Ruckus Wireless™ SmartCell Gateway™ 200

KPI and Report Reference Guide for SmartZone 3.4.1

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About This Guide

This *SmartCell Gateway™ (SCG) 200 KPI and Report Reference Guide* provides a number of statistics, graphs, and reports that you can use to establish key performance indicators (KPIs) for the network.

This guide is written for service operators and system administrators who are responsible for managing, configuring, and troubleshooting Ruckus Wireless devices. Consequently, it assumes a basic working knowledge of local area networks, wireless networking, and wireless devices.

NOTE: This guide assumes that the SmartCell Gateway has already been installed as described in the *Getting Started Guide*.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or HTML on the Ruckus Wireless Support web site at https://support.ruckuswireless.com/contact-us.

Document Conventions

Table 1 and Table 2 list the text and notice conventions that are used throughout this guide.

Table 1. Text conventions

Convention	Description	Example
`monospace`	Represents information as it appears on screen	`[Device name]>`
`monospace bold`	Represents information that you enter	`[Device name]>` **`set ipaddr 10.0.0.12`**
default font bold	Keyboard keys, software buttons, and field names	On the **Start** menu, click **All Programs**.
italics	Screen or page names	Click **Advanced Settings**. The *Advanced Settings* page appears.

Table 2. Notice conventions

Notice Type	Description
NOTE	Information that describes important features or instructions
CAUTION!	Information that alerts you to potential loss of data or potential damage to an application, system, or device
WARNING!	Information that alerts you to potential personal injury

Terminology

Table 3 lists the terms used in this guide.

Table 3. Terms used in this guide

Term	Description
AAA	Authentication, Authorization, and Accounting
AAR	AA Request
AP	Access Point
APN	Access Point Name
ASA	Abort Session Answer
ASR	Abort Session Request

Table 3. Terms used in this guide

Term	Description
BRA	Binding Revocation Acknowledgment
BRI	Binding Revocation Indicator
CEA	Capability-Exchange Answer
CER	Capacity Exchange Request
CGF	Charging Gateway Function
COA	Change of Authorization
DEA	Diameter EAP Answer
DER	Diameter EAP Request
DHCP	Dynamic Host Configuration Protocol
DM	Dynamic Multipoint
DP	Data Plane
DPA	Disconnect Peer Answer
DPR	Disconnect Peer Request
DRT	Data Record Transfer
GGSN	Gateway GPRS Support Node
GRE	Generic Route Encapsulation
GSN	GPRS Support Node
GTP-C	GPRS Tunneling Protocol – Control Plane
HLR	Home Location Register
KPI	Key Performance Indicators
LMA	Local Mobility Anchor
NAS	Network Access Server
PBA	Proxy Binding Acknowledgment
PBU	Proxy Binding Update
PDG	Packet Data Gateway
PDP	Packet Data Protocol
PGW	Packet Data Network Gateway
PMIP	Proxy Mobile IPv6
RADIUS	Remote Authentication Dial-In User Service
RAR	Re-Auth Request

Table 3. Terms used in this guide

Term	Description
SCG	Smart Cell Gateway
SCG-CBlade	SCG Controller Blade
SCG-DBlade	SCG Data Blade
SG	Service Gateway
SNMP	Simple Management Network Protocol
SSID	Service Set Identifiers
STA	Session Termination Answer
STR	Session Termination Request
TCP	Transmission Control Protocol
TTG	Tunnel Termination Gateway
UE	User Equipment
UE-IP	User Equipment - IP Address
UE-MAC	User Equipment - MAC Address
VLAN	Virtual LAN
WLAN	Wireless LAN

Related Documentation

For a complete list of documents that accompany this release, refer to the Release Notes.

Online Training Resources

To access a variety of online Ruckus Wireless training modules, including free introductory courses to wireless networking essentials, site surveys, and Ruckus Wireless products, visit the Ruckus Wireless Training Portal at: https://training.ruckuswireless.com

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- Document title
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- Page number (if appropriate)

For example:

- SCG 200 KPI and Report Reference Guide for SmartZone 3.4.1
- Part number: 800-71360-001
- Page 88

SCG Key Performance Indicators

1

In this chapter:

- Overview
- KPIs under the Monitoring Tab
- KPIs under the Administration Tab

Overview

The SCG-200 provides a number of statistics, graphs, and reports that you can use to establish Key Performance Indicators (KPIs) for the network. You can use these KPIs to determine, among others, the quality of wireless service that users are getting, the overall health of the SCG system, and any issues that may impact the SCG managed devices and, consequently, the network.

NOTE: Refer to About This Guide chapter for terminologies used in this guide.

KPIs under the Monitoring Tab

The following sections describe the various key performance indicators that the SCG provides in the **Monitor** section.

1 Access Point Zone
2 Access Point
3 Client KPIs
4 SCG System KPIs

NOTE: For information on *Rogue Access Points Alarms* and *Events* refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Access Point Zone

An AP zone functions as a way of grouping Ruckus Wireless APs and applying a particular set of settings (including WLANs and their settings) to these groups of Ruckus Wireless APs. By default, an AP zone named *staging zone* exists. Any AP that registers with the SCG that is not assigned a specific zone is automatically assigned to the staging zone. Each AP zone can include up to 2048 WLAN services.

Navigate to **Monitor** > **AP Zone** to view the access point zone KPIs. Table 1 lists the key performance indicators for statistics related to the AP zones as seen in Figure 1.

NOTE: For information on configuring AP Zone, refer to the *SmartCell Gateway 200 Administrator Guide* (PDF) or the *SmartCell Gateway 200 Online Help*, which is accessible from the SCG web interface.

Figure 1. KPIs for AP Zone

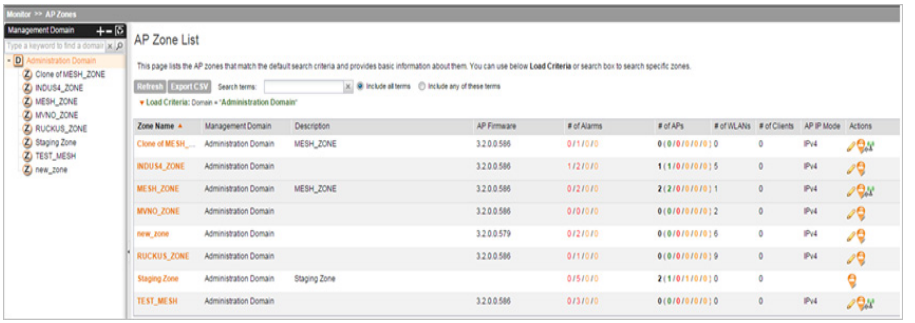


Table 1. KPIs for AP zone

KPI	Description
Number of APs per zone	Total number of APs that belong to each AP zone.
Number of APs by mesh role	Total number of APs per mesh role. Mesh roles include Root AP, Mesh AP, and eMesh AP.
Number of APs by model and radio frequency	Total number of managed APs by AP model and radio frequencies (2.4GHz and 5GHz) that they use.
Number of WLANs	Total number of WLANs in the AP zone.
Number of Clients	Total number of clients as reported by managed APs. Managed APs are polled for client count every 15 minutes.
Number of Alarms	Total number of alarms generated on managed APs.
Number of Events	Total number of events generated on managed APs.

NOTE: For information on statistics, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Access Point

Once you have created registration rules and the AP zones, APs can be assigned automatically. APs will be able to join or register with the SCG automatically.

To view the KPIs, navigate to **Monitor** > **Access Point.** Table 2 lists the key performance indicators for statistics related to access points as seen in Figure 2.

NOTE: For information on configuring Access Points, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 2. KPIs for Access Points

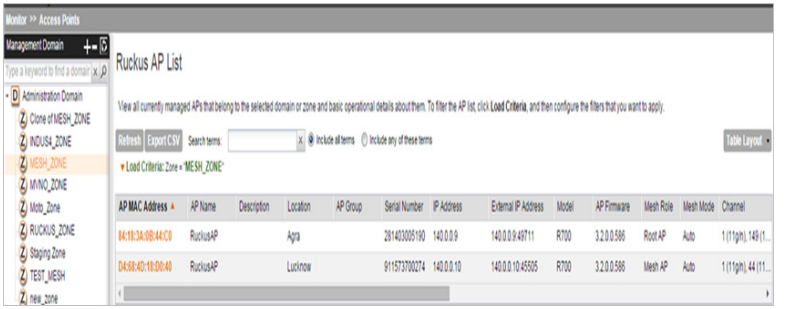


Table 2. KPIs for access points

KPI	Description
IP address	Indicates the IP address of the wireless client.
External IP address	Indicates the IP address and port number that the SCG uses to communicate with the device.
Model	Indicates the model number of the Ruckus Wireless access point.
AP Firmware	Indicates the firmware version that is installed on the access point.
AP Uptime	Indicates the length of time that has elapsed since the access point was last powered on.
AP Zones	Lists all AP zones to which each managed access point belongs.

