

If this is your First-Time-Use of MAPS<sup>TM</sup> LTE eGTP (S5S8 interface) application, then we recommend you follow all the steps explained in MAPS-LTE-eGTP-Quick-Install-Guide to install MAPS<sup>TM</sup> LTE eGTP application before proceeding with the steps below.

## PacketLoad Web Configurations

PacketLoad is available in following platform variants -

• **PacketLoad<sup>TM</sup> 4 x 1Gbps (PKS172)** - Data Traffic Generator 1U Rack Appliance with 4 x 1Gbps NIC interfaces: total capacity of up to 4 Gbits/sec Stateful TCP/HTTP Traffic.



• **PacketLoad™ 4 x 10Gbps (PKS174)** - Data Traffic Generator 2U Rack Appliance with 4 x 10Gbps NIC interfaces: total capacity of up to 40 Gbits/sec Stateful TCP/HTTP Traffic



- Place the device on a sturdy surface or install into a 19" rack.
- Do not block any airflow vents for proper operation and cooling. The system uses side and back vents for cooling.
- On a single-4-port setup, the first 2 ports (non-Management) from left to right (Eth0 and Eth1) are Server ports, and the last 2 ports (Eth2 and Eth3) are Client ports. The ports are paired "Eth0-Eth2" and "Eth1- Eth3". For multi-box configurations, all ports can be configured as Servers or Clients. The ports are used as Server—Client pairs for testing the DUT. Appropriate Ethernet cables should be used.
- Insert the power cable into device and then into the power outlet. The switch in the back of the system turns on the system. Insert the Ethernet cable into port MGMT0, and the other end into your Laptop or PC, or your network

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### Access the Configuration

- Assign an IP address to the PacketLoad device. Make sure that the PC and the PacketLoad device are in the same subnet.
- Access the device using the browser by entering the IP address assigned to the PacketLoad appliance, <u>http://192.168.1.1</u>

**Note:** The Login page also provides the PacketLoad appliance model details such as the Serial Number, Software Version, IP address, MAC Address, and other related information as seen in the figure

- Provide the following login credentials:
  - $\blacktriangleright$  Username = root
  - $\blacktriangleright$  Password = root
- Click "Login" button and login to the main menu as seen in the figure below.
- Under the Administration menu click on Configure System and select the System Setup from the drop down to configure the IP address for Management Ports (Mgmt 0, Mgmt 1)

- Configure the system by defining all the new parameters
  - Assign new IPV4 address (make sure that the PC and PacketLoad should be in the same subnet series)
  - Enter all the other network parameters and save the configuration
  - Click on Save and Commit, PacketLoad will save all the changes made into the configuration and restart the networking configuration.

**Note**: - Record these values for future reference if needed.

• PacketLoad now will be found at the new address as configured, to access the device go to web browser and enter the new address http:// new\_address

PacketLoad Inc.         ×           → C         □         192.168.1.1/nl/index.php				
<b>PacketLoad™</b>	Control Center			
Please Login	Model: Pa Serial Number:	cketLoad 634 "Performer"		
Username: root Password: ••••	Software Version: System Revision: Mgmt 0 IP Address Mgmt 1 IP Address Mgmt 1 IP Address Mgmt 1 IP Address Mgmt 1 IMAC Addre System Date:	000000016r2p4 000000003 : 192.168.1.1 ss: 00:26:14:02:29:e8 : 192.168.2 : 192.168.2 : 192.168.2 : 02:26:14:02:29:e9 Tue Sep 6 15:27:44 IST 2016		

PacketLoad™ GL Communications Inc.	User: root	Eth0 Eth1 1	Eth2 Eth3
	Run Test and Manage R	esults	
Manage Test Execution	<ul> <li>View Running Test</li> </ul>	Man	age Test Results 🔹
	Test Setup		
Manage Payloads	<ul> <li>Create Test Configurations</li> </ul>	<ul> <li>Manage</li> </ul>	• Test Configurations 🔹
	Administration		
Configure System	- Logout		User's Guide
System Setup			
Multi-System Setup			
Restore Defaults			
Firmware update			
Reboot System			
Halt System			

