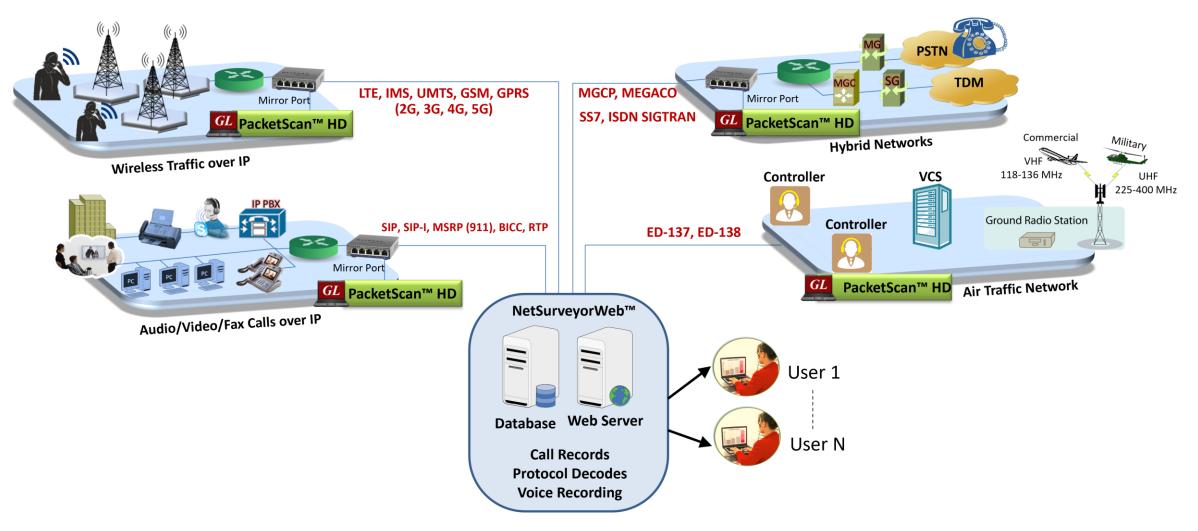
PacketScan[™] High Density All-IP Analyzer (1, 10, 25, 40, or 100 GigE Networks)



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878 Phone: (301) 670-4784 Fax: (301) 670-9187 Email: <u>info@gl.com</u> Website: https://www.gl.com

PacketScan[™] HD All-IP Signaling and Traffic Analysis (2G/3G/4G/5G/VoIP/RTP, RTCP/Fax Analysis)





PacketScan™ HD Features

- Signaling Protocol analysis: SIP, MGCP, MEGACO, H.323, SCTP, SCCP (Skinny), SS7 SIGTRAN, ISDN-SIGTRAN, GSM A over IP, GPRS over IP, UMTS over IP, LTE, Diameter
- Voice/Fax Captures, segregates, and monitors packets; perform voice quality testing in real-time over VoIP network. G.711, G726, GSM, GSM EFR, GSM HR, G729/B, G.722, G.722.1, ILBC, SPEEX, SMV, T.38
- Video Calls Video quality statistics such as MDI (Media Delivery Index), Packet Lost, Duplicate, out of sequence and Frame Rates are provided for each video session
- 5G Analyzer Captures, decodes, and collects statistics over N1N2, N4, N8, N12 and N13 interfaces of the 5G network
- NetSurveyorWeb Can be deployed as a Probe for a centralized monitoring system connected to an Oracle database



Why this product?

- Lossless wirespeed capture of IP traffic across high speed (1, 10, 25, 40, and 100 GigE) links
- Non-intrusive capture and record over Ethernet (Electrical and Optical) interfaces at nano-second time precision
- Filter on inner layer of GTP tunnel traffic like inner IPv4/IPv6 addresses
- Ability to capture and analyse high volume calls with traffic. Process up to 20000 simultaneous calls with bidirectional RTP traffic.
 Up to 50,000 calls can be achieved by scaling with higher configurations
- PacketScan[™] HD available in both Portable as well as 2U rack mounted Network Monitoring Appliance w/ 4x 1GigE (PKV120) or 2x 10GigE (PKV122) network interface cards
- Create up to 10 user defined hardware filters to filter-out traffic based on MAC, 802.1Q (VLANs), IPv4, TCP, UDP, SIP, and RTP parameters
- Supports almost all industry standard IP and Wireless Protocols (from SIP to LTE)
- Supports all RTP traffic Voice, Video, Fax T.38, Digits, Tones, Impairments
- Capture and Call processing is enhanced to handle different Tunnel traffic (VXLAN, GRE and GTP) and multiple tunnelling
- Support for eCPRI decode



Key Features

- User can create their own filters using custom filter option which provides flexibility to check the fields and use the logical conditions more efficiently
- Supports decoding of eCPRI protocol
- Long-Term activity reporting
- Captures, Segregates, Monitors, Build CDRs, and Collects Statistics on all IP calls
- In-depth real-time and post-process data investigation using Packet Data Analysis (PDA) feature
- Complex Filtering and Search capabilities to record all or filtered traffic into a trace file
- Supports TCP Analytics application analyzes TCP connections between both internal Local Area Network (LAN) and external Wide Area Network (WAN) computers including servers and clients. The application helps troubleshoot large bandwidth consumption, failed TCP sessions, packet loss, poor TCP throughput and more
- Provides Call Quality Scores like MOS, R-Factor, Delay, Jitter, Packet Loss and more
- Supports Centralized Remoter Network Monitoring with NetSurveyorWeb[™] a web-based client that can connect to PacketScan[™] probes through a web server that facilitates display of call data records using a web interface



Supported Protocols and Codecs

	Supported Codecs	Supported Protocols
•	G.711 A/µ-law	• SIP, SIP-I, SIP-T, H.323, MEGACO, MGCP, Diameter, Skinny
•	G.722, G.722.2 (AMR-WB), G.722.1, G.726, G.729A/B	(SCCP)
•	GSM (EFR, FR and HR)	• LTE
•	AMR (Narrowband and Wideband)	• 5G N1N2, N4, N12, N13
•	EVRC, EVRCB, EVRC-C, iLBC, Speex, SpeexWB, RFC 2833, and user-	• SIGTRAN – SS7, ISDN
	defined codecs for voice and tones.	GSM A and Abis over IP
•	EVS OPUS	GPRS Gb and Gn over IP
\backslash	isit Voice Codec webpage for more details	UMTS IuCS and IuPS over IP
		T.38 Fax and Video calls
		Visit Supported Protocols for more details

For more information on other features, refer to PacketScan[™] Basic (PKV100) presentation.

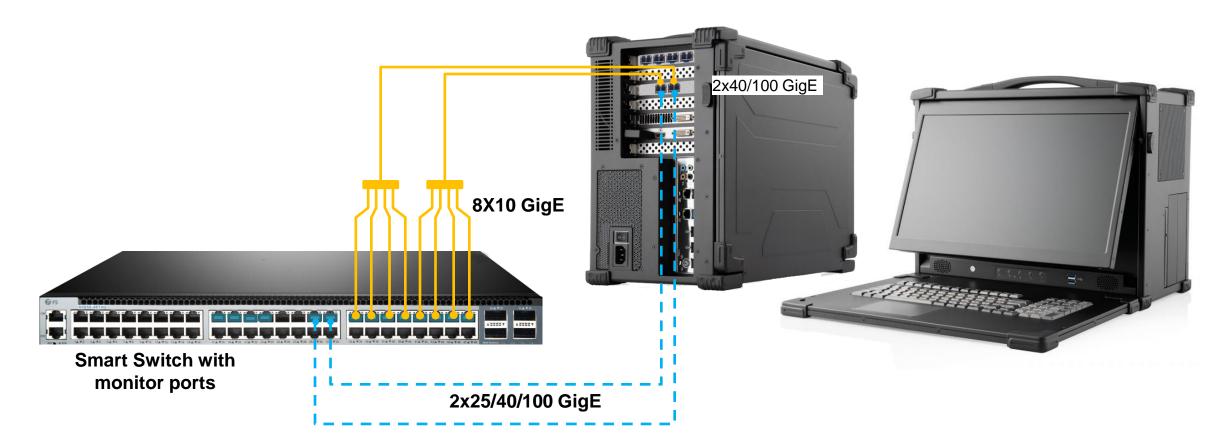


PacketScan[™] HD (4x1 GigE, 2x1/10 GigE, 2x25 GigE, 8x10 GigE, and 2x40/100 GigE)





PacketScan[™] HD with 2 x 25/40/100 GigE or 8 x 10 GigE



The above setup could manage rates as below:

- 2 x 25/40/100 GigE card can also be used as 8 x 10 GigE (with Breakout)
- System can also be outfitted with multiple cards with easy switching



PacketScan[™] HD 2U Rack Appliance





Back Panel



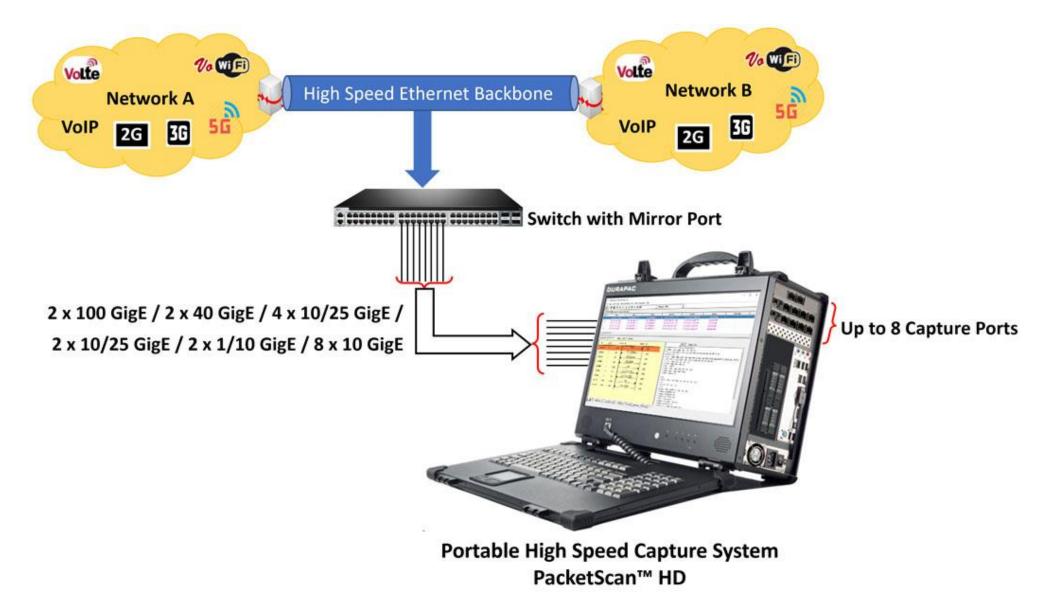
PacketScan[™] HD Systems

• PacketScan[™] HD appliance is also available in three systems "Low End", "Medium End" and "High End"

	Low End	Medium End	High End
Data Rate	4x1GigE	4x1/10GigE Or 2x1/10GigE	8x10GigE, 2x10/25GigE, 2x40GigE, 2x100GigE
RAM	16 GB RAM	32 GB RAM	128 GB RAM
NVME Storage [SSD]	2 TB	4x SSDs user configurable disk size (4x 1.92 TB in the base configuration)	8x SSDs user configurable disk size (8x 3.84 TB in the base configuration)



High Density Traffic





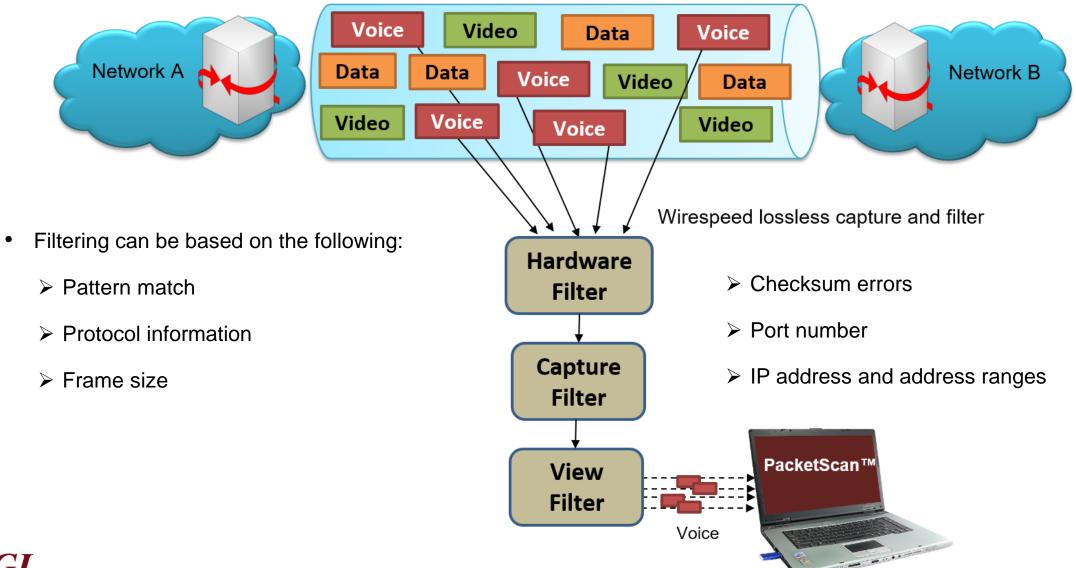
RTP Traffic Capabilities and Performance

Product Version	Max Simultaneous Calls							
	Signaling + RTP Voice Traffic							
PacketScan 1G (4x 1GigE) SIP 64-bit	 20000 calls with bi-directional RTP traffic Extracting/recording voice 2500 simultaneous calls (maximum) Option to record filtered calls of interest only 							
PacketScan 10G (2x 10GigE) SIP 64-bit	 30000 calls with bi-directional RTP traffic Extracting/recording voice 2500 simultaneous calls (maximum) Option to record filtered calls of interest only 							

** The above performance is evaluated on a high-end Core i7 system with typical 12GB RAM



Wirespeed Filtering

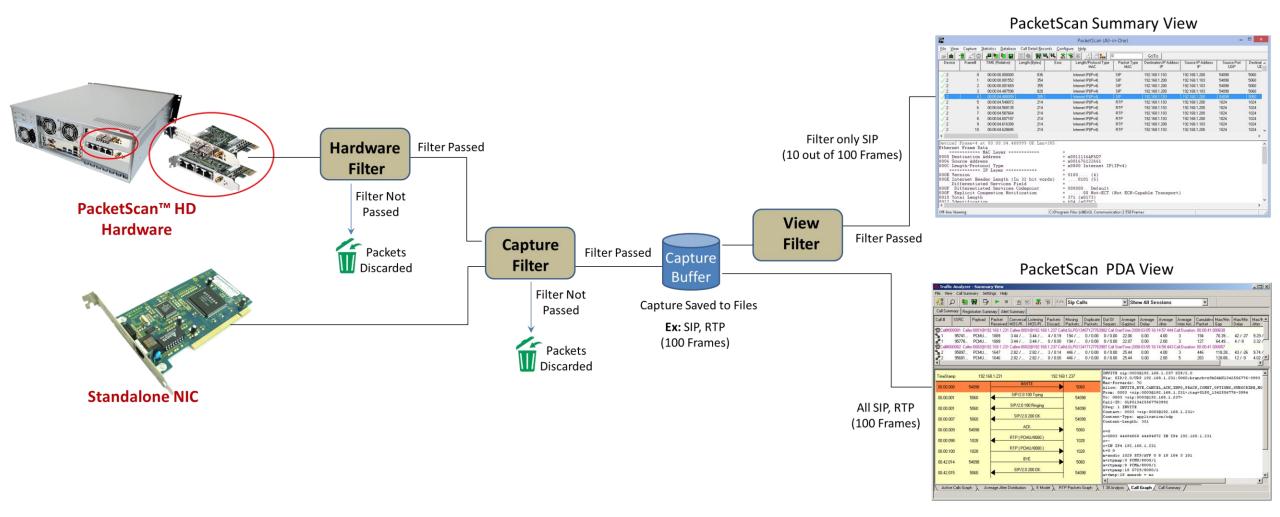


3 Stages of Filtering

- Hardware Filter (HWF) "Special NIC" with hardware filtering very fast
- Capture Filter (CF) Powerful software filtering but a little slower
- View Filter (VF) applies on the captured frames to filter only frames of interest
- PacketScan[™] HD captured files to/from Wireshark®
- PacketScan[™] HD PDA for detailed voice, fax, and video analysis

