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Ruckus Virtual SmartZone-Data Plane and Virtual SmartZone-High Scale Gn Interface Guide, 5.2

Supporting SmartZone 5.2

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Contents

Preface

Document Conventions

The following table lists the text conventions that are used throughout this guide.

TABLE 1 Text Conventions

Convention	Description	Example
monospace	Identifies command syntax examples	device(config)# interface ethernet 1/1/6
bold	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the **Start** menu, click **All Programs**.
italics	Publication titles	Refer to the *Ruckus Small Cell Release Notes* for more information.

Notes, Cautions, and Safety Warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE
A NOTE provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An ATTENTION statement indicates some information that you must read before continuing with the current action or task.

CAUTION
A CAUTION statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER
A DANGER statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Command Syntax Conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.

Convention	Description
italic text	Identifies a variable.
[ ]	Syntax components displayed within square brackets are optional.
	Default responses to system prompts are enclosed in square brackets.
{ x	y	z }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x	y	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Document Feedback

Ruckus is interested in improving its documentation and welcomes your comments and suggestions.

You can email your comments to Ruckus at #Ruckus-Docs@commscope.com.

When contacting us, include the following information:

- Document title and release number
- Document part number (on the cover page)
- Page number (if appropriate)

For example:

- Ruckus SmartZone Upgrade Guide, Release 5.0
- Part number: 800-71850-001 Rev A
- Page 7

Ruckus Product Documentation Resources

Visit the Ruckus website to locate related documentation for your product and additional Ruckus resources.

Release Notes and other user documentation are available at https://support.ruckuswireless.com/documents. You can locate the documentation by product or perform a text search. Access to Release Notes requires an active support contract and a Ruckus Support Portal user account. Other technical documentation content is available without logging in to the Ruckus Support Portal.

White papers, data sheets, and other product documentation are available at https://www.ruckuswireless.com.

Online Training Resources

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

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The Customer Services and Support (CSS) organization is available to provide assistance to customers with active warranties on their Ruckus products, and customers and partners with active support contracts.

For product support information and details on contacting the Support Team, go directly to the Ruckus Support Portal using https://support.ruckuswireless.com, or go to https://www.ruckuswireless.com and select **Support**.

What Support Do I Need?

Technical issues are usually described in terms of priority (or severity). To determine if you need to call and open a case or access the self-service resources, use the following criteria:

- Priority 1 (P1)—Critical. Network or service is down and business is impacted. No known workaround. Go to the **Open a Case** section.
- Priority 2 (P2)—High. Network or service is impacted, but not down. Business impact may be high. Workaround may be available. Go to the **Open a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Go to the **Self-Service Resources** section.
- Priority 4 (P4)—Low. Requests for information, product documentation, or product enhancements. Go to the **Self-Service Resources** section.

Open a Case

When your entire network is down (P1), or severely impacted (P2), call the appropriate telephone number listed below to get help:

- Continental United States: 1-855-782-5871
- Canada: 1-855-782-5871
- Europe, Middle East, Africa, Central and South America, and Asia Pacific, toll-free numbers are available at https://support.ruckuswireless.com/contact-us and Live Chat is also available.
- Worldwide toll number for our support organization. Phone charges will apply: +1-650-265-0903

We suggest that you keep a physical note of the appropriate support number in case you have an entire network outage.

Self-Service Resources

The Ruckus Support Portal at https://support.ruckuswireless.com offers a number of tools to help you to research and resolve problems with your Ruckus products, including:

- Technical Documentation—https://support.ruckuswireless.com/documents
- Community Forums—https://forums.ruckuswireless.com/ruckuswireless/categories
- Knowledge Base Articles—https://support.ruckuswireless.com/answers
- Software Downloads and Release Notes—https://support.ruckuswireless.com/#products_grid
- Security Bulletins—https://support.ruckuswireless.com/security

Using these resources will help you to resolve some issues, and will provide TAC with additional data from your troubleshooting analysis if you still require assistance through a support case or RMA. If you still require help, open and manage your case at https://support.ruckuswireless.com/case_management.

About This Guide

Overview

This *Virtual SmartZone - High Scale (vSZ-H) and Virtual SmartZone-Data Plane (vSZ-D) Gn Interface Reference Guide* lists the interface messages used between the controller and the Gateway GPRS Serving Node (GGSN).

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

> **NOTE**
> vSZ-H and vSZ-D is referred as *"the controller"* throughout this guide.

> **NOTE**
> If release notes are shipped with your product and the information there differs from the information in this guide, follow the instructions in the release notes.

