ERICSSON

Credit Control Configuration

OPERATION DIRECTIONS

55/1543-AXB 250 10/4-V3 Uen DY

Contents

1 Introduction

This document describes configuration of the online credit control functions for Service-Aware Charging and Control (SACC) in the EPG for GSM, WCDMA, LTE, trusted non-3GPP network, and untrusted non-3GPP network.

To facilitate the understanding of this document, see CPI Library Readers' Guide.

1.1 Scope

This document covers the following issues:

— Enabling credit control

— Configuring credit control sessions

— Configuring quota reservation and reporting

— Configuring redirection parameters

— Configuring alarms

For an overview of credit control, see Credit Control.

Note: This document applies for the SACC solution.

1.2 Target Groups

This document is intended for personnel performing configuration of the EPG. The document assumes a basic knowledge of data communication and telecommunication.

2 Prerequisites

Before configuring the online credit control functions, ensure the following prerequisites are met:

— The Gy+ real-time charging license must be activated. Optional licensed features in the EPG are turned off by default. In order to employ these features in the EPG, licenses must be purchased from Ericsson. For information on how to purchase licenses and enable licensed features, see Software License Management or contact your local Ericsson support.

— An Access Point Name (APN) must be configured. Refer to APN Configuration for more information.

— A Diameter Application System (DAS) must be previously configured for the Ro application in the GGSN and PGW, see Diameter Configuration. Additional DASs should be configured if the DAS is received over the Gx+ interface.

— The user category and the rule space must be configured. Refer to SACC Configuration for more information.

3 Enable Credit Control

To enable SACC credit control in the EPG, the following mandatory actions must be taken:

— Select the service specification.

— Associate a DAS with the credit control profile.

— Associate the credit control profile with a user category.

The following sections describe these actions.

3.1 Select Service Specification

The service specification to apply for credit control over the Gy+ interface is selected by configuring a service context identifier. The service context identifier is included as a `Service-Context-Id` AVP in `Credit Control Request` (CCR) messages sent to the OCS.

To configure the 3GPP Gy service context identifier of a credit control profile, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   service-context-id (6.32251@3gpp.org | 8.32251@3gpp.org |
12.32251@3gpp.org | 13.32251@3gpp.org | 15.32251@3gpp.org)
```

To configure the Ericsson Gy service context identifier of a credit control profile, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
```

```
   service-context-id (v1.gy.ggsn@ericsson.com | v2.gy.ggs
n@ericsson.com | v3.gy.ggsn@ericsson.com | v4.gy.ggsn@eric
sson.com | pgw.15.32251@ericsson.com)
```

To configure a provider specific service context identifier of a credit control profile, include the following statement. For more information, contact Ericsson support.

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   service-context-id <service-context@domain>
```

Note: A PGW-enabled APN does not support 3GPP release 6 and Ericsson Gy version 1.

3.1.1 Configure Alternative Service Context Identifier

The EPG can be configured to use an alternative service context identifier as `Service-Context-Id` AVP other than the applied service specification. The alternative service context identifier can be, for example, a provider specific service context identifier or an alternative release of the service specification.

To configure an alternative service context identifier to be included as `Service-Context-Id` AVP of a credit control profile, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   ccr-context-id <service-context@domain>
```

3.2 Associate DAS with Credit Control Profile

To associate a DAS with a credit control profile, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   diameter-application-system <diameter-application-system>
```

In order to associate a DAS with the credit control profile, the DAS must be previously configured in the GGSN and PGW, refer to Diameter Configuration.

3.2.1 Configure Additional Allowed DAS

Additional DASs allowed for the profile can also be configured. Additional DASs should be configured if the DAS is received over the Gx+ interface.

To add an additional DAS allowed for a credit control profile, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
```

```
   additional-allowed-das <diameter-application-system>
```

3.3 Associate Credit Control Profile with User Category

Do!

Block bearer creation before associating a credit control profile with a user category.

For detailed instructions for performing configuration that requires blocking bearer creation, refer to Deleting and Modifying APNs.

To associate a credit control profile with the default user category, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-category default
   credit-control-ro-profile <profile-id>
```

To associate a credit control profile with a specific user category, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> user-category
category <category-id>
   credit-control-ro-profile <profile-id>
```

The profile associated with a user category must be configured according to Section 3.2 on page 3.

For instructions on configuring a user category, refer to SACC Configuration.

4 Configure Charging Characteristics Query

In case no charging characteristics have been received from the Serving GPRS Support Node (SGSN), Mobility Management Entity (MME), Trusted WLAN Access Network (TWAN), or Evolved Packet Data Gateway (ePDG), a query to the OCS can be used to select charging characteristics for a user.

To configure the charging characteristics to use when the OCS enables credit control for a user, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control query-ocs credit-control-user
   cc <value>
```

To configure the charging characteristics to use when the OCS disables credit control for a user, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control query-ocs no-credit-control-user
   cc <value>
```

To configure the charging characteristics to use when no valid answer is received from the OCS for a user, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control query-ocs no-valid-answer
   cc <value>
```

5 Configure Credit Control Sessions

This section describes configurable parameters, related to the Credit Control Sessions.

5.1 Configure Optional Message Attributes

For information on Attribute-Value Pairs (AVPs), refer to Gy+ Interface Description.

The following AVPs included in `CCR` messages, are configurable.

5.1.1 Configure User-Name AVP

By default, the GGSN and PGW include the Network Access Identifier (NAI) of the user session in the `User-Name` AVP.

To configure the type of the `User-Name` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   user-name (imsi | nai)
```

5.1.2 Configure Subscription-Id AVP

By default, the GGSN and PGW include the Mobile Subscriber ISDN Number (MSISDN) and International Mobile Subscriber Identity (IMSI) as `Subscription-Id` AVP instances.