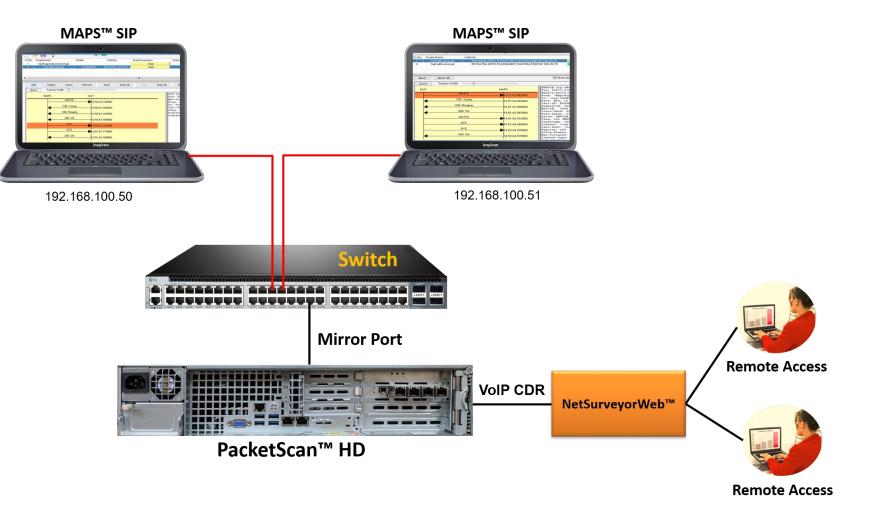


3 Stages of Filtering (Contd.)



Communications

Demo



- Generate VoIP calls (SIP signaling and RTP traffic) with MAPS[™] SIP
- Connect PacketScan[™] HD to a mirror port
- Capture and analyze the VoIP calls



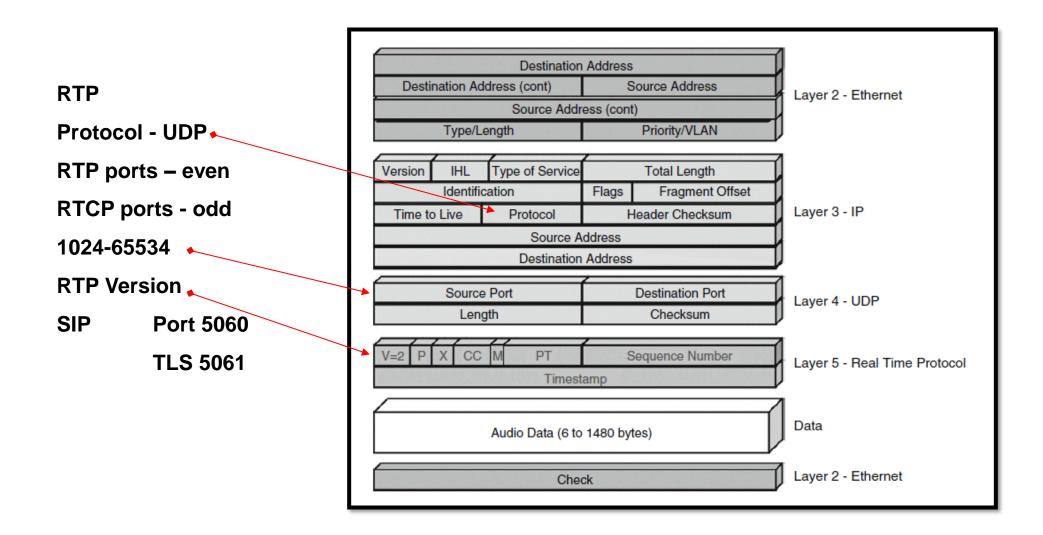
Link and Ports Interface Testing

			n			3.8.5.7-8a9442			
	A	Type		Link	Down	Rx		x Max	
-	0	SFP+		Full	2	499.99M	0.00		55.50 C
	0	SFP+		Full	15	2.25M	0.00		53.80 C
	1	SFP-CU		Full	0	0.00M	0.00		N/A
	1	SFP-CU		Full	0	0.00M	0.00		N/A
		P Empty		Down	0	0.00M		M 9018	
5	1 SF	P Empty		Down	0	0.00M	0.00	M 9018	N/A
Port	0 - A	dapter () Intf	0: NT		ork adapter			Totals
Port						ork adapter 1 counters Octets	: #0	0000052	Totals
Pack		:	# 00000	00007	RX RMON	1 counters			
Pack Broa	ets	:	#00000 #00000	000007	RX RMON 01452306 00000000	1 counters Octets	: #0	0000000	6089229846
Pack Broad 64 of	ets dcast	:	#00000 #00000 #00000	000007	<u>RX RMON</u> 01452306 000000000 000000000	<u>1 counters</u> Octets Multicast	: #0 : #0	0000000	6089229846 0701451020
Pack Broad 64 of 128-3	ets dcast ctets 255 oc	: : : tets :	#00000 #00000 #00000	000007	<u>RX RMON</u> 01452306 000000000 000000000	1 counters Octets Multicast 65-127 octets	: #0 : #0 s : #0	000000000000000000000000000000000000000	26089229846 00701451020 0000000000000000000000000000000000
Pack Broad 64 of 128-1 512-1	ets dcast ctets 255 oc	tets :	#00000 #00000 #00000 #00000	000007 000000 000000 000000 000007	<u>RX RMON</u> 01452306 000000000 000000000 000000000	1 counters Octets Multicast 65-127 octets 256-511 octets	: #0 : #0 s : #0 ets: #0	000000000000000000000000000000000000000	26089229846 00701451020 0000000000000000000000000000000000
Pack Broa 64 o 128- 512- Unde	ets dcast ctets 255 oc 1023 o	tets : ctets :	#00000 #00000 #00000 #00000 #00000	000007 000000 000000 000000 000007 000007	RX RMON 01452306 000000000 000000000 000000000 0000000	1 counters Octets Multicast 65-127 octets 256-511 octets 1024-1518 octe	: #0 : #0 s : #0 ets: #0 : #0		26089229846 00701451020 0000000000000000000000000000000000
Pack Broad 64 od 128- 512- Unde Frag	ets dcast ctets 255 oc 1023 o rsize	tets : ctets : :	#00000 #00000 #00000 #00000 #00000 #00000	000007 000000 000000 000000 000007 000000	RX RMON 01452306 000000000 000000000 000000000 01452306 000000000	1 counters Octets Multicast 65-127 octets 256-511 octets 1024-1518 octe Oversize	: #0 : #0 s : #0 ets: #0 : #0 : #0		6089229846 0701451020 00000000000 0000000000000000 0000000
Pack Broad 64 od 128- 512- Unde Frag	ets dcast ctets 255 oc 1023 o rsize ments event	tets : ctets : : : : : : :	#00000 #00000 #00000 #00000 #00000 #00000	000007 000000 000000 000007 000007 000000	RX RMON 01452306 000000000 000000000 000000000 01452306 000000000 000000000	1 counters Octets Multicast 65-127 octets 256-511 octets 1024-1518 octe Oversize Collisions	: #0 : #0 s : #0 ets: #0 : #0 : #0 ors: #0		6089229846 0701451020 00000000000 0000000000000000 0000000

Quit Sensors Color stat XTimeSync MEEE 1588 PTP Stream Dump



Ethernet Frame Structure





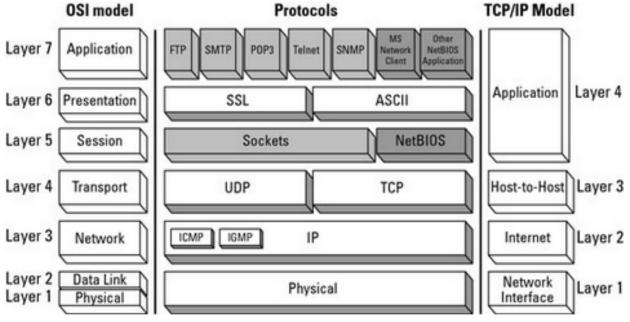
Open System Interconnection

		Layer	
Cables, NIC Basic Network Hardware 10BASE-T, 100BASE-T,	1	Physical	
1000BASE-T	2	Data Link	Switches Link Layer – physical addressing MAC, ARP, L2TP
Routers Internet layer - packet forwarding path determination,	3	Network	5, , ,
logical addressing IPv4, IPv6, MPLS	4	Transport	Transport layer – End-to-end connection and reliability UDP, TCP, SCTTP
Session/Port Layer – interhost	5	Session	
connection. SIP, RTP, HTTP, DNS	6	Presentation	Presentation layer – Data representation Encryption
Network process to application E-mail, Database	7	Application	



OSI TCP Model

The Transmission Control Protocol/Internet Protocol (TCP/IP) suite was created by the U.S. Department of Defense (DoD) to ensure that communications could survive any conditions and that data integrity wouldn't be compromised under malicious attacks.



Application (layer 4): Acts as final endpoints at either end of a communication session between two network hosts

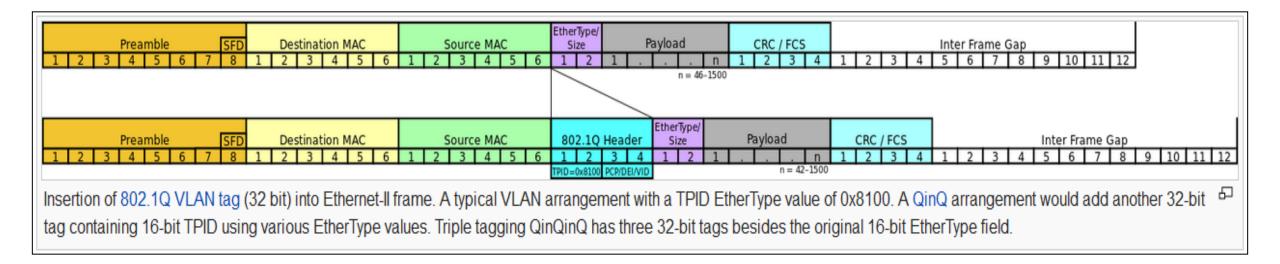
Host-to-host (layer 3): Manages the flow of traffic between two hosts or devices, ensuring that data arrives at the application on the host for which it is targeted

Internet (layer 2): Contains all functionality that manages the movement of data between two network devices over a routed network

Network interface (layer 1): Deals with all physical components of network connectivity between the network and the IP protocol



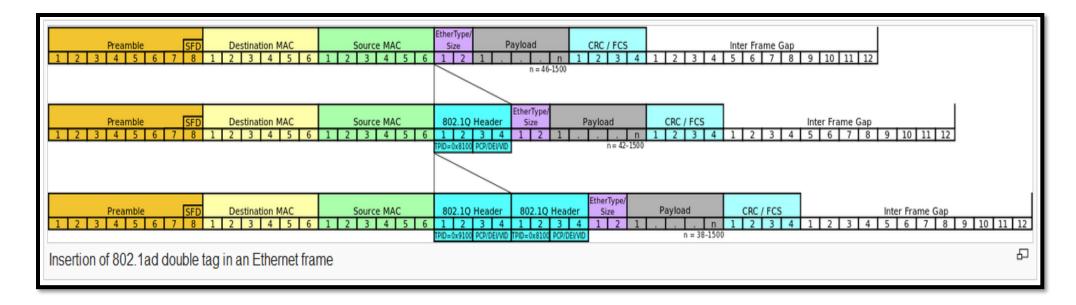
Ethernet Frame (FCS)



- Frame Check Sequence (FCS)
 - > The FCS field contains a number that is calculated by the source node based on the data in the frame
 - ➤ TRUE/FALSE



Ethernet Frame (VLANs)



IEEE 802.1Q is the networking standard that supports virtual LANs (VLANs) on an Ethernet network ٠

Tag Protocol Identifier (TPID)	16 bita	3	1	12 bits
Tag Control Information (TCI)	16 bits	bits	bit	12 bits
The TCI field is further divided into				
Priority code point (PCP)				TCI
Drop eligible indicator (DEI)	TPID	PCP	DEI	VID
VLAN identifier (VID)				



Internet Protocol IPv4

			ernet ader					erent vices			_			IP	v4 He	ade	r Fo	ormat		_	Expli Cong		ion	1 I										
Offsets	Octet	Ler	ngth		(0	Poin	t						1							Notif	cati	ion	1							3			
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	1	2 13	14	1	5 16	17	•	18 19	2	0	21 22	2	23	24	25	26	;	27 28	29	3	0 31
0	0		Vers	sion			IF	ΗL				DS	CP			E	CN								Total Length									
4	32				Identification Flags Fragment Offset																													
8	64			Tir	ne ⁻	To L	ive						Pro	otod	col									He	ad	ler C	he	cksur	n					
12	96												/			S	our	ce IP A	ddre	es	s													
16	128	Destination IP Address																																
20	160								O	otio	ons (if I	HL >	- 5	5)																				

Protocol Number	Protocol Name 🕨 🕨	Abbreviation
1	Internet Control Message Protocol	ICMP
2	Internet Group Management Protocol	IGMP
6	Transmission Control Protocol	TCP
17	User Datagram Protocol	UDP
41	IPv6 encapsulation	ENCAP
89	Open Shortest Path First	OSPF
132	Stream Control Transmission Protocol	SCTP

Identification – Used for uniquely identifying the group of fragments of a single IP datagram.

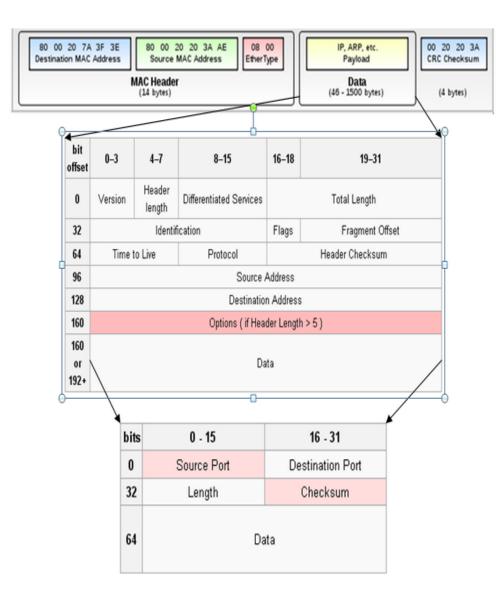
Flags – Used to control or identify fragments.

Fragment Offset – 13 bits long and specifies the offset of a particular fragment relative to the beginning of the original unfragmented IP datagram.



UDP Frame

UDP Port FTP – 20 Data Transfer FTP – 21 FTP Control SSH – 22 Telnet – 23 SMTP – 25 E-Mail HTTP – 80 HTTPS – 443 RTP – even 1024 - 65535 RTCP – odd SIP – 5060 (Destination Port) SIP over TLS - 5061