Table 2. KPIs for access points (Continued)

KPI	Description
MB of Data Transmitted	Indicates the amount of data (in MB) uploaded and downloaded through each radio and per access point.
Number of Alarms	Indicates the number of alarms generated on the access point.
Number of Events	Indicates the number of events generated on the access point.
SCG appliance that is managing each AP	Lists each SCG node that manages each access point.
WLANs on each AP	Lists all WLANs on each access point, including information about their BSSID, radios, authentication method, and client count.
Status	Indicates whether the access point is currently connected (online) or disconnected (offline).
Associated Clients	Lists clients that are reporting to the access point.
Radio Channel Information	Lists radio channel information, including: • Current channel • Channelization • Background scan configuration • TX power • Number of authorized clients • % retries/% drops • % non-unicast • Packets/bytes received • Packets/bytes transmitted • Noise floor • PHY errors • % air time (total/busy/RX/TX)

Client KPIs

To view the KPIs, navigate to **Monitor** > **Clients.** Table 3 lists the key performance indicator for statistics related to wireless clients. See Figure 3.

NOTE: For information on configuring Clients, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 3. KPIs for Clients

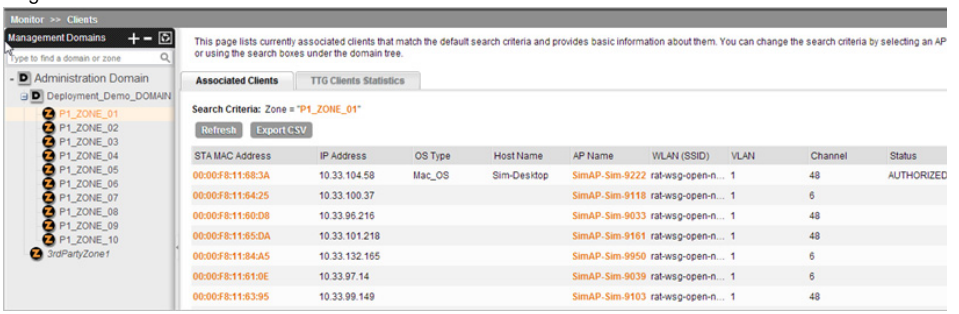


Table 3 lists the wireless client details that are shown in the table.

Table 3. KPIs for Clients

KPI	Description
STA MAC Address	MAC address of the wireless station. Clicking this link loads a page that displays detailed information about the wireless client.
IP Address	IP address assigned to the wireless client
OS Type	Operating system that the wireless client is using
Host Name	Host name of the wireless client
AP Name	Name assigned to the access point. Clicking this link loads a page that displays detailed information about the access point.
WLAN (SSID)	Name of the WLAN service or SSID with which the wireless client is associated.
VLAN	VLAN ID assigned to the wireless client
Channel	Radio channel used by the wireless client to access the WLAN service on the access point

Table 3. KPIs for Clients

KPI	Description
Status	Indicates whether the wireless client is authorized or unauthorized to access the WLAN service
User Name	Name of the user logged on to the wireless client
Auth Method	Authentication method used by the access point
Encryption Method	Encryption method used by the access point
Actions	Icons for actions that you can perform, including: • – Click to disconnect the wireless client from the access point.

SCG System KPIs

The SCG system KPI status or usage can be viewed for time period (8 hours to 30 days). The SCG system includes CPU, memory, tunnel statistics and disk usage.

To view the KPIs, navigate to **Monitor > System.** Table 4 lists the key performance indicators for statistics related to the SCG system. See Figure 4.

Figure 4. KPIs for SCG System

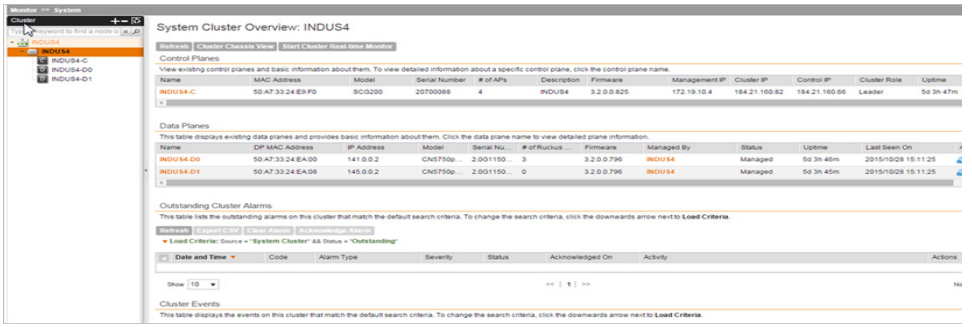


Table 4. KPIs for the SCG system

KPI	Description
CPU status	CPU/memory/disk free usage/interface usage/ are available for 8 hours, 24 hours, 7days and 30 days.
Datapath statistics	Datapath statistics is at the gateway and controller.

Table 4. KPIs for the SCG system

KPI	Description
Disk usage (free/utilized space)	Indicates the percentage of free disk space on the SCG web interface.
Memory status	CPU/memory/disk free usage/interface usage/ are available for 8 hours, 24 hours, 7days and 30 days.
Interface usage	Indicates: • The Tx and Rx bytes on the control, cluster, and management interfaces for the last 15 minutes, hourly, daily or monthly. • The amount of packets (including Tx, Rx, Tx dropped, and Rx dropped) on the control, cluster, and management interfaces for the last 15 minutes, hourly, daily or monthly.
Port usage	Indicates: • The Tx and Rx bytes on the port 0 - port 5 for the last 8 hours to 30 days. • The amount of packets (including Tx, Rx, Tx dropped, and Rx dropped) on the port0 - port5 for the last 8 hours to 30 days.

KPIs under the Administration Tab

1 HLR Statistics
2 SCTP Associations
3 CGF Transactions
4 CGF Connectivities
5 DHCP Server
6 DHCP Relay
7 GGSN Connections
8 GGSN/PGW GTP-C Sessions
9 RADIUS Server
10 RADIUS Proxy
11 LMA Signaling
12 LMA Connectivity Status
13 Diameter Stack Statistics
14 Diameter STa Statistics

HLR Statistics

The SCG and multiple HLRs manage wireless services gateway for authentication/ authorization and for unsolicited change of authorization. To view the KPIs, navigate to **Administration** > **Diagnostic menu.**

Table 5 lists the key performance indicators based on the statistics received or sent from the HLR. See Figure 5.

NOTE: For information on configuring HLR Service, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 5. HLR statistics

Table 5. KPIs for HLR

KPI	Description
Association	Indicates the number of associations configured / number of active associations.
Rtg Fail	Indicates the reported routing failure on outbound MAP messages (*TC_Notice*).
AuthInfoReqSim	Indicates the *MAP-SEND-AUTH-INFO-REQ SIM* (successful / error response from HLR / no response from HLR).
AuthInfoReqAka	Indicates the *MAP-SEND-AUTH-INFO-REQ AKA* (successful / error response from HLR / no response from HLR).
UpdGprsSim	Indicates the *MAP-GPRS-UPDATE-LOCATION-REQ SIM* (successful / error response from HLR / no response from HLR).
UpdGprsAka	Indicates the *MAP-GPRS-UPDATE-LOCATION-REQ AKA* (successful / error response from HLR / no response from HLR).
RstDtaSim	Indicates the *MAP-RESTORE-DATA SIM* (successful / error response from HLR / no response from HLR).
RstDtaAka	Indicates the *MAP-RESTORE-DATA AKA* (successful / error response from HLR / no response from HLR).
InsrtDtaSim	Indicates the *MAP-INSERT-SUBSCRIBER-DATA SIM* (successful / failed).
InsrtDtaAka	Indicates the *MAP-INSERT-SUBSCRIBER-DATA AKA* (successful / failed).
SaInsrtDta	Indicates the *MAP-INSERT-SUBSCRIBER-DATA* (received / unknown subscriber / decode failure or any other error).
RemoteDelSubsData	Indicates the *MAP-DEL-SUBS-DATA-REQ* (successful / failed).
RemoteCanLoc	Indicates the *MAP-CANCEL-LOC-REQ* (successful / failed).

SCTP Associations

An HLR instance can be accessed via one or more SCTP association. One SCTP association can have a connection to one or more HLRs. To view the KPIs, navigate to **Administration** > **Diagnostic menu.**

Table 6 lists the key performance indicators based on the statistics received or sent from the SCTP to the HLR. See Figure 6.

NOTE: For information on configuring SCTP, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 6. SCTP association

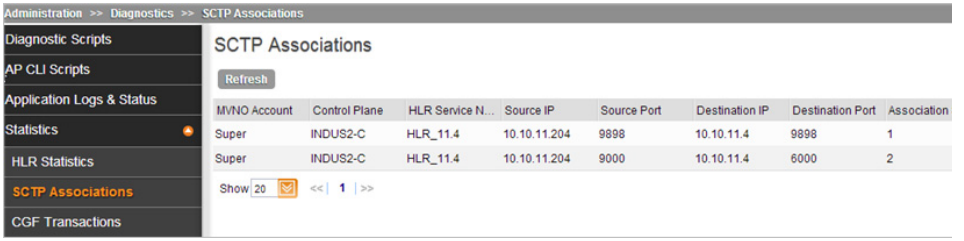


Table 6. SCTP association

KPI	Description
Source IP	Indicates the SCTP sender's port number.
Source Port	Indicates the SCTP sender's source port.
Destination IP	Indicates the destination IP address for identifying the association, to which the packet belongs.
Destination Port	Indicates the SCTP destination port.
Association State	Indicates the state of the SCTP association. Value 1 indicates it as established and value 2 indicates closure.
ASP State	Indicates the ASP state. Value 1 indicates active mode, value 2 indicates inactive mode and value 3 indicates a downlink.