To configure the GGSN and PGW to include only one instance of the `Subscription-Id` AVP and the type, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   subscription-id (imsi | msisdn)
```

5.1.3 Exclude 3GPP-GGSN-MCC-MNC AVP from PS-Information AVP

To configure the GGSN and PGW to exclude the EPG Public Land Mobile Network (PLMN) identifier from the `PS-Information` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-ggsn-plmn-id
```

5.1.4 Exclude 3GPP-IMSI-MCC-MNC AVP from PS-Information AVP

To configure the GGSN and PGW to exclude the user PLMN identifier from the `PS-Information` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-user-plmn-id
```

5.1.5 Configure Called-Station-Id AVP in PS-Information AVP

To configure which APN name to include in the `Called-Station-Id` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   select-apn (used | logical | requested)
```

The `select-apn` configuration has three options. Page 7 describes how the selected option determines which APN name is included in the `Called-Station-Id` AVP.

Table 1 The APN Name in Called-Station-Id AVP

Option	The APN Name in `Called-Station-Id` AVP
used	Same as the configured APN name for the selected APN. The GGSN and PGW apply the `used` option by default.
logical	Same as the configured APN name for the requested APN(1).
requested	Same as the requested APN name in the GTP message, if the APN was changed by Radius Assisted Selection of APN (RAAS) or the PCRF-Assisted APN Selection. Same as the configured APN name for the requested APN(1), if the APN was not changed by RAAS or the PCRF-Assisted APN Selection.

(1) The requested APN means the APN that was received over the Gn/Gp, S5/S8, GTP-based S2a, GTP-based S2b, or PMIPv6-based S2a interface.

5.1.6 Exclude PDP-Context-Type from PS-Information AVP

To configure the GGSN and PGW to exclude bearer type information from the `PS-Information` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-pdp-context-type
```

5.1.7 Exclude Presence-Reporting-Area-Information AVP from PS-Information AVP

To configure the PGW to exclude the `Presence-Reporting-Area-Information` AVP from the `PS-Information` AVP in the `CCR-Initial` message to the OCS, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-presence-reporting-area
```

5.1.8 Configure Charging-Rule-Base-Name AVP in PS-Information AVP

To configure the GGSN and PGW to include the `Charging-Rule-Base-Name` AVP, using either the name of an installed ACG or the name of the rule space used for the user session, in the `PS-Information` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
```

```
   charging-rule-base-name (access-control-group-na
me | rule-space-name)
```

5.1.9 Include Predefined Service-Identifier AVP in MSCC AVP

To configure the GGSN and PGW to include the Service-Identifier AVP, using either a default value or the Rating-Group AVP value, in the Multiple-Services-Credit-Control (MSCC) AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   mscc-service-identifier (service-id <si-id> | rating-group-id)
```

The predefined Service-Identifier AVP is incompatible with SI level reporting, see Section 6.15 on page 21.

5.1.10 Include QoS-Information AVP in MSCC AVP

To configure the PGW to include the `QoS-Information` AVP within the MSCC AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   mscc-qos-information
```

5.1.11 Include PS-Previous-Information AVP in Service-Information AVP

To configure the GGSN and PGW to include the `PS-Previous-Information` AVP in the `Service-Information` AVP at rating condition change, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   ps-previous-information
```

5.1.12 Include Time-First-Usage AVP and Time-Last-Usage AVP in Used-Service-Unit AVP

To configure the GGSN and PGW to include the `Time-First-Usage` and `Time-Last-Usage` AVPs within the `Used-Service-Unit` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   used-service-unit-time-usage
```

Note: This configuration has no effect for quota types other than volume.

5.1.13 Exclude 3GPP2-BSID AVP from PS-Information AVP

To configure the PGW to exclude the `3GPP2-BSID` AVP from the `PS-Information` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-threegpp2-bsid
```

Note: This configuration is only applicable for PMIPv6-based S2a access.

5.1.14 Exclude User-Equipment-Info AVP

To configure the PGW to exclude the `User-Equipment-Info` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-cdma-user-equipment-info
```

Note: This configuration is only applicable for PMIPv6-based S2a access.

5.1.15 Configure User-Equipment-Info AVP

By default, the GGSN and PGW include the IMEISV of the user equipment in the `User-Equipment-Info` AVP.

To configure the type of the `User-Equipment-Info` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   u-wlan-user-equipment-info (imeisv | mac)
```

Note: This configuration is only applicable for untrusted Wi-Fi access.

5.1.16 Include 3GPP-Selection-Mode AVP in PS-Information AVP

To configure the PGW to include the `3GPP-Selection-Mode` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   cdma-selection-mode
```

Note: This configuration is only applicable for PMIPv6-based S2a access.

5.1.17 Include SGSN-Address AVP in PS-Information AVP Based on Address Type Preference

The default behavior of the GGSN and PGW is to include both IPv4 and IPv6 addresses when both are present. By using this configuration option, it is possible to include only one address, either IPv4 or IPv6, and priority is given to the specified type. In case the specified type is not present, the other type is included if it is present.

To configure the GGSN and PGW to include a preferred address type, such as IPv4, IPv6, or both, in the SGSN-Address AVP within the PS-Information AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   sgsn-address (ipv4 | ipv6 | ipv4v6)
```

5.1.18 Include GGSN-Address AVP in PS-Information AVP Based on Address Type Preference

The default behavior of the GGSN and PGW is to include both IPv4 and IPv6 addresses when both are present. By using this configuration option, it is possible to include only one address, either IPv4 or IPv6, and priority is given to the specified type. In case the specified type is not present, the other type is included if it is present.

