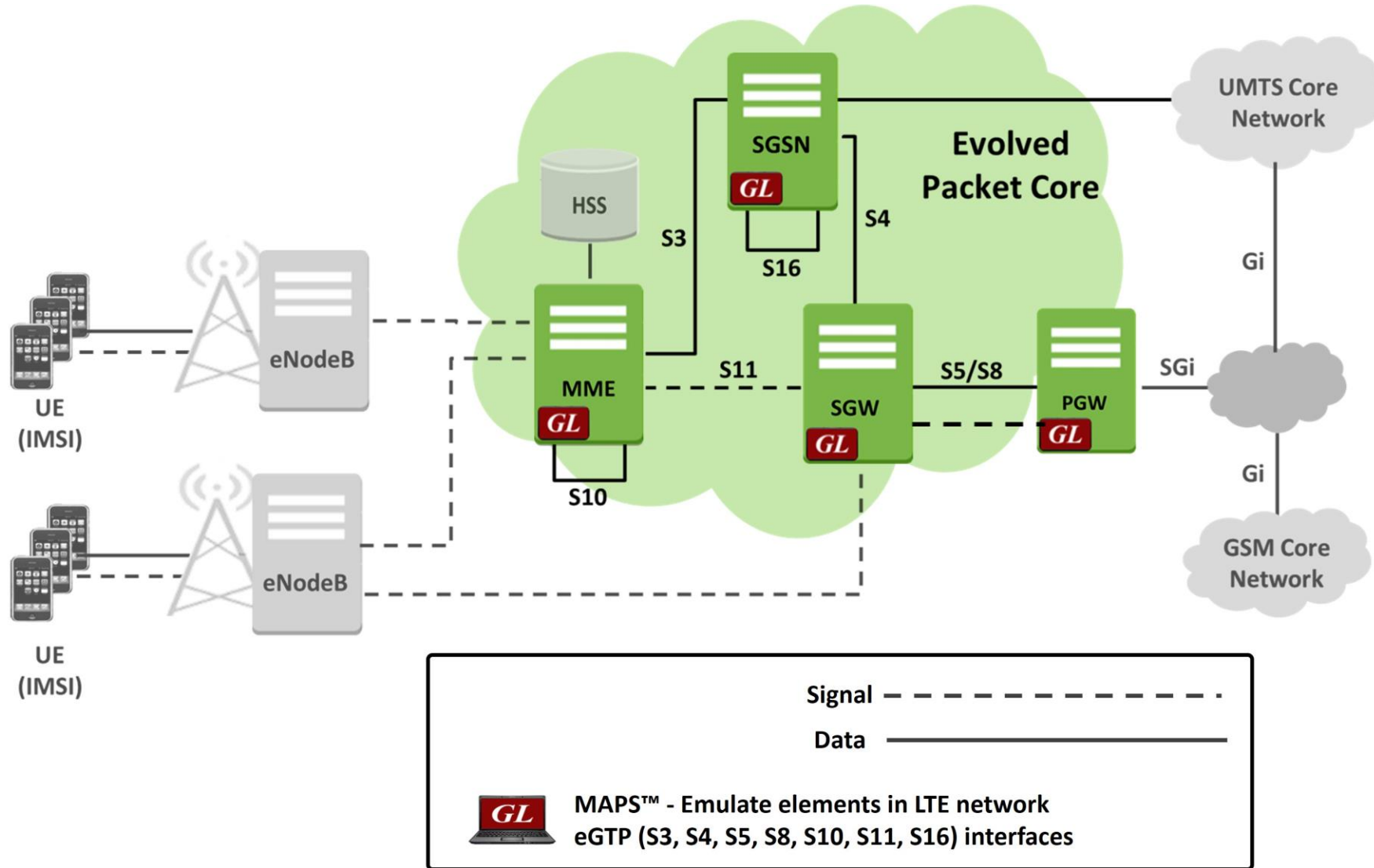

MAPS™ LTE eGTP Interface Emulator



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Phone: (301) 670-4784 Fax: (301) 670-9187 Email: info@gl.com
Website: <https://www.gl.com>