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

Legend

The following table lists the legend/presence code used in this guide.

TABLE 2 Legends/presence code used in this guide

Legend / Presence	Description
M	Mandatory
O	Optional
C	Conditional

Terminology

The table lists the terms used in this guide.

TABLE 3 Terms used in this guide

Terminology	Description
AAA	Authentication, Authorization, and Accounting
EPS	Evolved Packet System
GGSN	Gateway GPRS Support Node

TABLE 3 Terms used in this guide (continued)

Terminology	Description
GSN	GPRS Support Node
LCS	Location Services
MAP	Mobile Application Part
MSISDN	Mobile Subscriber Integrated Services Digital Network Number
MWSG	Metro Wireless Security Gateway
PDP	Packet Data Protocol
RAC	Radio Access Controller
SZ300	SmartZone 300 controller
TEID	Tunnel End Point Identifier
UDP	User Datagram Protocol
UE	User Equipment

References

References lists the specifications and standards that are referred to in this guide.

TABLE 4 References used in this guide

No.	Reference	Description
1	3GPP TS 23.234	3GPP system to WLAN inter-working
2	3GPP TS 33.234	Wireless Local Area Network (WLAN) inter-working security
3	3GPP TS 29.002	3rd Generation Partnership Project: Mobile Application Part (MAP) specification
4	3GPP TS 29.060	General Packet Radio Service (GPRS): GPRS Tunneling Protocol (GTP) across the Gn and Gp interfaces
5	IETF RFC 791 (1981)	Internet Protocol (STD 5)
6	IETF RFC 768 (1980)	User Datagram Protocol (STD 6)

What's New in This Document

No change in content from previous release of 5.1.2.

Tunnel Management Message

Overview

The Gn interface is used to control the signal between Controller and GGSN (Gateway GPRS Support Node) as well as for tunneling end user data payload within the backbone network between both the nodes.

GPRS Tunneling Protocol (GTP) transmits user data packets and signaling between controller and GGSN. GTP encapsulates traffic and creates GTP tunnels, which act as virtual data channels for transmission of packet data between controller and GGSN. A GTP tunnel is established between controller and GGSN through a create PDP context procedure for a data session initiated from UE.

A GTP tunnel is identified by a pair of IP addresses and a pair of GTP Tunnel End Point Identifiers (TEIDs), where one IP address and TEID is for the SGSN and the other is for the GGSN. TEID is a session identifier used by GTP protocol entities in the SGSN and in the GGSN.

The two TEID are defined each for GTP-C and GTP-U. GTP-U is a tunneling mechanism that provides a service for carrying user data packets. On both planes, a GTP header encapsulates the data package, called GTP Packet Data Unit (G-PDU), and a path implemented by UDP/IP is used as bearer of the GTP traffic. GTP-C is a tunnel control and management protocol and is used to create, modify and delete tunnels.

The controller supports the following categories of GTP signaling traffic:

- **Path management messages**—The main purpose of these messages is to supervise an UDP/IP path to ensure that connectivity failure can be detected on time. This is managed by frequently sending GTP echo or echo response packets between the controller and the GGSN.

- **Tunnel management messages**—These contain messages that establish, modify and release GTP tunnels.

The following diagram shows the message flow between the controller and GGSN for establishing a GTP tunnel.

