PacketScan[™] GPRS Protocol Analyzer for Wireless & IP Networks



Overview

GPRS, or General Packet Radio Service, was introduced (in the late 90's and early 2000's) to provide data carrying capabilities to basic GSM networks and 3G networks. GL's <u>GPRS Protocol Analyzer</u> within **PacketScan™-All IP Protocol Analyzer** is an optional module (PKV103) available with additional licensing with PacketScan analyzer (PKV100).

With the support of additional license, the PacketScan[™] permits continuous GPRS data connectivity over wireless GSM networks. The GPRS Analyzer when connected between SGSN and BSS elements of a GPRS network, permits the monitoring of Gb interface. Similarly, when connected between SGSN and GGSN elements, permits monitoring of the Gn interface.

GL's GPRS Protocol Analyzer offers powerful features to capture, monitor, decode, and collect statistics of GPRS messages over IP.

For more details, refer <u>PacketScan[™] - All-IP Analyzer</u> webpage.

Main Features

- Decode and analyze signaling and user data protocols over Gb and Ga/Gn interfaces
- Provides details about routing area update, PDP activation, and traffic patterns in the network
- Any protocol field can be added to the summary view, filtering, and search features providing users more flexibility to monitor required protocol fields
- Trigger intelligent actions based on signaling and traffic conditions
- Support for Multi-technology, Multi-protocol
- Displays Summary, Detail, Hex dump, Statistics, and Call Detail Views
- Hex dump View displays the frame information in HEX and ASCII format, the contents of this view can also be copied to clipboard
- Statistics View displays statistics based on frame count, byte count, frames/sec, bytes/sec etc for the entire capture data
- Call Detail View displays called/ calling number, released calls, call status, & more
- Provides a consolidated interface for all the important settings required in the analyzer. All the configuration settings done in any of these options can be saved to a file, loaded from a configuration file
- Allows the captured frames to be saved to a trace file using different conventions such as user-defined prefixes, date-time prefixes, total number of files, file size, frame count, or time limit
- Supported on Windows[®]8 and above (32 bit and 64 bit) Operating System

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Protocol Stack and Standards

Entire GPRS IP stack supported by PacketScan[™].

GMM SMG SMS TOM SNDCP
LLC
BSSGP
GPRS-NS
UDP
IP
MAC
GPRS Gb

Figure: GPRS Gb over IP Protocol Stack

GTP-IP
GTPv2
UDP
IP
MAC
GPRS Gn

Figure: GPRS Gn over IP Protocol Stack

Supported Protocols	Standard / Specification Used				
	GPRS Gb Interface				
BSSGP	3GPP TS 08.18 V8.10.0				
LLC	3GPP TS 04.64 V8.7.0				
GMM	3GPP TS 04.08 V7.19.0				
SMS	3GPP TS 03.40 V7.5.0 / GSM 03.38 version 7.2.0				
ТОМ	3GPP TS 04.64 V8.7.0 (2001-12)-Annex B				
SNDCP	3GPP TS 04.64 V8.7.0				
SMG	3GPP TS 04.08 V7.19.0				
NS (Network Service Frame Relay)	GSM 8.16 ETSI TS 101 299 V8.0.0				
GPRS Gn Interface					
GTP / GTPv2 / GTP	3GPP TS 09.60 V7.9.0 / 3GPP TS 29.060 V6.5.0 / 3GPP TS 32.005 V3.7.0 and 3GPP TS 32.015 V3.12.0				

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Summary and Detail View of GPRS over IP

User can select a frame in Summary View to analyze and decode each GPRS over IP frame in the Detail View.

The detail view of GPRS over IP call displays the following:

- MAC Layer
- IP Layer
- UDP Layer
- GTP Layer
- GTP IP Layer
- GTP UDP Layer

APacketScan 🔆	(All-in-One)						_ 🗆
<u>F</u> ile ⊻iew Cap	oture <u>S</u> tatistics [atabase Call Detail <u>R</u> ec	ords <u>⊂</u> onfigure	Help			
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Dev	Frame#	TIME (Relative)	Len IC	IP Type	Error M	essage Type	Protocols
$\sqrt{0}$	54	00:01:44.845729	119		G	-PDU	Internet IP(IPv4)
/ 0	55	00:02:22.716729	143				Internet IP(IPv4)
(0	EC .	00.02.22.110120	110		0	DDII	Internet ID(ID(4)
•							<u>•</u>
	GTP'/	GTP Laver =====		-			
02A Versio	on	,		= 001	GTP V1		
02A Proto	col Type			=1.	GTP V2		
GTP La	ayer Message			=			
02A E				=	0 Not Pre	esent	
02A S				=	.1. Presen	t	
02A PN				=	1 Presen	t	
02B Messa	age Type			= 11111	111 G-PDU		
02C Leng	th of GTP Me	ssage		= 69 (x	0045)		
02E Tunne	el Endpoint	Identifier		= 8 (x0	0000008)		
032 Seque	ence Number			= 1482	(x05CA)		
No Er	xtension Hea	der		= x00			
	===== GTP I	P Layer ======		=			
1036 Versio	on			= 0100.	(4)		
1036 Intern	net Header I	ength (In 32 bi	t words)	=0	101 (5)		
Type o	of Service			=			
1037 Prece	edence			= 000	Routine		
1037 Delay	У			=0.	Normal	Delay	
1037 Thro	ughput			=0	Normal	Through	put
0037 Relia	ability			=	U Normal	Reliabi	lity
1037 Reser	rved for Fut	ure Use		=	.00 (0)		
1038 Total	Length			= 65 (X	0041)		
03A Ident:	ification			= 26033	(x65B1)		
103C Reserv	ved			= 0	(0)		
U3C DF				= .0	May Fra	agment	
U3C MF				=	Last F:	ragment	
U3C Fragme	ent Offset			= U (.00000 0000	00000)	
103E Time	To Live			= 255 (XFF)		
USF Proto	CO1			= 00010	UUI User Da	atagram	
JU4U Header	r Check Sum			= XESF5			~ ~
1042 Source	e IP Address	1		= 192.1	68.2.201 (RCUA802C	9)
1046 Destin	nation IP Ad	dress		= 125.2	2.47.125 (x7D162F7	D)
	== GIP U	Dr Layer ======			(**F2DA)		
DOMA SOUTCE	e Fort			- 50330	(XESDA)		
DAE Jesti	hation Fort	Data)		= 15 (x	0025)		
1050 Check	n (neauer +	Data)		= 36792	(VSFAF)		
	SWA	1		= 50705	(AULHE)		
)ff-line Viewing		E:\BACKUP	Document_Imag	les\P 3 490 F	rames		