To configure the GGSN and PGW to include a preferred address type, such as IPv4, IPv6, or both, in the GGSN-Address AVP within the PS-Information AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   ggsn-address (ipv4 | ipv6 | ipv4v6)
```

5.1.19 Exclude PDN-Connection-Id AVP from PS-Information AVP

To configure the GGSN and PGW to exclude the PDN-Connection-Id AVP from the PS-Information AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-pdn-connection-id
```

5.1.20 Exclude QoS-Information AVP from PS-Information AVP

To configure the GGSN and PGW to exclude the QoS-Information AVP from the PS-Information AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-ps-information-qos-information
```

5.1.21 Exclude Start-Time AVP from PS-Information AVP

To configure the GGSN and PGW to exclude the Start-Time AVP from the PS-Information AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-ps-information-start-time
```

5.1.22 Exclude Stop-Time AVP from PS-Information AVP

To configure the GGSN and PGW to exclude the `Stop-Time` AVP from the `PS-Information` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   no-ps-information-stop-time
```

5.1.23 Include UNI-PDU-CP-Only-Flag AVP in PS-Information

To configure the`UNI-PDU-CP-Only-Flag` AVP, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   ps-information-uni-pdu-cp-only-flag
```

By using this configuration option, the `UNI-PDU-CP-Only-Flag` AVP is included in CCR message at PS-information level.

In the `UNI-PDU-CP-Only-Flag` AVP:

— If the `Control Plane Only PDN Connection Indication` is set in GTP message, the AVP is included in Rf Access Control Rules (ACRs) with value 1 of `UNI-PDU-CP-Only`.

— Else, the AVP is included with value `0` of `UNI-PDU-both-UP-CP`.

5.2 Enable Rule Space Negotiation for Ericsson Gy

For Ericsson Gy, the default behavior of the GGSN and PGW is to communicate the present rule space without negotiation in the `CCR-Initial` message to the OCS at user session establishment.

To configure the GGSN and PGW to enable rule space negotiation with the OCS, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   rule-space-negotiation
```

5.3 Enable Service-Initiated Session Setup

To configure the GGSN and PGW not to initiate a credit control session at user session creation, but instead wait for the UE to access a service before initiating the session, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   no-initiate-session-on-activation
```

5.4 Enable Preemptive Quota from OCS for 3GPP Gy

For 3GPP Gy, the default behavior of the GGSN and PGW is not to accept preemptive quota from the OCS. To configure the GGSN and PGW to accept preemptive quota from the OCS for 3GPP Gy, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   preemptive-reservation
```

5.5 Disable Preemptive Quota from OCS for Ericsson Gy

For Ericsson Gy, the default behavior of the GGSN and PGW is to accept preemptive quota from the OCS. To configure the GGSN and PGW not to accept preemptive quota from the OCS for Ericsson Gy, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   no-preemptive-reservation
```

6 Configure Quota Reservation and Reporting

The following section describes configuration of parameters related to quota reservation and reporting.

6.1 Configure Quota Holding Time

The Quota Holding Time (QHT) can be configured either to a number of seconds, or to infinity. The default QHT is 180 seconds. The configurable range is 5–86,400 seconds.

To configure the QHT to a number of seconds, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-n
ame> quota-handling
   holding-time-period <seconds>
```

To configure the QHT to infinity, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-n
ame> quota-handling
   holding-time-infinity
```

6.2 Configure User Denied Time

The User Denied Time (UDT) can be configured to a number of seconds between 5 and 86,400. The default UDT is 180 seconds. To configure the UDT, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-n
ame> quota-handling
   user-denied-time <seconds>
```

6.3 Configure Packet Handling Pending Initial Quota Requests

The GGSN and PGW can be configured to allow a number of packets, to drop all packets, or to buffer a number of packets while waiting for the OCS to respond to an initial quota request for a credit instance. The configuration is performed per ACR on rule space level. Only one type of packet handling can be configured per ACR. By default, all packets are allowed to pass.

6.3.1 Configure Allowing Packets to Pass

To configure the GGSN and PGW to allow packets to pass pending initial quota requests for an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> allow-pending-authorization
   access-control-rule (<acr-id> | <acr-id>-<acr-id>)
```

To configure the maximum number of packets allowed to pass per ACR and user session, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> allow-pending-authorization
   pass-through-limit <number>
```

The default limit for the number of packets allowed to pass is 5. The configurable range is 1–254.

6.3.2 Configure Dropping of Packets

To configure the GGSN and PGW to drop packets pending initial quota requests for an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name>
   drop-pending-authorization (<acr-id> | <acr-id>-<acr-id>)
```

6.3.3 Configure Buffering of Packets

To configure the GGSN and PGW to buffer packets pending initial quota requests for an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> buffer-pending-authorization
   access-control-rule (<acr-id> | <acr-id>-<acr-id>)
```

To configure the maximum number of packets to buffer per ACR and user session, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> buffer-pending-authorization
   buffer-limit <number>
```

The default limit for the number of packets to buffer is 5. The configurable range is 1–100.

6.4 Configure Grant Access Time

To configure the grant access time after which the GGSN and PGW grants temporary access to requested services while waiting for the OCS to respond to a quota request for a credit instance, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   grant-access-time <seconds>
```

The configurable range is 1–60 seconds. The configured grant access time must be less than the DAS request timer value. For more information on the request timer configuration, refer to Diameter Configuration.

6.5 Configure Packet Handling Pending Update Quota Requests

The GGSN and PGW can be configured to allow a number of packets or to drop all packets while waiting for the OCS to respond to an update quota request for a

credit instance. The configuration is performed per ACR on rule space level. Only one type of packet handling can be configured per ACR. By default, all packets are allowed to pass.

6.5.1 Configure Allowing Packets to Pass

To configure the GGSN and PGW to allow packets to pass pending update quota requests for an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-nam
e> allow-pending-update
   access-control-rule (<acr-id> | <acr-id>-<acr-id>)
```