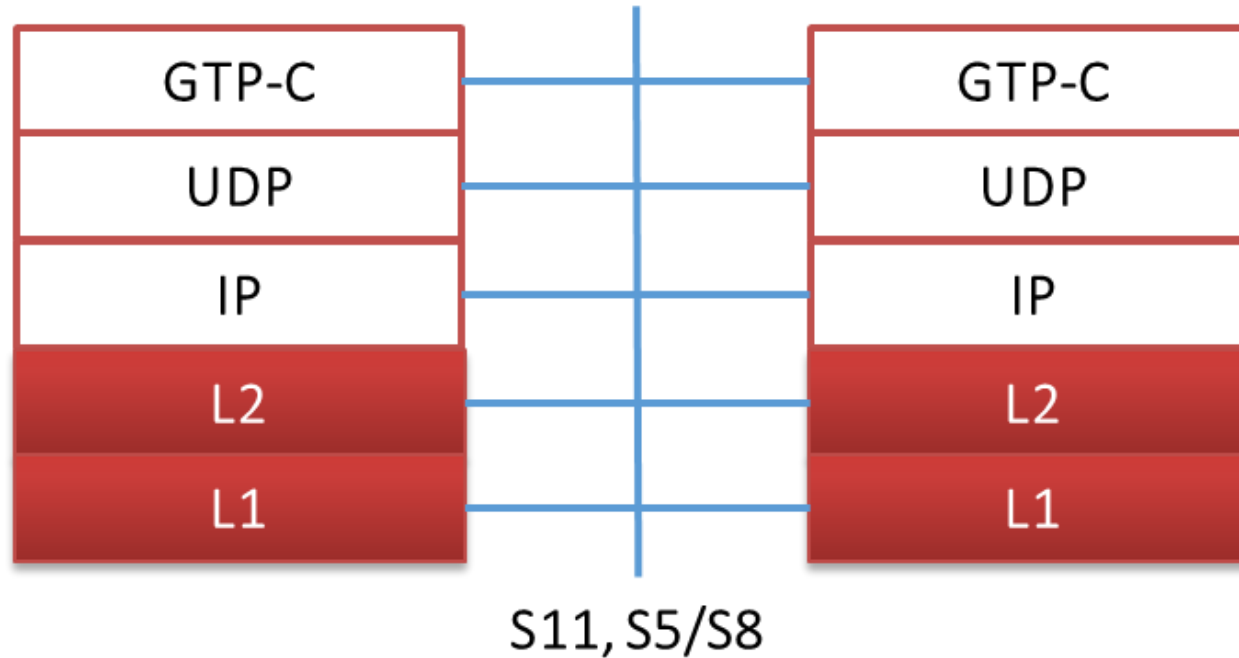
MAPS™ eGTP Interfaces Emulator



Key Features

- Setup a virtual real-time network simulating 4G-LTE network elements using 'MAPS™ 4G Wireless Lab Suite'
- Emulate MME, SGW and PDN GW elements in the LTE eGTP interface
- Supports both Control Plane and User-plane simulation across different interfaces
- Supports Path Management and Tunnel Management procedures over eGTP interfaces
- Massive UE simulation (up to 500000) with Auto generation feature for high density load testing
- Generates and responds to hundreds of UE signaling (Load testing)
- Generates and process GTP-C messages (valid and invalid)
- Supports GTP Traffic (GTP User Plane Data) which includes verification like BERT testing, HTTP traffic generation capability - requires additional licensing 'ETH101'
- Option to offload GTP traffic to Gateway (GGSN)- requires additional licensing 'ETH102'
- High-volume eGTP-u (User Plane) traffic simulation possible with support of 'Packet Load' appliance; both 4Gbps and 40Gbps variants are available to suit customer needs