Packetl	.0ad <sup>™</sup> [	User: root		
Device Name:	PacketLoadInc		Mai	n Menu User's Guide
	Mgmt 0	Mgmt 1	Model: Packe	tLoad 634 "Performer
IPv4 Addr:	192.168.12.60	192.168.2.1	Serial Number:	00000308
IPv4 Mask:	255.255.255.0	255.255.255.0	Software Version:	000000016r2p4
Network:	192.168.12.1	192.168.2.0	Mgmt 0 IP Address:	192.168.12.60
Gateway:	192.168.12.1	192.168.2.0	Mgmt 0 MAC Address:	00:26:14:02:29:d0
Broadcast:	192.168.12.255	192.168.2.255	Mgmt 1 IP Address: Mgmt 1 MAC Address:	192.168.2.1 00:26:14:02:29:d1
DNS Server:	192.168.1.2	192.168.2.0	System Date:	Mon Apr 24 10:31:16 IST 20
DNS Domain			Free Disk Space:	843.93 GB
Select time	zone	Select language		
Asia/Kolkata	•	English 🔻		
	Save and Com	mit		



• To change the login credentials, click on the **Configure System** under **Administration** and select **Change Login**.



Enter the new Username, Password and click on the Update Login.

# Change System Login Username: Password: Confirm Password:

Update Login

#### PacketLoad Software Installation

PacketLoad software installation is required to load different traffic (HTTP/PCAP) configurations on to the PacketLoad 1G/10G Hardware device.

• Run the MAPS-PacketLoadx64.exe executable file from GL's installation USB stick. Follow the on-screen instruction to complete the installation procedure.



- Double-click on the **PacketLoad** shortcut icon **PacketLoad** ctreated on the desktop to invoke MAPS<sup>TM</sup> Packet Load application.
- By default, Testbed Setup Configuration window is invoked. By default, 'TestBedDefault' configuration is loaded in the window. Verify and validate the highlighted parameter settings:

Client IP Address = [Local IP address]

PacketLoad IP Address = [Device Management Port IP address]

PaketLoad Traffic Type = HTTP/PCAP Traffic

PaketLoad Traffic Mode = GTP to GTP

🕵 MAPS (Message Automation Protocol	Simulation) PacketLoad - [T	estbed Setup - TestBedDefault]
Configurations Emulator Reports Edito	r Debug Tools Windows He	lp
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Config	Value	
PacketLoad		HDTrafficType
<ul> <li>Client IP Address</li> </ul>	10.10.1.29	Select Option
<ul> <li>PacketLoad IP Address</li> </ul>	10.10.1.6	
<ul> <li>PacketLoad Traffic Type</li> </ul>	HTTP Traffic	HTTP Traffic
PacketLoad Traffic Mode	GTP To GTP	



## PacketLoad Profile Configuration

- From main window, select **Editor**  $\rightarrow$  **Profile Editor**. This will invoke Profile Editor window.
- By default, in the Profile Editor window PacketLoad Configurations file is displayed. •
- On the left-pane, select PacketLoadConfiguration, and set the PacketLoad Traffic Type as PCAP/HTTP. •
- If PacketLoad Traffic Type is set to PCAP, the following are configured -•

HTTP Rate Percentage = 0

PCAP Rate Percentage = 100

If PacketLoad Traffic Type is set to HTTP, the following are configured -•

HTTP Rate Percentage = 100

PCAP Rate Percentage = 0

- Depending on the PackLoad device connected (1G/10G), configure the Total Port Bandwidth in Mbps . For 1G PacketLoad device, configure Total Port Bandwidth in Mbps = 1000 Similarly, for 10G PacketLoad device, configure Total Port Bandwidth in Mbps = 10000
- Click on **m** to save the profile. Exit from Profile Editor window.

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MAPS (Message Automation Protocol Simulation) PacketLoad - [Profile Editor - PacketLoad Configurations] 474