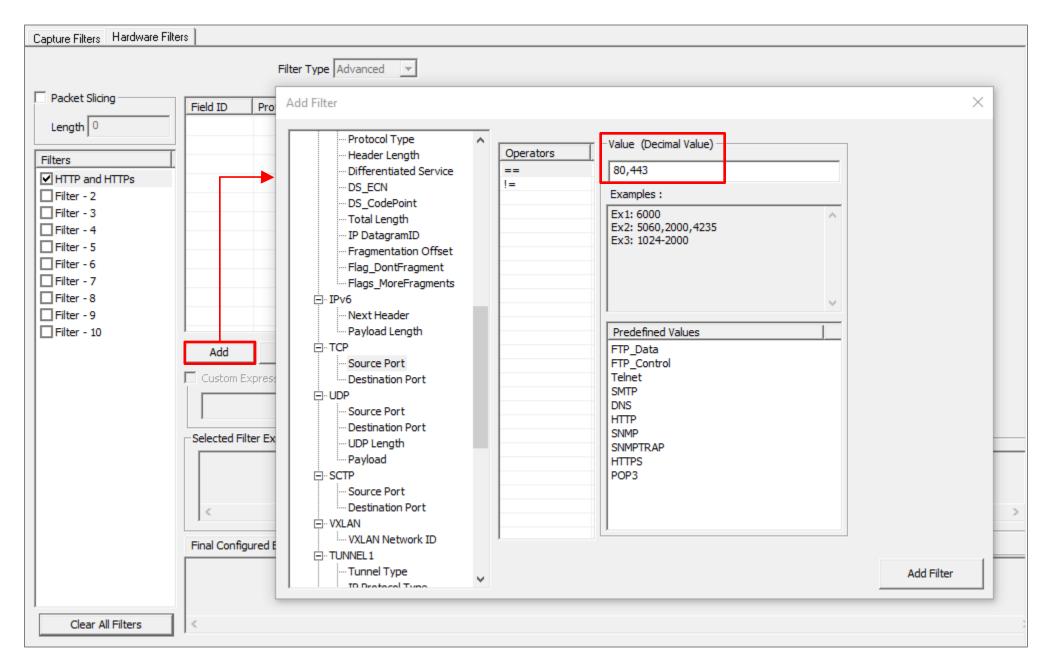
Real-time Analysis

🕌 PacketS	can (IpProt) HD										- 0 X	7	
File View	Capture Sta	itistics Database Call D											
i 🕋 🖆 🕚		년 🛄 🦉 🔛 📰 🌑	- W V W W	\$ \$ \$ \$ \$ \$ \$ \$		GoTo							
Device	Frame#	TIME (Relative)	Length (Bytes)	Error Packet Type MAC	Source IP Address IP	Destination IP Address IP		on Address V6	Source Port Do	estination Port Source Po UDP TCP	ort Destination Port TCP		
<u>√</u> 2	0	00:00:00.00000000		SIP	192.168.1.200	192.168.1.103		5		060	INV		
✓ 2	1	00:00:00.001552000		SIP	192.168.1.103	192.168.1.200				060	10(
2	2	00:00:00.001669000		SIP	192.168.1.103	192.168.1.200				060	18(\rightarrow	Summary View
2	3	00:00:04.487598000		SIP	192.168.1.103	192.168.1.200				060	20(
√ 2	4	00:00:04.488999000	385	SIP	192.168.1.200	192.168.1.103		5	54098 5	060	AC 🗸	·	
<											>	_	
Ethernet	Frame Dat					•	*** Right click to	SHOW/HI	DE layer de	etails or copy **	**		
	stination A	AC Layer ========		= = x0011116AF6D7									
	rce Addres			$= \times 0011110 \text{ MP 6D7}$								\rightarrow	Detail View
000C Len	gth/Protoc	ol Type		= x0800 Internet IP(I	Pv4)								
<	T	P Taver =======		=							>		
Hex Dump	of the Fr	ame Data									^		
+	6 X E6 D7	+	-+	++++ iöx va E									
		80 11 B0 F9 C0 A8		اں× ∨ <u>م</u> 12 6 > €°ùÀ¨ÈÀ¨									
01 67 D3	52 13 C4	03 22 FA 5F 49 4E	56 49 54 45	gÓR Ä "ú_INVITE								\rightarrow	Hex Dump View
		30 30 31 40 31 39		sip:0001@192.16							~		·
Σ ∎ Devi		Error Code	∑ Lengt		Σ	Time Stamp	∑ Destination Addr	ress		Source Address	Σ ^		
2		0	55	RTP (3)	×58	18989F839E9AB3	x0011116AF6D7			×001676122661	192.1		
total 2		total 0	total 55	total RTP (3)	tota	l x5818989F839E9AB3	total x0011116AF6D7			total x001676122661	total		
2		0	60	RTP (3)		D99FA3839E9AB3	x001676122661			x0011116AF6D7	192.1		
total 2		total 0	total 60	total RTP (3)		I x40D99FA3839E9AB	3 total x001676122661			total x0011116AF6D7	total		Statistics View
2		0	122	RTCP (2)		465EE27F9E9AB3	x0011116AF6D7			×001676122661	192.1		
total 2		total 0	total 122	total RTCP (2)	tota	I x70465EE27F9E9AB	3 total x0011116AF6D7			total x001676122661	total Y	·	
<											>	_	
Call ID	Call St	atus Protocol	Call Originati	ing (Number / Address)	Call Destination	(Number / Address)	Call Start Date & T	ime	Call Duration	Protocol Spec	cific Info		
0	Termina	ated SIP		0001@192.168.1.200		0001@192.168.1.103	54736-11375-00 00:00:00.	.9 00	:49:57.772500	SIPCalIID> GLPG-4	8363		
												\rightarrow	Call Detail Records View
Off-line Viev	. in a			CA Discourse File A	21. Communications In	c\PacketScan\E: 2 550 Fra							
Off-line Viev	wing.			U:\Program Files\I	ac communications in	iu (Mauketscan (E: jz 000 Fra	arries						

- Default panes summary, detail, and hex dump of the frame data views
- Optional panes statistics and call trace views



TCP Frame



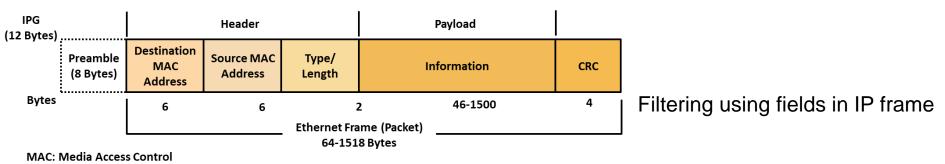
Filtering HTTP Traffic

Capture Filters Hardware Filter	rs							
		Filter T	ype Advanced 🚽					
Packet Slicing	Field ID	Protocol	Field Name	Operator	Value	Condition	Operators	Value (Decimal Value)
Length 0	F1	TCP	Source Port	==	80		==	80
	F2	TCP	Destination Port	==	80		!=	Examples :
Filters								Ex1: 6000 Ex2: 5060,2000,4235 Ex3: 1024-2000
Filter - 3								Predefined Values
Filter - 5								FTP_Data FTP_Control Telnet
Filter - 7								SMTP DNS
Filter - 9								НТТР
	Add	Insert	Delete Clear	All			Update	1
	Custom E	Expression					 	-
	F1 F2	2					 Validate & Update]
	Selected Fi	ilter Expressio	n					
	Assign[S	treamId = 10]	=((mTcpSrcPort == 80) OR	(mTcpDestPo	ort == 80))			^
								U I
	<							>
	Final Confid	oured Express	ions Final Applied Expressio					
			((mTcpSrcPort == 80) OR (n	1	== 80))		 	~
								×
Clear All Filters	<							>

Hardware Filters for Ethernet Fields

Capture Filters Hardware Filte	rs							
		Filter T	ype Advanced 💌					
Packet Slicing	Field ID	Protocol	Field Name	Operator	Value	Condition	Operators	Value (Hex Value)
Length 0	F1	MAC	Ether Type	==	0800		==	0800
								Examples :
	-		MAC (Ether Typ	pe)				Note:Supports single & multiple value only Ex1: 0809
🗄 GENERAL								Ex2: 8100,9000,AF02
🕒 🖽 MAC			802.1Q (VLAN	S)				Predefined Values
🕀 VLANO	L		IPv4					AARP (0x80F3) AppleTalk (0x809B)
🕀 VLAN1								ARP (0x0806) ATA over Ethernet(0X88A2)
🔄 VLAN2			IPv6					Audio Video Transport Protocol (0x22f0)
IPv4	ļ			_				CFM Protocol / OAM (0x8902)
. IPv6	Add	Insert	Delete Clear	All			Update	1
. ARP	Custom E	Expression					 	-
I TCP							 Validate & Update	1
😟 UDP	Columbral E	lt	-					<u> </u>
🛓 · SIP		Iter Expression	n =((mMacTypeLength == 0xi	1800))				
	- Abbighto	u cumiu – 10j		,				
	<							>
	1							
	Final Config	gured Express	ions Final Applied Expressio	ns				
								^
								~
Clear All Filters	<							>

Ethernet Frame Structure



Ethernet Frame Format

IPG: Inter Packet Gap

CRC: Cyclic Redundancy Check

802.3 Ethernet packet and frame structure

Layer	Preamble	Start of frame delimiter	MAC destination	MAC source	802.1Q tag (optional)	Ethertype (Ethernet II) or length (IEEE 802.3)	Payload	Frame check sequence (32-bit CRC)	Interpacket gap			
	7 octets	1 octet	6 octets	6 octets	(4 octets)	2 octets	46(42) ^[b] -1500 octets	4 octets	12 octets			
Layer 2 Ethernet frame			\leftarrow 64–1518(1522) octets \rightarrow									
Layer 1 Ethernet packet	← 72–1526(1530) octets →											



Filtering SIP and RTP Traffic

Capture Filters Hardware Filte	as								
		Filter T	ype Advanced 🚽						
Packet Slicing	Field ID	Protocol	Field Name	Operator	Value	Condition	Layer 4 Protocol	Value (Decimal Value)	
Length 0	F1	SIP	SIP Port	==	5060		UDP	5060	
	F2	RTP	RTP Packets	==	TRUE		Г ТСР	Examples :	
Filters								Ex1: 5060	^
Filter - 2	L						SCTP	Ex2: 5060,2000,4235 Ex3: 5060-5070	•
Filter - 3	L							1	•
Filter - 4	L								
Filter - 5									
Filter - 7									
Filter - 8									
Filter - 9									
	Add	Insert	Delete Clear	All			Update	1	
	Custom E	_]]	
	F1 F2	-						1	
							Validate & Update]	
	Selected Fil	ter Expressior	1						
	HashMas	k[mHashMask	SrcPort = 0xFFFE; mHashMas	skDstPort = 0	xFFFE] = Hash5Tuple			^	
	Assign[S	treamId = 10]	=((((Layer4Protocol == UDF)) AND (mSrcf	Port == 5060 OR mDe	estPort == 5060)) OR ((mUdpSrcPort != (0102	3)) AND (mRtpVersion==2)))	
	<								
								7	
	Final Config	jured Expressi	ons Final Applied Expressio	ns					
	HashMask[n Assign[Stre	nHashMaskSrc amId = 10] =(Port = 0xFFFE; mHashMaskD (((Layer4Protocol == UDP))	stPort = 0xFF AND (mSrcPor	FE] = Hash5Tuple t == 5060 OR mDest	Port == 5060)) OR ((ml	JdpSrcPort != (0., 1023))	AND (mRtpVersion==2)))	
Clear All Filters	<							>	
	,								

Packet Data Analyzer (PDA) Summary View

- Summary View displays -
 - Summary of data transmission in each direction including calling number, called number, call id, start time, duration, missing packets, etc.
 - Includes separate statistical counts on total packets, calls, failed calls, captured frames, etc., for SIP, H323, MEGACO, and RTP based calls
 - Provides various graphs to view active calls, average jitter distribution, E-model based measurements for R-factor / MOS/ Packet discarded, RTP packets, T.38 fax analysis, and call signaling, Gap, Jitter, Gap/Jitter Distribution, Wave and Spectral Display for media stream analysis, VoIP calls and more

ρ	🍓 🙀 📑 🕨 🖛	🖀 🕱 🕷 🖀 SI	P 🔹 Show All	Calls	•	Call Count: 824	
Summ	mary SIP Registration Summar	y Alert Summary					
ŧ	Caller	Callee	StartTime	Duration	VoiceQuality_L	VoiceQuality_R	Con
	0001@192.168.12.92	0001@192.168.12.94	2023-06-01 15:01:34.419	00:01:00.023			
	0002@192.168.12.92	0002@192.168.12.94	2023-06-01 15:01:34.482	00:01:00.033			
	0003@192.168.12.92	0003@192.168.12.94	2023-06-01 15:01:34.533	00:01:00.045			
	0004@192.168.12.92	0004@192.168.12.94	2023-06-01 15:01:34.583	00:01:00.037			
	0005@192.168.12.92	0005@192.168.12.94	2023-06-01 15:01:34.623	00:01:00.049			
	0006@192.168.12.92	0006@192.168.12.94	2023-06-01 15:01:34.684	00:01:00.041			
	0007@192.168.12.92	0007@192.168.12.94	2023-06-01 15:01:34.715	00:01:00.043			
	0008@192.168.12.92	0008@192.168.12.94	2023-06-01 15:01:34.786	00:01:00.024			
		Export Graph Duration	,,		Counter Type Total Calls Active Calls	Counters 824 0	\$
allsP	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed	824 0 756 0 68 0 824 5 496 5 496	-
e=2	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames	824 0 756 0 68 0 824 5 496 5 496 5 496	-
llsP	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded	824 0 756 0 68 0 824 5 496 5 496 5 496 5 496	-
e=2	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded TimeToProcess(mm:s)	824 0 756 0 68 0 824 5 496 5 496 5 496 5 496 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$
e=2	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded	824 0 756 0 68 0 824 5 496 5 496 5 496 5 496 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$
e=2	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded TimeToProcess/Sec :: Rate(N HdWriteDrop	824 0 756 0 68 0 824 5 496 5 496 5 496 5 496 5 496 1 0:0 Mbps) 0 :: 0.0	\$
e=2	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded TimeToProcess/Sec :: Rate(N	824 0 756 0 68 0 824 5 496 5 496 5 496 5 496 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	\$
e=2	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded TimeToProcess/Sec :: Rate(N HdlWriteDrop <frm:byte> VOIP Bandwidth</frm:byte>	824 0 756 0 68 0 824 5 496 5 496 5 496 5 496 5 496 0 1 0.0 Wbps) 0 :: 0.0	\$
20 15	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded TimeToProcess/Sec :: Rate(N HdlWriteDrop VOIP Bandwidth SIP Bandwidth H323 Bandwidth MEGACD Bandwidth	824 0 756 0 68 0 824 5496 5496 5496 5496 0 1 0.0 0 0.0 0.00 0.00 0.00 0.00	\$
20 15	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frame Purged Before Proce Queue ToDecode:Decoded TimeToProcess/Sec :: Rate(N HdlWriteDrop <frm:byte> VOIP Bandwidth SIP Bandwidth H232 Bandwidth MEGACO Bandwidth RTP Bandwidth RTP Bandwidth</frm:byte>	824 0 756 0 68 0 824 5 496 5 496 5 496 5 496 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0	\$
20 20 15 10 5	PerSecond 2023-06-01 - 15:02:13 CPS=1	Graph Start - (2023-05-31 15:02	2:16) Graph End - (2023-06-01 15:02		Total Calls Active Calls Completed Calls Purged Calls(cleared) Failed Calls Calls Per Second Non Purged Calls Total Frames Last Frame Processed Total Processed Frames Frames Purged Before Proce Queue ToDecode:Decoded TimeToProcess/Sec :: Rate(N HdlWriteDrop VOIP Bandwidth SIP Bandwidth H323 Bandwidth MEGACD Bandwidth	824 0 756 0 68 0 824 5496 5496 5496 5496 0 1 0.0 0 0.0 0.00 0.00 0.00 0.00	\$



Displaying Filtered Calls using Expressions

- Filter CDRs (Call Detail Records) based on parameters such as caller, time, message count, etc.
- The expression supports the following mathematical operators: ==, <=, >=, !=, <, >, &&, ||
- For example, the filter expression "Error Code==400||Error Code>600" will display calls with Error Code equal to 400 and calls with Error Code greater than 600

PDA Packet Data	Analyzer - Sun	nmary View				– 🗆 X
File View Cal	l Summary l	Protocol Config	urations GUI Configurations Help			
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Call Summary SI	P Registration 9	ummary Alert S	iummary			
Payload_R	ErrorCode	FailureCause	CallID	EndTime	PostDialDelay	SessionDisconnectDe
	400	5	GL-MAPS-2654-766727097-26124-3688@192.168.12.92	2023-06-01 15:02:12.275	9	0
	603	4	GL-MAPS-2679-766728649-26314-14696@192.168.12.92	2023-06-01 15:02:13.828	9	0
					10	0
	604	4	GL-MAPS-2677-766728698-26320-13540@192.168.12.92	2023-06-01 15:02:13.879	19	0
	604 606	4	GL-MAPS-2677-766728748-26320-13540@192.168.12.92 GL-MAPS-2677-766728748-26326-14572@192.168.12.92	2023-06-01 15:02:13.879 2023-06-01 15:02:13.919	9	0
						_



Save Call in *.hdl, *.pcap, and *.pcapng Formats

Call Summary SIP Registration Summary All Her Summary Callee StartTime Duration 1 00014/192.168.12.92 00014/192.168.12.94 2023-06-01 15:0134.419 000-01:00.023 2 00034/192.168.12.92 00034/192.168.12.94 2023-06-01 15:0134.420 000-01:00.033 3 00034/192.168.12.92 00034/192.168.12.94 2023-06-01 15:0134.823 Save Call 4 000-04/192.168.12.92 00036/192.168.12.94 2023-06-01 15:0134.833 Save Call 5 00036/192.168.12.92 00036/192.168.12.94 2023-06-01 15:0134.834 Copy Cell Value 6 0006/192.168.12.92 0003/192.168.12.94 2023-06-01 15:0134.715 000-01:00.043 7 0007/192.168.12.92 0003/192.168.12.94 2023-06-01 15:0134.715 000-01:00.043 8 0006/192.168.12.94 2023-06-01 15:0134.715 00-01:00.043 File Type File Type File Type Path [C:VProgram Files/GEL Communications Inc/VPacketScan/ mile Process/next 9 15 15 16 15 16 15:02:00 File Type 9 15 16 16 01-15:02:00 01-15:02:00 <th>_</th> <th></th>	_	
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2 0002€192.168.12.92 0002€192.168.12.94 2023-06-01 15:01:34.482 00:01:00.033 3 0003€192.168.12.92 0003€192.168.12.94 2023-06-01 15:01:34.683 Save Call Copy Cell Value 6 0006€192.168.12.92 0006€192.168.12.94 2023-06-01 15:01:34.683 00:01:00.043 8 0008€192.168.12.92 0006€192.168.12.94 2023-06-01 15:01:34.624 00:01:00.043 8 0008€192.168.12.92 0006€192.168.12.94 2023-06-01 15:01:34.624 00:01:00.043 Copy Cell Value 00:01:00.043 0:01:00.043 0:01:00.043 Copy Cell Value 0:001:00.043 Copy Cell Value 0:01:00.043 Copy Cell Value 0:001:00.043 Copy Cell Value 0:01:00.043 Copy Cell Value Copy Cell Value 0:01:00.043 Copy Cell Value Copy Ce	VoiceQuality_R	Con
3 0003@192.168.12.92 0003@192.168.12.94 2023-06-01 15:01:34.533 Save Call 4 0004@192.168.12.92 0005@192.168.12.94 2023-06-01 15:01:34.633 Copy Cell Value 6 0005@192.168.12.92 0000@192.168.12.94 2023-06-01 15:01:34.633 Copy Cell Value 6 0006@192.168.12.94 2023-06-01 15:01:34.623 000101:00:041 00:01:00:041 7 0007@192.168.12.92 0000@192.168.12.94 2023-06-01 15:01:34.715 00:01:00:041 8 0000@192.168.12.94 2023-06-01 15:01:34.715 00:01:00:041 00:01:00:041 6 0000@192.168.12.94 2023-06-01 15:01:34.715 00:01:00:041 00:01:00:041 7 0007@192.168.12.94 2023-06-01 15:01:34.715 00:01:00:041 00:01:00:041 6 000@192.168.12.94 2023-06-01 15:01:34.725 00:01:00:041 00:01:00:041 6 000@192.168.12.94 2023-06-11 15:01:34.725 00:01:00:041 00:01:00:041 7 Save Call - CallNum_3 File Type File Type File Type File Type 9 The Circle Type Type Type Type Type Type Type Typ		
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Copy Cell Value to Clipboard