To configure the maximum number of packets allowed to pass per ACR and user session, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-nam
e> allow-pending-update
   pass-through-limit <number>
```

The default limit for the number of packets allowed to pass is 5. The configurable range is 1–254.

6.5.2 Configure Dropping of Packets

To configure the GGSN and PGW to drop packets pending update quota requests for an ACR or a consecutive range of ACRs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name>
   drop-pending-update (<acr-id> | <acr-id>-<acr-id>)
```

6.6 Configure No Quota Handling

To disable credit control for an RG or a consecutive range of RGs separated by -, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-n
ame> quota-handling
   no-quota-handling (<rg-id> | <rg-id>-<rg-id>)
```

6.7 Configure Default Requested Quota Type

Default requested quota type and amount can be configured to be included in the `Requested-Service-Unit` AVP at MSCC level in `CCR` messages sent to the OCS.

To configure a default requested total volume quota, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> quota-handling service-unit
   volume <octets>
```

To configure a default requested uplink volume quota, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> quota-handling service-unit
   uplink-volume <octets>
```

To configure a default requested downlink volume quota, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> quota-handling service-unit
   downlink-volume <octets>
```

The value range for volume quota is 0–18,446,744,073,709,551,615 octets.

To configure a default requested unit quota, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> quota-handling service-unit
   unit <units>
```

The value range for unit quota is 0–18,446,744,073,709,551,615 units.

To configure a default requested time quota, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> quota-handling service-unit
   time <seconds>
```

The value range for time quota is 0–4,294,967,295 seconds.

6.8 Configure Quota Request for Predefined RG

Quota request for a predefined RG can be configured to be included in the `Requested-Service-Unit` AVP at MSCC level in `CCR` messages sent to the OCS.

To configure the GGSN or PGW to request quota from the OCS for a predefined RG at credit control session establishment, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-n
ame> quota-handling
   request-on-session-initiation <rg-id>
```

6.9 Configure Handling at Zero Granted Service Units

By default, when the GGSN or PGW receives a CCA message with the Result-Code AVP set to DIAMETER_SUCCESS, the Granted Service Unit (GSU) set to 0, and no Final Unit Indication (FUI), the GGSN or PGW terminates the credit instance and sends a CCR-Update message to the OCS with the Reporting-Reason AVP set to FINAL, and activates the user denied timer.

6.9.1 Disable Sending of CCR-Update with Final Report at Zero Granted Service Units

To disable sending the final report at zero granted service units, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quot
a-handling quota-termination zero-quota
   final-report not-send
```

6.9.2 Configure Action at Zero Granted Service Units

To configure the action at zero granted service units, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quot
a-handling quota-terminination zero-quota
   termination-action (activate-validity-timer  | activ
ate-denied-timer | allow-access)
```

6.10 Configure Failure Handling per MSCC Level Result Code

To configure failure handling when receiving a certain error result code on MSCC level in a CCA message, follow the instructions in the sections below. The configurable error result codes are 4xxx (transient failures) and 5xxx (permanent failures). The following can be configured per set of error result codes:

— The sending of a CCR-Update message with final report

— The allowing or interrupting of an ongoing reported period

— The failure action to apply for the service

6.10.1 Configure Result Codes

To configure a result code, or a consecutive range of result codes separated by -, with a common failure handling, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quota-hand
ling quota-termination mscc-result-code profile <profile-id>
   result-codes (<result-code> | <result-code>-<result-code>)
```

6.10.2 Configure Sending of CCR-Update with Final Report

To configure the GGSN or PGW to send or not to send a `CCR-Update` message with final report at `MSCC-Update` failure, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quota-hand
ling quota-termination mscc-result-code profile <profile-id>
   final-report (send | not-send)
```

Table 2 shows the default behavior when sending of final reports is not configured.

Table 2 Default Behavior for Sending of Final Reports.

Result Code	Value	MSCC-Initial	MSCC-Update	MSCC-Final
DIAMETER_END_USER_SERVICE_DENIED	4010	Do not send	Send	Do not send
DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE	4011	Do not send	Do not send	Do not send
DIAMETER_CREDIT_LIMIT_REACHED	4012	Do not send	Send	Do not send
Transient failure (other)	4xxx	Do not send	Do not send	Do not send
DIAMETER_AUTHORIZATION_REJECTED	5003	Do not send	Do not send	Do not send
DIAMETER_RATING_FAILED	5031	Do not send	Do not send	Do not send
Permanent failure (other)	5xxx	Do not send	Do not send	Do not send

6.10.3 Configure Handling of the Ongoing Reported Period

To configure whether to allow or interrupt completion of an ongoing reported resolution period if time-based charging is used at `MSCC-Update` failure, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quota-hand
ling quota-termination mscc-result-code profile <profile-id>
   ongoing-reported-period (allow | not-allow)
```

Table 3 shows the default behavior when handling of the ongoing reported period is not configured.

Table 3 Default Behavior for Ongoing Reported Period.

Result Code	Value	MSCC-Initial	MSCC-Update	MSCC-Final
DIAMETER_END_USER_SERVICE_DENIED	4010	N/A	Allow period	Ignore
DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE	4011	N/A	Interrupt period	Ignore
DIAMETER_CREDIT_LIMIT_REACHED	4012	N/A	Allow period	Ignore
Transient failure (other)	4xxx	N/A	Interrupt period	Ignore
DIAMETER_AUTHORIZATION_REJECTED	5003	N/A	Interrupt period	Ignore
DIAMETER_RATING_FAILED	5031	N/A	Interrupt period	Ignore
Permanent failure (other)	5xxx	N/A	Interrupt period	Ignore