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# Profiles (Edit-F2)	Config	Value	
1 PacketLoadConfiguration	PacketLoadConfiguration		Primary_Traffic_Type
	- Configuration Type	Dynamic	Select Option
	<ul> <li>PacketLoad Traffic Type</li> </ul>	PCAP	
	<ul> <li>Total Port Bandwidth in Mbps</li> </ul>	1000	PCAP 💌
	<ul> <li>HTTP Rate Percentage</li> </ul>		
	<ul> <li>PCAP Rate Percentage</li> </ul>	100	
	<ul> <li>HTTP File Name</li> </ul>	1024_Bytes.txt	
	<ul> <li>PCAP File Name</li> </ul>	ETSI.pcap	
	- HTTP		
	– GET Vs POST	47	
	<ul> <li>SYN Burst Rate</li> </ul>	20	
	<ul> <li>TCP Session Termination</li> </ul>	FIN	
	<ul> <li>TCP Session Optimization</li> </ul>	Standard Session	
	<ul> <li>Session Max Segment Size</li> </ul>	1424	
	Zero Data Transaction	Disable	
	Dynamic User Control		
	Maximum Number of Users Per Client Port	100000	
	- TCP		
	<ul> <li>Number of Client TCP Ports</li> </ul>	16384	
	<ul> <li>TCP Port Number Start</li> </ul>	32768	
	L TCP Port Number End	65530	
	<ul> <li>System Configuration Mode</li> </ul>	Single PacketLoad Clients-Servers	
	<ul> <li>Server GTP Encapsulation</li> </ul>	Enable	
	<ul> <li>Client GTP Encapsulation</li> </ul>	Enable	
	<ul> <li>Port Configuration Mode</li> </ul>	Transparent Mode	
	HD Traffic Parameters		
	L Devices	1	Add Insert Delete
	L Devices 1		Descention
	HD Management IP Address	192.168.12.60	V



• Click on **Start** to start the Test Bed Setup.

# Dote:

Ensure to start Packet Load before running LTE eGTP (S5S8) application configured.

• The PCAP or HTTP traffic configuration can be verified in the PacketLoad web browser (<u>http://192.168.1.1</u>), refer to figure below.



## MAPS™ LTE eGTP (S5S8) application Verification

Functional verification of MAPS-LTEeGTP application requires a system with 2 NIC cards for testing. MAPS-LTEeGTP is configured as **PDN GW** (Packet Data Network GateWay) on one NIC and as **SGW** (Serving Gateway) on the other.

Note down the IP address of NIC1 and NIC2, in this example the IP addresses used and configured are:

- NIC1 IP address is 192.xx.xx.125, and configured as PDN GW
- ▶ NIC2 IP address is 192.xx.xx.124, and configured as SGW

\*Note: In this test scenario, we have configured MAPS<sup>™</sup> LTEeGTP as SGW generating calls and PDN GW to receive calls.

### First MAPS™ LTEeGTP (GUI) – (PGW)

- Right-click on the **MAPS-LTEeGTP** application using shortcut icon created on the desktop and select '**Run as Administrator**'. This instance of MAPS<sup>™</sup> is configured for *Call Reception*
- While invoking the first **MAPS-LTEeGTP** instance, verify the following in the <u>Protocol Selection</u> window -
  - Protocol Standard is set to LTE eGTP
  - Protocol Version to RELEASE 9
  - Select Node as PDN GateWay. Click Ok

ADAPTER INDE		NSPORT	HANDLER		
			Threecore		
Number Of Dev	ices = 4				
Adapter Index	= 2				
MAC Address =	0-7-e9-b5-fe	-5			
Ip Address = 1	92.168.13.12	4			
Ip Address = 1	92.168.13.13				
Adapter Index	= 2 (a	1.0			
MAC Address =	fc-aa-14-924	00-06			
Ip Address = 1	2,100,13,12	2			=
ip Address – I	52.100.15.12	/			
Adapter Index	= 0				
MAC Address =	fc-aa-14-92-	bd-c8			
Ip Address = 1	92, 168, 13, 120	5			
Ip Address = 1	92, 168, 13, 12	1			
Ip Address = 1	92.168.13.12	3			
Ip Address = 1	92.168.13.128	3			×
<				>	

- By default, <u>Testbed Setup</u> window is displayed, loaded with **TestBedDefault** configuration. Verify and validate the following parameter settings:
  - The Display Adapter Info option from the Help menu displays all the network adapters available in the system. Choose and set the Traffic Adapter Index value displayed against the IP address in use.
  - Set **PGW IP Address** to 192.xx.xx.125 (NIC1 IP address)
  - Set **PGW Port** to 2124