FIGURE 1 Message flow between controller and GGSN
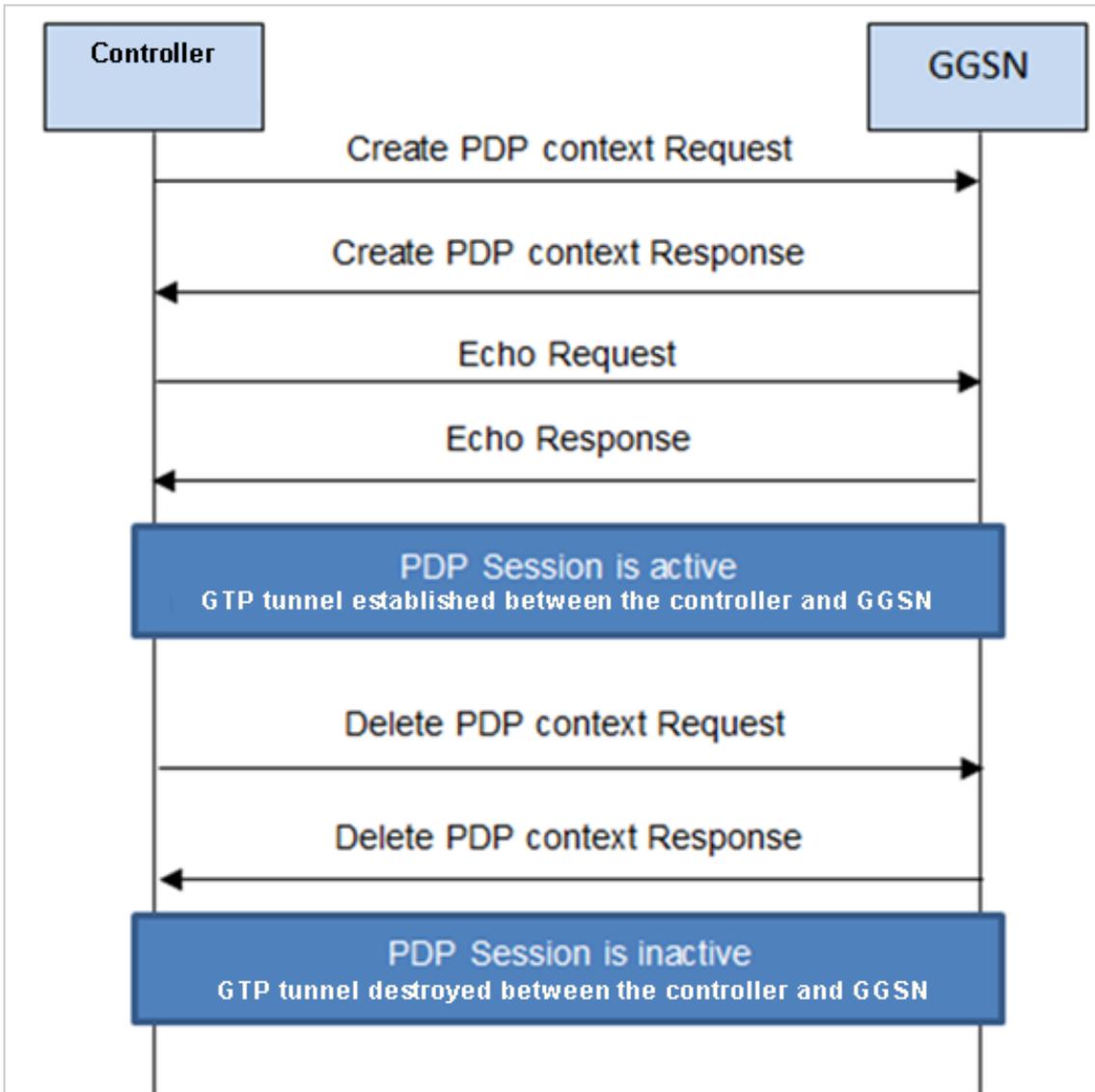
Create PDP Context Request

These messages are sent from the controller to the GGSN.

The table below lists the message attributes.

TABLE 5 Create PDP context request attributes

Attribute	Presence	Type	Description
Flags: • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • Spare bit- 0 • E - 0 • S - 1 • PN - 0	• Version - Determines the version of the GTP protocol • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0") • Extension header - Indicates the presence of a meaningful value of the next extension header • Sequence number - Value of the sequence number • N-PDU Number - Value of the N-PDU number
Common Flags	O	Octet	The common flags information element holds values for multiple bit flags. The controller sets bit 7 (Upgrade QoS Supported). All other bits are set to zero.
Message Type	M	Integer	Message type value is 16.
Length	M	Integer	Indicates the payload length in octets.
TEID	M	Integer	This attribute identifies a tunnel endpoint in the receiving GTP-U or GTP-C protocol entity. In response, GGSN assigns the TEID value received in TEID-C of the request message. The controller sends the TEID value as zero in Create PDP Request.
Sequence number	O	Integer	This attribute is used as a transaction identity for signaling messages having a response message defined for a request message. This is the sequence number value, which is copied from the request to the response message header.
N-PDU number	O	Integer	This attribute is used at the inter SGSN routing area update procedure and in the inter-system handover procedures. The controller sets the value to zero.
IMSI	C	Integer	This attribute is the subscriber identity of the mobile subscriber.
TEID Data I	M	Integer	This indicates the tunnel endpoint identifier for data transmission, which is requested by the receiver of the message flow. The controller generates TEID for the data plane.
TEID Control Plane	C	Integer	This indicates the tunnel endpoint identifier for the control plane. The controller generates TEID for the control plane.
NSAPI	M	Integer	For the controller initiated message, this attribute is a configurable value in flat file. The value ranges from 5-15.
End User Address	C	Integer	This attribute displays the protocol specific information about the external packet data network accessed by the GPRS subscriber. This attribute is included if it is a primary PDP context activation procedure. In order to get GGSN assigned IP address for the UE, the controller sets the PDP type organization to IETF(1) and PDP type number to IPv4(0x21). The length is 2 without the PDP address.
Access Point Name	C	DNS format/string	This attribute is included for the primary activation procedure but not for the secondary activation procedure.
Protocol Configuration	O	Integer	This attribute is used with IP PDP type.
GSN Address	M	Integer	This attribute is the SGSN address used for signaling.
GSN Address	M	Integer	This attribute is the SGSN address use for user traffic.
MSISDN	C	Integer	MS international ISDN numbers (CC + NDC + SN). This attribute is included in the primary PDP context activation procedure but not in the secondary PDP context activation procedure. The controller receives this value from the external AAA server.
Quality of service profile	M	Integer	This attribute specifies the quality of service (QoS) parameters for a PDP context. The controller receives this value from an external AAA server on the web interface.