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				v All Calls	•		Total : 824		
Call Sum	mary SIP Registration Summary	Alert Summary							
Call #	Caller	Callee	StartTime	Duration	VoiceQu	ality_L	VoiceQuality_	R	Cor \land
1	0001@192.168.12.92	0001@192.168.12.94	2023-06-01 15:01:34.419	00:01:00.023					
2	0002@192.168.12.92	0002@192.168.12.94	2023-06-01 15:01:34.482	00:01:00.033					
3	0003@192.168.12.92	0003@192.168.12.94	2023-06-01 15:01:34.5	Save Call					
4	0004@192.168.12.92	0004@192.168.12.94	2023-06-01 15:01:34.5	Copy Cell Value	↓				
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6	0006@192.168.12.92	0006@192.168.12.94	2023-06-01 15:01:34.684	00:01:00.041	_		_		
7	0007@192.168.12.92	0007@192.168.12.94	2023-06-01 15:01:34.715	00:01:00.043	File Edit F	ormat Vie	w Help		
8	0008@192.168.12.92	0008@192.168.12.94	2023-06-01 15:01:34.786	00:01:00.024	2023-06-0	01 15:01	L:34.533	<u>^</u>	~
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Calls	Per Second					Calls Per Se		0	
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						Total Frame	S	5 496	
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Calls F	Rate / RTP Packets Graph	Average Jitter Distribution	-Model), T.38 Analysis),	Call Flow \ Call Summary /				7	
							$\frac{\text{SIP}}{\text{NP}}$ RTP $\frac{1}{\text{ED}}$ ED137	,	



Packet Data Analysis (PDA) Call Graph – SIP Call

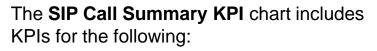
- Displays the message sequences of captured VoIP calls
- Decodes of the selected SIP message is displayed on the right pane

Caller 22. 168. 12.92 32. 168. 12.92 33. 168. 12.92 34. 168. 12.92 35. 168. 12.92 36. 168. 12.92 37. 17. 17. 17. 17. 17. 17. 17. 17. 17. 1	2 0002@192.1 2 0003@192.1 2 0004@192.1 2 0005@192.1 2 0006@192.1 2 0007@192.1 -	1	: 00:01:00.033 00:01:00.045 00:01:00.037 00:01:00.049 00:01:00.041 00:01:00.043	VoiceQuality_L VoiceQua	PCMU/8000 MuLAW_2/8000 PCMA/8000	Payload_R Result PCMU/8000 Pass MuLAW_2/8000 Pass PCMA/8000 Pass ALAW_2/8000 Pass G729/8000 Pass G7298/8000 Pass GSM/8000 Pass	ErrorCode 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
92. 168. 12.92 92. 168. 12.92		Construction Construction	00:01:00.023 00:01:00.033 00:01:00.045 00:01:00.037 00:01:00.049 00:01:00.041 00:01:00.043	VoiceQuality_L VoiceQua	PCMU/8000 MuLAW_2/8000 PCMA/8000 ALAW_2/8000 G729/8000 G729B/8000	PCMU/8000 Pass MuLAW_2/8000 Pass PCMA/8000 Pass ALAW_2/8000 Pass G729/8000 Pass G729B/8000 Pass	0 0 0 0 0
22. 168. 12. 92 22. 168. 12. 92 Frame# 0 1	2 0002@192.1 2 0003@192.1 2 0004@192.1 2 0005@192.1 2 0006@192.1 2 0007@192.1 -	68.12.94 2023-06-01 15:01:34.482 68.12.94 2023-06-01 15:01:34.533 68.12.94 2023-06-01 15:01:34.583 68.12.94 2023-06-01 15:01:34.623 68.12.94 2023-06-01 15:01:34.624 68.12.94 2023-06-01 15:01:34.715 iming Show Latest	2 00:01:00.033 3 00:01:00.045 3 00:01:00.037 4 00:01:00.049 4 00:01:00.041 5 00:01:00.043		MuLAW_2/8000 PCMA/8000 ALAW_2/8000 G729/8000 G729B/8000	MuLAW_2/8000 Pass PCMA/8000 Pass ALAW_2/8000 Pass G729/8000 Pass G729B/8000 Pass	0 0 0 0
92. 168. 12. 92 92. 168. 12. 92 Frame# 0 1	22 0003@192.1 22 0004@192.1 22 0005@192.1 22 0006@192.1 22 0007@192.1 22 0007@192.1 23 0007@192.1 24 0007@192.1 25060	68.12.94 2023-06-01 15:01:34.533 68.12.94 2023-06-01 15:01:34.583 68.12.94 2023-06-01 15:01:34.623 68.12.94 2023-06-01 15:01:34.624 68.12.94 2023-06-01 15:01:34.715 iming Show Latest	00:01:00.045 00:01:00.037 00:01:00.049 00:01:00.041 00:01:00.043		PCMA/8000 ALAW_2/8000 G729/8000 G729B/8000	PCMA/8000 Pass ALAW_2/8000 Pass G729/8000 Pass G729B/8000 Pass	0
92. 168. 12. 92 92. 168. 12. 92 1	22 0004@192.1 22 0005@192.1 22 0006@192.1 22 0007@192.1 23 0007@192.1 24 0007@192.1 25060	68.12.94 2023-06-01 15:01:34.583 68.12.94 2023-06-01 15:01:34.623 68.12.94 2023-06-01 15:01:34.623 68.12.94 2023-06-01 15:01:34.715 iming Show Latest	00:01:00.037 00:01:00.049 00:01:00.041 00:01:00.043		ALAW_2/8000 G729/8000 G729B/8000	ALAW_2/8000 Pass G729/8000 Pass G729B/8000 Pass	0
92. 168. 12. 92 92. 168. 12. 92 92. 168. 12. 92 92. 168. 12. 92 Frame# 0 1	22 0005@192.1 22 0006@192.1 22 0007@192.1 22 0007@192.1 23 Absolute T 192 5060	68.12.94 2023-06-01 15:01:34.623 68.12.94 2023-06-01 15:01:34.684 68.12.94 2023-06-01 15:01:34.715	00:01:00.049 00:01:00.041 00:01:00.043		G729/8000 G729B/8000	G729/8000 Pass G729B/8000 Pass	0
92. 168. 12.92 92. 168. 12.92 Frame# 0 1	22 0006@192.1 22 0007@192.1 - Absolute T 192 5060	68.12.94 2023-06-01 15:01:34.684 68.12.94 2023-06-01 15:01:34.715	00:01:00.041 00:01:00.043		G729B/8000	G729B/8000 Pass	
92. 168. 12.92	2 0007@192.1	68.12.94 2023-06-01 15:01:34.715	00:01:00.043				0
1	192 5060				in this are proved		
1	192 5060		100.100.10.01				
1	192 5060		1001001001				
1	5060	168.12.92	100 100 10 01				
1	5060	168.12.92			Find 🔽 Complete Stack		
1			192.168.12.94			-	
1		INVITE	5060	Destination Add	C Layer ====================================	= = x6C626D3EE	B30
307			5000	Source Address	CONTRACTOR CONTRACTOR	= x54BEF737B	
2	5060	SIP/2.0 100 Trying	5060	Length/Protocol			rnet IP(IPv4)
2		SIP/2.0 180 Ringing		Version	v4 Layer ==========	= 0100 (4)
2	5060		5060		r Length (In 32 bit wo		
	5000	SIP/2.0 200 OK	5000		Services Field	=	
9	5060		5060		d Services Codepoint	= 000000 D	
11	5060	ACK	5060		estion Notification	=00 N	ot-ECT (Not ECN-
	5000	21.15	5000	Total Length	Jegmentallonorrioad	= 761 (x02F9)
3984	5060	BYE	5060		Displaye	= 15592 (x3C	
		SIP/2 0 200 0K					
3985			5060				
	5060						
	5060				🕶 🔶 informa		
	5060			Fragment Offer Time To Live		= 128 (x80)	
	5060			Fragment Office Time To Live Protocol	the sele	$cted SIP = \frac{128}{00010001} (x80)$	
	5060		·	Fragment Offer Time To Live	the sele	$\begin{array}{r} = 128 (x80) \\ \text{cted SIP} = 00010001 \text{ U} \\ = x0000 \end{array}$	
		984 5060	984 5060 BYE	BYE 5060	BYE Total Length 1984 5060 SIP/2.0 200 0K 1985 5060 SIP/2.0 200 0K	BYE Total Length 1984 5060 5060 SIP/2.0 200 0K 5060 Don't fragment Operation Siperation	BYE Total Length = 761 (x02F9) 10984 5060 BYE 5060 Identification = 15592 (x3C) 10985 5060 SIP/2.0 200 OK 5060 Don't fragment Decoded = .0

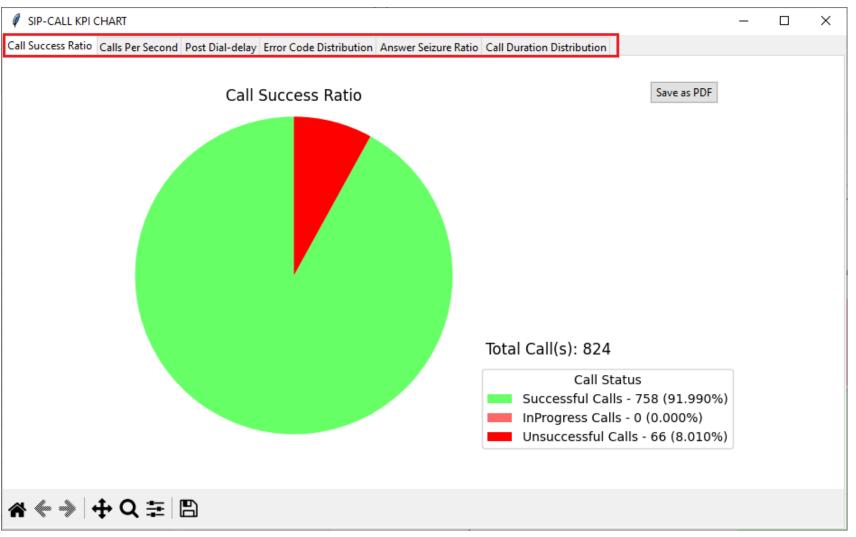


Key Performance Indicators (KPIs) Report for SIP Calls

Call Success Ratio KPI

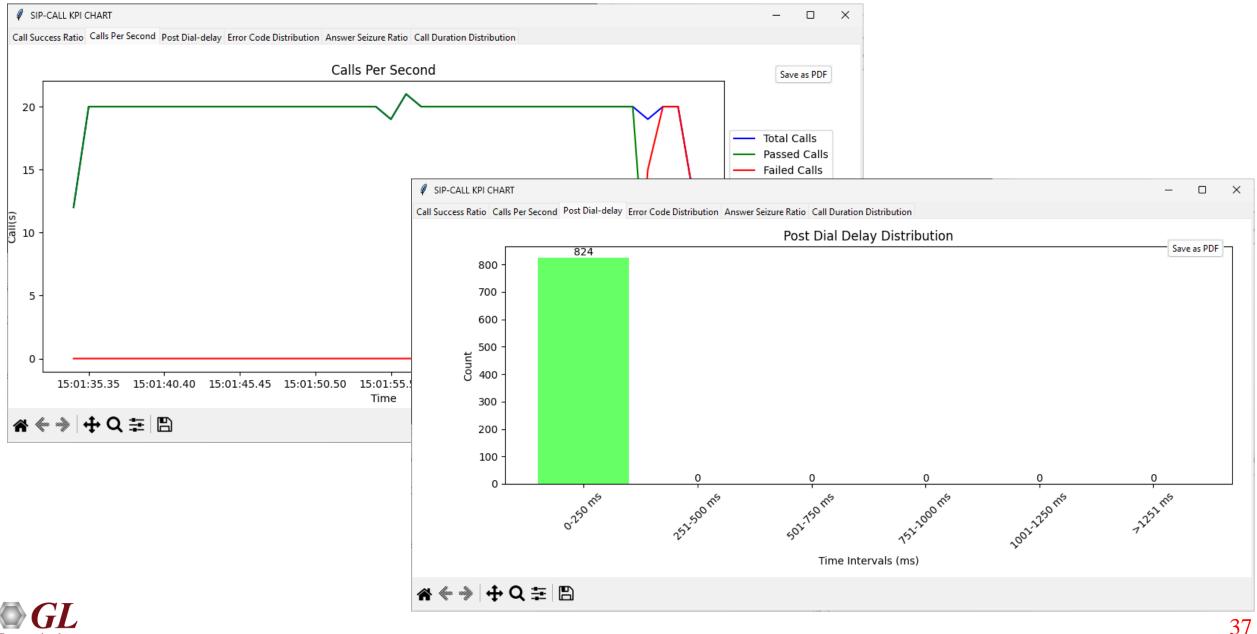


- Call Success Ratio: Displays graph for "Successful" and "Unsuccessful Calls," including counts and percentages (%)
- **Calls Per Second**: Shows graph "Total," "Passed," and "Failed Calls per second."
- **Post Dial Delay**: Shows delay counts in milliseconds (0-250ms, 251-500ms, etc.)
- Error Code Distribution: Lists Top 10 Call Failure Causes with counts and percentages (%)
- Answer Seizure Ratio: Shows "Answered" and "Unanswered Calls," with counts and percentages (%)
- **Call Duration Distribution**: Provides call counts for different durations (0-1 sec, 1-10 sec, etc.)