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- Set SGW IP Address to 192.xx.xx.124 (NIC2 IP address)
- Set SGW Port to 2124
- $\succ \qquad \text{Set$ **Traffic** $} = \text{Enable}$
- Set PacketLoad Traffic Type = PCAP/HTTP Traffic [Note: Make sure that the same PCAP/ HTTP traffic type is also configured in the PacketLoad Testbed Setup]
- Set PacketLoad Management IP Address = PacketLoad Device IP Address
- Click Save button and save the changes to the same the TestBedDefoult configuration file
  - the **TestBedDefault** configuration file.
- From main window, select Editor → Profile Editor. This will invoke Profile Editor window.
- On the Profile Editor window, click on *main and select* **MS\_Profiles.** Click on OK.
- Select MSProfile001, scroll-down to Mobile Traffic Parameters, and set the Traffic Type as HDTraffic.
- Click on 📩 to save the profile.
- Start the PGW TestBed Setup.

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Configurations Emulator Reports Editor	Debug Tools Windows Help
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Config	Value
PG Configuration	
<ul> <li>Traffic Adapter Index</li> </ul>	1
E PGW	1
L PGW	
<ul> <li>PGW IP Address</li> </ul>	192.168.13.125
- PGW Port	2124
<ul> <li>PGW IP Address for Traffic</li> </ul>	192.168.13.125
<ul> <li>PGW Port for Traffic</li> </ul>	2152
SGW Configuration	
<ul> <li>SGW IP Address</li> </ul>	192.168.13.124
SGW Port	2124
- Traffic Parameters	
– Traffic	Enable
<ul> <li>PacketLoad Traffic Type</li> </ul>	PCAP Traffic
PacketLoad Management IP Address	192.168.12.60
- Protocol Configuration Options	
<ul> <li>Primary DNS IP Address</li> </ul>	192.168.1.3
<ul> <li>Secondary DNS IP Address</li> </ul>	8.8.8.8
<ul> <li>Gateway IP Address</li> </ul>	192.168.12.1
Subnet Mask	255.255.0.0
APN Configuration	3
<ul> <li>End User Configuration</li> </ul>	MS_Profiles.xml
<ul> <li>Type Of UE Smulation</li> </ul>	Profiles
CSV FileName	\\192.168.13.131\csv\MS_Profile



• On the same MAPS-LTEeGTP main window, from Configuration menu → select Incoming Call Handler Configuration and invoke the window. Verify that S5S8CallControl.gls script is set against Create Session Request message. Exit from the window.

Incoming Call Handlers Configuration - default			- 🗆 🗙
🗀 🔒 🖪			
Message Name	Script Name	Scripts	
Create Session Request Echo Request Delete Session Request	S5S8CallControl.gls Path Management Procedures.gls	S5S8CallControl.gls	<ul> <li>Sequence</li> <li>Random</li> </ul>



## Second MAPS™ LTEeGTP (GUI) – (SGW)

- Right-click on the MAPS-LTEeGTP application using shortcut icon created on the desktop and select 'Run as Administrator'. This instance of MAPS<sup>™</sup> is configured for *Call Generation*.
- While invoking the second **MAPS-LTEeGTP** instance, verify the following in the <u>Protocol Selection</u> window -
  - > Protocol Standard is set to LTE eGTP
  - Protocol Version to RELEASE 9
  - Select Node as Serving GateWay. Click Ok
- By default, <u>Testbed Setup</u> window is displayed. Click default values as listed below:
  - The Display Adapter Info option from the Help menu displays all the network adapters available in the system. Choose and set the Traffic Adapter Index value displayed against the IP address in use.
  - Set SGW IP Address to 192.xx.xx.124 (NIC2 IP address)
  - Set SGW Port to 2124
  - Set PGW IP Address to 192.xx.xx.125 (NIC1 IP address)
  - Set **PGW Port** to 2124
  - $\succ$  Traffic = Enable
  - Set PacketLoad Traffic Type = PCAP/HTTP Traffic [Note: Make sure that the same PCAP/ HTTP traffic type is also configured in the PacketLoad Testbed Setup]
  - Set PacketLoad Management IP Address = PacketLoad Device IP Address
  - Click **Save** button and save the changes to the same **TestBedDefault\_S5S8** file.
- From main window, select Editor → Profile Editor. This will invoke Profile Editor window.
- On the Profile Editor window, click on and select MS\_S58Profiles. Click on OK.
- Select MSS5S8Profile0001, scroll-down to Mobile Traffic Parameters, and set the Traffic Type as HDTraffic.
- Click on to save the profile.
- Start the SGW TestBed Setup.



