

Tariff Time Support

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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

Feature Description

The Tariff switch time functionality is applied when a subscriber switches form one tariff plan to another.

The Tariff-Time-Change AVP is used to determine the tariff switch time, and the Monitoring-Time IE is used to support the Tariff time support functionality.

After a tariff timer expiry, the Gateway accumulates the usage separately in a charging bucket and continues to consume from the original quota value. At the time of next reporting, (Quota exhausted or another control events) the Gateway will report both usages (before and after tariff time change) for the same Charging Bucket.

The first reporting of this charging-bucket will have the Reporting-Reason: Tariff-Time-Change, and the second bucket will contain the last reporting reason, and the quota usage after the tariff-timer expiry.

The data traffic usage can be split into resource usage before a tariff switch and resources used after a tariff switch. The Tariff-Change-Usage AVP is used within the Used-Service-Units AVP to distinguish reported usage before and after the tariff time change.

Limitations

Following are the known limitations of this feature:

- Only one tariff time per RG/Service ID combination is supported per rulebase configuration.
- Allocation of different quota before and after tariff time change is not supported. This functionality is not in compliance with the 3GPP stanadards.

Tariff time replication

The tariff time replication feature is designed to optimize the Gz (offline) tariff time management within the CUPS architecture.

Table 1: Feature history

Feature name	Release information	Description
Tariff time replication on CUPS	2026.02.0	The feature enables replication of Gz tariff time from the Gy bucket. It ensures suppression of Sx Query-URR to prevent signalling storms in CUPS deployments. **Command introduced:** **egcdr tariff replicate-ocs-tariff-time-change**- This CLI command is configured in Active Charging Service command mode. **Default settings:** Disabled-Configuration required to Enable

When a rating group utilizes both online (Gy) and offline (Gz) charging, the Control Plane (CP) triggers a Gz Query-URR upon the expiry of a timer based on the OCS-provided tariff time. This process often leads to signaling overload on the Sx interface and CPU spikes during high-traffic periods.

This feature enables the automatic replication of the Gy tariff time to the Gz and suppresses unnecessary Gz Query-URRs, ensuring that Gz tariff time is synchronized with the OCS-provided Gy tariff time.

How tariff time replication works

Tariff time alignment

When the tariff time replication feature is enabled, the CP and UP nodes replicate the tariff time from the Gy bucket to the corresponding Gz bucket as per the applicability. This process is based upon the RG-SI mapping, when the rules have both offline and online charging enabled.

The RG-SI mapping is based on Rating group. Therefore, the Rating Group must be same to link the Gz and Gy URR.

Dynamic rule URRs

For dynamic rules

- the CP node creates the URRs for both the Gy and Gz and sends over Sx.
- the CP node is aware of the Gy and Gz URRs for a given RG-SI for a dynamic rule.

- the CP node ensures that whenever a tariff time is populated in the Gy URR for a dynamic rule, the same value is replicated in the corresponding Gz URR's Create or Update URR IE, if the offline charging is enabled in the rule definition charging action and the Service-Id and Rating Group are same.

Static rule URRs

For static rules

- the UP node creates the URRs for both Gy and Gz.
- the UP sends the Start-of-Traffic trigger for the Gy URR to CP, and the CP node requests for quota from the OCS.
- the CP sends a Gy Update-URR with the tariff time (if received), upon receiving the quota.
- the UP is aware of the corresponding Gz URRs for a given RG-SI for a static rule, based on the rating group and service id configuration is present in the charging-action.
- the UP ensures that whenever a tariff time is received for the Gy URR for a static rule, it is replicated in the corresponding Gz URR if the offline charging(egcdr) is enabled in the configuration.

Tariff time reporting at UP

Once the tariff time is updated in the Gz URR, the UP node generates the monitoring time snapshot based on the tariff time.

Enable Tariff Time replication

Before you begin

These are the steps to enable tariff time functionality.

Procedure

Step 1 Use the CLI **active-charging service** *service_name* to enter the Active Charging Service command mode.

Example:

```
[local]CP# config
[local]CP(config)# active-charging service ACS
[local]CP(config-acs)#
```

Step 2 Use the CLI **rulebase** *rulebase_name* to define the name of the rulebase.

Example:

```
[local]CP(config-acs)# rulebase cisco
[local]CP(config-rule-base)#
```

Step 3 Use the CLI **egcdr tariff minute** *minute* **hour** *hour* to define the rulebase tariff time.

Example:

```
[local]CP(config-rule-base)# egcdr tariff minute 1 hour 2
```

Step 4 Use the CLI command **egcdr tariff replicate-ocs-tariff-time-change** to replicate OCS tariff time to Gz URRs.

Example:

```
[local]CP(config-rule-base)# egcdr tariff replicate-ocs-tariff-time-change
```

Limitations of Tariff Time replication

The known limitations of the tariff time replication feature are:

- **Gz URR monitoring time initialization:** When both online and offline charging are enabled along with the CLI **egcdr tariff replicate-ocs-tariff-time-change**
  - the Gz URRs have the monitoring time (TTC) value set from the rulebase config only if the tariff time config is present in rulebase. If the tariff time is not present in the rulebase, then the Gz URRs do not have the monitoring time, until they receive the Gy monitoring time.
  - the Gz URR gets updated with Gy tariff time for all subsequent processing, upon receiving the Gy tariff time.
- **Usage loss during charging mode transition:** If the fetaure CLI is enbaled and the rulebase also has tariff time configuration, until the Gy montoring time is received from OCS, the Gz URR follows tariff time according to the rulebase tariff time.

  If the tariff time switch happens and the usage accumulated till the tariff time switch is not reported to the CP before the UP receives the Gy monitoring time, then the usage accumulated before the tariff time is lost.
- **Gz URR monitoring time behaviour on CLI state change:** When the CLI is enabled during a session, the monitoring time (TTC) value of Gz URRs will follow the last known or configured value until the next update, depending on the enable/disable actions performed.

  When the CLI is disabled during a session, the Gz URR Monitoring time will refllect the rulebase tariff time configured value only for a new session and not for existing session.

Monitoring and troubleshooting

This section highlights the show commands and outputs to monitor and troubleshoot the tariff time replication feature.

Show commands and outputs

show configuration active-charging service name

This show command displays the configuration of a specific Active Charging Service.

```
local]CP2# show configuration active-charging service name ACS
config
 active-charging service ACS
    rulebase cisco
      egcdr tariff replicate-from-ocs-tariff-time-change
end
```

show configuration active-charging service all

This show command displays the entire configuration for a specific Active Charging Service profile.

```
[local]CP2# show configuration active-charging service all
config
 active-charging service ACS
    rulebase cisco
      egcdr tariff replicate-from-ocs-tariff-time-change
end
```

show active-charging rulebase name

This show command displays the rulebase configuration for a specific Active Charging Service profile.

```
[local]CP2# show active-charging rulebase name cisco
Service Name: ACS
Rule Base Name: cisco
   EGCDR Fields:
     Tariff time thresholds (min:hrs):
      Time1:  1: 1
     Replicate-OCS-Tariff-time-Change: Yes
```

show user-plane-service rulebase name

This show command displays the rulebase configuration for a specific user plane service.

```
[local]laas-si-setup# show user-plane-service rulebase name cisco
 Service Name: ACS
  Rule Base Name: cisco
  EGCDR Fields:
     Tariff time thresholds (min:hrs):
      Time1:  1: 1
     Replicate-OCS-Tariff-time-Change: Yes
```