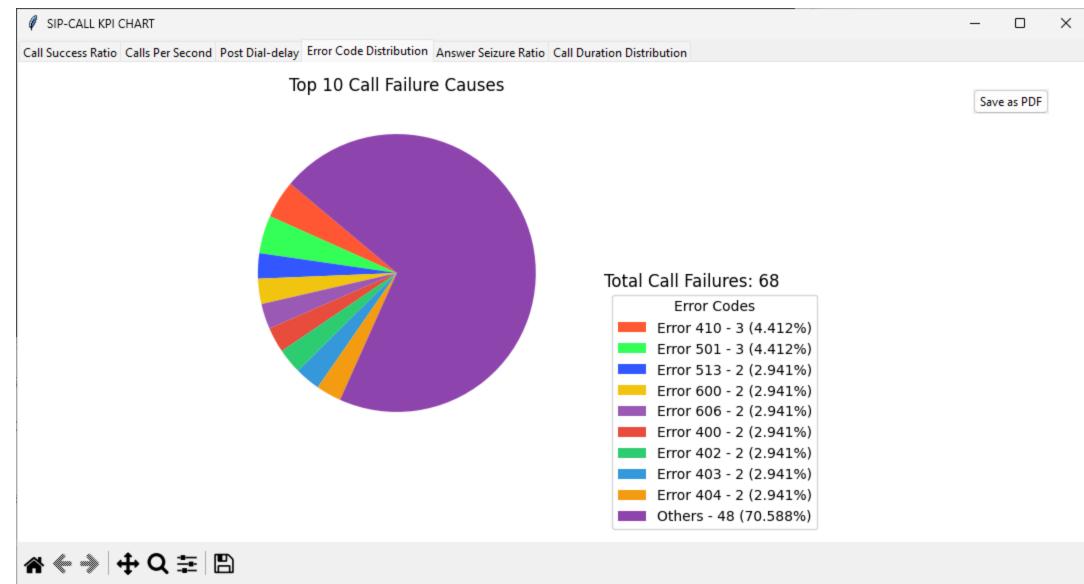


Calls Per Second and Post Delay KPIs



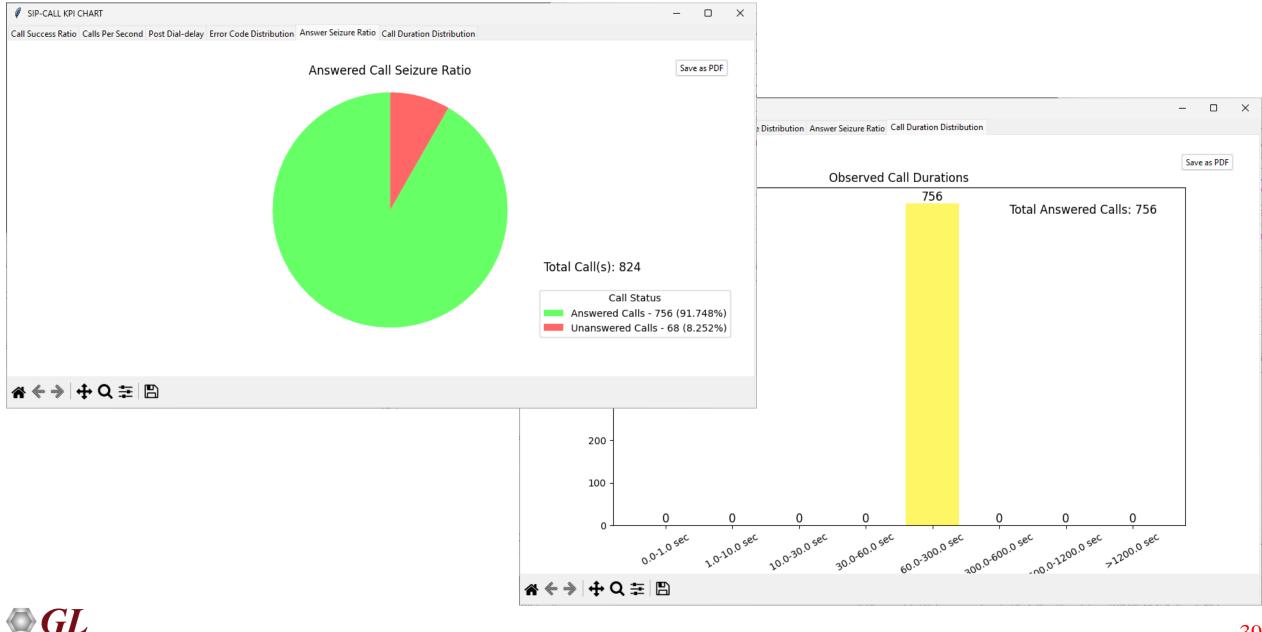
Communications

Error Code Distribution KPI



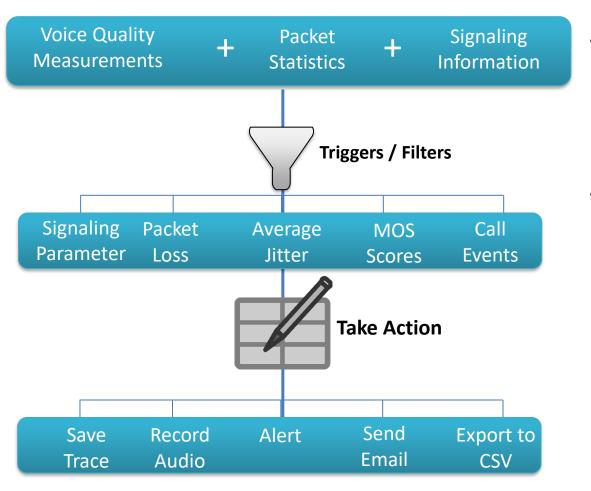


Answer Seizure Ratio and Call Duration Distribution KPIs



Communications

Triggers and Actions

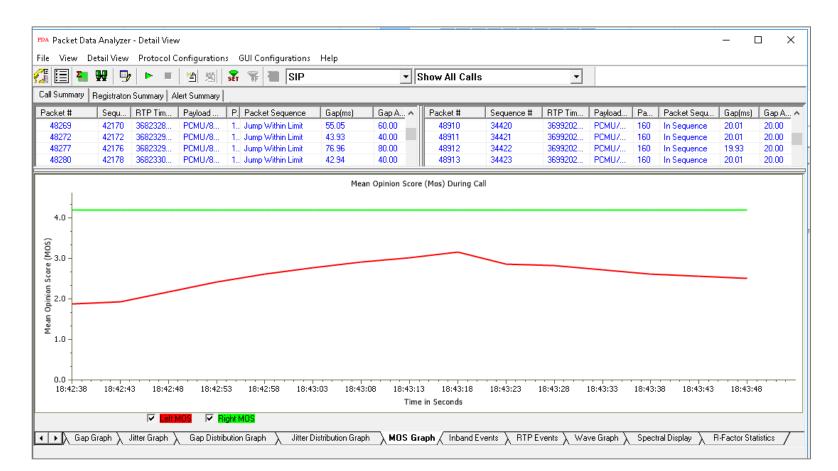


- Triggers can be:
 - Calling/Called Number, Pass/Fail Calls, Voice/SMS/Fax Calls, Call Duration, MOS, SIP Error Code
- Follow on actions can be performed:
 - Saves call in HDL or Wireshark file format
 - Export selected call detail records to CSV file
 - > Record audio to file and send email alerts
 - Extracts fax image in the TIFF format from the selected fax call

	MOS Distribution -	1		_
Codec	Poor MOS Value	Average MOS Value	Good MOS Value	1
PCMA	0.00-3.00	3.00-4.00	4.00-4.50	
PCMU	0.00-3.00	3.00-4.00	4.00-4.50	
G726-40	0.00-2.60	2.60-3.90	3.90-4.18	
G726-32	0.00-2.40	2.40-3.70	3.70-4.09	
G726-24	0.00-2.00	2.00-3.10	3.10-3.44	
G726-16	0.00-1.50	1.50-2.60	2.60-2.92	
G729	0.00-2.40	2.40-3.70	3.70-4.01	
G729B	0.00-2.40	2.40-3.70	3.70-4.01	
GSM	0.00-2.20	2.20-3.30	3.30-3.68	
GSM-EFR	0.00-2.60	2.60-3.90	3.90-4.16	
AMR	0.00-2.20	2.20-3.30	3.30-4.16	
GSM-HR	0.00-2.20	2.20-3.30	3.30-3.53	
EVRC	0.00-2.20	2.20-3.30	3.30-3.95	
ILBC	0.00-2.40	2.40-3.70	3.70-4.01	
SPEEX	0.00-1.80	1.80-2.90	2.90-4.14	
ILBC-13-33	0.00-2.40	2.40-3.70	3.70-4.01	
G722	0.00-2.40	2.40-3.70	3.70-3.91	
SPEEX-WB	0.00-2.40	2.40-3.70	3.70-4.14	
AMR-WB	0.00-2.00	2.00-3.10	3.10-4.18	
EVRCB	0.00-2.20	2.20-3.30	3.30-3.95	
EVS-NB	0.00-2.60	2.60-3.90	3.90-4.20	
EVS-WB	0.00-2.60	2.60-3.90	3.90-4.20	
EVS-SWB	0.00-2.60	2.60-3.90	3.90-4.20	
EVS-FB	0.00-2.60	2.60-3.90	3.90-4.20	
ODI IC-NR	0 00-2 40	2 40-2 20	3 70-4 06	
<			>	
/oice Quality Sample MOS E		s Voice Quality Range Poor%::0-75	·	7
		Average%:: Good%::90-	76-89	

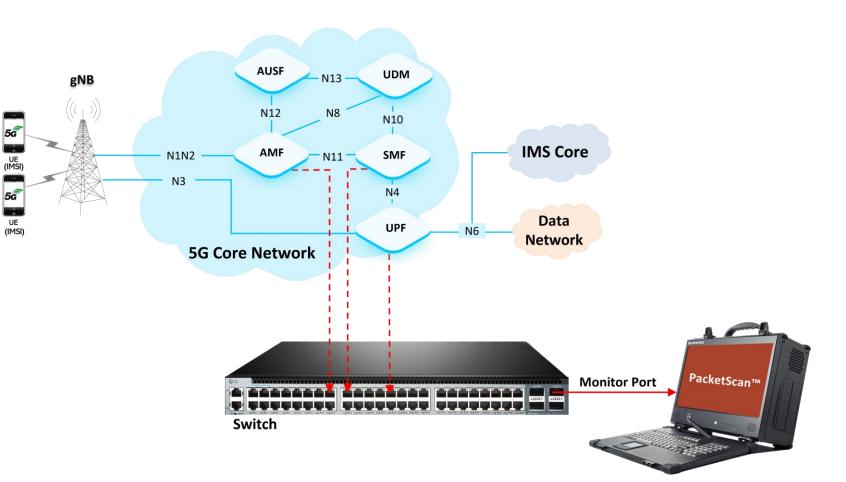
Voice Quality Metrics (Sample based)

• MOS is calculated periodically throughout the call which can help to mark the calls with Good, Average and Poor voice quality



5G Protocol Analyzer

- Capture, Decode, and Analysis of Calls in 5G Network
- Supported protocols Non-Access Stratum (NAS), Next Generation Application
 Protocol (NGAP), Packet Forwarding
 Control Protocol (PFCP), XnAP, SCTP,
 UDP, TCP, and IP
- Following interfaces are supported in Packet Data Analyzer:
 - N1 N2, N4, N8, N10, N11, N12, and N13
 - Packet Data Analyzer feature in
 Packetscan[™] HD provide a complete
 call flow of a 5G session





Decode View - 5G NGAP Layer

—	etScan <mark>6</mark> 4-bit w Capture <u>S</u> tatisti	ics <u>D</u> atabase Call Detail <u>R</u>	ecords <u>C</u> onfigu	ıre <u>H</u> elp				- 0	×
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Device	Frame#	TIME (Relative)	Length (Bytes)	Error	Length/Protocol Type MAC	Packet Type MAC	Source IP Address IPv4	Destination IP Address IPv4	
/ 0	0	00:00:00.00000000	130		Internet IP(IPv4)		192.168.31.55	192.168.31.77	
/ 0	1	00:00:00.070066000	126		Internet IP(IPv4)		192.168.31.77	192.168.31.55	
/ 0	2	00:00:00.400049000	102		Internet IP(IPv4)		192.168.31.55	192.168.31.77	
/0	3	00:00:00.472182000	130		Internet IP(IPv4)		192.168.31.77	192.168.31.55	
	-				· · ·				
/ 0	4	00:00:05.829074000	230		Internet IP(IPv4)		192.168.31.55	192.168.31.77	
/ 0	5	00:00:05.883006000	82		Internet IP(IPv4)		192.168.31.77	192.168.31.55	· · · ·
c									>
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	arameter Paddi		-	20000					_
		layer ========			(8)				_
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	nitiatingmessa ProcedureCode	ige		Lid Downlin	nkNASTransport				
	procedureCriti			iqnore(1	-				
	Value	Cality	- 1	. ignore(i)				
042	DownlinkNASTr	eneront	_						
042	ProtocolIE-C] Items					
045	Item	oncarner	= (
045	ProtocolIE-	Field	=	,					
045	ProtocolIE		= 1	0 id-AMF-U	-NGAP-TD				
047		Titicality	= [
049	Value	,	=	10,000,00	,				- 1
04A	AMF-UE-NG	SAP-ID	= 2	2					
04B	Item		= 1						
04B	ProtocolIE-	Field	=						
04B	ProtocolIE	E-ID	= 8	5 id-RAN-U	E-NGAP-ID				
04D	procedureC	Criticality	= 0) reject(0))				
04F	Value		=						
050	RAN-UE-NG	SAP-ID	= 2						
051	Item		= 2	2					
051	ProtocolIE-		=						
051	ProtocolIE		-	8 id-NAS-PI					
053		riticality	= () reject(0)				
055	Value		=						
055	NAS-PDU	-	=						
056	NAS PDU			7E00560002	JUUU2188821DE340CB3	50DB1EFA850501	A484A20103AE3588D45	F780000CBE535FE4F4B1	55
===	===== 5G N	MAS Layer ========			- W 1 - 1 - 1 - W				
056 Ex	tended Protoco)l Discriminator			6 Mobility Manageme		4 4 1		
	curity Header	туре	= .	0000 PIa	ain NAS message, no	t security pro	rected		
c									>
ilter is act	ive.		C:\Pro	gram Files\GL Co	ommunications Inc\Pai Idle f	itr 23 of 113 395 fram	ies Missed F	Frames : O	

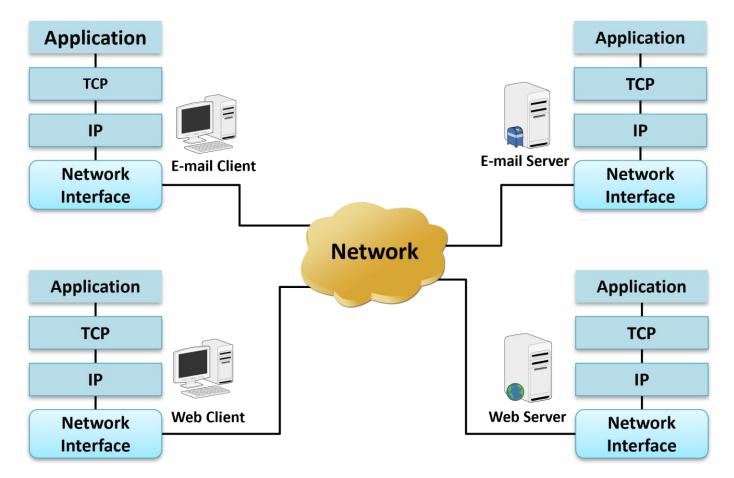
Call Graph – 5G N1N2

	¹ acket Data Analyzer - Summary View View Call Summary Protocol Co		stions Holp							— [x c
		1 🖄 🚮 🏋 🌹 📲 50		N1N2 Interface V S	how All Calls	-	Call Count: 1				
	Summary SIP Registration Summary A										
			Dunahian		cuct	CTMCI	THEFT	-4/0	AME		
Call#		EndTime 2024-05-29 01:20:36.313	Duration 00:00:16.009	SUPI 001013012041631	SUCI 3012041631	STMSI 2304464386	IMEISV 1234567890123001	gNB 192.168.31.77	AMF 192.168.31.55	<u>н</u>	tanUeNgapId
1	2024-03-29 01:20:10:490	2024-03-29 01:20:30:313	00:00:10:009	001013012041631	3012041631	2304404300	1234307090123001	192,100,31,77	192,100,31,33		
<											>
Colur	nn Width 📙 🖂 Abso	lute Timing 🔲 Show Latest				_					
gNB	Δ	MF	AUSF	L	лди 🔼		Find 🔽 Complete	Stack			
<u> </u>	InitialUEMessage - Registration Request					===== NGAP	Layer =======				^
		38412				NGAP-PDU InitiatingMesss		= I	nitiatingMessage	(0)	
	51002	POST /nausf-auth/v1/ue-au	thentications co	66		ProcedureCode	.9-	= 1	.5 id-InitialUEMe	ssage	
	51002		-			procedureCriti	cality		reject(0)	-	
			51001 POST /nu	udm-ueau/v1/suci-0-001-01-000	6666	Value		=			
					0000	InitialUEMess ProtocolIE-C		=	Items		
			51001	200	6666	Item	oncainer	- 0			
		201				ProtocolIE-	Field	=			
	51002	201		66		ProtocolIE			5 id-RAN-UE-NGAR	-ID	
D	pwnlinkNASTransport - Authentication R.						riticality	= 0	reject(0)		
	· · ·	38412				Value RAN-UE-NG	AP-TD	= 2			
U	plinkNASTransport - Authentication Res	38412				Item		= 1			
						ProtocolIE-		=			
	51002	PUT /nausf-auth/v1/ue-authe	ntications/A	66		ProtocolIE			8 id-NAS-PDU		
	51062					procedureC Value	riticality	= 0	reject(0)		
	51002	200	66	66		NAS-PDU		-			
	pwnlinkNASTransport - Security Mode C					NAS PDU	Dump	= x	7E004171000D0100	F11000000	000
IK	owninknyko mansport - Security mode c	38412				Item		= 2	:		
			POST /nu	udm-ueau/v1/imsi-00101301204		ProtocolIE- ProtocolIE		=	.21 id-UserLocati	T 6	
			51001		6666		riticality		.21 1d-UserLocat1 reject(0)	oninforma	.010:
υ	plinkNASTransport - Security Mode Com	20412				Value		=	10,000,07		
		38412					ionInformation		serLocationInfor	mationNR	(1)
			51001	201	6666		tionInformationN	R =			
				-intentioner Jacob October	0000	nR-CGI pLMNId	lentity	=			
	51006	PUT /nudm-uecm/v1/in	isi-ooT013012041631/fe	gistrations/amf-3gpp-access	6666	MCC		= 0	01		
			201			MINC		= 0			
	51006	•			6666	nRCell tAI	Identity	= 0	000000000000000000000000000000000000000	0000000000	000
	51000	GET /nudn	n-sdm/v2/imsi 00101301	2041631/nssai	0000		lentity				
	51006				6666	MCC		= 0	01		
	51006	4	200		6666	MNC		= 0			
	0,000	- CET		0410011	0000	tAC Item		= x = 3	000001		
	51006	GET /nudm-	sdm/v2/imsi-001013012	041631/am-data	6666	ProtocolIE-	Field	= 3			
			200			ProtocolIE	-ID		0 id-RRCEstablis	hmentCaus	e
	51006	•	200		6666 🗸	procedure	riticality	= 0	reject(0)		¥
<					>	<					>
\ Ca	Ils Rate \lambda Call Flow 🖉 Call Summary	1									
<u> </u>		1									