and select TestBedDefault\_S5S8 and check for the parameter

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🧀 🔒 🔣	
Config	Value
SGW Configuration	
<ul> <li>Traffic Adapter Index</li> </ul>	1
- SGW	1
L SGW 1	
<ul> <li>SGW IP Address</li> </ul>	192.168.13.124
<ul> <li>SGW Port</li> </ul>	2124
<ul> <li>SGW IP Address For Traffic</li> </ul>	192.168.13.124
<ul> <li>GTP Port For Traffic</li> </ul>	2152
PLMN Identities	
<ul> <li>Mobile Country Code</li> </ul>	001
<ul> <li>Mobile Network Code</li> </ul>	01
L PGW Configuration	
<ul> <li>PGW IP Address</li> </ul>	192.168.13.125
L PGW Port	2124
Traffic Parameters	
- Traffic	Enable
<ul> <li>PacketLoad Traffic Type</li> </ul>	PCAP Traffic
<ul> <li>PacketLoad Management IP Address</li> </ul>	192.168.12.60
PacketLoad Traffic Mode	GTP To GTP
4 UE Simulation Parameters	
<ul> <li>Type Of UE Simulation</li> </ul>	Profiles
<ul> <li>End User Configuration</li> </ul>	MS_S5S8Profiles.xml
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# Profiles (Edit-F2)	Config	Value
1 MSS5S8Profile0001	Packet Numbers	100
2 MSS5S8Profile0002	<ul> <li>Inter Frame Gap</li> </ul>	100
3 MSS5S8Profile0003	GTPU Remote Address Mobile Traffic Parameters	192.168.3.1
4 MSS5S8Profile0004	<ul> <li>UDP Src Port</li> </ul>	2152
5 MSS5S8Profile0005	<ul> <li>UDP Dst Port</li> </ul>	2152
6 MSS5S8Profile0006	- TCP Server Ip - TCP port for HTTP	192.168.114.65 80
7 MSS5S8Profile0007	<ul> <li>Transmission Type</li> </ul>	Once
8 MSS5S8Profile0008	<ul> <li>Start File Count</li> </ul>	1
9 MSS5S8Profile0009	<ul> <li>Traffic File Name</li> <li>File Count For Concurrent and Sequential</li> </ul>	www.etsi.org 3
10 MSS5S8Profile0010	<ul> <li>File Playback Count</li> </ul>	1
11 MSS5S8Profile0011	<ul> <li>Tx File For Once Transmission from List</li> </ul>	5
12 MSS5S8Profile0012	<ul> <li>OS Socket</li> </ul>	Disable
12 MCCECOD8-0012	Traffic Type	HDTraffic

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- In the second MAPS-LTEeGTP (SGW) instance, click the *Call Generation* icon on main window, and invoke the *Call Generation* window.
  - By default, you will observe multiple call instances loaded with S5S8SessionControl.gls scripts and MSS5S8Profile00\*\* profiles. <u>Note:</u> If the profile is not loaded, click on the call instance in the Profile column and select the configured MSS5S8Profile0001 profile and set it for the call instance.
  - Select the call instance loaded with S5S8SessionControl.gls script and MSS5S8Profile0001 profile in the Call Generation window and click Start button to initiate the call generation.
- Wait for the calls to terminate and verify the call flow under the **Message Sequence** tab at both generation and reception end.
- Select any message in the ladder diagram and observe the respective decode message on the right pane for the respective



- Return to first instance of **MAPS-LTEeGTP** (PGW), click <sup>>>></sup> icon and invoke the **Call Reception** window. Observe that the calls are automatically received running the Rx script.
- On MAPS<sup>™</sup> SGW (or PGW) main menu, from **Report** menu
   → select User Defined Statistics to invoke Statistics window.
- Similarly, from MAPS<sup>™</sup> SGW (or PGW) main menu, from **Report** menu → select **User Defined Graphs** to invoke Graphs window as shown below. All the four graphs Bandwidth on each port, HTTP and TCP Traffic Graph, and number of Added and Stopped Users ratio Graph are displayed as shown in the figure below.