CGF Transactions

The SCG plays the CTF role of collecting the chargeable event information for TTG sessions (that is, sessions toward GGSN/PGW). The CGF (Charging Data Functions) service receives the CDR generated at the SCG, based on configurations. To view the KPIs, navigate to **Administration** > **Diagnostic menu.**

Table 7 lists the key performance indicators for CGF transaction statistics based on the request and response messages that the CDR transfers. See Figure 7.

NOTE: For information on configuring CGF Service, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 7. CGF transactions

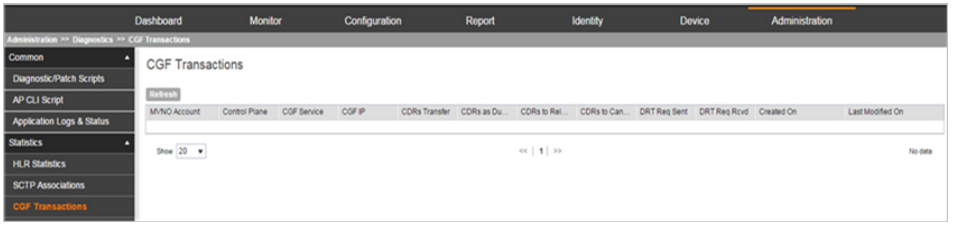


Table 7. KPIs for CGF Transaction

KPI	Description
CDRs Transfer	Indicates the number of CDRs transferred to the CGF server (successful / failed).
CDRs as Duplicate	Indicates the number of CDRs sent as possible duplicate (successful / failed).
CDRs to Release	Indicates the number of CDRs that the SCG wants the CGF server to release (successful / failed).
CDRs to Cancel	Indicates the number of CDRs that the SCG wants the CGF server to cancel (successful / failed).
DRT Req Rcvd	Indicates the number of data record transfer responses received (successful / failed).
DRT Req Sent	Indicates the number of data record transfer requests sent.

CGF Connectivities

CGF Connectivities is related to management messages. It checks the connectivity of the node and sends the echo and node alive requests. To view the KPIs, navigate to **Administration** > **Diagnostic menu.**

Table 8 lists the key performance indicators related to the connectivity between the SCG and CGF for management messages. See Figure 8.

NOTE: For information on configuring CGF Connectivities, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 8. CGF connectivity

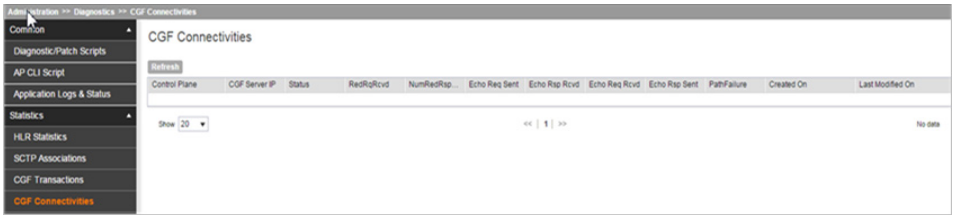


Table 8. KPIs for CGF connectivity

KPI	Description
RedRqRcvd	Indicates the number of redirection requests received by the SCG from CGF.
NumRedRspSnt	Indicates the number of redirection responses sent by the SCG to CGF.
Echo Req Sent	Indicates the number of echo requests initiated by the SCG towards CGF.
Echo Rsp Rcvd	Indicates the number of echo responses received by the SCG from CGF.
Echo Req Rcvd	Indicates the number of echo requests initiated by CGF towards the SCG.
Echo Rsp Sent	Indicates the number of echo responses received by CGF from the SCG.
Path Failure	Indicates the number of times the CGF server was unreachable.

DHCP Server

The SCG comes with a built-in DHCP server, which can be enabled for assigning IP addresses to devices that are connected to it. The SCG's DHCP server will only assign addresses to devices that are on its own subnet and are a part of the same VLAN (if VLANs are assigned). To view the KPIs, navigate to **Administration** > **Diagnostic menu.**

Table 9 lists the key performance indicators related to the Dynamic Host Configuration Protocol (DHCP) server functions. See Figure 9.

NOTE: For information on configuring DHCP Service, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 9. DHCP server

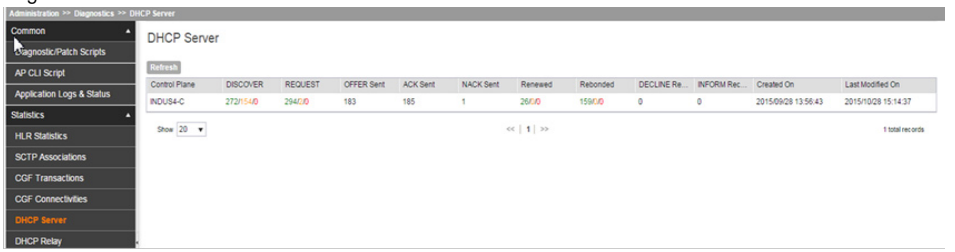


Table 9. KPIs for DHCP server

KPI	Description
DISCOVER	Indicates the number of DHCP discover messages processed by the DHCP server.
REQUEST	Indicates the number of DHCP request messages sent by the DHCP server.
OFFER Sent	Indicates the number of DHCP offer messages processed by the DHCP server. This excludes duplicate messages.
ACK Sent	Indicates the number of DHCP acknowledgment messages sent by the DHCP server.
NACK Sent	Indicates the number of DHCP not acknowledged (NACK) messages sent by the DHCP server.
Renewed	Indicates the number of DHCP request messages for renewing the lease period handled.
Rebonded	Indicates the number of DHCP request messages for rebonding.

Table 9. KPIs for DHCP server

KPI	Description
DECLINE Received	Indicates the number of DHCP decline messages received.
INFORM Received	Indicates the number of DHCP inform messages received.

DHCP Relay

DHCP relay is when the DHCP server acts as relay at the SCG. To view the KPIs, navigate to **Administration** > **Diagnostic menu.**

Table 10 lists the key performance indicators related to the DHCP relay. See Figure 10.

NOTE: For information on configuring DHCP Service, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 10. DHCP relay

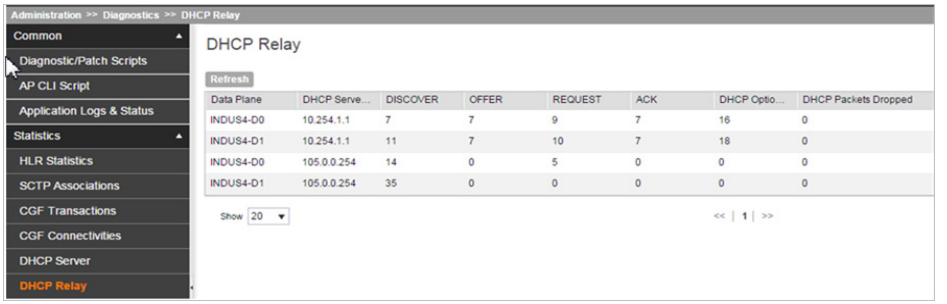


Table 10. KPIs for DHCP relay

KPI	Description
DISCOVER	Indicates the number of DHCP discover messages forwarded to the DHCP server.
OFFER	Indicates the number of DHCP offer messages received from the DHCP server.

Table 10. KPIs for DHCP relay

KPI	Description
REQUEST	Indicates the number of DHCP request messages forwarded to the DHCP server.
ACK	Indicates the number of DHCP acknowledgment messages received from the DHCP server.
DHCP Opt82	Indicates the number of DHCP reply messages received, which include Option 82 in the header. (replies include offer and acknowledgment messages.)
DHCP Packets Dropped	Indicates the number of DHCP packets that are dropped.

GGSN Connections

The SCG has 3GPP defined Tunnel Terminating Gateway (TTG) functionality, which enables it to act as a gateway between the UE (southbound) and the telecom core (northbound). This is to tunnel the traffic between the UE (User Equipment such as mobile phone) and the SCG gateway, which terminates the tunnel and transfers the data over to the GGSN (Gateway GPRS Serving Node).

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 11 lists the key performance indicators for path management message statistics of GGSN connections. See Figure 11.

