**GTPP Overview and CDR Configuration in ASR5x00**

**Introduction**

This document describes about the overview of GTPP accounting and explains about the different modes of GTPP group configuration for storage and transfer of Charging Data Records (CDR).

**Prerequisites**

**Requirements**

Cisco recommends that you have knowledge of these topics before you attempt the configuration that is described in this document

* GTPP Accounting Overview
* HDD Storage
* 3GPP TS 32.295

**Components Used**

The information in this document is based on these software and hardware versions:

* Cisco 5000 and 5500 Series Aggregated Services Routers (ASRs) Versions 14.0 and later
* HDD storage feature (licensed) is enabled in the ASR for local storage.

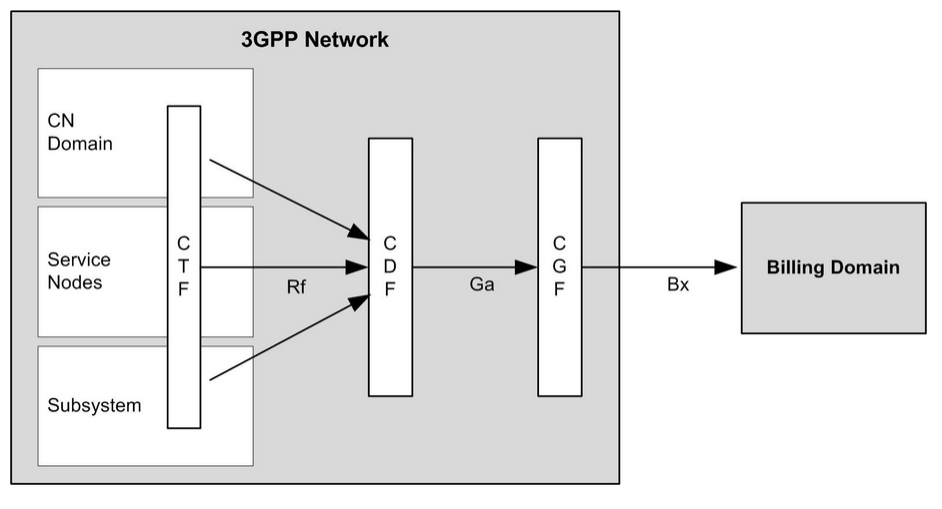
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

**Explanation about GTPP Accounting**

The Ga is the reference point from Charging Data Function (CDF) to the CGF, which is intended for the transport of CDRs. The CDF could either be GGSN, P-GW, S-GW, or any other similar products.

By definition, dealing with CDRs only implies that Ga is solely related to offline charging.

**Diagram**



As illustrated in the above figure, the CDF (Charging Data Function) in each network domain, service or subsystem is relevant for the network side of the Ga reference point. Different mappings of the ubiquitous offline charging functions, CDF and CGF (Charging Gateway Function), onto physical implementations are possible.