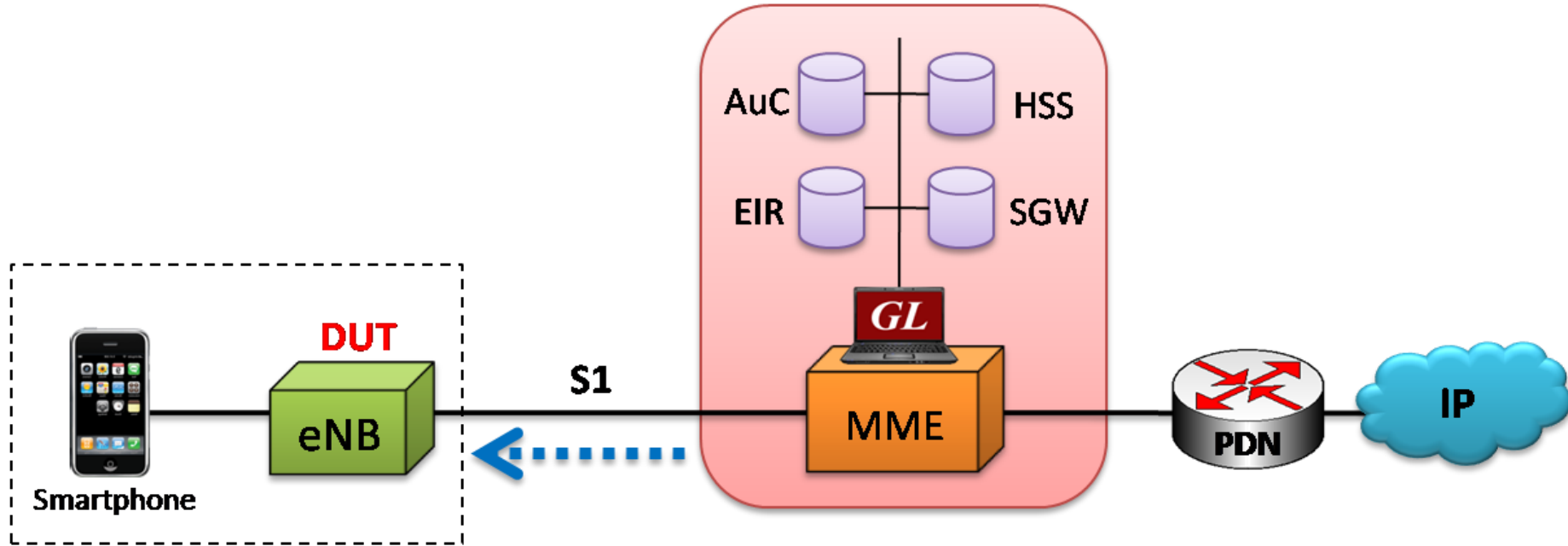
MAPS™ Protocol Stack



| Supported Protocols | Standard / Specification Used |
|-----------------------------|---------------------------------|
| S11, S5/S8 Interface | |
| Evolved GTP (eGTP) for EPS | 3GPP TS 29.274 V8.0.0 (2008-12) |
| Evolved GTP (eGTP) for EPS | 3GPP TS 29.274 V9.2.0 (2010-03) |