NOTE: For information on configuring GGSN Service, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 11. GGSN connections

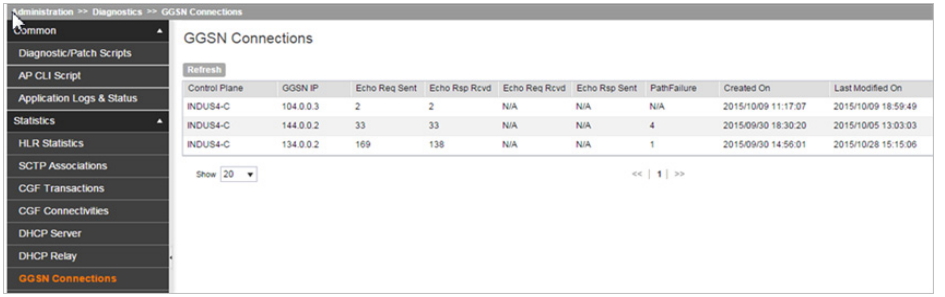


Table 11. KPIs for GGSN connections

KPI	Description
Echo Req Sent	Indicates the number of echo requests initiated by the SCG towards GGSN.
Echo Rsp Rcvd	Indicates the number of echo responses received by the SCG from GGSN.
Echo Req Rcvd	Indicates the number of echo requests initiated by GGSN towards the SCG.
Echo Rsp Sent	Indicates the number of echo responses received by GGSN from the SCG.
Path Failure	Indicates the number of times GGSN was unreachable.

GGSN/PGW GTP-C Sessions

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 12 lists the key performance indicators for tunnel management messages of GGSN/PGW GTP-C sessions. See Figure 12.

NOTE: For information on configuring GGSN Service, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 12. GGSN/PGW GTP-C session

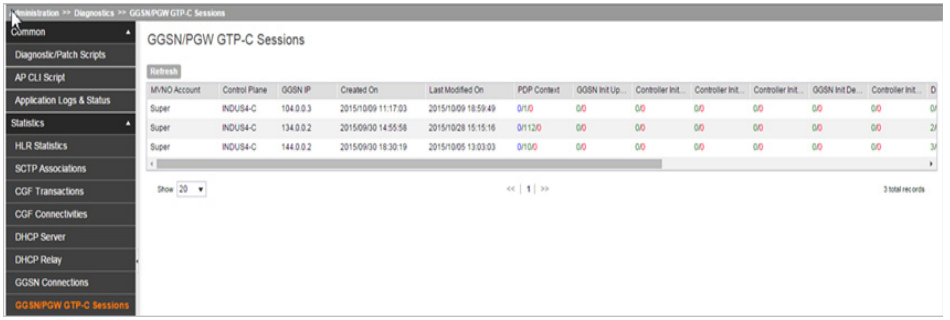


Table 12. KPIs for GGSN/PGW GTP-C connection

KPI	Description
PDP Context	Indicates the Policy Decision Point (PDP) which can either be active, successful or failed.
GGSN Init Update	Indicates the PDP update received (successful / failed).
SCG Init Update (Roaming)	Indicates the PDP update initiated (successful / failed).
SCG Init Update (CoA from AAA)	Indicates the number of SCG initiated update - CoA from AAA (successful / failed).
SCG Init Update (Events from HLR)	Indicates the number of SCG initiated update - Event from HLR (successful / failed).
GGSN Init Delete	Indicates the number of successful GGSN initiated delete session (successful / failed).
SCG Init Delete (Error)	Indicates the number of SCG initiated delete due to critical error (successful / failed).

Table 12. KPIs for GGSN/PGW GTP-C connection

KPI	Description
DM Init Delete	Indicates the number of the SCG initiated delete due to Dynamic Multipoint (DM) from AAA (successful / failed).
SCG Init Delete (Event from HLR)	Indicates the number of SCG initiated delete due to event from HLR (successful / failed).
SCG Init Delete (Timeout)	Indicates the number of SCG initiated delete due to timeout at the SCG (successful / failed).
AP Init Delete	Indicates the number of AP initiated delete due to timeout at Access Point (AP) (successful / failed).
DP Init Delete	Indicates the number of data plane initiated delete due to timeout at Data Plane (DP) (successful / failed).
Client Init Delete	Indicates the number of client initiated delete (successful / failed).
Admin Init Delete	Indicates the number of admin initiated delete (successful / failed).

RADIUS Server

A RADIUS service defines the external RADIUS server configuration. RADIUS services authenticates profiles to specify external RADIUS services used based on the realm value.

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 13 lists the key performance indicators for the statistics related to the RADIUS server. See Figure 13.

NOTE: For information on configuring RADIUS Service, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 13. RADIUS server

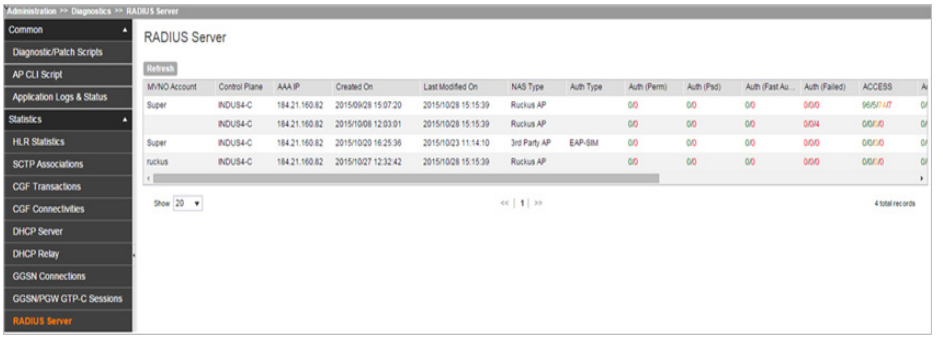


Table 13. KPIs for RADIUS server

KPI	Description
NAS Type	Indicates the NAS type.
Auth Type	Indicates the authentication type.
Auth (Perm)	Indicates the number of authentications done using Permanent ID (successful / failed).
Auth (Psd)	Indicates the number of authentications done using Pseudonym ID (successful / failed).
Auth (Fast Auth)	Indicates the number of authentications done using fast re-auth ID (successful / failed).
Auth (Failed)	Indicates the number of authentication requests for (unknown pseudonym ID / unknown fast re-auth ID) the number of incomplete authentications processed.
ACCESS	Indicates the number of RADIUS access from NAS (requests received / accepts sent / challenge sent / rejects sent).
Accounting Session	Indicates the number of accounting sessions established (successful / failed).
Accounting Request	Indicates the number of RADIUS accounting requests received / number of RADIUS accounting accepts sent.
AP Accounting	Indicates the number of AP accounting sessions established (successful / failed).
AP Accounting Request/ Response	Indicates the number of AP accounting (request / response).
AP Accounting ON Request	Indicates the number of AP accounting ON (request / response).

Table 13. KPIs for RADIUS server

KPI	Description
AP Accounting OFF Request	Indicates the number of AP accounting OFF (request / response).

RADIUS Proxy

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 14 lists the key performance indicators related to the RADIUS proxy. See Figure 14.

NOTE: For information on configuring RADIUS Proxy, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 14. RADIUS proxy

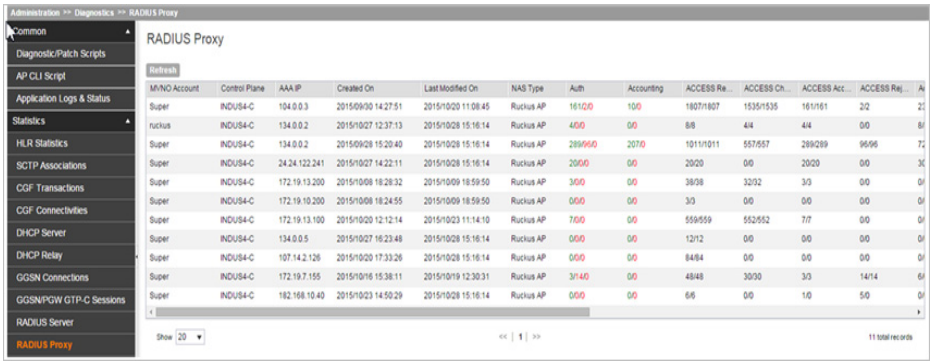


Table 14. KPIs for RADIUS proxy

KPI	Description
NAS Type	Indicates the NAS type.
Auth	Indicates the number of authentications (successful / failed / incomplete).
Accounting	Indicates the number of accounting sessions established (successful / failed).
ACCESS Request	Indicates the number of RADIUS access requests received from NAS or the number of RADIUS access requests sent to AAA server.
ACCESS Challenge	Indicates the number of RADIUS access challenges received from AAA server or the number of RADIUS access challenge sent to NAS.
ACCESS Accept	Indicates the number of RADIUS access accepts received from AAA server or the number of RADIUS access accepts sent to NAS.
ACCESS Reject	Indicates the number of RADIUS access rejects received from AAA server or the number of RADIUS access rejects sent to the NAS.
Account Request	Indicates the number of RADIUS accounting requests received from NAS or the number of RADIUS accounting requests sent to AAA server.
Accounting Response	Indicates the number of RADIUS accounting responses received from AAA server or the number of RADIUS accounting responses sent to NAS.
CoA (AAA)	Indicates the number of RADIUS CoA requests received from AAA server or the number of RADIUS CoA responses sent to AAA server (successful) or the number of RADIUS CoA responses sent to AAA server (failed).
DM (AAA)	Indicates the number of RADIUS DM requests received from AAA server or the number of RADIUS DM responses sent to AAA server (successful) or the number of RADIUS DM responses sent to AAA server (failed).