6.10.4 Configure Failure Action

The failure action to apply for a service at `MSCC-Initial` or `MSCC-Update` failure can be to deny the service, either permanently or temporarily during UDT, or to reinitiate the service immediately at next access. To configure the failure action, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quota-hand
ling quota-termination mscc-result-code profile <profile-id>
   termination-action (activate-denied-timer | allow-a
ccess | services-not-allowed)
```

Note: Failure action cannot be configured for the DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE result code.

Table 4 shows the default behavior when the failure action is not configured.

Table 4 Default Behavior of Failure Action.

Result Code	Value	MSCC-Initial	MSCC-Update	MSCC-Final
DIAMETER_END_USER_SERVICE_DENIED	4010	Apply UDT	Apply UDT	Ignore
DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE	4011	Allow	Allow	Ignore

Result Code	Value	MSCC-Initial	MSCC-Update	MSCC-Final
DIAMETER_CREDIT_LIMIT_REACHED	4012	Apply UDT	Apply UDT	Ignore
Transient failure (other)	4xxx	Apply UDT	Apply UDT	Ignore
DIAMETER_AUTHORIZATION_REJECTED	5003	Deny	Deny	Ignore
DIAMETER_RATING_FAILED	5031	Deny	Deny	Ignore
Permanent failure (other)	5xxx	Apply UDT	Apply UDT	Ignore

6.11 Enable Final Unit Redirection for MSCC Level Result Codes

The EPG supports final unit redirection for error result codes 4xxx (Transient failures) and 5xxx (Permanent failure) at MSCC level. To enable final unit redirection on error result codes, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id>
   fui-redirect-on-failure-code
```

Note: Final unit redirection cannot be enabled individually per error result code.

6.12 Configure Quota Handling after Final Unit Actions

By default, the GGSN or PGW reinitiates a credit instance when the user accesses services previously restricted by a Final Unit Action (FUA).

To configure the GGSN or PGW to immediately send an initial quota request for a credit instance when the GGSN or PGW lifts the restrictions imposed by the FUA, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> quota-handling final-unit-action
    request-quota-on-action-stop
```

6.13 Configure Local Triggers for GGSN-Initiated and PGW-Initiated Quota Reauthorization

The OCS can specify which events trigger reauthorization of a credit instance. Alternatively, the GGSN and PGW can be configured with one or more local

triggers for credit instance reauthorization. To configure a local trigger, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quot
a-handling re-authorization-triggers
   rating-condition-change (cell-id | ecgi | lac | location | qos
| rac | rat-type | sgsn-address | sgsn-plmn-id | tac | time-zone)
```

By default, local triggers are only used in the absence of any triggers from the OCS. To configure the GGSN and PGW to use local triggers instead of any triggers from the OCS, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name> quot
a-handling re-authorization-triggers
   ignore-external
```

6.13.1 Configure Default Trigger Format

The GGSN and PGW supports two formats for the reporting of credit instance reauthorization triggers. By default, as `Trigger-Type` AVPs included in a `Trigger` AVP in the MSCC AVP, or optionally as `Trigger-Type` AVPs included in the MSCC AVP. The default trigger format is applied for default triggers in case the OCS has not indicated the format. To configure the default trigger format, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   default-trigger-format (trigger-type | trigger)
```

6.14 Configure Local Volume Quota Threshold

The OCS can specify a volume quota threshold in bytes at which the GGSN and the PGW triggers reauthorization of a credit instance. Alternatively, the GGSN and PGW can be configured with a local threshold in percentage, to be applied as the remainder of the granted volume quota. To configure a local volume quota threshold, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-n
ame> quota-handling
   volume-quota-threshold <value>
```

The value range is 5-25 percent.

6.15 Enable SI Level Usage Reporting

The GGSN and PGW support quota reservation and usage reporting on RG level. Optionally, usage reporting can be enabled in addition on SI level, for one or

more individual SIs. To enable usage reporting on SI level, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> ccr-avp
   service-id-level-reporting
```

To enable usage reporting for an SI or a consecutive range of SIs, include the following statement:

```
Ericsson(config)# epg pgw rule-space <rule-space-name
> quota-handling quota-reporting
   service-id-level-reporting (<si-id> | <si-id>-<si-id>)
```

For instructions on configuring SI mapping, refer to SACC Configuration.

7 Configure Redirection Parameters

Before redirection parameters can be configured, traffic redirection must be enabled in the GGSN and PGW. For information on how to enable redirection for a service, refer to Traffic Redirection Configuration.

To configure the GGSN and PGW to append the request Uniform Resource Identifier (URI) to the redirect URI, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> redirect
   append-uri
```

To configure the GGSN and PGW to suppress URI formatting, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <profile-id> redirect
   no-uri-formatting
```

8 Configure Alarms

To enable the generation of the Diameter Error Code Indicated by Result Code alarm for a result code or a consecutive range of result codes separated by -, include the following statement:

```
Ericsson(config)# epg pgw fault-management alarm service-based-charging erro
   error-codes (<result-code> | result-code>-<result-code>)
```

To disable the generation of the CCA Includes Invalid or Inconsistent AVPs alarm, include the following statement:

```
Ericsson(config)# epg pgw fault-management alarm service-based-charging
   no-invalid-cca
```

To disable the generation of the Invalid Service Context ID for a Credit Control Profile alarm, include the following statement:

```
Ericsson(config)# epg pgw fault-management alarm service-based-charging
   no-invalid-service-context-id-ccr
```

To disable the generation of the Rule Space Not Valid for a Specific APN alarm, include the following statement:

```
Ericsson(config)# epg pgw fault-management alarm service-based-charging
   no-invalid-rule-space-cca
```

To disable the generation of the Unrecognized Rating Group from OCS alarm, include the following statement:

```
Ericsson(config)# epg pgw fault-management alarm service-based-charging
   no-invalid-rating-group-ccr
```

To enable the generation of the Unrecognized Rating Group to OCS alarm, include the following statement:

```
Ericsson(config)# epg pgw fault-management alarm service-based-charging
   invalid-rating-group-ccr
```

For more information on Diameter result codes indicating error used in the `error-indication-cca` statement, refer to SoC with IETF RFC 6733.

