

Gy+ Credit Control Request File Format

PRINTOUT DESCRIPTION

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1 Introduction

This document describes the file naming scheme, structure, and content of the credit control request file format generated by the PGW when the gy+ failure handling profile states that the PGW must fall back to a file if CCR-Termination fail.

For more information about gy failure handling and fallback to file functionality, refer to [Credit Control](#).





2 Overview

The PGW uses the specified file format to write failed CCR-Termination messages on the gy interface to file. CCR-Termination messages include usage report information.

The files can be pulled using Secure File Transfer Protocol (SFTP) from a specified directory on the EPG.





3 Credit Control Request Format

Credit Control Request Format files consist of a variable length File Header followed by one or more CCR records.

3.1 Naming and Storing Conventions of CCR Files

The file naming and file storing conventions ensure that CCR file names are unique among a large number of PGW nodes over an extended period of time, and that stored CCR files can be retrieved without the need for manual assistance.

The file name includes the following information:

nodeID_-_RC.date_-_time

Table 1 describes the fields that make up the file name.

Table 1 Fields Included in the Gy Credit Control Request File Name

nodeID	Includes the name of the configured PGW node name.
RC	A running count starting with -1. This count is assigned by a process in the PGW at file closure.
date	Includes the date when the file was closed in ASCII. The contents of the field are in the format yyyymmdd , where: <ul style="list-style-type: none"> • yyyy is the year the file was closed in four digit notation. • mm is the month the file was closed in two digit notation (01...12). • dd is the day the file was closed in two digit notation (01...31).
time	Includes the time when the file was closed in ASCII. The contents of the field are in the format hhmmtimezone <ul style="list-style-type: none"> • hh is the hour of local time the file was closed in two digit notation, based on a 24 hour clock (00...23). • mm is the minute of local time the file was closed in two digit notation (00...59). • timezone indicates the local time deviation from UTC (-1200 to +1200). Both -0000 and +0000 indicate no deviation from UTC.

The following example shows the file name of sequence number **10** for the EPG named **epg112-4-pgw** would generate on the **25th of October 2016** at **14:45** in Stockholm.

epg112-4-pgw_-_10.20161025_-_1445+0100

Example 1 File Naming



By default the EPG stores files in the following directory:

— `/var/opt/services/epg/gyccr`

Alternatively, if separate charging file directories based on EPG role is configured, the EPG stores files in the following directory:

— `/var/opt/services/epg/pgw_gyccr`

Note: The correct service-role must be assigned to the user to access the directories. For more information on service roles, refer to *Commands: S* (sa-filter to sham link).

3.2 CCR File Format

The CCR file format is shown in Figure 1.

File Header
CCR 1
CCR 2
...
CCR N

Figure 1 CCR File Format

3.3 CCR File Header

The CCR file header contains information about the CCR records in the file. As the contents of the CCR File Header are based on the CCR records in the file, the CCR file header is populated when the CCR file is ready to be closed.

Figure 2 shows the contents of the CCR file header.



Bits								
Octets	8	7	6	5	4	3	2	1
1..4	File length							
5..8	Header length							
9	High Release Identifier			High Version Identifier				
10	Low Release Identifier			Low Version Identifier				
11..14	File opening timestamp							
15..18	Timestamp when last CCR was appended to file							
19..22	Number of CCRs in file							
23..26	File sequence number							
27	File Closure Trigger Reason							
28..47	IP Address of Node that generated file							
48	Lost CCR indicator							
49..50	Length of CCR routing filter							
51..xy	CCR Routing Filter							
xy+1..xy+2	Length of Private Extension							
xy+3..n	Private Extension							

Figure 2 CCR File Header

The following sections describe the individual fields that compose the CCR File Header.

3.3.1 File Length

The File Length field, made up of four octets, indicates the total length of the CCR file in octets, including the file header.

3.3.2 Header Length

The Header Length field, made up of four octets, indicates the total length of the CCR File Header in octets.

3.3.3 High Release Identifier / High Version Identifier

The High Release Identifier field contains the highest release of CCR records in the CCR file. The High Version Identifier field contains the highest version of the highest release of CCR records in the CCR file.

The High Release identifier value is hard-coded to 2 and the High Version identifier is hard-coded to 7 in these fields.