Table 14. KPIs for RADIUS proxy

KPI	Description
DM (NAS)	Indicates the number of RADIUS DM requests sent to NAS or the number of RADIUS DM responses received from NAS (successful) or the number of RADIUS DM responses received from NAS (failed).
AP Accounting	Indicates the number of AP accounting sessions established (successful / failed).
AP Accounting Request/ Response	Indicates the number of AP accounting (request / response).
AP Accounting ON Request	Indicates the number of AP accounting ON (request / response).
AP Accounting OFF Request	Indicates the number of AP accounting OFF (request / response).
Dropped Authentication Requests due to Rate limiting (Dropped Authentication Requests / Dropped Accounting Requests)	Indicates the actual number of dropped requests when the total number of requests received from NAS is greater than MOR value against each RADIUS service / server.
CoA (NAS)	Indicates the number of CoA requests proxied to NAS (3rd party AP).
CoA Autz Only	Indicates the number of RADIUS authorize only requests.

LMA Signaling

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 15 lists the key performance indicators related to the LMA Signaling. See Figure 15.

NOTE: For information on configuring LMA Signaling refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 15. LMA signaling

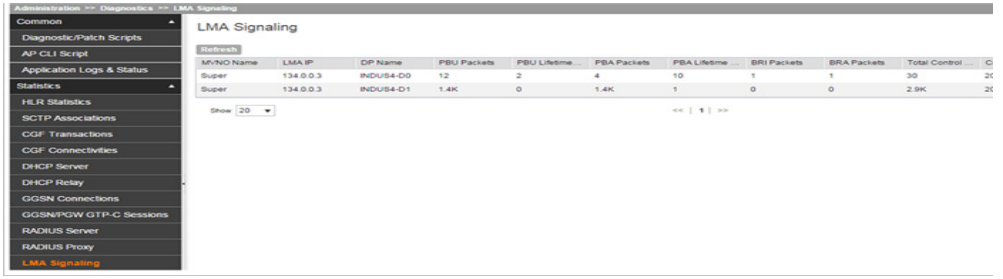


Table 15. KPIs for LMA signalling

KPI	Description
DP Name	Indicates the MAC address of the data blade.
PBU Packets	Indicates the number of control PBU packets.
PBU Lifetime 0 Packets	Indicates the number of control PBU lifetime 0 packets.
PBA Packets	Indicates the number of control PBA packets.
PBA Lifetime 0 Packets	Indicates the number of control PBA lifetime 0 packets.
BRI Packets	Indicates the number of control BRI packets.
BRA Packets	Indicates the number of control BRA packets.
Total Control Packets	Indicates the total number of control packets.

LMA Connectivity Status

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 16 lists the key performance indicators related to the LMA connectivity status. See Figure 16.

NOTE: For information on configuring LMA connectivity status refers to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 16. LMA connectivity status

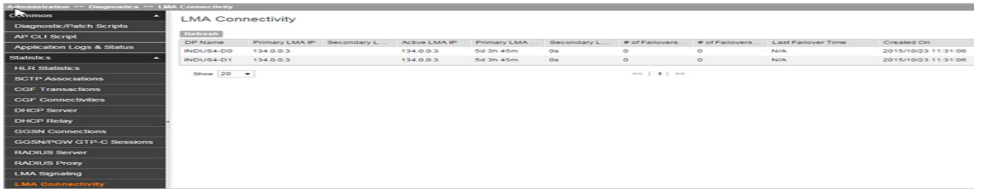


Table 16. KPIs for LMA connectivity status

KPI	Description
DP Name	Indicates the MAC address of the data blade.
Primary LMA IP	Indicates the IP address of the primary LMA.
Secondary LMA IP	Indicates the IP address of the secondary LMA.
Active LMA IP	Indicates the IP address of the current active LMA.
Primary LMA Duration	Indicates the duration in seconds that the primary LMA was active.
Secondary LMA Duration	Indicates the duration in seconds that the secondary LMA was active.
# of Failover (Primary > Secondary>	Indicates the number of times a failover occurs from the primary to secondary LMA.
# of Failover (Secondary > Primary>	Indicates the number of times a failover occurs from the secondary to primary LMA.
Last Failover Time	Indicates the time in seconds of the last LMA failover.

Diameter Stack Statistics

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 17 lists the key performance indicators related to the Diameter Stack Statistics. See Figure 17.

NOTE: For information on configuring Diameter Services refers to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 17. Diameter stack statistics

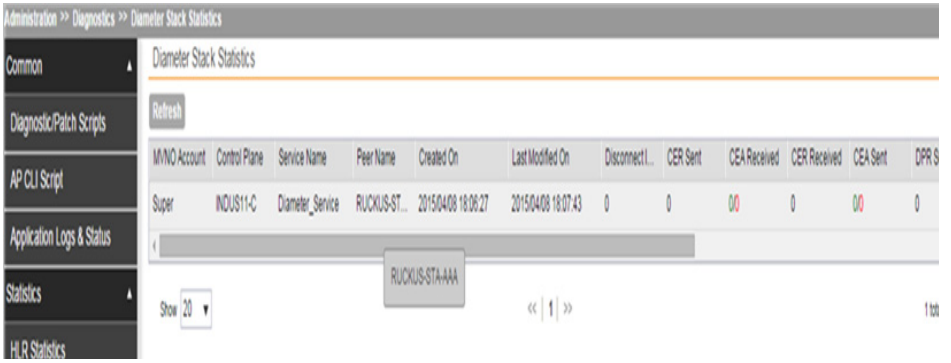


Table 17. KPIs for Diameter stack statistics

KPI	Description
MVNO Account	MVNO account created with management privileges
Control Plane	Name of the control plane
Service Name	Diameter service name
Peer Name	Diameter peer name, to which the connection is established
Created On	Date of record creation
Last Modified On	Date when the record was last modified
Disconnect Indication	Number of disconnection indications
CER Sent	Number of Capacity Exchange Request (CERs) sent by the stack to the remote diameter peer
CEA Received	Number of Capability-Exchange-Answer (CEA) responses received by the stack from the remote diameter peer

Table 17. KPIs for Diameter stack statistics

KPI	Description
CER Received	Number of CERs received by the stack from the remote diameter peer
CEA Sent	Number of CEA responses sent by the stack to the remote diameter peer
DPR Sent	Number of Disconnect Peer Request (DPR) sent by the stack to the remote diameter peer
DPA Received	Number of Disconnect Peer Answer (DPA) received by the stack from the remote diameter peer
DPR Received	Number of disconnect peer requests received by the stack from the remote diameter peer
DPA Sent	Number of disconnect peer answers sent by the stack to the remote diameter peer
DWR Sent	Number of Device WatchDog Request (DWR) sent by the stack to the remote diameter peer
DWA Received	Number of Device WatchDog Answer (DWA) received by the stack from the remote diameter peer
DWR Received	Number of device watchdog requests received by the stack from the remote diameter peer
DWA Sent	Number of device watchdog answers) sent by the stack to the remote diameter peer

Diameter STa Statistics

To view the KPIs, navigate to **Administration** > **Diagnostic menu.** Table 18 lists the key performance indicators related to the Diameter STa Statistics. See Figure 18.

NOTE: For information on configuring Diameter Services refers to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

Figure 18. Diameter STa statistics

Table 18. KPIs for Diameter STa statistics

KPI	Description
MVNO Account	MVNO account created with management privileges
Control Plane	Name of the control plane
STA Service Name	Diameter service name
Peer IP	Diameter IP address, to which the connection is established.
Application ID	Application identifier of the STa interface
Created On	Date of record creation
Last Modified On	Date when the record was last modified
Session created	Number of sessions created
DER Sent	Number of Diameter EAP Request (DER) sent from the SCG to 3GPP AAA Radius server
DEA Received	Number of Diameter EAP Answer (DEA) received from the 3GPP AAA Radius server

Table 18. KPIs for Diameter STa statistics

KPI	Description
STR Sent	Number of Session Termination Request (STR) sent from the SCG to 3GPP AAA Radius server
STA Received	Number of Session Termination Answer (STA) received from the 3GPP AAA Radius server
ASR Received	Number of Abort Session Request (ASR) with session termination indication received from the 3GPP AAA Radius server
ASA Sent	Number of Abort Session Answer (ASA) sent with result code (success or failure)
RAR Received	Number of Re-Auth Request (RAR) with session update indication received from the 3GPP AAA Radius server
AAR Sent	Number of AA-Request (AAR) sent from the SCG to the 3GPP AAA Radius server
AAA Received	Number of AAA received from 3GPP AAA Radius server
DER ReAuth Sent	Number of Diameter EAP Request (DER) re-authorization sent from the SCG to the 3GPP AAA Radius server
DEA ReAuth Received	Number of Diameter EAP Answer (DEA) re-authorization received from 3GPP AAA Radius server
Tx Timeout	Number of Tx timeouts
Msgs Dropped	Number of messages from 3GPP AAA that were dropped or had a decode failure

SCG Reports

2

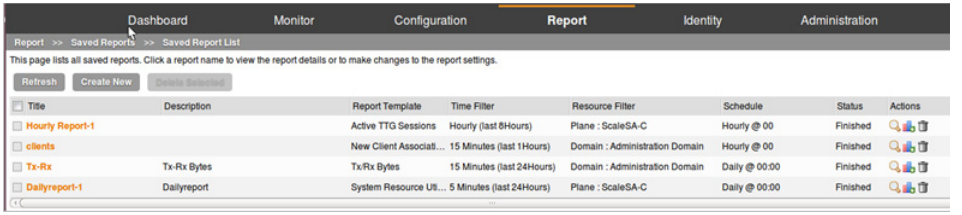
In this chapter:

- Saved Reports
- Historical Client Statistics
- Network Tunnel Statistics

Saved Reports

Saved reports list the reports that have been created and saved (Figure 19). To view the list of saved reports navigate to **Report > Saved Reports.** Click a report name to view the details or to modify the report settings.