9 Configuring Failure Handling for Credit Control Sessions

The following section describes how to configure failure handling for credit control sessions. For complete failure handling, do the following:

— Configure the required failure handling profiles and include failure actions and conditions.

— Configure the retention profiles that are referenced from the Gy failure handling profiles if failure action `retain` is configured.

— Associate the failure handling profiles with a credit control profile.

9.1 Configuring Failure Handling Profiles

A failure handling profile defines configurable failure handling options related to credit control. One or more failure handling profiles can be configured.

To configure a failure handling profile, include the following statement:

```
Ericsson(config)# epg pgw credit-control
   failure-handling-profile <failure-handling-profile-name>
```

9.1.1 Configure Gy Failure Handling

This section describes how to configure Gy failure handling including the conditions and actions related to Gy+ request session level failures. Example 1 shows an example of a failure handling profile.

Figure 1 shows the failure handling profile configuration structure.

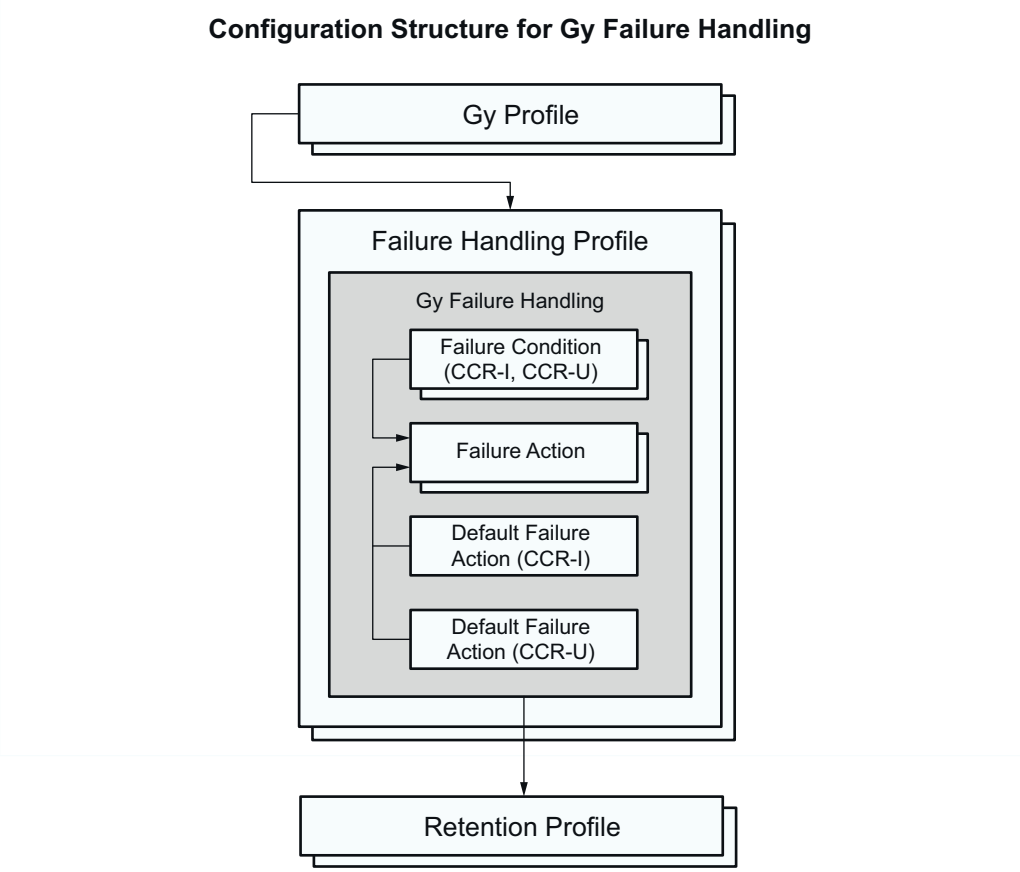

Figure 1 Configuration Structure for Failure Handling Profiles

To configure Gy failure handling, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling
```

Note: The standards RFC 4006 and 3GPP TS 32.299 recommend termination of the user session for the following result codes:

- DIAMETER_END_USER_SERVICE_DENICED (4010)
- DIAMETER_CREDIT_LIMIT_REACHED (4012)
- DIAMETER_AUTHORIZATION_REJECTED (5003)
- DIAMETER_USER_UNKNOWN (5030)

Note: The standards RFC 4006 and 3GPP TS 32.299 recommend continuation of the user session for the result code DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE (4011).

9.1.1.1 Configure Default Action for Request Level Failures

The default failure action for failed Gy+ requests is to terminate the user session. The default action can be changed by associating a user defined failure action

For information on how to configure failure actions, see Section 9.1.1.4 on page 29

9.1.1.1.1 Configure Default Failure Action for CCR-Initial Messages

To associate a failure action to use as the default `CCR-Initial` message failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling
   default-ccr-initial-failure-action <failure-action-name>
```

9.1.1.1.2 Configure Default Failure Action for CCR-Update Messages

To associate a failure action to use as the default `CCR-Update` message failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling
   default-ccr-update-failure-action <failure-action-name>
```

9.1.1.2 Configure Server Restart Action

Before the next CCR is sent, the default server restart failure action is to subsequently reestablish the credit control session. The default action can be changed by associating a user defined failure action.

To associate a failure action to use as the server restart failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling
   server-restart-action <failure-action-name>
```

9.1.1.3 Configure a Failure Condition

A failure condition specifies the request failures that trigger an associated failure-action during a credit control session failure. To configure a request failure condition, perform the following steps:

— Configure the failure condition name.

— Configure the failure condition priority.