TCP Analytics Network

- Analyze TCP connections between internal company LAN connected computers and outside computers on the WAN
- Analyze TCP connections of a particular client server pair
- Analyze TCP connections on a subset of a LAN
- Display top level statistics
- Communicate with PacketScan[™] to display packets that belong to a selected TCP connection
- Export information to CSV files for subsequent Excel or a database import
- Sort tabular information by column values





TCP Data Processing

si 🖆	1	ao <u>- 9 5 2 8</u> 🗐		¥, ¥,	📲 👪 🖷 🛒			GoTo					
Device	Frame#	TIME (Date)	Length (Bytes)	Error	Destination Port UDP	FIN Finish Data Flag TCP	Protocol IP	RST Reset Connection Flag TCP	Sequence Number TCP	Source IP Address IP	Source Port TCP	Source Port UDP	SYN Synchror
/1	144	2022-07-29 17:33:24.556410000	54			 more data from sender 	TCP	- do not reset connection	2753544325	192.168.12.92	54791		- not set
/1	145	2022-07-29 17:33:24.728730000	86										
/1	146	2022-07-29 17:33:24.812591000	60										
/ 1	147	2022-07-29 17:33:25.045551000	105			- more data from sender	TCP	 do not reset connection 	2510704147	192.168.30.155	3389		- not set
/ 1	148	2022-07-29 17:33:25.056367000	Processed 20	000 000						192.168.30.155		3389	
/ 1	149	2022-07-29 17:33:25.056368000	Processed 20	000 000						192.168.30.155		3389	
/ 1	150	2022-07-29 17:33:25.056552000					·····			192.168.12.92		54511	
1	151	2022-07-29 17:33:25.058647000	Progress inc	licator. C	ick cancel to stop the p	rocess.	Cancel			192.168.30.155		3389	
/ 1	152	2022-07-29 17:33:25.077041000					<u>i</u>			192.168.30.155		3389	
/ 1	153	2022-07-29 17:33:25.077213000	54		3389		UDP			192.168.12.92		54511	
/ 1	154	2022-07-29 17:33:25.094835000	54			- more data from sender	TCP	 do not reset connection 	1890036032	192.168.12.92	57522		- not set
/ 1	155	2022-07-29 17:33:25.095795000	60										
/ 1	156	2022-07-29 17:33:25.141599000	137		3389		UDP			192.168.12.92		54511	
1	157	2022-07-29 17:33:25.186258000	60										
/ 1	158	2022-07-29 17:33:25.479651000	105			- more data from sender	TCP	 do not reset connection 	2131187858	192.168.30.146	3389		 not set
(1)	159	2022-07-29 17:33:25.508338000	105			- more data from sender	TCP	 do not reset connection 	3823082860	192.168.30.104	3389		 not set
1	160	2022-07-29 17:33:25.521455000	60		54511		UDP			192.168.30.155		3389	
1	161	2022-07-29 17:33:25.526595000	54			- more data from sender	TCP	 do not reset connection 	3047300261	192.168.12.92	54789		- not set
1	162	2022-07-29 17:33:25.557192000	54			- more data from sender	TCP	 do not reset connection 	1417555879	192.168.12.92	56829		 not set
1	163	2022-07-29 17:33:25.723157000	86										
/ 1	164	2022-07-29 17:33:25.868552000	126			- more data from sender	TCP	 do not reset connection 	267330076	192.168.12.92	49292		- not set
(1)	165	2022-07-29 17:33:25.869198000	126			- more data from sender	TCP	 do not reset connection 	544278709	192.168.1.3	445		- not set
(1)	166	2022-07-29 17:33:25.869293000	126			- more data from sender	TCP	 do not reset connection 	267330148	192.168.12.92	49292		- not set
(1)	167	2022-07-29 17:33:25.869893000	126			- more data from sender	TCP	 do not reset connection 	544278781	192.168.1.3	445		 not set
/ 1 👘	168	2022-07-29 17:33:25.870038000	54			- more data from sender	TCP	RST	267330220	192.168.12.92	49292		- not set
/ 1	169	2022-07-29 17:33:26.056672000	60										
													>
vice	1 Fram	ne=144 at 2022-07-29 1	7:33:24 55	641000	0 OK Ten=54			*** Righ	nt click to SHOW	HIDE laver det	ails or con	U ***	
herr	et Fra	ame Data		041000	O OK LON-34			unu Kigi	IC CIICK CO DHOW,	MIDE Idyci det	orre or cop	.y	
		==== MAC Layer ====== ation Address		-	xCOEAE484BA93	,							
006 9	ource	Address			x54BEF737BC79								
		Protocol Type		=	x0800 Interne	et IP(IPv4)							
		==== IP Layer ======		-	0100 (4)								
	ersion	ı et Header Length (In S	32 bit words		0100 (4)								
		entiated Services Fiel		=									
00F	Differ	rentiated Services Cod	lepoint	=	000000 Defa	ault							
DOF _	Explic	it Congestion Notific	cation	-		-ECT (Not ECN-Cap	able Tran	sport)					
		No TCP SegmentationOf Length	tload:		40 (x0028)								
		fication			52172 (xCBCC)	1							
		red Bit			0Not								
		fragment		-	.1 Set								
		ragments ent Offset		-	0 Not	Set							
114	Pradme	ent litteet		-	n / n								>

 \bigcirc GL **Communications**

ESP Deciphering

• ESP deciphered packets as shown

GL

Communications

		s <u>D</u> atabase Call Detail <u>R</u>						
n belle se	1 🗾 🔁 🔁	TIME (Relative)	Length (Bytes)	Error Length/Protocol Type	GoTo Packet Type	Source IP Address	Destination IP Address	Source Address
	riallie#		Length (bytes)	MAC	MAC	IPv4	IPv4	IPv6
	0	00:00:00.000000000	769	Internet IP(IPv4)	SIP	192.168.12.86	192.168.12.45	
	1	00:00:00.515721000	769	Internet IP(IPv4)	SIP	192.168.12.86	192.168.12.45	
	2	00:00:01.537143000	769	Internet IP(IPv4)	SIP	192.168.12.86	192.168.12.45	
	3	00:00:03.558945000	769	Internet IP(IPv4)	SIP	192.168.12.86	192.168.12.45	
	4	00:00:04.626310000	764	Internet IP(IPv4)	SIP	192.168.12.90	192.168.12.45	
	-	00.00.05.1.(0077000	704	1.1.1000-0	00	100 100 10 00	100.100.10.45	
He	ader Check Su	n	= x240	3				
Sc	urce IP Addres	SS	= 192.	168.12.86 (xCOA80C56)				
	stination IP # ====== UDP]	Address Layer ==========	= 192.: =	168.12.45 (xCOA80C2D)				
	rce Port			(x13C4)				
	tination Port	5		(x13C4)				
	gth (Header + cksum	Data)	= 735 = x16F1	(x02DF)				
		Laver =======	- XIOF	D				
HDF		,	= INVI	TE sip:0001@192.168.12.45	SIP/2.0			
HDF				SIP/2.0/UDP 192.168.12.86	5:5060;branch=z9hG4bK-	-29-103772070-10509-44	472	
HDF				Forwards: 70				
HDF HDF				w: INVITE,BYE,CANCEL,ACK,] : 0001 <sip:0001@192.168.1< td=""><td></td><td></td><td>ER, UPDAIE</td><td></td></sip:0001@192.168.1<>			ER, UPDAIE	
HDF				0001 <sip:0001@192.168.12.< td=""><td></td><td>-103//20/0-10300-44/2</td><td></td><td></td></sip:0001@192.168.12.<>		-103//20/0-10300-44/2		
HDF				-ID: GL-MAPS-28-103772070-		2.86		
HDF			= CSeq	: 1 INVITE				
HDF				act: 0001 <sip:0001@192.16< td=""><td>58.12.86></td><td></td><td></td><td></td></sip:0001@192.16<>	58.12.86>			
HDF				ent-Type: application/sdp				
HDF			= Conte =	ent-Length: 238				
BOL	v		= = v=0					
BOL				01 31062954 1 IN IP4 192.1	168 12 90			
BOL	-		= s=SI					
BOL				IP4 192.168.12.90				
BOD			= t=0					
BOI				dio 1034 RTP/AVP 0 8 101				
BOL				pmap:0 PCMU/8000				
BOI				pmap:8 PCMA/8000 pmap:101 telephone-event/8	2000			
				pmap:101 telephone-event/8 tp:101 0-15	3000			
			= a=pt;					
BOI			= a=sei					
	Y							
BOI BOI	Y							