Figure 19. Saved reports



All the SCG reports can be displayed in different time intervals (15 minutes, hourly, daily, or monthly) for the specified time filter (in hours) and exported in comma-separated value (CSV) format and portable document format (PDF).

NOTE: For information on creating reports, refer to the *Administrator Guide for SmartZone* (PDF) or the *SmartZone Online Help*, which is accessible from the SCG web interface.

The following is the list of reports that can be generated.

- Active TTG Sessions Report
- Client Number Report
- Client Number vs. Air Time Report
- Continuously Disconnected APs Report
- Failed Client Associations Report
- New Client Associations Report
- System Resource Utilization Report
- Tx/Rx Bytes Report

Active TTG Sessions Report

The Active TTG sessions report shows a historical view of the number of active TTG sessions established in the SCG. The active TTG session report can be shown in different time intervals for a specified duration. The report can be generated based on specific control planes or GGSN IP addresses.

Client Number Report

Generate the client number report to view the minimum and maximum number of clients connected to SCG for a given period of time. You can generate this report based on a specific management domain, AP zone, AP, SSID, or radio type.

Client Number vs. Air Time Report

Generate the client number vs. air time report to the average number of clients connected to the SCG and the corresponding airtime utilization (Tx, Rx, busy). You can use this report to display discrepancies in the number of clients, actual throughput, user experience and to troubleshoot these issues.

You can generate this report based on a specific management domain, AP zone, AP or radio type.

Continuously Disconnected APs Report

The continuously disconnected APs report lists access points that were disconnected within a specified time period (hours). You can generate this report based on a specific management domain or AP zone.

Failed Client Associations Report

Generate the Failed Client Associations report to view a list of clients that failed to join the SCG managed access points. You can use this report, for example, to pinpoint APs that may have settings that are preventing clients from associating with it successfully. You can generate this report based on a management domain, AP zone, AP, SSID, or radio type.

New Client Associations Report

Generate the new client associations report to view a list of clients that have associated with the SCG managed access points. You can generate this report management domain, AP zone, AP, SSID, or radio type.

System Resource Utilization Report

Generate the system resource utilization report to view the system's CPU and memory usage. You can generate this report based on a single plane or multiple planes.

Tx/Rx Bytes Report

Generate the Tx/Rx Bytes report to view the number of bytes that have been sent and received through SCG. You can generate this report based on a specific management domain, AP zone, AP, SSID, or radio type.

Historical Client Statistics

Historical client report is based on the UE session statistics. This report is displayed under **Report > Historical Client Statistics.** See Figure 20.

Table 19 contains the report for UE sessions. This is a cumulative value per session and one entry is created per session. Data is reported every 60 seconds and is not bin data. The user interface displays the table and its corresponding graph chart. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per GGSN IP for each bin.

Figure 20. Historical client statistics

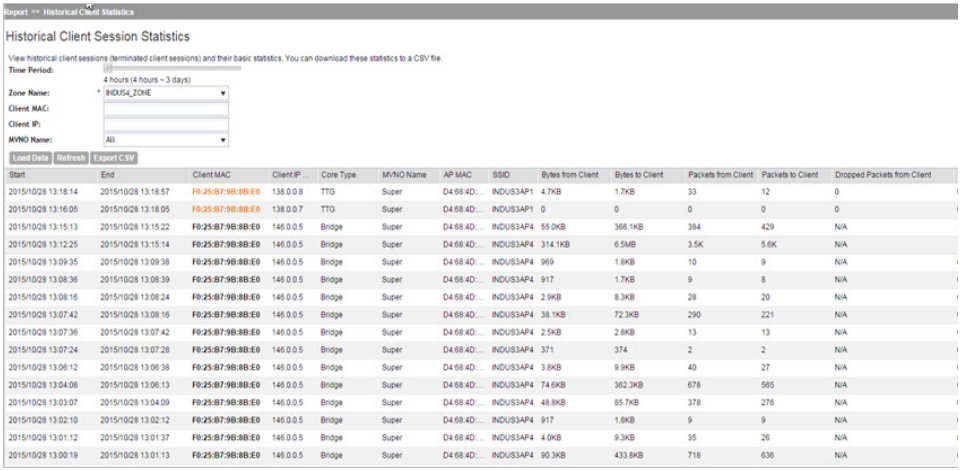


Table 19. Historical data attributes

Attribute	Type	Description
start	Long	Indicates the session creation time.
end	Long	Indicates the session end time.
Client Mac	String	Indicates the Mac address of the client.
Client IP Address	String	Indicates the IP address of the client.
Core Type	String	Indicates the core network tunnel type.
MVNO Name	String	Indicates the MVNO account.
AP MAC	String	Mac address for the AP.
SSID	Long	Indicates the service set identifier.
Bytes from Client	Long	Indicates the number of bytes received from the client.
Bytes to Client	Long	Indicates the number of bytes sent to the client.
Packets from Client	Long	Indicates the number of packets received from the client.
Packets to Client	Long	Indicates the number of packets sent to the client.
Dropped packets from Client	Long	Indicates the number of packets dropped from client.
Dropped packets to Client	Long	Indicates the number of packets dropped to client.

Network Tunnel Statistics

Tunnel statistics or report is displayed under **Report > Network Tunnel Statistics.** This includes:

- Ruckus AP - Ruckus GRE
- Ruckus AP - AP Soft GRE
- Ruckus AP - AP IPsec
- 3rd Party AP - L2oGRE
- 3rd Party AP - Q-in-Q Layer 2
- Core Network Tunnel - L2oGRE
- Core Network Tunnel -L3oGRE
- Core Network Tunnel - GTP
- Core Network Tunnel -PMIPv6

Ruckus AP - Ruckus GRE

Table 20 contains the report based on the statistics for access Ruckus GRE. Each entry contains the 15 minutes cumulative data.

The SCG web interface (**Network Tunnel Statistics > Access Network Tunnel > Ruckus AP > Ruckus GRE)** displays the table and its corresponding graph chart as seen in Figure 21. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per AP for each bin.

Figure 21. Ruckus GRE report

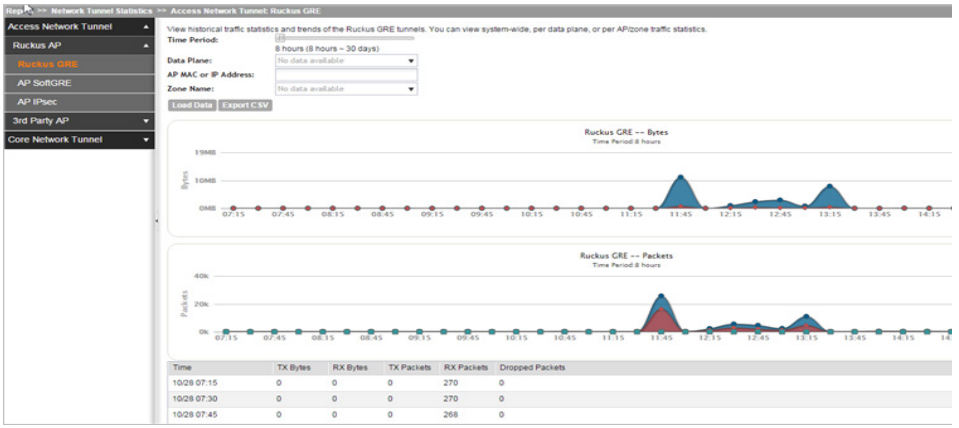


Table 20. Ruckus GRE report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.
TXPkts	Long	Indicates the number of packets sent.
RXPkts	Long	Indicates the number of packets received.
Dropped Packets	Long	Indicates the number of packets dropped.

Ruckus AP - AP Soft GRE

Table 21 contains the report based on the statistics for access point Soft GRE. Each entry contains the 15 minutes cumulative data.

The SCG web interface (**Network Tunnel Statistics > Access Network Tunnel > Ruckus AP > AP Soft GRE)** displays the table and its corresponding graph chart as seen in Figure 22. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per AP for each bin.