Figure: Detail View of GPRS over IP

INI Decode Options

The .INI file configuration enables the user to enter the required custom value for each protocol in the PacketScanProt.ini file (located in Program Files\GL Communication Inc) to get proper decodes. For GPRS protocols, enter the minimum and maximum UDP source and destination port values to decode GPRS messages over IP.

PacketScanProt - Notepad	-		×		
<u>F</u> ile <u>E</u> dit F <u>o</u> rmat <u>V</u> iew <u>H</u> elp					
; UDP Port values for GPRS-GB. ^					
[#UDP_PORT_FLAG_INDEX]					
UDP_PORT_GB_MIN = 2100					
$UDP_PORI_GB_MAX = 2200$					
			¥ .		



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GPRS Statistics

The Statistics are calculated based on the GPRS protocol fields. The figure below depicts statistic data based on **Create PDP Context Request** and **Delete PDP Context Request** message types of GPRS protocol decodes in PacketScan[™].

PAPac	:ketScan (#	\ll-in-One)						
Eile V	/iew Captu	re <u>S</u> tatistics <u>D</u> ataba	se Call	Detail <u>R</u> ecords <u>C</u> onfig	ure <u>H</u> elp			
	🖆 🖊 🔒	🖉 🕒 🖳 🎦			• 🚮 🎀 🛒 _⊈		GoTo	
Dev	Frame#	TIME (Relative)	Len	Error Message Type	Protocols	Source IP Address	Destination IP Address	GTP UDP Des 🔺
$\sqrt{0}$	44	00:00:31.181000	119	G-PDU	Internet IP(IPv4)	192.168.2.102	192.168.2.101	53
V 0	45	00:04:45.347459	213	G-PDU	Internet IP(IPv4)	192.168.2.101	192.168.2.102	64423
V 0	46	00:04:47.972459	234		Internet IP(IPv4)	192.168.2.102	192.168.2.150	
V 0	47	00:04:48.347459	209	G-PDU	Internet IP(IPv4)	192.168.2.101	192.168.2.102	58330
V 0	48	00:04:51.004459	230		Internet IP(IPv4)	192.168.2.102	192.168.2.150	
V 0	49	00:05:07.976459	143		Internet IP(IPv4)	192.168.2.150	192.168.2.102	
V 0	50	00:05:10.145459	118	G-PDU	Internet IP(IPv4)	192.168.2.102	192.168.2.101	53
V 0	51	00:04:46.365459	222	G-PDU	Internet IP(IPv4)	192.168.2.101	192.168.2.102	60826
V 0	52	00:04:49.026459	243		Internet IP(IPv4)	192.168.2.102	192.168.2.150	
V 0	53	00:01:41.919729	144		Internet IP(IPv4)	192.168.2.150	192.168.2.102	-
								▶
9	Message Typ	De 🖩	Frame	Count(Message Type)				
Create	PDP Contex	t Request (16) 2						
Create	PDP Contex	t Response (17) 2						
Delete PDP Context Request (20) 2								
Delete PDP Context Resource (21) 2								
G-PDU	J (255)	1167						
'				E:\BACKUP\Doc	ument Images\Packet	3 490 Frames		

Figure: Statistic View

Network-Wide Monitoring of GPRS Network

GL's NetSurveyorWeb[™] is a web-based client that can connect to GPRS protocol analyzer probe for monitoring the entire SIGTRAN network through a web server that facilitates display of call data records, protocol frames, and KPIs. This system allows you to deploy multiple SIGTRAN Analyzer probes to be deployed at strategic locations in a network, transmit and collect voice, data, protocol, statistics, and performance information, and relay this information to a central / distributed network management system (NMS).

For more details, visit Packet Monitoring and Surveillance System webpage.



Buyer's Guide

Item No	Product Description
<u>PKV103</u>	IP Based GSM and UMTS Analyzer, requires PKV100
<u>PKV109</u>	Offline GSM and UMTS Analyzer, requires PKV101
<u>PKV100</u>	PacketScan™ (Real-time and Offline)
<u>PKV101</u>	PacketScan™ - Offline
<u>PKV120</u>	PacketScan™ HD – High Density IP Traffic Analyzer w/ 4x1GigE - includes PKV100 – Online (not Offline) for temporary audio codec support
<u>PKV122</u>	PacketScan™ HD – High Density IP Traffic Analyzer w/ 2x10GigE - includes PKV100 – Online (not Offline) for temporary audio codec support
<u>PKV170</u>	NetSurveyorWeb™ (Network Surveillance Software) for IP Network

<u>Note</u>: PCs which include GL hardware/software require Intel or AMD processors for compliance.

For more details, refer <u>PacketScan[™]-All IP Protocol Analyzer</u> webpage.



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