Comparison of Before and After Deciphering

Device	Frame#	TIME (Relative)	igth (Bytes) Error	And and a second second second second	GoTo Packet Type	Source IP Address		ss Sou	rce Address					
		00:00:00:00:00:00	822	MAC Internet (P(IPv4)	MAC	IPv4	IPv4		IPv6					
1	1	00:00:00.515721000	822	Internet IP(IPv4)		192.168.12.86	192.168.12.45							
1	2	00:00:01.537143000	822	Internet IP(IPv4)		192.168.12.86	192.168.12.45							
1	3	00:00:03.558945000	822	Internet IP(IPv4)		192.168.12.86	192.168.12.45							
1	4	00:00:04.626310000	806	Internet IP(IPv4)		192.168.12.90 192.168.12.90	192.168.12.45 192.168.12.45							
1	5	00:00:05.143077000 00:00:06.165570000	806 806	Internet IP(IPv4) Internet IP(IPv4)		192.168.12.90	192.168.12.45							
4	-	00.00.00.0000000		· · · · · · · · · · · · · · · · · · ·		100.100.10.00	100.100.10.10		>					
0 Des 06 Sou 06 Les	t Frame Dat. stination A urce Addres ngth/Protoc	AC Layer ====== ddress s ol Type	= = xE0D55EA = xFCAA149	DFBFD 2AB2F ternet IP(IPv4)		*** Right click to	SHOW/HIDE layer deta	eciphering						
E Ve: E In	rsion ternet Head	Pv4 Layer ========= er Length (In 32 bit word	= = 0100 is) =0101	(4) (5)	Packe	tScan 64-bit								- 0
F D:	ifferentiat	d Services Field ed Services Codepoint	= = 000000	Default			tabase Call Detail <u>R</u> ecords							
DF E	Hdr No TCP	gestion Notification SegmentationOffload	=00	Not-ECT (Not ECN-Capable	·	summers from any formation, formation from any					GoTo			
0 Te	otal Length		= 808 (x03	(28)	Device	Frame# TIM	IE (Relative) Length (B	ytes) Error	Length/Protocol Type MAC	Pac	ket Type MAC	Source IP Address IPv4	Destination IP Address IPv4	Source Address IPv6
	dentifications eserved Bit		= 31181 (x	:79CD)										IFV0
	on't fragme		= 0 = .0	Not Set	$\sqrt{1}$	0	00:00:00.000000000	Contractory of the Contractory o	met IP(IPv4)	SIP		92.168.12.86	192.168.12.45	
Mo	ore fragmen	ts	=0	Not Set 0000 00000000)	1	1	00:00:00.515721000 00:00:01.537143000		met IP(IPv4)	SIP		92.168.12.86 92.168.12.86	192.168.12.45 192.168.12.45	
	ragment Off ime To Live		= 0 (00 = 128 (x80		11	2	00:00:03.558945000		met IP(IPv4) met IP(IPv4)	SIP		92.168.12.86	192.168.12.45	
7 P:	rotocol		= 00110010	Encap Security Payload	11	4	00:00:04.626310000		met IP(IPv4)	SIP		92.168.12.90	192.168.12.45	
	eader Check		= x2403	12 06 (-00100056)		-	00.00.05.4 (0077000			010		02.100.12.00	100.100.10.15	
E De	ource IP Ad estination	aress IP Address	= 192.168.	12.86 (xC0A80C56) 12.45 (xC0A80C2D)	S									
	====== E	ncapsulating Security Pay	load Protocol I	ayer =================	0018 H 001A S	eader Check Sum ource IP Address		= x2403 = 192.168.12.86 (VC0390CE6)					
Sec	curity Para	meter Index er	= 97709536 = 1 (x0000	(x05D2EDE0)				- 172.100.12.00 (xCOA80C2D)					
					DOLF L	estination IP Addre	155	= 192.168.12.45 (After Dec	inhouing
ESI	quence Numb P Payload D			.9A723AF44BFA3074B9C6D55	534 (Tend ===	======= UDP Layer		=	,				After Dec	Ionering
ESI					534 (Leng 0022 Sc	urce Port		= = 5060 (x13C4)	,				After Dec	ipnering
ESI					534 (Leng 0022 So 0024 De 0026 Le	======= UDP Layer urce Port stination Port ngth (Header + Data		= = 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF)	,				After Dec	ipnering
ESI					534 (Leng 0022 Sc 0024 De 0026 Le 0028 Ch	====== UDP Layer urce Port stination Port ngth (Header + Data ecksum	.)	= = 5060 (x13C4) = 5060 (x13C4)	,				After Dec	ipnering
	P Payload D		= x49F7431		534 (Leng 0022 Sc 0024 De 0026 Le 0028 Ch	======= UDP Layer urce Port stination Port ngth (Header + Data ecksum ======= SIP Layer	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB		TP/2 0			After Dec	ipnering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Leng 0022 Sc 0024 De 0026 Le 0028 Ch 0028 Ch HI	UDP Layer urce Fort stination Fort ngth (Header + Data ecksum SIP Layer R R	.)	= = 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = = INVITE sip:0001 = Via: SIP/2.0/UD	@192.168.12.45 S P 192.168.12.86:		=z9hG4bK-29-1	03772070-10509-4		ipnering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0028 Ch 0028 Ch HI HI HI	urce Port stination Port ngth (Header + Data ecksum stress SIP Layer R R R	.)	= 5060 (x13C4) 5060 (x13C4) = 735 (x02DF) = x16FB = = INVITE sip:0001 = Via: SIP/2.0/UD Max-Forwards: 7	@192.168.12.45 S P 192.168.12.86: 0	5060;branch			4472	ipnering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0028 Ch 0028 Ch HL HD HD HD	urce Port stination Port ngth (Header + Data ecksum R R R R	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 Allow: INVITE,E	@192.168.12.45 S P 192.168.12.86: 0 VE,CANCEL.ACK.IN	5060;branch FO,OPTIONS,	SUBSCRIBE, NOT	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 De 0024 De 0026 Le 0026 Le 0028 Ch HD HD HD HD HD HD HD	UDP Layer urce Port stination Port ngth (Header + Data ecksum R R R R R R R R R	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 = Allow: INVITE, E = From: 0001 <sip:0 To: 0001 <sip:0< td=""><td>@192.168.12.45 S P 192.168.12.86: 0 VE,CANCEL,ACK,IN :0001@192.168.12 001@192.168.12</td><td>5060;branch FO,OPTIONS, .86>;tag=Fr 5></td><td>SUBSCRIBE,NOT omTag-26-1037</td><td>IFY, REFER, REGIST</td><td>4472 TER, UPDATE</td><td>ipnering</td></sip:0<></sip:0 	@192.168.12.45 S P 192.168.12.86: 0 VE,CANCEL,ACK,IN :0001@192.168.12 001@192.168.12	5060;branch FO,OPTIONS, .86>;tag=Fr 5>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ipnering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0028 Ch 0028 Ch HI HI HI HI HI HI HI HI	urce Port stination Port ngth (Header + Data ecksum R R R R R R R R R R R	.)	= 5060 (x13C4) 5060 (x13C4) 735 (x02DF) = x16FB = INVITE sip:0001 Via: SIP/2.0/UD Max-Forwards: 7 Allow: INVITE.E From: 0001 <sip:0 Call-DD: GL-MAP</sip:0 	@192.168.12.45 S P 192.168.12.86: 0 VE,CANCEL,ACK,IN :0001@192.168.12 001@192.168.12	5060;branch FO,OPTIONS, .86>;tag=Fr 5>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ipnering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 De 0024 De 0026 Le 0026 Le 0028 Ch HD HD HD HD HD HD HD	====== UDP Layer urce Port ngth (Header + Data ecksum ======= SIP Layer R R R R R R R R R R R R R	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = 116FB = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 = Allow: INVITE. = From: 0001 (sip:0 = Call-ID: GL-MAP CSeq: 1 INVITE	@192.168.12.45 S P 192.168.12.86: 0 YE,CANCEL,ACK,IN :0001@192.168.12.4 S-28-103772070-1	5060;branch F0,OPTIONS, .86>;tag=Fr 5> 0508-4472@1	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ipnering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0028 Ch 0028 Ch HL HD HL HL HL HL HL HL HL HL HL HL HL HL HL	urce Port stination Port ngth (Header + Data ecksum R R R R R R R R R R R R R R R R R R R	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 = Allow: INVITE, B = From: 0001 (sip:0 C Call-TD: GL-MAP = CSeq: 1 INVITE = Contact: 0001 (C C Contact: 0001 (C C C C C C C C C C C C C C C C C C C	@192.168.12.45 S P 192.168.12.86: 0 YE,CANCEL,ACK.IN :0001@192.168.12 010@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp	5060;branch F0,OPTIONS, .86>;tag=Fr 5> 0508-4472@1	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ipnering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 De 0024 De 0026 Le 0028 Ch HD HD HD HD HD HD HD HD HD HD HD HD HD	urce Port stination Port ngth (Header + Data ecksum R R R R R R R R R R R R R R R R R R R	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 Allow: INVITE, E = From: 0001 <sip:0 = Call-ID: GL-MAP = Contact: 0001 <</sip:0 	@192.168.12.45 S P 192.168.12.86: 0 YE,CANCEL,ACK.IN :0001@192.168.12 010@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp	5060;branch F0,OPTIONS, .86>;tag=Fr 5> 0508-4472@1	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0028 Ch 0028 Ch HL HD HL HL HL HL HL HL HL HL HL HL HL HL HL	urce Port stination Port ngth (Header + Data ecksum R R R R R R R R R R R R R R R R R R R	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Max-Forwards: 7 = Allow: INVITE, B = From: 0001 <sip:0 = Call-TD: GL-MAF = Costact: 0001 < = Contact: 0001 < = Contact: 0001 < = Contact: number of the second = Contact = 0001 < = Contact = 00001 < = Contact = 00001 < = Contact = 00001 < = Contact = 00001 < = Cont</sip:0 	@192.168.12.45 S P 192.168.12.86: 0 YE,CANCEL,ACK.IN :0001@192.168.12 001@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238	5060;branch FO,OPTIONS, .86>;tag=Fr 5> 0508-4472@1 .12.86>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0022 Cc 0024 Le 0026 Le 0028 Ch HI HI HI HI HI HI HI HI HI HI HI HI HI	UDP Layer urce Port ngth (Header + Data ecksum R R R R R R R R R R R R R R R R R R R	.)	= 5060 (x13C4) 5060 (x13C4) 735 (x02DF) x16FB = INVITE sip:0001 Wax-Forwards: 7 Allow: INVITE, B From: 0001 <sip:0 Call-ID: GL-MAP CSeq: 1 INVITE Contact: 0001 < Content-Type: a Content-Length: = c = 0001 31062954</sip:0 	@192.168.12.45 S P 192.168.12.86: 0 YE,CANCEL,ACK.IN :0001@192.168.12 001@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238	5060;branch FO,OPTIONS, .86>;tag=Fr 5> 0508-4472@1 .12.86>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuerung
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0028 Ch 0028 Ch HI HI HI HI HI HI HI HI HI HI HI HI HI	UDP Layer urce Port ngth (Header + Data ecksum R R R R R R R R R R R R R	.)	<pre>= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD Max-Forwards: 7 = Allow: INVITE,B = From: 0001 <sip:0 = Call-ID: GL-MHP = Coseq: 1 INVITE = Contact: 0001 < Content-Type: a = Content-Length: = v=0 = o=0001 31062254 = sSIP Call</sip:0 </pre>	@192.168.12.45 S P 192.168.12.86: 0 YE_CANCEL,ACK_IN 001@192.168.12. 001@192.168.12. 001@192.168.22.4 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16	5060;branch FO,OPTIONS, .86>;tag=Fr 5> 0508-4472@1 .12.86>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
ESI	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0026 Le 0028 Ch HI HI HI HI HI HI HI HI HI HI HI HI HI	urce Port stination Port ngth (Header + Data ecksum R R R R R R R R R R R R R R R R R R R	.)	= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD Max-Forwards: 7 Allow: INVITE.E = From: 0001 <sip:0 Call-D: GL-MAP = Content-InVITE = Contact: 0001 < = Content-Type: a = Content-Length: = = v=0 = 0=0001 31062954 = s=SIP Call = c=IN IP4 192.16</sip:0 	@192.168.12.45 S P 192.168.12.86: 0 YE_CANCEL.ACK.IN :0001@192.168.12.4 S-28-10372070-1 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16 8.12.90	5060;branch FO,OPTIONS, .86>;tag=Fr 5> 0508-4472@1 .12.86>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0026 Le 0026 Le 0028 Ch HI HI HI HI HI HI HI HI HI HI HI HI HI	UDP Layer urce Port ngth (Header + Data <u>ecksum</u> R R R R R R R R R R R R R	.)	<pre>= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP-2.0/UD Max-Forwards: 7 = Allow: INVITE, B = From: 0001 (sip:0 = Call-TD: GL-MAP = CSeq: 1 INVITE = Contact: 0001 (= Content-Isength: = v=0 = o=0001 31062954 = s=SIP Call = c=IN IP4 192.16 = t=0 0 = m=audio 1034 RT</pre>	<pre>@192.168.12.45 S P 192.168.12.86: 0 VF,CANCEL,ACK.IN :0001@192.168.12 001@192.168.12 v01@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16 8.12.90 P/AVP 0 8 101</pre>	5060;branch FO,OPTIONS, .86>;tag=Fr 5> 0508-4472@1 .12.86>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0026 Le 0026 Le 0028 Ch HI HI HI HI HI HI HI HI HI HI HI HI HI	UDP Layer urce Port ngth (Header + Data ecksum R R R R R R R R R R R R R	.)	<pre>= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 Allow: INVITE.B = From: 0001 <sip:0 = Call-ID: GL-MAP = CSeq: 1 INVITE = Contact: 0001 <sip:0 = Call-ID: GL-MAP = Content-Type: a = Content-Type: a = content-Length: = v=0 = c=0001 31062954 = s=SIP Call = c=IN IP4 192.16 = t=0 0 = m=audio 1034 RT</sip:0 </sip:0 </pre>	<pre>@192.168.12.45 S P 192.168.12.86: 0 YE_CANCEL.ACK.IN :0001@192.168.12 001@192.168.12 001@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16 8.12.90 P/AVP 0 8 101 /8000</pre>	5060;branch FO,OPTIONS, .86>;tag=Fr 5> 0508-4472@1 .12.86>	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 Dc 0026 Le 0026 Le 0028 Ch HD HD HD HD HD HD HD HD HD HD HD HD HD	UDP Layer urce Port ngth (Header + Data ecksum R R R R R R R R R R R R R	.)	<pre>= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD Max-Forwards: 7 Allow: INVITE, B = From: 0001 <sip:0 = Call-ID: GL-MAP = Content-InvITE = Content-InvITE = content-InvITE = v=0 = c=0001 31062954 = s=SIP Call = c=IN IP4 192.16 = t=0 0 = m=audio 1034 FT = a=rtpmap:0 FCMU = a=rtpmap:0 FCMU</sip:0 </pre>	<pre>@192.168.12.45 S P 192.168.12.86: 0 YE_CANCEL_ACK_IN :0001@192.168.12 001@192.168.12 001@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16 8.12.90 P/AVP 0 8 101 /8000 /8000 /8000 /8000</pre>	5060;branch FO,OPTIONS, 86>;tag=Fr 50 508-4472@1 .12.86> 8.12.90	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuerud
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0026 Le 0026 Le 0028 Ch HI HI HI HI HI HI HI HI HI HI HI HI HI	UPP Layer urce Port ngth (Header + Data ecksum R R R R R R R R R R R R R	.)	<pre>= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 Allow: INVITE.B = From: 0001 <sip:0 Call-ID: GL-MAP = Content-ImVITE.B = Contact: 0001 < = Content-Type: a = Content-Length: = = v=0 = -0001 31062954 = s=SIP Call = c=IN IP4 192.16 = t=0 0 = m=audio 1034 RT = a=rtpmap:0 PCMA = a=rtpmap:0 PCMA</sip:0 </pre>	<pre>@192.168.12.45 S P 192.168.12.86: 0 YE_CANCEL_ACK_IN :0001@192.168.12 001@192.168.12 001@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16 8.12.90 P/AVP 0 8 101 /8000 /8000 /8000 /8000</pre>	5060;branch FO,OPTIONS, 86>;tag=Fr 50 508-4472@1 .12.86> 8.12.90	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuering
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0022 C 0022 C HI HI HI HI HI HI HI HI HI HI HI HI HI	UDP Layer urce Port ngth (Header + Data ecksum R R R R R R R R R R R R R	.)	<pre>= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD Max-Forwards: 7 Allow: INVITE, B = From: 0001 <sip:0 = Call-TD: GL-MAP = Content-JuvITE = Contact: 0001 < = Content-IuvITE = contact: 0001 < = content-Length: = = v=0 = o=0001 31062954 = s=SIP Call = c=IN IP4 192.16 = t=0 0 = m=audio 1034 RT = a=rtpmap: 0 PCMU = a=rtpmap: 101 te = a=fmtp:101 o=15 = a=ptime:20</sip:0 </pre>	<pre>@192.168.12.45 S P 192.168.12.86: 0 YE_CANCEL_ACK_IN :0001@192.168.12 001@192.168.12 001@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16 8.12.90 P/AVP 0 8 101 /8000 /8000 /8000 /8000</pre>	5060;branch FO,OPTIONS, 86>;tag=Fr 50 508-4472@1 .12.86> 8.12.90	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ibuerud
	P Payload D		= x49F7431	9A723AF44BFA3074B9C6D5	534 (Lens 0022 Sc 0024 De 0026 Le 0026 Le 0026 Le 0028 Ch HI HI HI HI HI HI HI HI HI HI HI HI HI	UDP Layer urce Port ngth (Header + Data ecksum R R R R R R R R R R R R R	.)	<pre>= 5060 (x13C4) = 5060 (x13C4) = 735 (x02DF) = x16FB = INVITE sip:0001 = Via: SIP/2.0/UD = Max-Forwards: 7 Allow: INVITE.B = From: 0001 <sip:0 Call-ID: GL-MAP = Content-ImVITE.B = Contact: 0001 < = Content-Type: a = Content-Length: = = v=0 = -0001 31062954 = s=SIP Call = c=IN IP4 192.16 = t=0 0 = m=audio 1034 RT = a=rtpmap:0 PCMA = a=rtpmap:0 PCMA</sip:0 </pre>	<pre>@192.168.12.45 S P 192.168.12.86: 0 YE_CANCEL_ACK_IN :0001@192.168.12 001@192.168.12 001@192.168.12.4 S-28-103772070-1 sip:0001@192.168 pplication/sdp 238 1 IN IP4 192.16 8.12.90 P/AVP 0 8 101 /8000 /8000 /8000 /8000</pre>	5060;branch FO,OPTIONS, 86>;tag=Fr 50 508-4472@1 .12.86> 8.12.90	SUBSCRIBE,NOT omTag-26-1037	IFY, REFER, REGIST	4472 TER, UPDATE	ipnering

Analysis of eCPRI Decodes in Offline PacketScan[™] HD

Over UDP

Device0 Frame=6 at 2022-06-09 06:07:36.7112060	000 OK Len=112 *** Righ
Ethernet Frame Data	
======== MAC Layer ========	=
0000 Destination Address	= xFCAA149225C4
	= x54BEF737CB9A
000C Length/Protocol Type	= x86DD IPv6
========== IPv6 Layer =========	=
000E Protocol Version	= 0110 (6)
000E Traffic Class	= 0 (0000 0000)
000F Flow Label	= 834513 (1100 10111011 11010001)
0012 Payload Length	= 58 (x003A)
0014 Next Header	= 00010001 User Datagram Protocol (UDP)
0015 Hop Limit	= 64 (x40)
0016 Source Address	= fe80::64f2:5e84:f1db:502
0026 Destination Address	= fe80:::589e:b2d5:9074:2bec
======== UDP Layer ========	=
0036 Source Port	= 64000 (xFA00)
0038 Destination Port	= 64000 (xFA00)
003A Length (Header + Data)	= 58 (x003A)
003C Checksum	= x7F76
======== eCPRI Layer ========	=
003E C	=0 eCPRI message is the last one inside the eCPRI PD
003E eCPRI Protocol Revision	= 0001 (1)
003F eCPRI Message Type	= 00000100 Remote Memory Access
0040 eCPRI Payload Size	= 28 (x001C)
0042 Remote Memory Access ID	= 17 (x11)
0043 Req/Resp	=0010 Failure
0043 Read/Write	= 0010 Write_No_Resp
0044 Element ID	= 8755 (x2233)
0046 Address	= x050403020100
004C Length	= 16 (x0010)
User Data	= xFFEEDDCCBBAA99887766554433221100



Analysis of eCPRI Decodes in Offline PacketScan[™] HD (Contd.)

Over MAC

Device0 Frame=0 at 2019-02-13 11:36:46.00000000	0 OK Len=64 *** Right
Ethernet Frame Data	O OK LEN-04 *** KIGHU
========= MAC Layer =========	=
0000 Destination Address	= x008016000000
0006 Source Address	= x008016884EFF
0000 Jength/Protocol Type	= xAEFE eCPRI
========= eCPRI Laver =========	- AREFE COINT
000E C	=0 eCPRI message is the last one inside the eCPRI PDU
000E eCPRI Protocol Revision	= 0001 (1)
000F eCPRI Message Type	= 00000000 IQ Data
0010 eCPRI Payload Size	= 20 (x0014)
eCPRI Payload	= x123487650F0E0D0C0B0A09080706050403020100
======================================	
ecpriPcid	
0012 BandSector_ID	=010010 (18)
0012 DU_Port_ID	= 00(0)
0013 RU_Port_ID	=0100 (4)
0013 CC_ID	= 0011 (3)
ecpriSeqid	= 0011 (3)
0014 Sequence ID	= 135 (x87)
0015 Subsequence ID	= .1100101 (101)
0015 E bit	= 0 More fragments follow
0016 FilterIndex	=1111 Reserved
0016 payloadVersion	= .000 (0)
0016 dataDirection	= 0 (0) = 0 UpLink
0017 frameId	= 14 (x0E)
0018 subframeId	= 0000(0)
0018 slotId	= 52 (1101 00)
0019 startSymbolid	=001100 (12)
001A sectionId	= 176 (00001011 0000)
001B symInc	=0 use the current symbol number
001B rb	=1 every other RB used
001B startPrbu	= 521 (10 00001001)
001D numPrbu	= 8 (x08)
udCompHdr	= 0 (A00)
001E udCompMeth	- =0111 Reserved
001E udIqWidth	= 0000 I and Q are each 16 bit wide
Dump	= x050403020100
Damp	- Y020402070100



PDA - Alert Summary

Mp Tra	ffic Analys	er - Summary View						_ 0	x
<u>File V</u>	jew <u>H</u> elp								
Call St	ummary 🗍 Re	egistraton Summary Alert Summ	mary						
Call#	Protocol	Message	Туре	Threshold	Value	Caller	Callee	Callid	\Box
1	SIP	mos value between 3 to 4	Warning	2.00-4.00	3.57	0005@192.168.1.236	0005@192.168.1.234	GLPG143457205760	
2	SIP	mos value between 3 to 4	Warning	2.00-4.00	3.39	0006@192.168.1.236	0006@192.168.1.234	GLPG143617205763	
3	SIP	mos value between 3 to 4	Warning	2.00-4.00	2.77	0008@192.168.1.236	0008@192.168.1.234	GLPG143617205769	
3	SIP	mos value between 1 to 2.5	Critical	1.00-2.50	2.36	0008@192.168.1.236	0008@192.168.1.234	GLPG143617205769	
4	SIP	mos value between 3 to 4	Warning	2.00-4.00	3.48	0009@192.168.1.236	0009@192.168.1.234	GLPG143617205772	
5	SIP	mos value between 3 to 4	Warning	2.00-4.00	3.30	0011@192.168.1.236	0011@192.168.1.234	GLPG143777205778	
6	SIP	mos value between 3 to 4	Warning	2.00-4.00	2.77	0012@192.168.1.236	0012@192.168.1.234	GLPG143927205781	
6	SIP	mos value between 1 to 2.5	Critical	1.00-2.50	2.31	0012@192.168.1.236	0012@192.168.1.234	GLPG143927205781	
7	SIP	mos value between 3 to 4	Warning	2.00-4.00	2.27	0001@192.168.1.231	0001@192.168.1.237	GLPG13407127763982	
7	SIP	mos value between 1 to 2.5	Critical	1.00-2.50	2.27	0001@192.168.1.231	0001@192.168.1.237	GLPG13407127763982	
8	SIP	mos value between 1 to 2.5	Critical	1.00-2.50	1.47	0002@192.168.1.231	0002@192.168.1.237	GLPG13417127763987	
9	SIP	mos value between 1 to 2.5	Critical	1.00-2.50	1.04	0003@192.168.1.231	0003@192.168.1.237	GLPG13425567763992	
J.									