3.3.4 Low Release Identifier / Low Version Identifier

The Low Release Identifier field contains the lowest release of CCR records in the CCR file. The Low Version Identifier field contains the lowest version of the lowest release of CCR records in the CCR file.



The Low Release identifier value is hard-coded to 2 and the Low Version identifier is hard-coded to 7 in these fields.

3.3.5 File Opening Timestamp

The File Opening Timestamp field, made up four octets, contains the time in Coordinated Universal Time (UTC) format when the CCR file was opened. The time values are spread out over four octets according to the following format:

- Binary bits 1–4 indicate the month (1...12) according to the local time zone of the EPG.
- Binary bits 5–9 indicate the date (1...31) according to the local time zone of the EPG.
- Binary bits 10–14 indicate the hour (0...23) according to the local time zone of the EPG.
- Binary bits 15–20 indicate the minute (0...59) according to the local time zone of the EPG.
- Binary bit 21 indicates the sign of the deviation of the local time of the EPG from UTC. A bit value of 1 expresses + time deviation, while a bit value of 0 expresses - time deviation. In case, there is no time deviation from UTC, the binary bit can take either value.
- Binary bits 22–26 indicate the hour (0...23) deviation of the local time of the EPG from UTC.
- Binary bits 27–32 indicate the minute (0...59) deviation of the local time of the EPG from UTC.

3.3.6 Last CCR Append Timestamp

The Last CCR Append Timestamp field, made up of four octets, contains the time the last CCR was appended to the file in UTC format. The format is the same as the File Opening Timestamp octets.

3.3.7 Number of CCRs in File

The Number of CCRs in File field, made up of four octets, contains the total number of CCR records that are included in the file.

3.3.8 File Sequence Number

The File Sequence Number field, made up of four octets, contains a unique number created by the Diameter peer system generating the CCR files. The number is allocated sequentially to each CCR file. The running count of the File Sequence Number field starts from 0.



The sequence number is reset to 0 when the running number reaches the maximum value.

3.3.9 File Closure Trigger Reason

The File Closure Trigger Reason field, made up of one octet, contains a value that identifies the reason for CCR file closure.

The EPG uses the value 0, meaning an undefined normal closure reason.

3.3.10 IP Address of the Node

The IP Address of the Node field contains the IPv4 and IPv6 addresses of the PGW control plane instance that generates the file.

3.3.11 Lost CCR Indicator

The Lost CCR Indicator field, made up of one octet, indicates the number of CCRs that were lost during processing in the EPG. In the EPG, the value is always set to 00000000, which indicates that no CCR is lost.

3.3.12 Length of CCR Routing Filter

The Length of CCR Routing Filter field, made up of two octets, contains a value that specifies the length of the following CCR Routing Filter field.

The EPG uses the value 1.

3.3.13 CCR Routing Filter

The CCR Routing Filter field is set to blank in ASCII format.

3.3.14 Length of Private Extension / Private Extension

The Length of Private Extension and Private Extension fields are not applicable for the CCR files.

3.4 CCR Header

Figure 3 shows the format of a CCR message.



CCR Header
Diameter Header
AVP 1
AVP 2
....
AVP N

Figure 3 CCR Format

Figure 4 shows the contents of the CCR header.

Bits								
Octets	8	7	6	5	4	3	2	1
1..2	Record length							
3	Release Identifier			Version Identifier				
4	Data Record Format			TS number				

Figure 4 CCR Header

The following sections describe the individual fields that make up the CCR header.

3.4.1 Record Length

The Record Length, made up of two octets, specifies the length of the following CCR, excluding the four header octets. If the record size is larger than 65,534 bytes, the record length is set to 65535 (0xFFFF).

3.4.2 Release Identifier / Version Identifier

The Release Identifier field contains the release of the following CCR. The Version Identifier field contains the version of the following CCR.

The value of Release Identifier is hard-coded to 2 in the EPG.

The value of Version Identifier is hard-coded to 7 in the EPG.

3.4.3 Data Record Format / TS Number

The Data Record Format field contains a value that identifies the CCR encoding used in the following CCR. The TS Number field contains a value that identifies the 3GPP TS the encoding is based on.

The value of Data Record Format is hard-coded to 6 in the EPG.

The value of TS Number is hard-coded to 4 in the EPG.