMS-media
  - Uplink Bytes (IMS-media)
  - Downlink Packets (IMS-media
  - Downlink Bytes (IMS-media)
  - Packets Discarded (IMS-media
  - Bytes Discarded (IMS-media
- QoS Stats:

- QCI <n>:
  - Uplink Packets
  - Uplink Bytes
  - Downlink Packets
  - Downlink Byte
  - Packets Discarded
  - Bytes Discarded
- Non-Std QCI(Non-GBR):
  - Uplink Packets
  - Uplink Bytes
  - Downlink Packets
  - Downlink Byte
  - Packets Discarded
  - Bytes Discarded

- Non-Std QCI(GBR):
  - Uplink Packets
  - Uplink Bytes
  - Downlink Packets
  - Downlink Byte
  - Packets Discarded
  - Bytes Discarded

- Total uplink packets GBR QCI's:
  - Total uplink Bytes GBR QCI's
  - Total Downlink packets GBR QCI's
  - Total Downlink Bytes GBR QCI's
  - Total uplink packets Non-GBR QCI's
  - Total uplink Bytes Non-GBR QCI's
  - Total Downlink packets Non-GBR QCI's
  - Total Downlink Bytes Non-GBR QCI's

- Path Management Messages:
  - Echo Request Rx

- Echo Response Rx
- Echo Request Tx
- Echo Response Tx
- SuppExtnHdr Tx
- SuppExtnHdr Rx

- Peer Stats:
  - Total GTPU Peers
  - Total GTPU Peers with Stats

- Tunnel Management Messages:
  - Error Indication Tx
  - Error Indication Rx
  - Error Indication Rx Discarded

- Optimization Stats:
  - Total Packets Input
  - Total Packets Optimized
  - Total TCP Packets Input:
  - Total TCP Packets Optimized:
  - Total UDP Packets Input
  - Total UDP Packets Optimized
  - Total Fragments Input

- IPSec Data Stats:
  - Discards Due To IPSec Tunnel Not Present
    - Packets Discarded
    - Bytes Discarded
    - Err-Ind Tx Discarded

Note In CUPS, the "Packets Discarded" statistics are the aggregate of packets dropped at the Session manager and packets dropped at VPP. As VPP handles majority packets, the packet drops at VPP can only be categorized broadly under these statistics.

You can view specific packet drop reasons only for packets dropped at session manager. Packets dropped at VPP are categorized under Packets Discarded counter in the **show gtpu statistics** CLI.

show module p2p user-plane-ipv6-addr

Executing this show command displays the following output:

- Control-Plane Sx-Service name
  - Priority
  - User-Plane ip
  - version
  - update/rollback time

show saegw-service all

The output of this command has been enhanced to include the following new field in support of the Sx Service associated with an SAEGW Service.

sx-service

show saegw-service name

The output of this command is similar to the **show saegw-service all** CLI command and displays the field for the specified saegw-service name.

show service all

The output of this command has been modified to include user-plane service and its related parameters.

- Context ID
- Service ID
- Context Name
- Service Name
- State
- MaxSessions
- Type

show subscriber all

The output of this command has been modified to include user-plane service and its related parameters:

- Access type
  - user-plane
- Access Tech

- Call State
- Access CSCF Status
- Link Status
- Network Type
- CALLID
- MSID
- USERNAME
- IP
- TIME-IDLE

show subscribers user-plane-only all

Executing this show command displays the following output:

- Access Type
- Interface Type
- Call State
- CALL ID
- LOCAL SEID
- IP
- PDN-INSTANCE
- TIME-IDLE

show subscribers user-plane-only called/seid *called/seid* flow flow-id *flow-id*

Executing this show command displays the following output:

- Callid
  - Interface Type
  - IP address
  - Flow ID
  - Uplink pkts
  - Downlink pkts
  - Uplink bytes
  - Downlink bytes
  - UE IP address

    - UE Port
    - Server IP address
    - Server Port
    - Protocol
- Total Flows found
- Total subscribers matching specified criteria

show subscribers user-plane-only called/seid *called/seid* flows full

Executing this show command displays the following output:

- Callid
    - Interface Type
    - IP address
    - Flow ID
    - Uplink pkts
    - Downlink pkts
    - Uplink bytes
    - Downlink bytes
    - UE IP address
    - UE Port
    - Server IP address
    - Server Port
    - Protocol
    - Flow ID
    - Uplink pkts
    - Downlink pkts
    - UE IP address
    - UE Port
    - Server IP address
    - Server Port
    - Protocol
- Total Flows found

- Total subscribers matching specified criteria

show subscribers user-plane-only called/seid *called/seid* flows

Executing this show command displays the following output:

- Sessmgr Instance
  - Application Protocol
  - Transport Protocol
    - Tethered Flow
      - Recovered Flow
  - Total Number of Active flows

show subscribers user-plane-only callid *call_id* pdr all

Executing this show command displays the following output:

- Source Interface
- Type
- Destination Interface
- Type
- vv
- PDR-ID
- Linked FAR-ID
- Linked URR-ID
- Linked QER-ID
- Total subscribers matching specified criteria

show subscribers user-plane-only callid/seid *callid/seid* pdr full all

Executing this show command displays the following output:

- Callid
  - Interface Type
  - IP address
- PDR-ID
- Hits

- Match Bypassed
- Matched Bytes
    - Precedence
    - Source Interface
- Matched Packets
- SDF Filter(s)
    - Filter 1
        - Protocol
        - Src IP Addr
        - Src Port
        - Dst IP Addr
        - Dst Port
- SPI
    - Local F-TEID
    - Outer header removal
    - Application ID
- Linked FARID
    - Destination Interface
    - Apply Action
    - Outer Header Creation
    - Remote TEID
    - Remote IP Address
    - Remote Port
- Linked QERID
    - PDR-ID
    - Hits
    - Match Bypassed
    - Matched Bytes
        - Precedence
        - Source Interface

- SDF Filter(s)
  - Filter 1
    - Protocol
    - Src IP Addr
    - Src Port
    - Dst IP Addr
    - Dst Port
    - SPI
- Local F-TEID
- Outer header removal
- Application ID

- Linked FARID
  - Destination Interface
  - Apply Action
  - Outer Header Creation
  - Remote TEID
  - Remote IP Address
  - Remote Port

- Total PDRs found
- Total subscribers matching specified criteria

show subscribers user-plane-only callid/seid *callid/seid* pdr id *pdr-id*

Executing this show command displays the following output:

- Callid
  - Interface Type
  - IP address

- PDR-ID
- Hits
- Match Bypassed
- Matched Bytes
  - Precedence

        - Source Interface
    - Matched Packets
    - SDF Filter(s)
        - Filter 1
            - Protocol
            - Src IP Addr
            - Src Port
            - Dst IP Addr
            - Dst Port
            - SPI
    - Local F-TEID
    - Outer header removal
    - Application ID
    - Linked FARID
        - Destination Interface
        - Apply Action
        - Outer Header Creation
        - Remote TEID
    - Remote IP Address
    - Remote Port
    - Linked QERID
    - Total PDRs found
    - Total subscribers matching specified criteria

show subscribers user-plane-only flows

Executing this show command displays the following output:

- Sessmgr Instance
    - Application Protocol
    - Transport Protocol
        - Tethered Flow
            - Recovered Flow

- Flow-ID
- Bytes-Up
- Bytes-Down
- Pkts-Up
- Total Number of Active flows
- Total subscribers matching specified criteria

show subscribers user-plane-only full all

Executing this show command displays the following output:

- Local SEID
- Remote SEID
- State
- Connect Time
- Idle time
- Access Type
- Network Type
- user-plane-service-name
- Callid
- Interface Type
- Card/Cpu
- IP allocation type
- IP address
- Source context
- Destination context
- PDN-Instance
- User-plane-Sx-addr
- Control-plane-Sx-addr
- Number of associated PDRs
- Number of associated FARs
- Number of associated QERs
- Number of associated URRs
- input pkts

- output pkts
- input bytes
- output bytes
- input bytes dropped
- output bytes dropped
- input pkts dropped
- output pkts dropped
- pk rate from user(bps)
- pk rate to user(bps)
- ave rate from user(bps)
- ave rate to user(bps)
- sust rate from user(bps)
- sust rate to user(pps)
- pk rate from user(pps)
- pk rate to user(pps)
- ave rate from user(bps)
- ave rate to user(pps)
- sust rate from user(pps)
- sust rate to user(pps)
- ipv4 bad hdr
- ipv4 ttl exceeded
- ipv4 fragments sent
- ipv4 could not fragment
- ipv4 bad length trim
- ipv4 input mcast drop
- ipv4 input bcast drop
- input pkts dropped (0 mbr)
- output pkts dropped (0 mbr)
- ip source violations
- ipv4 output no-flow drop
- ipv6 bad hdr
- ipv6 bad length trim