Testing Scenarios

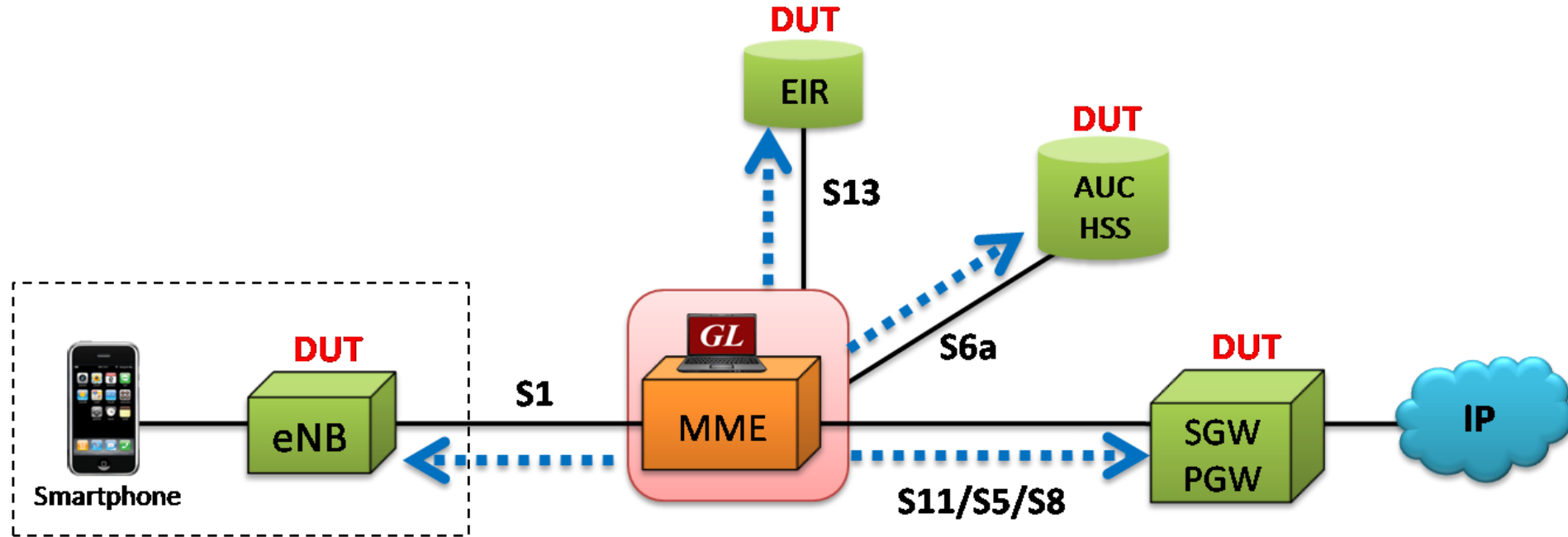
#1 Single Interface Simulation



 MAPS™ MME, HSS, AuC, EIR, SGW

Testing Scenarios (Contd.)