Figure 22. AP Soft GRE report

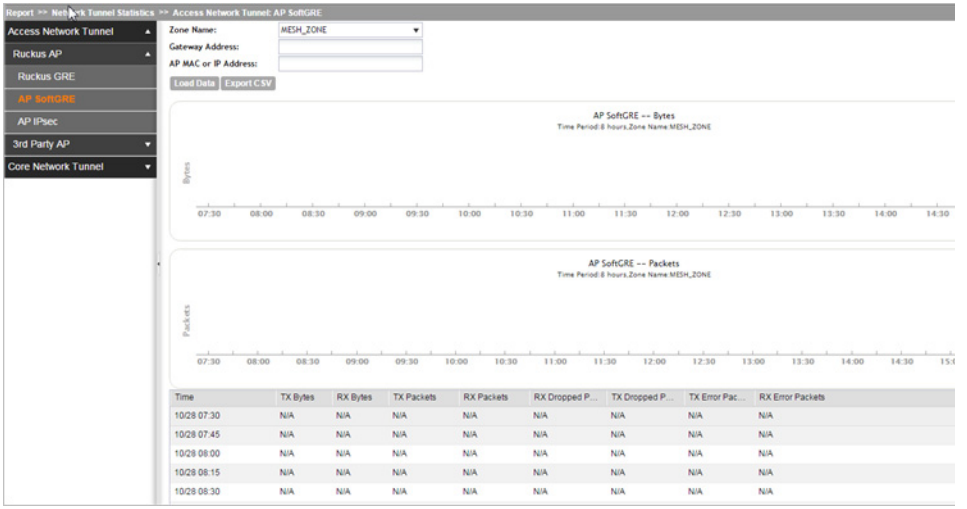


Table 21. AP Soft GRE report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.
TXPkts	Long	Indicates the number of packets sent.
RXPkts	Long	Indicates the number of packets received.
RX Dropped Packets	Long	Indicates the number of packets dropped.
TX Dropped Packets	Long	Indicates the number of packets dropped.
TX Error Packets	Long	Indicates the number of packets with a header error.
RX Error Packets	Long	Indicates the number of packets with a header error.

Ruckus AP - AP IPsec

Table 22 contains the report based on the statistics for access point IPsec. Each entry contains the 15 minutes cumulative data.

The SCG web interface (**Network Tunnel Statistics > Access Network Tunnel > AP IPsec)** displays the table and its corresponding graph chart as seen in Figure 23. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per AP for each bin.

Figure 23. AP IPsec

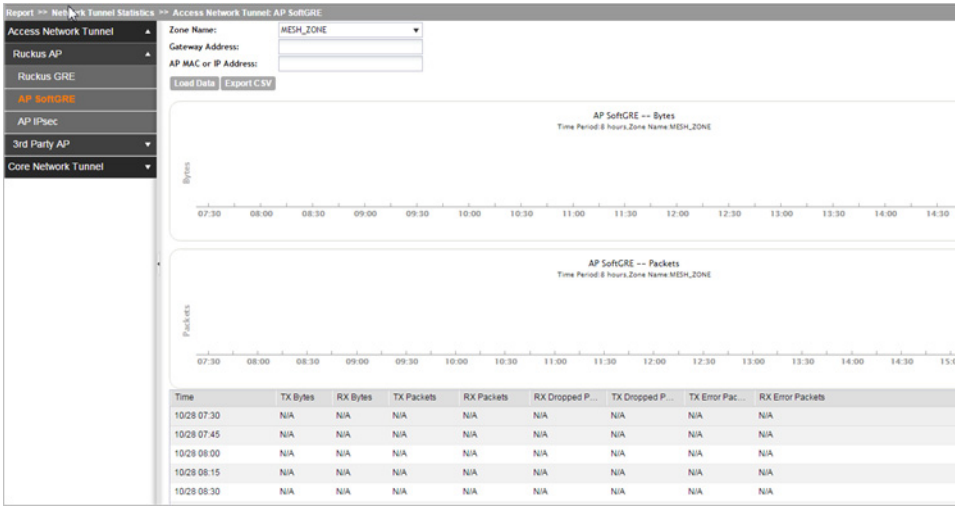


Table 22. AP IPsec report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.
TXPkts	Long	Indicates the number of packets sent.
RXPkts	Long	Indicates the number of packets received.
TX Dropped Packets	Long	Indicates the number of packets dropped.

Table 22. AP IPsec report attributes

Attribute	Type	Description
RX Dropped Packets	Long	Indicates the number of packets dropped.

3rd Party AP - L2oGRE

Table 23 contains the report based on the statistics for access side tunnels L2oGRE and L3oGRE. Each entry contains the 15 minutes cumulative data.

The SCG web interface (**Network Tunnel Statistics > 3rd Party AP> L2oGRE**) displays the table and its corresponding graph chart as seen in Figure 24. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per AP for each bin.

Figure 24. L2oGRE Report

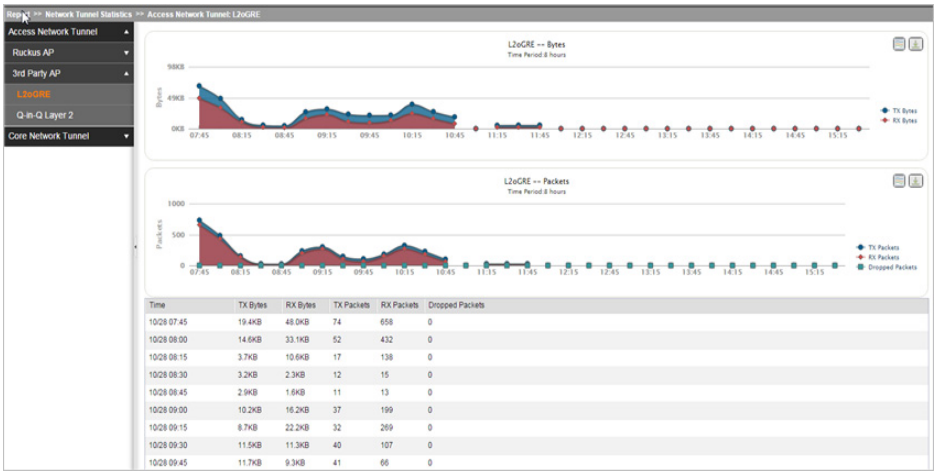


Table 23. L2oGRE report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.
TXPkts	Long	Indicates the number of packets sent.

Table 23. L2oGRE report attributes

Attribute	Type	Description
RXPkts	Long	Indicates the number of packets received.
Dropped Packets	Long	Indicates the number of packets dropped.

3rd Party AP - Q-in-Q Layer 2

Table 24 contains the report based on the statistics for access side tunnels Q-in-Q. Each entry contains the 15 minutes cumulative data.

The SCG web interface (**Network Tunnel Statistics > 3rd Party AP > Q-in-Q Layer 2)** displays the table and its corresponding graph chart as seen in Figure 25. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per Q-in-Q tag pair for each bin.

Figure 25. Q-in-Q layer 2 report

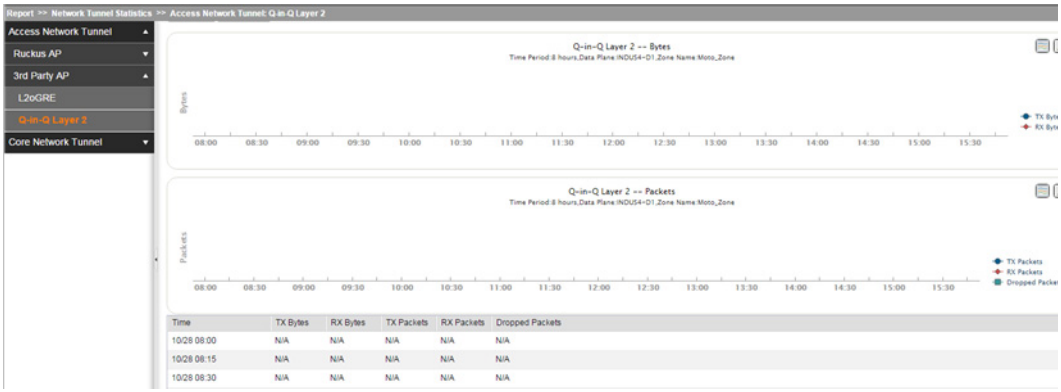


Table 24. Q-in-Q report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.
TXPkts	Long	Indicates the number of packets sent.
RXPkts	Long	Indicates the number of packets received.
Dropped Packets	Long	Indicates the number of packets dropped.

Core Network Tunnel - L2oGRE

Table 25 contains the report based on the statistics for core side gateway of L2oGRE. Each entry contains the 15 minutes cumulative data.

The user interface (**Network Tunnel Statistics > Core Network Tunnel > L2oGRE**) displays the table and its corresponding graph chart as seen in Figure 26. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per Gateway IP for each bin.