- ipv4 input mcast drop
- ipv4 input bcast drop
- input pkts dropped (0 mbr)
- output pkts dropped (0 mbr)
- ip source violations
- ipv4 output no-flow drop
- ipv6 bad hdr
- ipv6 bad length trim
- ipv4 icmp packets dropped
- APN AMBR Input Pkts Drop
- APN AMBR Output Pkts Drop
- APN AMBR Input Bytes Drop
- APN AMBR Output Bytes Drop
- Total subscribers matching specified criteria

show subscribers user-plane-only seid *seid* pdr all

Executing this show command displays the following output:

- Source Interface
  - Type
- Destination Interface
  - Type
- vv
- PRD-ID
- Linked FAR-ID
- Linked URR-ID
- Linked QER-ID
- Total subscribers matching specified criteria

show user-plane-service [all | name *name*]

Executing this show command displays the following output:

- Service name

- Service-Id
- Context
- Status
- PGW Ingress GTPU Service
- SGW Ingress GTPU Service
- SGW Egress GTPU Service
- Control Plane Tunnel GTPU Service
- Sx Service

show user-plane-service statistics all

Executing this show command displays the following output:

- VPN Name
- Subscribers Total
  - PDNs Total
    - Active
    - Setup
    - Released
    - Rejected
- PDNs By PDN-Type
  - IPv4 PDNs
    - Active
    - Setup
    - Released
  - IPv6 PDNs
    - Active
    - Setup
    - Released
  - IPv4v6 PDNs
    - Active
    - Setup

- Released

- PDNs By interface-Type
  - Sxa interface-type PDNs
    - Active
    - Released
  - Sxb interface-type PDNs
    - Active
    - Setup
    - Released

- PDNs Rejected By Reason
  - No Resource
  - Missing or unknown APN
  - Addr not alloc
  - Addr not present
  - No memory available
  - System Failure
  - PDR install failed

- PDNs Released By Reason
  - Network initiated release
  - Admin disconnect

- Total Data Statistics
  - Uplink
    - Total Pkts
    - Total Bytes
    - Total Dropped Pkts
    - Total Dropped Bytes
  - Downlink
    - Total Pkts
    - Total Bytes
    - Total Dropped Pkts

- Total Dropped Bytes

- Data Statistics Per PDN-Type
  - IPv4 PDNs
    - Uplink
      - Total Pkts
      - Total Bytes
    - Downlink
      - Total Pkts
      - Total Bytes
  - IPv6 PDN Data Statistics
    - Uplink
      - Total Pkts
      - Total Bytes
    - Downlink
      - Total Pkts
      - Total Bytes
  - IPv4v6 PDN Data Statistics
    - Uplink
      - Total Pkts v4
      - Total Bytes v4
      - Total Pkts v6
      - Total Bytes v6
    - Downlink
      - Total Pkts v4
      - Total Bytes v4
      - Total Pkts v6
      - Total Bytes v6

- Flow Statistics
  - Max Flow Reached

- Pkts Dropped - system Limit (L4)
- Ip Flow Statistics
  - Total Flows v4
    - Uplink
    - Total Pkts v4
    - Total Bytes v4
    - Total Error Pkts v4
    - Total Error Bytes v4
  - Active Flows v4
    - Downlink
    - Total Pkts v4
    - Total Bytes v4
    - Total Error Pkts v4
    - Total Error Bytes v4
  - Total Flows v6
    - Uplink
    - Total Pkts v6
    - Total Bytes v6
    - Total Error Pkts v6
    - Total Error Bytes v6
  - Active Flows v6
    - Downlink
    - Total Pkts v6
    - Total Bytes v6
    - Total Error Pkts v6
    - Total Error Bytes v6

- Udp Flow Statistics
  - Total Udp Flows
    - Uplink
      - Total Udp Pkts

- Total Udp Bytes
- Total Udp Error Pkts
- Total Udp Error Bytes

- Downlink
  - Total Udp Pkts
  - Total Udp Bytes
  - Total Udp Error Pkts
  - Total Udp Error Bytes

- TCP Flow Statistics
  - Total TCP Flows
    - Uplink
      - Total TCP Pkts
      - Total TCP Bytes
      - Total TCP Error Pkts
      - Total TCP Error Bytes

    - Downlink
      - Total TCP Pkts
      - Total TCP Bytes
      - Total TCP Error Pkts
      - Total TCP Error Bytes

show user-plane-service statistics charging action

This command displays charging action statistics for all or specified charging actions that are configured in the Active Charging Service (ACS). A charging action represents actions to be taken when a configured rule is matched. Actions range from generating accounting records to dropping the IP packet, and so on. The charging action also determines the metering principle—Whether to count retransmitted packets, and which protocol field to use for billing (L3/L4/L7, and so on).