- Generates alerts when vital parameters go beyond a specified value
- Provides an active list of the alerts for the events in a tabular column
- Displays the summary of call#, user-defined message, threshold value, actual value for which the alert occurred, callee, caller, and callid



Registration Summary

- Displays the SIP registration information in a tabular format which includes user agent, registrar, registered time, status, and so on for each user agent
- Displays the active registration graph of the entire registration summary
- Provides the trace display of each registration

		lyzer - Summary	View							_		×
e Vie		mmary Help		▼ Total : 15								
		Show All Regi egistration Summary										
11 Sunn 11 #	Method		ster Request Ti		Registrar	Result	Status	ErrorCode	Call ID	Begiste	ered Time	-li
201 11	Register		11-15 11:18:1	0001@192.168.12.112	192.168.12.112	Passed	Registered	0	GL-MAPS-16-338		1-15 11:18:1.	
	DeRegiste	er 2023	411-15 11:18:2	0001@192.168.12.112	192.168.12.112	Passed	De-Registered	0	GL-MAPS-16-338	34		
	Register	2023	411-15 11:19:1	0001@192.168.12.112	192.168.12.112	Failed	Failed	404	GL-MAPS-23-339	37		
	Register		411-15 11:19:2	0001@192.168.12.112	192.168.12.112	Failed	Failed	403	GL-MAPS-28-339			
	Register	2023	411-15 11:19:4	0001@192.168.12.112	192.168.12.112	Failed	Failed	423	GL-MAPS-33-339			
	Register		-11-15 11:20:0	0001@192.168.12.112	192.168.12.112	Failed	Failed	480	GL-MAPS-38-339			
	Register		-11-15 11:20:2	0001@192.168.12.112	192.168.12.112	Failed	Failed	482	GL-MAPS-43-340			
	Register	2023	-11-15 11:20:5	0001@192.168.12.112	192.168.12.112	Failed	Failed	400	GL-MAPS-48-340	43		
_										0		1
gistrat	tion Type Re	egistration 🔹	Export	Graph Duration 7 days	▼ 2023-11-15 11:18:1	8 🔻 Goto	Save Upda	te Graph		n Statistics	Count	
				,	· ,				Total Regi		15	
									Active Reg	Istrations	0	
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1										Registrations	5	
1				(2023-11-08 11:24:50) Gra					Failed Reg	Registrations istrations	5 10	
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	tration Per								Failed Reg Timed Out	Registrations istrations	5 10 0	
						1:49)	Jnsuccessful		Failed Reg Timed Out	Registrations istrations Registrations Registrations	5 10 0	
				(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49)			Failed Reg Timed Out InProgress Registratio	Registrations istrations Registrations Registrations	5 10 0 0 13	
				(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49)			Failed Reg Timed Out InProgress Registratio	Registrations istrations Registrations Registrations n Sessions	5 10 0 0 13	
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legis 10				(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49)			Failed Reg Timed Out InProgress Registratio De-Registr Registratio De-Registr Failed Reg Client Fai 403 For 404 Not 423 Inte 480 Ter 482 Loo 4xx Oth	Registrations strations Registrations n Sessions ation Sessions ation Sessions ation Messages ation Messa istration Cat ures idden Found ryal Too Brief iporarily Una p Detected r Client Failure	5 10 0 0 13 2 13 2 13 2 13 1 1 1 1 1 1 1	
10 10 8 4 4 4				(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49)			Failed Reg Timed Out InProgress Registratio De-Registr Failed Reg Client Fai 403 Fori 404 Not 423 Inte 480 Ter 480 Ter 480 Ter 480 Ter 480 Ter 480 Ter	Registrations Istrations Registrations In Sessions ation Sessions ation Messages ation Messa istration Cat ures idden Found rval Too Brief poraily Una p Detected rr Client Failure ilures	5 10 0 13 2 13 2 13 2 13 2 1 1 1 1 1 1 1 1 1 1 1 1 1	
10 8 8 8 6 6 4 2 0 0	tration Per	Second	Graph Start -	(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49) ♥∎∪	Insuccessful		Failed Reg Timed Out InProgress Registratio De-Registr Failed Reg Client Fai 404 Not 423 Inte 480 Ter 480 Ter 482 Loc 482 Co 482 Not	Registrations Istrations Registrations Registrations In Sessions ation Sessions ation Messages ation Messa istration Cat ures idden Found rval Too Brief porarily Una p Detected arr Client Failure ilures ver Internal	5 10 0 13 5 2 13 2 13 2 13 2 1 1 1 1 1 1 1 1 1 1 1 1 1	
10 10 10 2 2 0		Second	Graph Start -	(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49)		15 - 11:25:0	Failed Reg Timed Out InProgress Registratio De-Registr Failed Reg Client Fai 403 For 403 For 500 Ser 500 Ser 500 Ser 500 Ser	Registrations istrations Registrations Registrations n Sessions ation Sessions ation Sessions ation Messages ation Messa ation Messa istration Cat ures bidden Found trval Too Brief iporarily Una p Detected rr Client Failure ilures rer Internal r Server Fail	5 10 0 13 5 2 13 2 13 2 13 2 1 1 1 1 1 1 1 1 1 1 1 1 1	
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10 10 10 2 2 0	tration Per	Second	Graph Start -	(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49) ♥∎∪	Insuccessful		Failed Reg Timed Out InProgress Registratio De-Registr Failed Reg Client Fai 403 For 404 Not 423 Inte 480 Ter 480 Ter 480 Ter 480 Ter 480 Cer 55x Oth Global Fa 603 Der	Registrations istrations Registrations n Sessions ation Sessions ation Sessions ation Messages ation Messa ation Cat ures ation Cat ures ation Cat porarily Una p Detected reclient Failure ilures ver Internal er Server Fail liures line	5 10 0 13 2 13 2 13 2 1 1 1 1 1 1 1 1 1 1 1 1 1	
10 10 10 10 10 10 10 10 10 10	tration Per	Second	Graph Start -	(2023-11-08 11:24:50) Gra	ph End - (2023-11-15 11:24	1:49) ♥∎∪	Insuccessful		Failed Reg Timed Out InProgress Registratio De-Registr Failed Reg Client Fai 403 For 404 Not 423 Inte 480 Ter 480 Ter 480 Ter 480 Ter 480 Cer 55x Oth Global Fa 603 Der	Registrations Istrations Registrations Registrations In Sessions ation Sessions ation Sessions In Messages ation Messa istration Cat ures bidden Found Irval Too Brief porarily Una p Detected or Client Failure llures ver Internal r Server Fail llures	5 10 0 13 2 13 2 13 2 1 1 1 1 1 1 1 1 1 1 1 1 1	



Registration Trace

1			Show All R	egistrations	•				
Call Summary	y Registraton Summary A	Alert Summary			104 MA				
Call # L	Jser Agent	Registrar	Status	Registered Time	TTL (secs)	Expiry Time	Remaining Time	RRD (msecs)	Registratio
0	0001@192.168.1.115	192.168.1.190	Registered	2011-01-03 18:31:09	120	2011-01-03 18:33:09		0	1
0	0002@192.168.1.115	192.168.1.190	Re-Registered	2011-01-03 18:35:33	120	2011-01-03 18:37:33		246162	2
	0001@192.168.1.115	192.168.1.190	De-Registered	2011-01-03 18:32:01	120	2011-01-03 18:34:01		0	1
) (0001@192.168.1.115	192.168.1.190	Registered	2011-01-03 18:33:59	120	2011-01-03 18:35:59		21	1
54098 5060	SIP/2.0 407 Proxy	GISTER Authentication Required	5060	Max-Fo Allow: From: To: si Call-J	0001 ≺sip:(.p:0001@192 .D: GLPG-923	23369124778		PTIONS,SUBSC	
	SIP/2.0 407 Proxy	Authentication Required		Max-Fo Allow: From: To: si Call-I CSeq: Expire Contac	orwards: 70 INVITE,BY 0001 <sip:0 p:0001@192 D: GLPG-92 1 REGISTER es: 120</sip:0 	0001@192.168.1.115 .168.1.115 23369124778 ip:0001@192.168.1.	>;tag=GLPG_33	PTIONS,SUBSC	

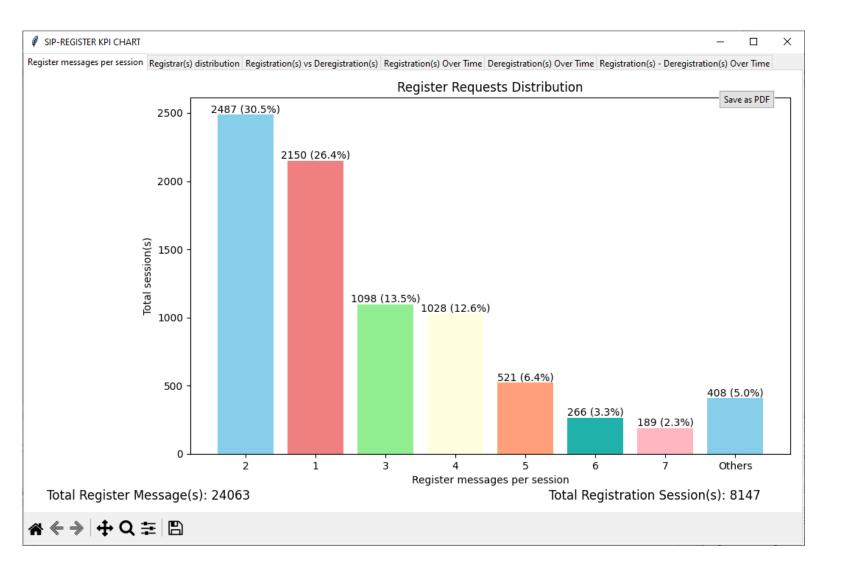
- Displays the message sequence of registered calls
- Message sequence pictorially displays the messages exchanged for a particular scenario between a user agent and the registrar



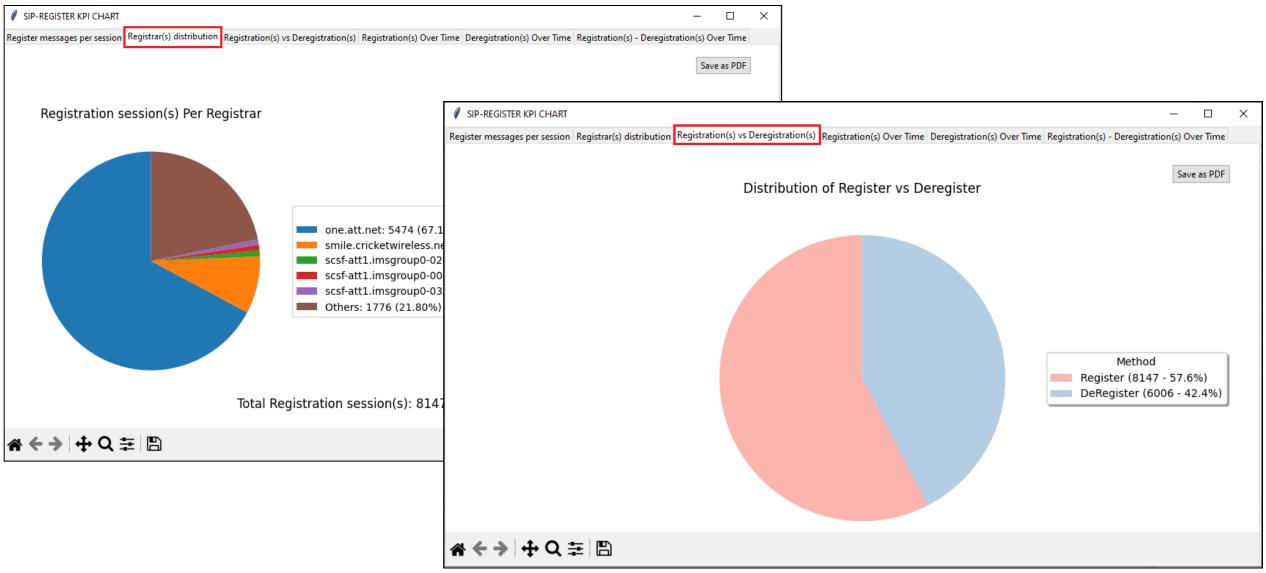
KPI Report (Registration)

The SIP Registration Summary KPI Report includes KPIs for the following:

- Register Messages per Session: Shows a graph for the distribution of Register Requests
- **Registrar(s) Distribution:** Displays a graph for the number of Registration sessions per Registrar
- Registration(s) vs Deregistration(s): Illustrates a graph comparing the distribution of Register and Deregister counts with percentages (%)
- Registration(s) Over Time: Show the graphs for "Successful," "Failed," and "Total Attempts" per second
- Deregistration(s) Over Time: Displays a graph for "Successful" and "Total Attempts" per second
- Registration(s) Deregistration(s) Over Time: Shows a graph for overall "Register & Deregister attempts," "Register & Deregister passed," and "Register & Deregister failed" attempts per second

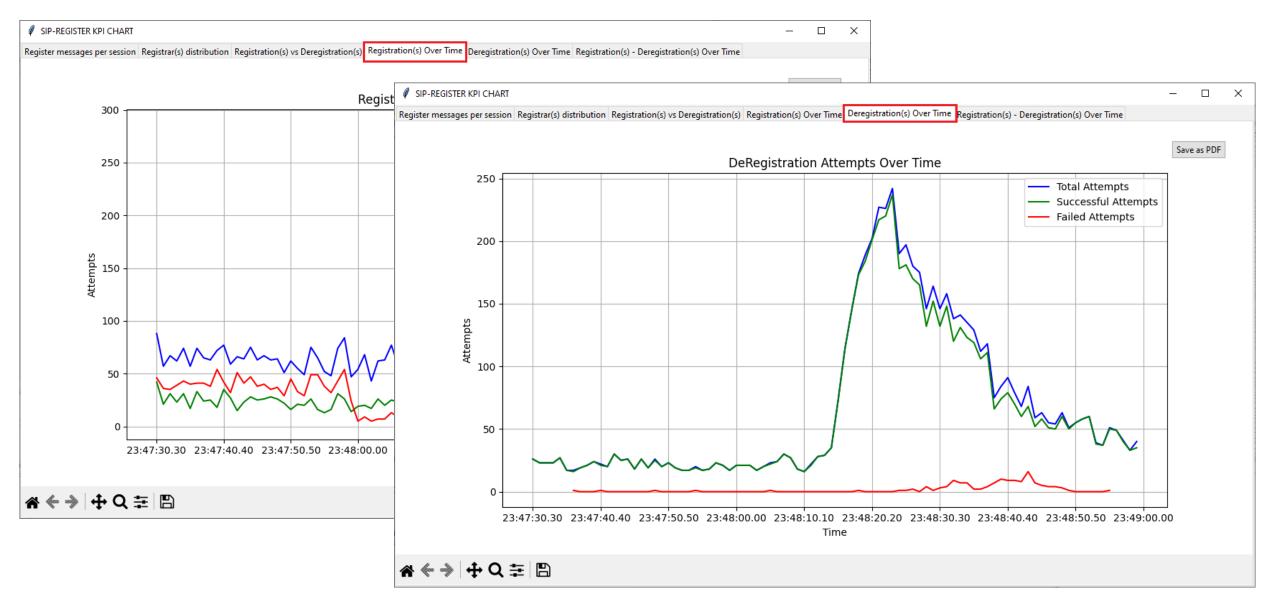


Registrar Distribution, Registration vs Deregistration KPIs



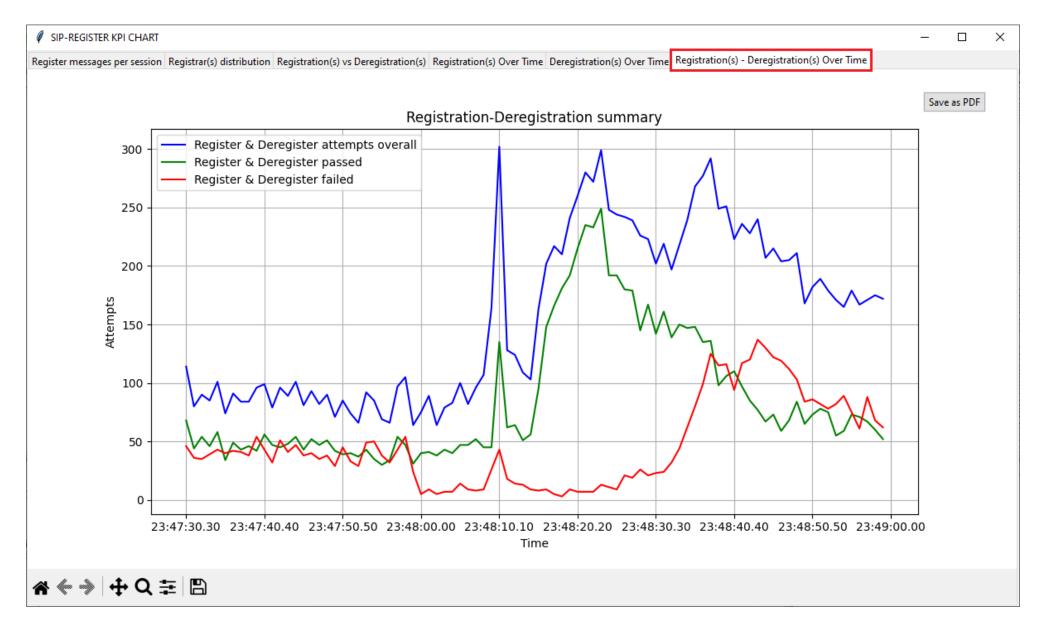


Registration over Time, Deregistration over Time KPIs





Registration-Deregistration over Time KPI





Thank you