Figure 26. L2oGRE report

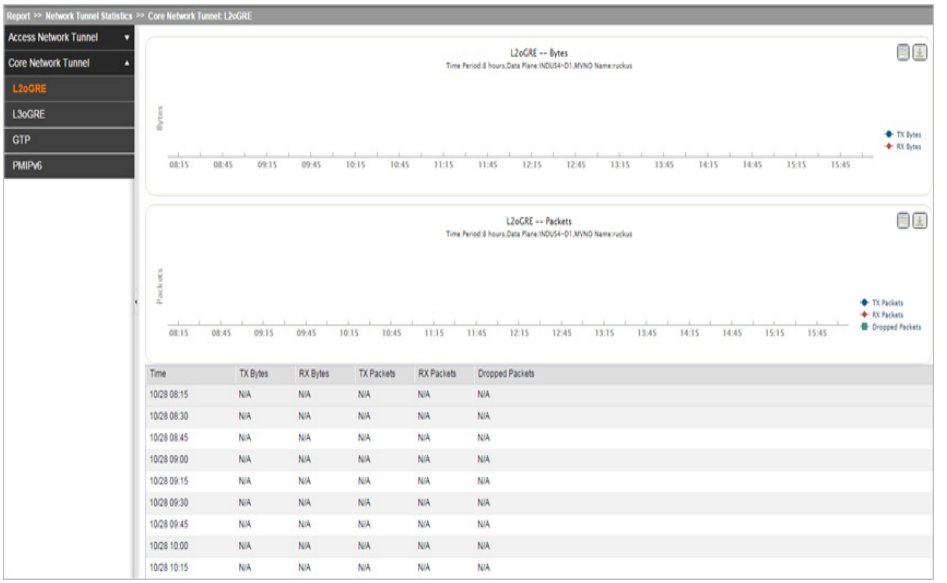


Table 25. L2oGRE report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.
TXPkts	Long	Indicates the number of packets sent.
RXPkts	Long	Indicates the number of packets received.
Dropped Packets	Long	Indicates the number of packets dropped.

Core Network Tunnel -L3oGRE

Table 26 contains the report based on the statistics for core side gateway of L3oGRE. Each entry contains the 15 minutes cumulative data.

The user interface (**Network Tunnel Statistics > Core Network Tunnel > L3oGRE**) displays the table and its corresponding graph chart as seen in Figure 27. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per Gateway IP for each bin.

Figure 27. L3oGRE report

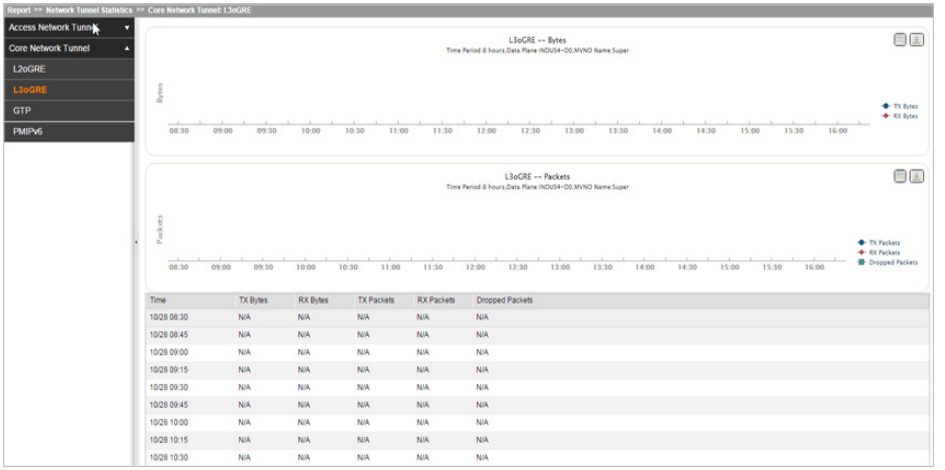


Table 26. L3oGRE report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.
TXPkts	Long	Indicates the number of packets sent.
RXPkts	Long	Indicates the number of packets received.
Dropped Packets	Long	Indicates the number of packets dropped.

Core Network Tunnel - GTP

Table 27 contains the statistics for core side gateway of GGSN GTP-U. Each record contains the accumulated data for a 15 minute period. The table entry contains TX/RX statistics from all packets received from a GGSN in the last 15 minutes. The attribute, MVNO-ID is provided by the SCG-CBlade.

The user interface (**Network Tunnel Statistics > Core Network Tunnel > GTP**) displays the table and its corresponding graph chart as seen in Figure 28. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per GGSN IP for each bin.

Figure 28. GTP report

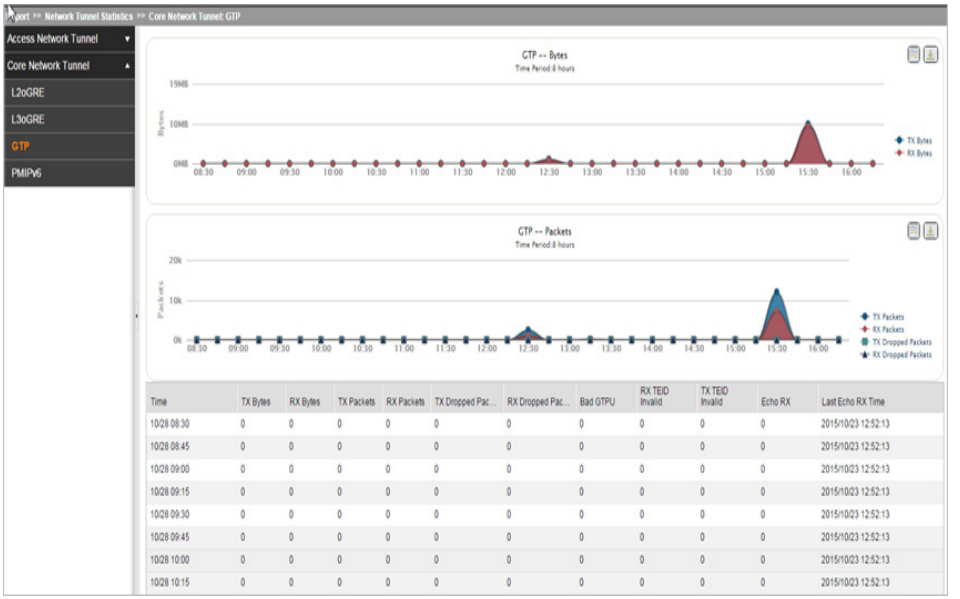


Table 27. GTP report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent.
RXBytes	Long	Indicates the number of bytes received.

Table 27. GTP report attributes

Attribute	Type	Description
TXPkts	Long	Indicates the number of packets sent.
RXPkts	Long	Indicates the number of packets received.
TX Dropped Packets	Long	Indicates the number of packets dropped that are to be sent to GGSN.
RX Dropped Packets	Long	Indicates the number of packets dropped by GGSN.
Bad GTPU	Long	Number of packets received from GGSN with bad GTP header.
RXTeidInvalid	Long	Number of packets received from GGSN with bad TEID.
TXteidInvalid	Long	Number of packets for GGSN with bad/unknown TEID.
EchoRX	Long	Number of GTPU echo request received from GGSN.
LastEchoRxTime	Long	Timestamp of the last GTPU echo request/reply received from GGSN.

Core Network Tunnel -PMIPv6

Table 28 contains the report based on the statistics for core side gateway of PIMPv6. Each entry contains the 15 minutes cumulative data.

The user interface (**Network Tunnel Statistics > Core Network Tunnel > PMIPv6**) displays the table and its corresponding graph chart as seen in Figure 29. The two representations are synchronized and controlled by the search criteria. For performance reasons, the SCG may pre-calculate the total counters per DP or per Gateway IP for each bin.

Figure 29. PMIPv6 report

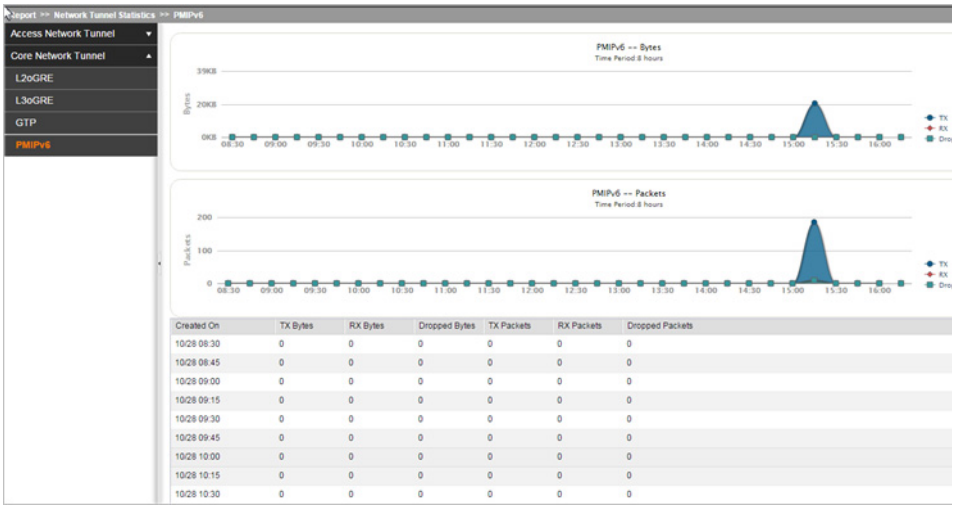


Table 28. PMIPv6 report attributes

Attribute	Type	Description
Time	Long	Bin ID, which is stamped at a 15 minute interval. For example, 10:00, 10:15.
TXBytes	Long	Indicates the number of bytes sent to LMA.
RXBytes	Long	Indicates the number of bytes received from LMA.
Dropped Bytes	Long	Indicates the number of bytes dropped from LMA.
TXPkts	Long	Indicates the number of packets sent to LMA.
RXPkts	Long	Indicates the number of packets received from LMA.
Dropped Packets	Long	Indicates the number of packets dropped from LMA.

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