TABLE 5 Create PDP context request attributes (continued)

Attribute	Presence	Type	Description
RAT Type	O	Integer	This attribute value is always set to 3(IWLAN) in case the messages are initiated by the controller.
Error Indication	O	Integer	These messages are sent from the GGSN to the controller. Error Indication on page 18 lists the message attribute.

Create PDP Context Response

These messages are sent by the GGSN to the controller.

The table below lists the message attributes.

TABLE 6 Create PDP context response attributes

Attribute	Presence	Type	Description
Flags: • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • Spare bit- 0 • E - 0 • S - 1 • PN - 0	• Version - Determines the version of the GTP protocol • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0") • Extension header - Indicates the presence of a meaningful value of the next extension header • Sequence number - Value of the sequence number • N-PDU Number - Value of the N-PDU number
Message Type	M	Integer	Message type value is 17.
Length	M	Integer	This attribute indicates the payload length in octets.
TEID	M	Integer	This attribute identifies a tunnel endpoint in the receiving GTP-U or GTP-C protocol entity. TEID of control plane is received as a response in the create PDP context request message from the controller.
Sequence number	O	Integer	This attribute is used as a transaction identity for signaling messages having a response message defined for a request message. This is the sequence number value which is copied from the request to the response message header.
N-PDU number	O	Integer	This attribute is used at the inter SGSN routing area update procedure and in the inter-system handover procedures.
Cause	M	Integer	This attribute indicates the acceptance or the rejection of the corresponding request.
Reordering required	C	Integer	This attribute is ignored by the controller.
Recovery	O	Integer	This attribute indicates if the peer GSN has restarted.
TEID Data I	M	Integer	This attribute indicates the tunnel endpoint identifier for data transmission, which is requested by the receiver of the message flow.
TEID Control Plane	C	Integer	This attribute indicates the tunnel endpoint identifier for the control plane. This attribute should be present, if the SGSN has not confirmed successful assignment of its Tunnel Endpoint Identifier Control Plane to the peer GGSN.
Charging ID	O	Integer	Charging ID value 0 is reserved and will not be assigned by the GGSN. This attribute is used to identify all charging records produced in SGSN(s) and the GGSN for this PDP context. This attribute is generated by the GGSN and is unique within the GGSN. This value is used by controller in accounting messages towards AAA server.
End User Address	C	Integer	This is address assigned by the GGSN for the user, UE.
Protocol Configuration	O	Integer	This is the primary and secondary DNS server IP address.

TABLE 6 Create PDP context response attributes (continued)

Attribute	Presence	Type	Description
GSN Address	M	Integer	This attribute is the GGSN address used for signaling.
GSN Address	M	Integer	This attribute is the GGSN address use for user traffic.
Quality of Service	M	Integer	Quality of Service assigned by the GGSN for the user.
Error Indication	O	Integer	These messages are sent from the GGSN to the controller. Error Indication on page 18 lists the message attribute.

Update PDP Context Request

These messages are sent from the GGSN to the controller or vice versa. In case of a GGSN initiated request, the change in data plane IP address at GGSN handled by the controller.

In case of a controller initiated request, the change in data plane IP address at the controller is sent to the GGSN. The table below lists the message attributes.