— Configure an association to a failure action.

— Configure the failure condition message type and one or more message failure types.

  - Configure timeout as a possible message failure type.
  - Configure connection failure as a possible message failure type.
  - Configure Diameter result codes as a possible message failure type.

9.1.1.3.1 Configure Name

To configure the name of a failure condition, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling
   request-failure-condition <request-failure-condition-name>
```

9.1.1.3.2 Configure Priority

The failure condition priority specifies the importance of a failure condition in relation to other failure conditions. To configure the priority of a request failure condition, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling request-f
ailure-condition <request-failure-condition-name>
   priority <value>
```

The value range of priority is 1-128.

Note: A lower value means higher priority

9.1.1.3.3 Configure Failure Action Association

The failure action association specifies what action to take when a failure condition is matched.

For information on how to configure a failure action, refer to Section 9.1.1.4 on page 29.

To associate a failure action with a failure condition, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling request-f
ailure-condition <request-failure-condition-name>
   failure-action <failure-action-name>
```

9.1.1.3.4 Configure Message Type

The message type specifies the Gy message for which the configured failure types are matched against. To configure the message type, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling request-f
ailure-condition <request-failure-condition-name>
   message-type (<ccr-initial> | <ccr-update>)
```

9.1.1.3.5 Configure Message Failure Type Timeout

Message timeout occurs if a response to a request is not received within the configured request timeout for a DAS, or when the GGSN or PGW fails to send the message because it timed out according to the internal traffic shaper. To configure message timeout as a failure condition, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling request-fa
ilure-condition <request-failure-condition-name> message-type
( <ccr-initial> | <ccr-update> )
   timeout
```

9.1.1.3.6 Configure Message Failure Type Connection Failure

Connection failure occurs if a message cannot be sent because a route cannot be found. For example, if all peers in a DAS are unavailable. To configure message connection failure as a failure condition, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling request-fa
ilure-condition <request-failure-condition-name> message-type
( <ccr-initial> | <ccr-update> )
   connection-failure
```

9.1.1.3.7 Configure Message Failure Type Result Codes

Diameter result codes indicate success or failure of Diameter messages. To configure which result codes are failure conditions include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling request-fa
ilure-condition <request-failure-condition-name> message-type
(<ccr-initial> | <ccr-update>)
   result-code (<result-code> | <result-code>-<result-code>)
```

Result codes can be configured as single result codes, or by configuring a range of result codes.

Note: The following result codes are ignored if configured:

- (2001) DIAMETER_SUCCESS
- (2002) DIAMETER_LIMITED_SUCCESS

9.1.1.4 Configure a Failure Action

A failure action defines the treatment of a user session for a specific type of failure. To configure a failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling
   failure-action <failure-action-name>
```

9.1.1.4.1 Configure Continue Failure Action

Configuration of the Continue failure action allows the possibility to continue the user session with or without credit control for a limited or unlimited duration. Continue can be configured with a number of optional properties which control the continue behavior.

Configure Continue

Continue the user session without credit control and without time restriction.

To configure the Continue failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-
profile <failure-handling-profile-name> gy-failure-handling
failure-action <failure-action-name>
   continue
```

Configure Termination of the Credit Control Session

To configure the termination of the credit control session related to the user session, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling failure-action
<failure-action-name> continue
   send-ccr-termination
```

Configure Continue Time

Limit the time that the user session can continue without credit control.

To configure the continuation time for the Continue failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling failure-action
<failure-action-name> continue
    continue-time <value>
```

Configure Reestablish

Reestablish the credit control session for user sessions continuing without credit control.

To configure the Reestablish failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling failure-action
<failure-action-name> continue
   reestablish
```

Note: continueTime must be configured when reestablish is configured

Configure Retain

Retain the credit control and continue the user session with locally configured credit control properties and attempt to restore the credit control session.

To configure the Retain failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile failure-handl
   retain
```

Retain attributes are configured in retention profiles. To configure an association to a credit control retention profile from a Gy failure handling profile, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-
profile <failure-handling-profile-name> gy-failure-handling
retention-profile <retention-profile-name>
```

For information on how to configure a retention profile, refer to Section 9.2 on page 33

9.1.1.4.2 Configure Terminate Failure Action

The Terminate failure action leads to the GGSN or PGW rejecting or deleting user sessions.

Configure Terminate

To configure the Terminate failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-
profile <failure-handling-profile-name> gy-failure-handling
failure-action <failure-action-name>
   terminate
```

Configure Termination of the Related Credit Control Session

To configure the GGSN or PGW to terminate the credit control session related to the user session when a failure action is applied, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling failure-action
<failure-action-name> terminate
```

```
   send-ccr-termination
```

Configure Termination with GTP Cause Code Reactivation Requested

To configure the GGSN or PGW to terminate the user session with the cause code `Reactivation Requested` included in the user session deletion request message, include the following command:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling failure-action
<failure-action-name> terminate
   send-reactivation-requested
```

Configure GTPv1 Cause Code for User Session Termination

To configure the GTPv1 cause code to be included when rejecting the user session creation procedure, include the following statement:

```
Ericsson(config)# epg pgw  credit-control  failure-handling-
profile <failure-handling-profile-name> gy-failure-handling
failure-action <failure-action-name> terminate
   gtpv1-cause <gtpv1cause-code-number>
```

Configure GTPv2 Cause Code for User Session Termination

To configure the GTPv2 cause code to be included when rejecting the user session creation procedure, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling failure-action
<failure-action-name> terminate
   gtpv2-cause <gtpv2cause-code-number>
```