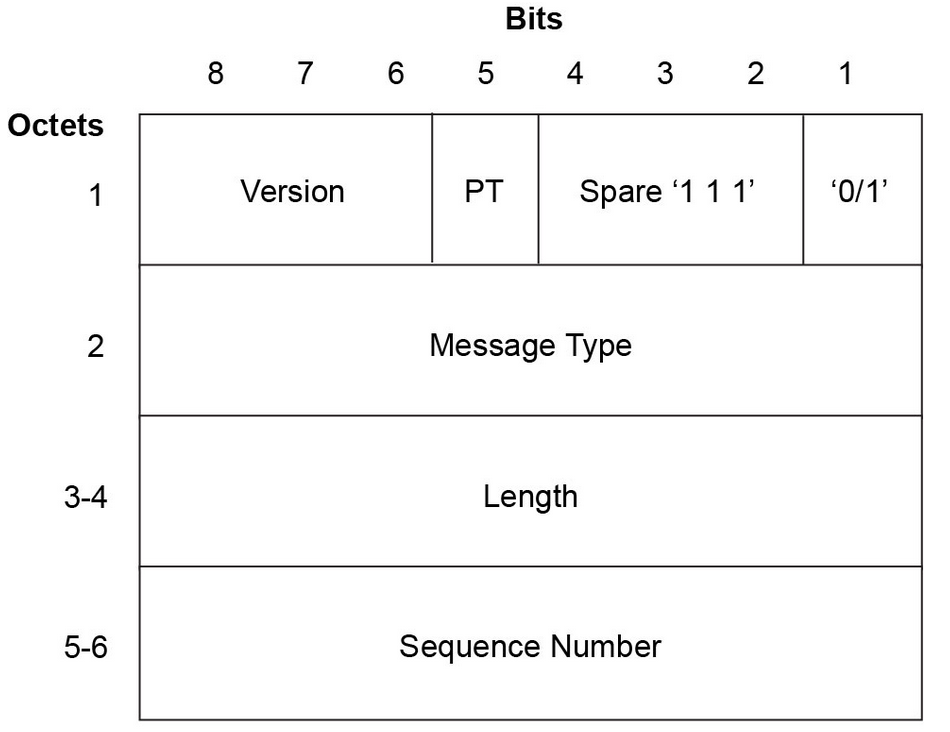
The transport protocol associated to the Ga reference point, providing functions for transfer of CDRs from CDF to CGF, is GTPP.

Each CDF will have an O&M configurable address list of CGFs (Charging Gateways) to which it can send its CDRs. The list will be organized in CGF address priority order. If the primary CGF is not available (for example, out of service), then the CDF will send the CDRs to the secondary CGF and so on.

Each CDR generating function will only send the records to the CGF(s) of the same PLMN, not to CGF(s) located in other PLMNs.

Each CGF in the PLMN will know the other CGFs' network addresses (for example, for redundancy reasons, to be able to recommend another CGF address). This is achieved by O&M configuration facilities that will enable each CGF to have a configurable list of peer CGF addresses.

**GTPP Header**



Bit 5 of octet 1 of the GTPP header is the Protocol Type (PT) flag: it is '0' if the message is GTPP.

The Version bits indicate the GTPP protocol version when the Protocol Type flag is '0'.

Bit 1 of octet 1 is not used in GTPP (except in v0), and it is marked '0' in the GTPP header. It is in use in GTPP v0 and distinguishes the used header-length. In the case of GTPP v0, this bit being marked one (1) indicates the usage of the 6 octets header. If the bit is set to '0' (usually the case) the 20-octet header is used. For all other versions of GTPP, this bit is not used and is set to '0'. However, this does not suggest the use of the 20-octet header, rather a shorter 6-octet header.

The Length indicates the length of payload (number of octets after the GTPP header). The Sequence Number of the packet is part of the GTPP header.

**Charging Data Records (CDR)**

A Charging Data Record is a formatted collection of information about a chargeable event. The CDRs generated by GGSN/SGSN are sent to an external node for storage. CDRs are written to files in formats supported by the external node and stored on the HDD. From the HDD, CDR files can be pushed/pulled using FTP/SFTP protocols.

**Directory Structure:** In releases prior to 16.0, by default, the CDRs are placed in the following directory paths for local mode:

* RAM-disk: */records/cdr/<gtpp\_group\_name><vpn\_id>/*
* HDD: */hd-raid/data/records/cdr/<gtpp\_group\_name><vpn\_id>/*

In releases prior to 16.0, the CDRs are defaulted to be stored in the following directory paths for GTPP Streaming mode:

* RAM-disk: */records/cdr/hdd\_sec\_stor\_<gtpp-group-name><vpn-id>/*
* HDD: */hd-raid/data/records/cdr/hdd\_sec\_stor\_<gtpp-group-name><vpn-id>/*

In 16.0 and later releases, by default, the CDRs are placed in the following directory paths for local mode:

* RAM-disk: */records/cdr/<gtpp-group-name><context-name>/*
* HDD: */hd-raid/data/records/cdr/<gtpp-group-name><context-name>/*

In 16.0 and later releases, the CDRs are defaulted to be stored in the following directory paths for GTPP Streaming mode:

* RAM-disk: */records/cdr/hdd\_sec\_stor\_<gtpp-group-name><context-name>/*
* HDD: */hd-raid/data/records/cdr/hdd\_sec\_stor\_<gtpp-group-name><context-name>/*

**File Formats:** The GSS file formats, Custom1 to Custom8 are supported.

**Supported Products:** GGSN, SGSN, P-GW, S-GW

**CDR configuration**

ASR 5x00 can be configured to stream the CDRs directly to the CGF or store the CDRs in the HDD (only if HDD feature is enabled).

This can be achieved by configuring different GTPP groups, wherein a ‘default’ GTPP group configuration will explain what to be done in the event of the failure of CGF.

Below is the configuration syntax:

**configure > context** *context\_name* **> gtpp group** *group\_name*

**gtpp charging-agent address** *ip\_address* **[ port** *port* **]**

**[ default | no ] gtpp source-port-validation**

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| **default**  Restores this parameter to its default setting of enabled.  **no**  Validates the IP source address but not the UDP source port. |

**gtpp max-cdrs** *max\_cdrs* **[ wait-time** *wait\_time* **]**

**default gtpp max-cdrs**

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| **default**  Sets the default configuration.  *max\_cdrs*  Specifies the maximum number of CDRs to insert in a single packet as an integer from 1 through 255.  Default: 1  **wait-time***wait\_time*  Specifies the number of seconds the GSN waits to send the packet while accumulating CDRs as defined by  **max-cdrs**. If the **wait-time** interval expires before **max-cdrs** is reached, this keyword over-rides and the  packet is sent. Default: Disabled  *wait\_time* is an integer from 1 through 300. |

**gtpp attribute {** apn-ambr | apn-ni | apn-selection-mode | charging-characteristicselection-mode | camel-info | cell-plmn-id | diagnostics | duration-ms | dynamic-flag |furnish-charging-information | imei | local-record-sequence-number | losdv | ms-timezone | msisdn | node-id | node-id-suffix *STRING* | pdn-connection-id | pdp-address | pdp-type | pgw-plmn-id | plmn-id | rat | recordextension | record-extensions rat | served-mnai | served-pdp-pdn-address-extension | sgsn-change | sms { destination-number | recordingentity | service-centre } | start-time | stop-time | uli | user-csg-information **} +**

**default gtpp attribute {** apn-ambr | apn-ni | apn-selection-mode | chargingcharacteristic-selection-mode | cell-plmn-id | diagnostics | duration-ms | dynamic-flag | furnish-charging-information | imei | local-record-sequence-number | losdv | ms-timezone | msisdn | node-id | pdn-connection-id | pdp-address | pdp-type | pgw-plmn-id | plmn-id | rat | recordextension | record-extensions rat | served-mnai | served-pdp-pdn-addressextension | sgsn-change | sms { destination-number | recording-entity | service-centre | start-time | stop-time | uli | user-csg-information **}**

**no gtpp attribute {** apn-ambr | apn-ni | apn-selection-mode | charging-characteristicselection-mode | cell-plmn-id | diagnostics | duration-ms | dynamic-flag | furnishcharging-information | imei | local-record-sequence-number | losdv | ms-timezone | msisdn | node-id | node-id-suffix | pdn-connection-id | pdp-address | pdp-type | pgw-plmn-id | plmn-id | rat | recordextension | record-extensions rat | served-mnai | served-pdp-pdn-addressextension | sgsn-change | sms { destination-number | recording-entity | service-centre | start-time | stop-time | uli | user-csg-information **}**