TABLE 7 Update PDP context request attributes

Attribute	Presence	Type	Description
Flags • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • Spare bit- 0 • E - 0 • S - 1 • PN - 0	• Version - Determines the version of the GTP protocol • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0") • Extension header - Indicates the presence of a meaningful value of the next extension header • Sequence number - Value of the sequence number
Common Flags	O	Octet	The common flags information element holds values for multiple bit flags. The controller sets only bit 7 (Upgrade QoS Supported). All other bits are set to zero.
Message Type	M	Integer	Message type value is 18.
Length	M	Integer	This attribute indicates the payload length in octets.
TEID	M	Integer	This attribute identifies a tunnel endpoint in the receiving GTP-U or GTP-C protocol entity.
Sequence number	O	Integer	This attribute is used as a transaction identity for signaling messages having a response message defined for a request message. This is the sequence number value, which is copied from the request to the response message header.
N-PDU number	O	Integer	This attribute is used at the inter SGSN routing area update procedure and in the inter-system handover procedures.
IMSI	C	Integer	This attribute is the subscriber identity of the user equipment.
Recovery	O	Integer	This attribute indicates if the peer GSN restarts. The value should be same as the values in the messages received from GGSN. This value is incremented and sent by the controller when restarted.
TEID Data I	M	Integer	This indicates the tunnel endpoint Identifier for data transmission, which is requested by the receiver of the message flow.
TEID Control Plane	C	Integer	This indicates the tunnel endpoint identifier for the control plane. This attribute should be present, if the SGSN has not confirmed successful assignment of its Tunnel Endpoint Identifier control plane to the peer GGSN.

TABLE 7 Update PDP context request attributes (continued)

Attribute	Presence	Type	Description
NSAPI	M	Integer	For the controller initiated message, this attribute is a configurable value in flat file. The value ranges from 5-15.
Protocol Configuration	O	Integer	This attribute is used with IP PDP type.
GSN Address	M	Integer	This attribute is the controller address used for signaling.
GSN Address	M	Integer	This attribute is the controller address use for user traffic.
Quality of Service	M	Integer	The purpose of the quality of service information element is to specify the QoS parameters for a PDP context.
RAT Type	O	Integer	This attribute value is always set to 3(IWLAN) in case the messages are initiated by the controller.
Error Indication	O	Integer	These messages are sent from the GGSN to the controller. Error Indication on page 18 lists the message attribute.

Update PDP Context Response

These messages are sent from the GGSN to the controller or vice versa.

The table below lists the message attributes.

TABLE 8 Update PDP context response attributes

Attribute	Presence	Type	Description
Flags • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • Spare bit- 0 • E - 0 • S - 1 • PN - 0	• Version - Determines the version of the GTP protocol • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0") • Extension header - Indicates the presence of a meaningful value of the next extension header • Sequence number - Value of the sequence number • N-PDU Number - Value of the N-PDU number
Message Type	M	Integer	Message type value is 19
Length	M	Integer	This attribute indicates the payload length in octets.
TEID	M	Integer	This attribute identifies a tunnel endpoint in the receiving GTP-U or GTP-C protocol entity
Sequence number	O	Integer	This attribute is used as a transaction identity for signaling messages having a response message defined for a request message. This is the sequence number value, which is copied from the request to the response message header.
N-PDU number	O	Integer	This attribute is used at the inter SGSN routing area update procedure and in the inter-system handover procedures. The controller sets this value to zero.
IMSI	O	Integer	This attribute is the subscriber identity of the mobile subscriber. The value is set in this attribute for messages sent from controller to GGSN.
Recovery	O	Integer	This attribute indicates if the peer GSN restarts. The value should equal to the value from the messages received from GGSN. This value is incremented and sent by the controller in case of a restart.
TEID Data I	M	Integer	This attribute indicates the tunnel endpoint Identifier for data transmission, which is requested by the receiver of the message flow.

TABLE 8 Update PDP context response attributes (continued)

Attribute	Presence	Type	Description
TEID Control Plane	C	Integer	This indicates the tunnel endpoint identifier for the control plane. This attribute should be present, if the SGSN has not confirmed successful assignment of its Tunnel Endpoint Identifier Control Plane to the peer GGSN.
GSN Address	M	Integer	This attribute is the controller address used for signaling.
Error Indication	O	Integer	These messages are sent from the GGSN to the controller. Error Indication on page 18 lists the message attribute.

Delete PDP Context Request

These messages are sent from the controller to the GGSN or vice versa. The table below lists the message attributes.