Configure Inclusion of CDR Change Condition for Retry and Terminate

To configure inclusion of the change condition cause related to a retry and terminate failure action in the offline Charging Data Record traffic volume and service data containers, include the following command:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling failure-action
<failure-action-name> terminate
   report-retry-in-condition-change
```

The change condition causes referenced are ‘Failure Handling Retry And Terminate Ongoing’ in the traffic volume containers and ‘Retry And Terminate Ongoing Session’ in the service data containers.

Note: This CLI should only be issued when message retry is also configured in the diameter application system configuration for the given failure condition. Refer to Diameter Configuration for information on how to configure message retry.

9.1.1.4.3 Configure Success Failure Action

The Success failure action adds the possibility to ignore unsuccessful diameter result codes and treat them as success

To configure the Success failure action, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-
profile <failure-handling-profile-name> gy-failure-handling
failure-action <failure-action-name>
   success
```

9.1.1.5 Configure Fallback To File For Failed CCR-Termination messages

The credit control file directory depends on the setting for separate charging file directories based on EPG role. For more information, refer to Offline Charging Configuration.

To configure the option to fall back to file for failed `CCR-Termination` messages, include the following statement:

```
Ericsson(config)# epg pgw credit-control failure-handling-profile
<failure-handling-profile-name> gy-failure-handling
fallback-to-file <ccr-termination>
```

9.1.1.6 Example of a Gy Credit Control Failure Handling Profile

Example 1 shows a failure handling profile. The example configuration results in the following behavior:

- `CCR-Initial` and `CCR-Update` message failure: `4011` leads to continuation of the user session without credit control.
- `CCR-Initial` and `CCR-Update` message failure: `4010`, `4012`, `5003` & `5030` leads to termination of the user session.
- Other `CCR-Initial` message failures configured to use the user defined default failure action lead to sending of the `CCR-Termination` message and user session rejection using GTP v1 cause code System Failure (`204`).
- Other `CCR-Update` message failures use hardcoded default failure action to terminate the user session without sending of `CCR-Termination` message.

```
epg pgw credit-control failure-handling-profile failureHandlingProfile1
gy-failure-handling default-ccr-initial-failure-action failureAction3
gy-failure-handling request-failure-condition requestFailureCondition1
  priority       1
  failure-action failureAction1
  message-type ccr-initial
   result-code [ 4011 ]
  !
  message-type ccr-update
   result-code [ 4011 ]
  !
!
gy-failure-handling request-failure-condition requestFailureCondition2
  priority       2
  failure-action failureAction2
  message-type ccr-initial
   result-code [ 4010, 4012, 5003, 5030 ]
  !
  message-type ccr-update
   result-code [ 4010, 4012, 5003, 5030 ]
  !
!
gy-failure-handling failure-action failureAction1
  continue
!
gy-failure-handling failure-action failureAction2
  terminate
  !
gy-failure-handling failure-action failureAction3
  terminate send-ccr-termination
  terminate gtpv1-cause 204
!
!
```

Example 1 A Failure Handling Profile

9.2 Configuration Retention Profile and Attributes

Configure Retention Profile

To configure a credit control retention profile that can be referenced from a Gy failure handling profile if continue retain is configured, include the following statement:

```
Ericsson(config)# epg pgw credit-control retention-pro
file <retention-profile-name>
```

Configure Maximum Number of Credit Control Restoration Attempts

To configure the mandatory maximum number of credit control restoration attempts within a retention profile, include the following statement:

```
Ericsson(config)# epg pgw credit-control retention-profile
<retention-profile-name> max-number-of-restoration-attempts
<max-number-of-restoration-attempts-value>
```

Configure Volume Quota

To configure the mandatory volume quota within a retention profile, include the following statement:

```
Ericsson(config)# epg pgw credit-control retention-profile
<retention-profile-name> quota-handling
   volume-quota <volume-quota-value>
```

The volume quota is configured in bytes and the supported range is `10000`-`1000000000` bytes.

Configure Validity Time

To configure the mandatory validity time within a retention profile, include the following statement:

```
Ericsson(config)# epg pgw credit-control retention-profile
<retention-profile-name> quota-handling
   validity-time <validity-time-value>
```

The validity time is configured in seconds and the supported range is 1-`86400` seconds.

Configure Volume Threshold Limit

To configure the volume threshold limit, include the following statement:

```
Ericsson(config)# epg pgw credit-control retention-profile
<retention-profile-name> quota-handling
   volume-threshold <volume-threshold-value>
```

The volume threshold limit is configured in bytes and the supported range is 1-`999990000` bytes. The difference between `volume-quota` and `volume-threshold` must be at least `10000` bytes.

Configure Volume Quota Limit and Volume Threshold Limit Last Granted By The OCS

To configure to use the volume quota limit and volume threshold limit that was last granted by the OCS instead of the locally configured values, include the following statement:

```
Ericsson(config)# epg pgw credit-control retention-profile
<retention-profile-name> quota-handling
   use-last-granted
```

Configure Send Message Update After Initial Failure

To configure to send `CCR-Update` at restoration of a credit control session that has entered retain state due to a CCR-Initial failure, include the following statement within a retention profile:

```
Ericsson(config)# epg pgw credit-control retention-profile
<retention-profile-name> update-after-initial-failure
```

Configure Increment Credit Control Request Number

To configure to increment the credit control request number in a `CCR-Update` message that is sent to restore a credit control session that has entered retention state after a `CCR-Update` request failure, include the following statement:

```
Ericsson(config)# epg pgw credit-control retention-profile
<retention-profile-name> increment-cc-request-number
```

9.3 Associating a Failure Handling Profile with a Credit Control Profile

To associate a failure handling profile to use with a credit control profile, include the following statement:

```
Ericsson(config)# epg pgw apn <apn-name> service-based-charging
credit-control ro-profile <gy-profile-id>
   failure-handling-profile <failure-handling-profile-name>
```

To configure a failure handling profile, see Section Configuring Failure Handling Profiles.