

Event-based CDRs for CUPS

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Revision History

Note Revision history details are not provided for features introduced before release 21.24.

Revision Details	Release
First introduced	Pre 21.24

Event-based CDRs for CUPS

This chapter includes the following topics:

Feature Description

The CUPS architecture now supports Even-based Call Data Record (CDR) generation to account subscriber data usage. The EPC network, which consists of the User-Plane and Control-Plane as separate nodes, requires interaction between these entities to provide data usage accounting.

Generation of a CDR is an integral functionality of the Control-Plane. The Control-Plane interacts with the User-Plane to receive usage data such as: Uplink bytes, Downlink bytes and so on, to generate a CDR. These CDRs are generated based on Event Triggers. The event triggers can be either from the Access side of the

Control-Plane or PCRF generated. The usage data acquired from these events from the User-Plane, is updated in the CDR.

The following functionalities are supported in this feature:

- Exchange of Packet Flow Control Plane (PFCP) Session Modification Request and PFCP Session Modification Response messages.
- Reporting usage data from the User-Plane to the Control-Plane based on a configured Tariff-Time.

Note The scope of this feature is restricted only to P-GW and SAE-GW.

How It Works

The usage data report of a subscriber is retrieved from the User-Plane using the following mechanisms:

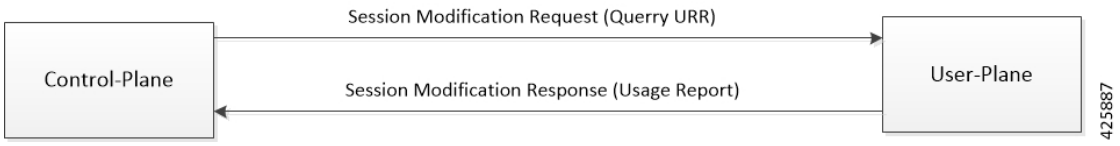
- **Pull mechanism**: The Control-Plane queries the User-Plane for the usage data report. The PFCP Session Modification Request/ PFCP Session Modification Response messages are used in this mechanism.
- **Push mechanism**: Here, the User-Plane sends the usage data report to the Control-Plane. The Tariff-Time configuration, which works with the existing Time/Volume-based push mechanism, is implemented. The PFCP Session Report Request/Session Report Response messages are used in this mechanism.

Fetching the Usage Report

In the CUPS architecture, because the User-Plane is a separate node, the Control-Plane node communicates with the User-Plane node using the PFCP protocol over the Sx interface to retrieve the usage data report of a subscriber.

The Control-Plane node sends the PFCP Session Modification request, containing the URRs for which the usage data report is reported. The User-Plane node responds with the PFCP Session Modification Response providing the usage data report for the requested URRs.

The following figure depicts the interaction between Control-Plane and User-Plane:



The following IEs are supported as part of the Sx Session Modification exchange messages:

- **Query URR**: This IE is present when the Control-Plane function requests immediate usage report(s) to the User-Plane function. Several IEs within the same IE type may be present to represent a list of URRs for which an immediate report is requested.
- **Usage Report**: This IE is present if the Query URR IE was present in the PFCP Session Modification Request and the traffic usage measurements for that URR are available at the User-Plane function. Several IEs within the same IE type may be present to represent a list of Usage Reports.

Tariff Time

Tariff-Time configuration is already supported by the Non-CUPS architecture. For CUPS, the Control-Plane uses the existing configuration. During a call set-up, PFCP Session Establishment Request carries the tariff time in the Monitoring Time IE, which is applicable to SDF URRs only. Bearer Level URR does not have this IE.

The Monitoring Time IE contains the configured time at which the usage data report of a subscriber is sent to the Control-Plane. Once the configured monitoring time expires the usage data report is sent, and sequentially, the time is automatically moved ahead by 24 hours indicating the time at which the next usage data report will be sent.



Note Before the next expiry of monitoring timer, usage data is reported continuously through the Time/Volume Threshold, if configured, or through an explicit request by the Control-Plane using the PFCP Session Modification Request (Query URR).

On the User-Plane, when the monitoring time expires for a URR, the Usage Report IE is sent to the Control-Plane. Sometimes, the monitoring time could expire for multiple subscribers at the same time. To avoid flooding of usage reports towards the Control-Plane, the User-Plane instead of reporting, piggybacks the usage data in the next outgoing message (PFCP Session Report Request or PFCP Session Modification Response) carrying the usage report.

The following IEs are supported as part of the Create URR IE within PFCP Session Modification Request:

- **Monitoring Time**: This IE contains the time at which the User-Plane function re-applies the volume or time threshold.
- **Subsequent Volume Threshold**: This IE may be present if the Monitoring Time IE is present and volume-based measurement is used. When present, it indicates the traffic volume value after which the User-Plane function reports the network resources usage to the Control-Plane function for the respective URR, for the period after the Monitoring Time.
- **Subsequent Time Threshold**: This IE may be present if the Monitoring Time IE is present and time-based measurement is used. When present, it indicates the traffic time value after which the User-Plane function reports the network resources usage to the Control-Plane function for the respective URR, for the period after the Monitoring Time.



Note In the non-CUPS architecture, P-GW supports four tariff-time instances in the Tariff-Time configuration. However, in CUPS only one tariff-time instance is supported.

Event Trigger

In this feature, an event trigger results in generation of either a partial CDR or a permanent CDR. In case of a partial event, only the CDR bucket is updated, but the actual CDR is not generated. But, in a permanent event trigger, a complete CDR is generated.

The following event triggers are supported in this feature:

- ULI Change (Partial event)

- Time Zone Change (Permanent event)
- Default Bearer QoS Change
- APN-AMBR Change



Note The GTPP trigger **egcdr max-losdv** is not supported in this release.

Standards Compliance

The Event-based CDRs for CUPS is based on the following standard(s):

- 3GPP TS 29.244: LTE; Interface between the Control Plane and the User Plane of EPC Nodes (3GPP TS 29.244 version 14.0.0 Release 14)

Monitoring and Troubleshooting

This section provides information on the show commands available to support Event-based CDRs for CUPS.

Show Commands and/or Outputs

This section provides information regarding show commands and/or their outputs in support of this feature:

show active-charging subscribers full callid *call_id* urr-info

On executing the above command the following new fields are displayed:

- Next Monitoring Time
  - Subsequent Time Threshold
  - Subsequent Volume Threshold

show subscribers user-plane-only callid *call_id* urr full all

On executing the above command the following new fields are displayed:

- Next Monitoring Time
  - Subsequent Time Threshold
  - Subsequent Volume Threshold