TABLE 9 Delete PDP context request attributes

Attribute	Presence	Type	Description
Flags • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • PT - GTP (1) • E - 0 • S - 1 • PN - 0	• Version - Determines the version of the GTP protocol • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0") • Extension header - Indicates the presence of a meaningful value of the next extension header • Sequence number - Value of the sequence number • N-PDU Number - Value of the N-PDU number
Message Type	M	Integer	Message type value is 20.
Length	M	Integer	This attribute indicates the payload length in octets.
TEID	M	Integer	This attribute identifies a tunnel endpoint in the receiving GTP-U or GTP-C protocol entity. It terminates the session of the TEID control plane end point. In case the request messages are initiated by the controller, the GGSN assigns the TEID value for a given session.
Sequence number	O	Integer	This attribute is used as a transaction identity for signaling messages having a response message defined for a request message. This is the sequence number value, which is copied from the request to the response message header.
Tear down Indicator	C	Integer	This attribute is either: • 0 - No • 1 - Yes
NSAPI	M	Integer	For the controller initiated message, this attribute is a configurable value in the flat file. The value ranges from 5-15 and is included in the create PDP request message.
Error Indication	O	Integer	These messages are sent from the GGSN to the controller. Error Indication on page 18 lists the message attribute.

Delete PDP Context Response

These messages are sent from the GGSN to the controller or vice versa.

The table below lists the message attributes.

TABLE 10 Delete PDP context response attributes

Attribute	Presence	Type	Description
Flags • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • Spare bit- 0 • E - 0 • S - 1 • PN - 0	• Version - Determines the version of the GTP protocol • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0") • Extension header - Indicates the presence of a meaningful value of the next extension header • Sequence number - Value of the sequence number • N-PDU Number - Value of the N-PDU number
Message Type	M	Integer	Message type value is 21.
Length	M	Integer	This attribute indicates the payload length in octets.
TEID	M	Integer	This attribute identifies a tunnel endpoint in the receiving GTP-U or GTP-C protocol entity.
Sequence number	O	Integer	This attribute is used as a transaction identity for signaling messages having a response message defined for a request message. This is the sequence number value, which is copied from the request to the response message header.
Cause	M	Integer	This attribute indicates the acceptance or rejection of the corresponding request.
Error Indication	O	Integer	These messages are sent from the GGSN to the controller. Error Indication on page 18 lists the message attribute.

Error Indication

Error indication message is supported by the controller when it is received at the data path.

When an error indication is received for a particular PDP, then the session is cleared on the controller. The table below lists the message attribute.

TABLE 11 Error indication

Attribute	Presence	Type	Description
GSN Address	M	Integer	This attribute is the SGSN address used for signaling.

Path Management Messages

Path Management Messages overview

Path management messages supervise an UDP/IP path to ensure connectivity failures are detected on time. This is managed by frequently sending GTP echo or echo response packets between the controller and the GGSN.

Echo Request

These messages are sent from the controller to GGSN server or from GGSN server to the controller.

The table below lists the message attributes.

TABLE 12 Echo request attributes

Attribute	Presence	Type	Description
Flags: • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • Spare bit- 0 • E - 0 • S - 1 • PN - 0	• Version - Determines the version of GTP protocol • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0") • Extension header - Indicates the presence of a meaningful value of the next extension header • Sequence number - Value of the sequence number is set to zero (0). • N-PDU Number - Value of the N-PDU number is set to zero (0).
Message Type	M	Integer	Message type value is 1.
TEID	M	Integer	This attribute value is set to zero (0).

Echo Response

These messages are sent from the controller to the GGSN server or vice versa. The table below lists the message attributes.

TABLE 13 Echo response attributes

Attribute	Presence	Type	Description
Flags: • Version • Protocol type • Spare bit • Extension header • Sequence number • N-PDU flag	M	• Version - 1 • PT - GTP (1) • Spare bit- 0 • E - 0 • S - 1 • PN - 0	• Version - Determines the version of the GTP protocol. • Protocol type - Protocol discriminator between GTP (when PT is "1") and GTP' (when PT is "0"). • Extension header - Indicates the presence of a meaningful value of the next extension header. • Sequence number - Value of the sequence number is set to zero (0). • N-PDU Number - Value of the N-PDU number is set to zero (0).

TABLE 13 Echo response attributes (continued)

Attribute	Presence	Type	Description
Message Type	M	Integer	Message type value is 2.
Recovery	O	Integer	Indicates if the peer GSN restarts. The value matches the values of the messages received from GGSN.
TEID	M	Integer	This attribute value is set to zero (0).

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