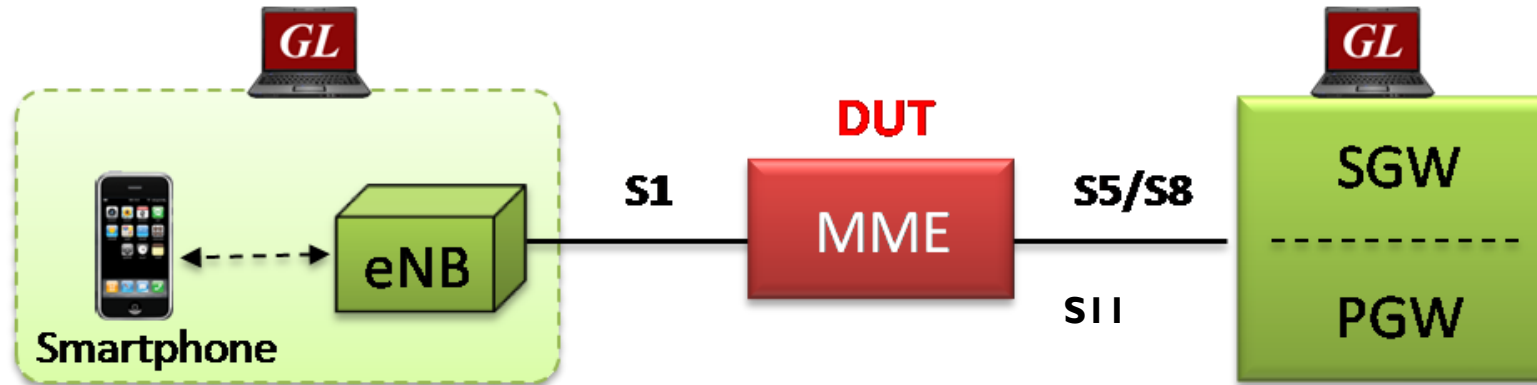
#2 Multi Interface Simulation



 **MAPS™ MME Emulator in LTE Network**

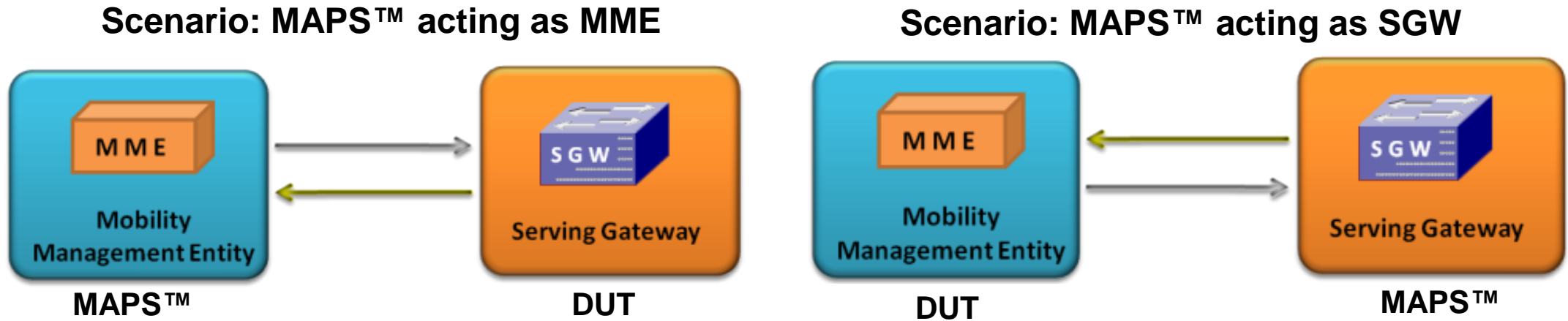
Testing Scenarios (Contd.)

#3 Wrap Around Testing



 **MAPS™ LTE S1, eGTP Emulators**

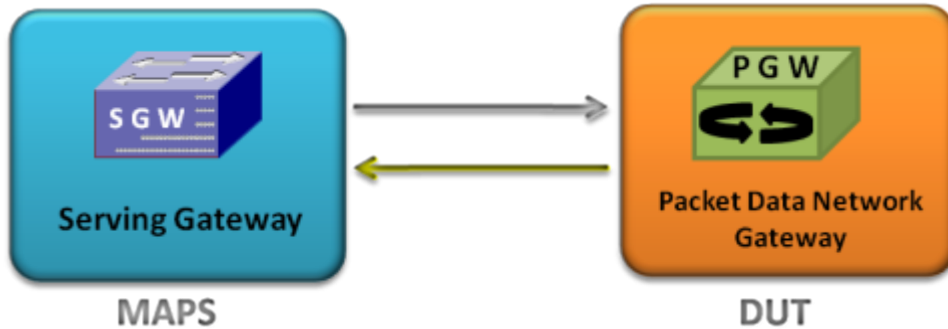
eGTP (S11) Configurations



- MAPS™ LTE eGTP can be configured to act as MME testing SGW and vice-versa
- Capable of initiating the message flow towards opposite element and respond to incoming messages

eGTP (S5 S8) Configurations (Contd.)