Syntax

show user-plane-service statistics charging-action
{ all [debug-info | verbose] | name *charging_action_name* **[debug-info | verbose] } [| { grep** *grep_options* **| more }]**

Notes:

- **all**: Displays information for all charging actions configured in ACS.
- **name** *charging_action_name*: Displays information for an existing charging action specified as an alphanumeric string from 1 through 63 characters.

This show CLI command doesn't support the following statistics with the value *0* that is displayed for each of its counter value.

```
PP Flows Readdressed:0
Bytes Charged Yet Packet Dropped:0
Predef-Rules Deactivated:0
Outer IP header dscp marked Pkts:0

Tethering Blocking Statistics:
   TTL Modified downlink packets:0

Throttle-Suppress Stats:
   Uplink Bytes:0    Downlink Bytes:0

XHeader Information:
IP Frags consumed by XHeader:0 IP Frags consumed by XHeader:0

Strip URL:
   Successful Token stripped:0
   Total strip URL failure:0
   Failure - Missing config:0
   Failure - Existing flow bid:0
   Failure - Token matching failed:0
   Failure - Empty packet:0
   Failure - Req end not found:0
   Failure - Subset of big token:0

URL-Readdressing:
   Requests URL-Readdressed:0
   Total Charging action hit - Req. Readdr.:0
   Proxy Disable Success:0
   Flows connected to URL Server:0


URL-Readdressing Error Conditions:
   Total connect failed to URL Server:0
   URL Readdress- pipelined case:0
   URL Readdress- Socket Mig. Failed:0
   Proxy Disable Failed:0

CAE-Readdressing:
   Requests CAE-Readdressed:0
   Responses CAE-Readdressed:0
```

```
  Requests having MVG xheader inserted:0
  Total CAE-Readdressed Uplink Bytes:0
  Total CAE-Readdressed Uplink Packets:0
  Total CAE-Readdressed Downlink Bytes:0
  Total CAE-Readdressed Downlink Packets:0
  Total Charging action hit - Req. Readdr.:0
  Total Charging action hit - Resp. Readdr:0
  Proxy Disable Success:0
  Flows connected to CAE:0

CAE Readdressing Error Conditions:
  Total connect failed to CAE:0
  Req. Readdr. - pipelined case:0
  Skipped Resp. Readdr. - pipelined req:0
  Req. Readdr. - Socket Mig. failed:0
  Skipped Resp. Readdr. - partial resp hdr:0
  Resp. Readdr. - Socket Mig. failed:0
  Total CAE load balancer failed:0
  Total MVG xheader insertion failed:0
  Proxy Disable Failed:0

  Rulebase Changed by flow action:0
  Terminate Session:0
  P2P random dropped packets:0
```

show user-plane-service statistics group-of-ruledefs

This command displays statistics for all groups or a specified group of **ruledef**s configured in the active charging service. The **group-of-ruledefs** is a collection of rule definitions that can be used in access policy creation.

Syntax

show user-plane-service statistics group-of-ruledefs { all | name *group_of_ruledefs_name* **} [| { grep** *grep_options* **| more }]**

Notes:

- **all**: Displays information for all **groups of ruledefs** configured in ACS.
- **name** *group_of_ruledefs_name*: Displays detailed information for an existing **group of ruledefs** specified as an alphanumeric string from 1 through 63 characters.
- **{ grep** *grep_options* **| more } Pipes**: Sends the output of this command to the specified command.
- The following clear CLI command is available for use:

  clear user-plane-service statistics group-of-ruledefs { all | name *group_of_ruledefs_name* **}**

show user-plane-service statistics ruledef

This command displays statistics for all or specified **ruledef** that is configured in an active charging service. The **ruledef** represents a set of matching conditions across multiple L3 - L7 protocol that is based on protocol fields and state information. You can use each **ruledef** across multiple rule bases within the active charging service.

Syntax

show user-plane-service statistics ruledef { all { charging | firewall [wide] | post-processing } | name *ruledef_name* **[wide] } [| { grep** *grep_options* **| more }]**

Notes:

- **all**: Displays statistics for **all ruledef**s of the specified type that is configured in the ACS.
- **charging**: Displays statistics for all **charging ruledef**s configured in the ACS.
- **firewall**: Displays statistics for all **firewall ruledef**s configured in the service.
- **post processing**: Displays statistics for all **post processing ruledef**s configured in the ACS.
- **name** *ruledef_name*: Displays statistics for an existing **ruledef** specified as an alphanumeric string from 1 through 63 characters.
- **wide**: Displays all available information in a single wide line.
- The following clear CLI command is available for use:

  clear user-plane-service statistics ruledef { all | charging | firewall | name *group_of_ruledefs_name* **}**