**gtpp dictionary {** custom1 | custom10 | custom11 | custom12 | custom13 | custom14 |

custom15 | custom16 | custom17 | custom18 | custom19 | custom2 | custom20 | custom21 |

custom22 | custom23 | custom24 | custom25 | custom26 | custom27 | custom28 | custom29 | custom3 | custom30 | custom31 | custom32 | custom33 | custom34 | custom35 | custom36 | custom37 | custom38 | custom39 | custom4 | custom40 | custom41 | custom42 | custom43 | custom44 | custom45 | custom46 | custom47 | custom48 | custom49 | custom5 | custom50 | custom51 | custom52 | custom53 | custom54 | custom55 | custom56 | custom57 | custom58 | custom59 | custom6 | custom60 | custom7 | custom8 | custom9 | standard **}**

**gtpp trigger {** apn-ambr-change | cell-update | dcca | direct-tunnel | egcdr max-losdv | ggsn-preservation-mode-change | inter-plmn-sgsn-change | ms-timezone-change | plmn-idchange | qos-change | rat-change [ generate { cdr | container } ] | routing-area-update | service-idle-out | serving-node-change-limit | sgsn-change-limit | tariff-time-change | time-limit | uli-change | volume-limit **}**

**default gtpp trigger**

**no gtpp trigger {** apn-ambr-change | cell-update | dcca | direct-tunnel | egcdr max-losdv | ggsn-preservation-mode-change | inter-plmn-sgsn-change | ms-timezone-change | plmn-idchange | qos-change | rat-change | routing-area-update | service-idle-out | serving-nodechange-limit | sgsn-change-limit | tariff-time-change | time-limit | uli-change | volumelimit**}**

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| **`**  **default**  Sets the specified trigger condition back to the default setting. All trigger conditions are enabled by default.  **no**  Disables the specified trigger condition. |

**gtpp server** *ip\_address* **[ max *msgs* ] [ priority *priority* ] [ udp-port *port* ] [ node-alive**

**{ enable | disable } ]**

**no gtpp server** *ip\_address* **[ udp-port** *port* **]**

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| **no**  Deletes a previously configured CGF.  *ip\_address*  Specifies the IP address of the CGF in IPv4 dotted-decimal or IPv6 colon-separated-hexadecimal notation.  **max** *msgs*  Specifies the maximum number of outstanding or unacknowledged GTPP packets (from any one AAA  Manager task) allowed for this CGF before the system begins buffering the packets.  *msgs* can be configured to an integer from 1 to 256. Default: 256  **priority***priority*  Default:1000 |

**gtpp storage-server mode { local | remote | streaming }**

**default gtpp storage-server mode**

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| **default**  Returns the GTPP group configuration to the default “remote” value for the GTPP storage server mode.  **local**  Specifies the use of the hard disk for storing CDRs. Default: Disabled    **remote**  Specifies the use of an external server for storing CDRs. This is the default value.    **streaming**  Default: Disabled  This keyword allows the operator to configure “streaming” mode of operation for GTPP group. When this  keyword is supplied the CDRs will be stored in following fashion:  When GTPP link is active with CGF, CDRs are sent to a CGF via GTPP and local hard disk is NOT  used as long as every record is acknowledged in time.  If the GTPP connection is considered to be down, all streaming CDRs will be saved temporarily on the  local hard disk and once the connection is restored, unacknowledged records will be retrieved from  the hard disk and sent to the CGF. |

Here is an example of the GTPP configuration

gtpp group ABCD\_group

gtpp charging-agent address XX.XX.XX.XX

no gtpp source-port-validation

gtpp max-cdrs 200 wait-time 60

gtpp attribute diagnostics

gtpp attribute local-record-sequence-number

gtpp attribute node-id-suffix SGSNX

no gtpp attribute node-id

gtpp dictionary custom33

no gtpp trigger qos-change

gtpp server YY.YY.YY.YY priority 1 max 100

gtpp server ZZ.ZZ.ZZ.ZZ priority 2 max 100

gtpp storage-server mode streaming