Scenario: MAPS™ acting as SGW



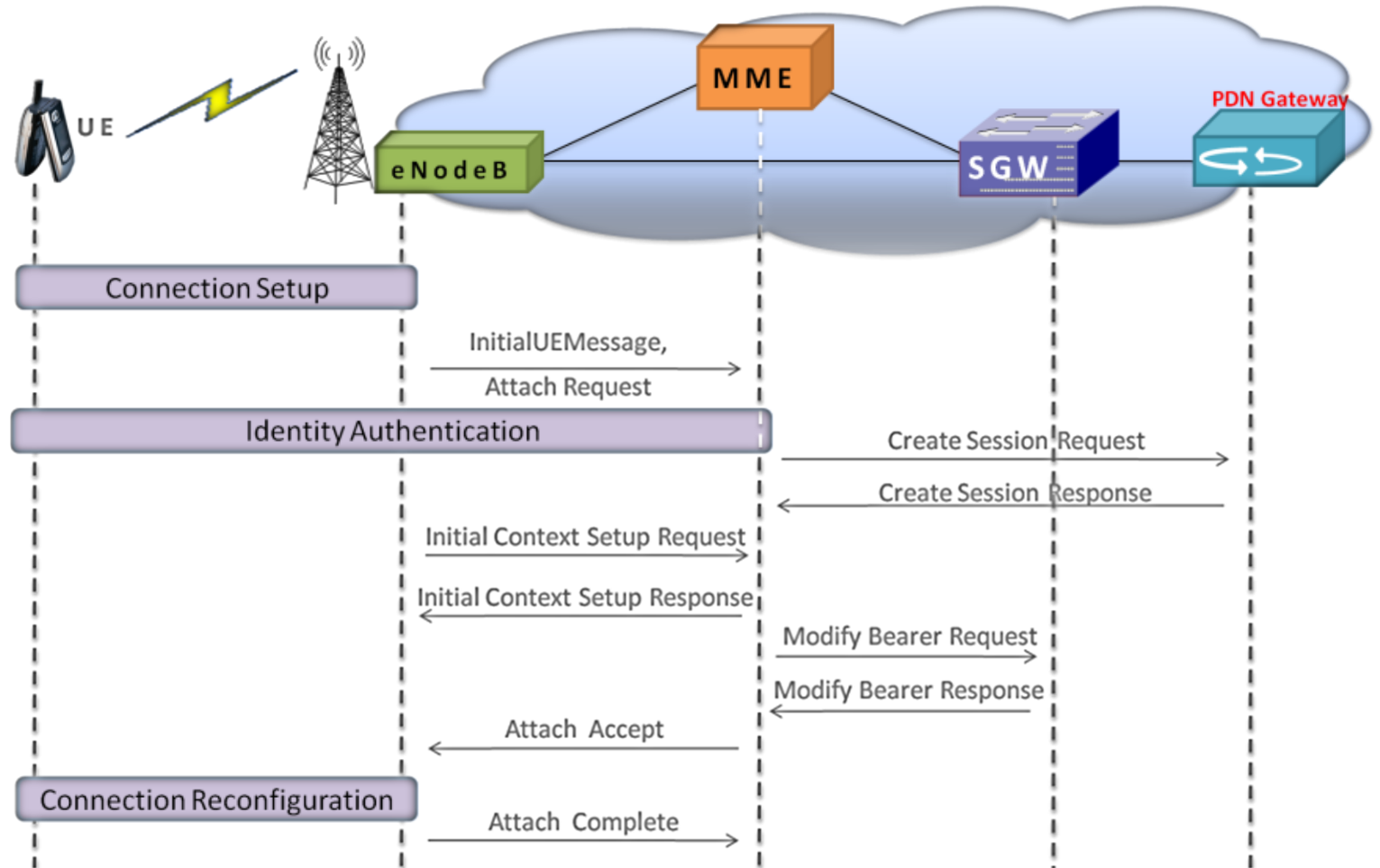
Scenario: MAPS™ acting as PGW



- MAPS™ - LTE eGTP can be configured to act as SGW testing PGW and vice-versa
- Capable of initiating the message flow towards opposite element and respond to incoming messages

LTE - eGTP (S11, S5/S8) Signaling Scenario

LTE - S11 and S5/S8 interfaces signaling scenario (messages between MME, SGW, and PGW)



LTE eGTP Call Generation

Active Calls Call Status Call Results

Loading Scripts and Profiles

The screenshot displays the MAPS MME (LTE eGTP RELEASE9) interface. At the top, there are three tabs: 'Active Calls', 'Call Status', and 'Call Results'. Below these is a table with columns: Sr., Script Name, Profile, Call Info, Script Execution, Status, Events, Result, Total Iterations, and Completed Iterations. The table contains four rows of data for 'S11SessionControl.gls' scripts. Below the table are control buttons: Add, Delete, Insert, Refresh, Start, Start All, Stop, Stop All, Abort, and Abort All. The main area is divided into two panes. The left pane, titled 'Message Sequence', shows a sequence of messages between MME and SGW: Create Session Request (11:25:54.319000), Create Session Response (11:25:54.340000), Modify Bearer Request (11:25:54.340000), Modify Bearer Response (11:25:54.362000), Delete Session Request (11:27:54.359000), and Delete Session Response (11:27:54.379000). The right pane, titled 'Decode Message', shows the decoded eGTP layer message details, including fields like Version, Piggybacking (P), TEID, Message Type, Message Length, Tunnel Endpoint Identifier, Sequence Number, IMSI, Information Element Id, Length, Instance, MSISDN, and User Location Info (ULI).

| Sr. | Script Name | Profile | Call Info | Script Execution | Status | Events | Result | Total Iterations | Completed Iterations |
|-----|-----------------------|----------------|-----------------------|------------------|--------------------|--------|---------|------------------|----------------------|
| 1 | S11SessionControl.gls | MSPProfile0001 | IMSI:.001013012041631 | Start | SESSION-TERMINATED | None | Pass | 1 | 1 |
| 2 | S11SessionControl.gls | MSPProfile0002 | IMSI:.001013012041632 | Start | SESSION-TERMINATED | None | Pass | 1 | 1 |
| 3 | S11SessionControl.gls | | | Start | | None | Unknown | 1 | 0 |
| 4 | S11SessionControl.gls | | | Start | | None | Unknown | 1 | 0 |

Message Sequence

Decode Message

LTE eGTP Incoming Call Reception

GL MAPS Serving GateWay (LTE eGTP RELEASE9) - [Call Reception]

Configurations Emulator Reports Editor Debug Tools Windows Help

| Sr No | Script Name | Profile | Call Info | Script Execution | Status | Events | Events Profile | Results |
|-------|--------------------------------|------------------|-----------------------|------------------|------------------------|-------------------|----------------|---------|
| 1 | Path Management Procedures.gls | | | Stop | ECHO-RESPONSE-RECEIVED | send Echo Request | | Pass |
| 2 | S11SessionControl.gls | MSS11Profile0001 | IMSI:.001013012041631 | Completed | SESSION-TERMINATED | None | | Pass |
| 3 | S11SessionControl.gls | MSS11Profile0002 | IMSI:.001013012041632 | Completed | SESSION-TERMINATED | None | | Pass |
| 4 | S11SessionControl.gls | MSS11Profile0001 | IMSI:.001013012041631 | Completed | SESSION-TERMINATED | None | | Pass |
| 5 | S11SessionControl.gls | MSS11Profile0002 | IMSI:.001013012041632 | Completed | SESSION-TERMINATED | None | | Pass |

Stop Stop All Abort Abort All Show Records Select Active Call Auto Trash Trash

Save Column Width Show Latest

MME SGW

```

graph TD
    MME -- Create Session Request --> SGW[11:25:54.331000]
    SGW -- Create Session Response --> MME[11:25:54.332000]
    MME -- Modify Bearer Request --> SGW[11:25:54.352000]
    SGW -- Modify Bearer Response --> MME[11:25:54.352000]
    MME -- Delete Session Request --> SGW[11:27:54.368000]
    SGW -- Delete Session Response --> MME[11:27:54.368000]
        
```

Find

```

===== eGTP Layer =====
0000 Version = 010..... GTP-C
0000 Piggybacking (P) = ...0.... No piggybacked message
0000 TEID = ....1.... TEID Present
0001 Message Type = 00100000 Create Session Request
0002 Message Length = 238 (x00EE)
0004 Tunnel Endpoint Identifier = 0 (x00000000)
0008 Sequence Number = 0 (x000000)
      IMSI
000C Information Element Id = 00000001 International Mobile Subscriber Identifier
000D Length = 8 (x0008)
000F Instance = ....0000 (0)
      IMSI
      MSISDN
0018 Information Element Id = 01001100 MSISDN
0019 Length = 5 (x0005)
001B Instance = ....0000 (0)
      MSISDN
      User Location Info (ULI)
0021 Information Element Id = 01010110 User Location Info(ULI)
        
```

Scripts **Message Sequence** Event Config Script Flow

● Initialisation Errors ● Error Events ● Captured Errors ● Link Status Up=0 Down:

Call Results

Message Sequence

Decode Message

Testbed Configuration

The screenshot displays the 'MAPS MME (LTE eGTP RELEASE9) - [Testbed Setup - TestBedDefault]' application window. The interface includes a menu bar with 'Configurations', 'Emulator', 'Reports', 'Editor', 'Debug Tools', 'Windows', and 'Help'. Below the menu is a toolbar with various icons. The main area is a configuration tree with a table of settings. The 'MME Configuration' section is expanded, showing a tree structure of settings. A 'Value' column is visible to the right of the tree. On the far right, there is a 'Enable' checkbox which is checked. At the bottom right, there are 'Start' and 'Edit' buttons. At the bottom of the window, there are status indicators for 'Initialisation Errors' and 'Error'.

| Config | Value |
|---------------------------------------|---|
| MME Configuration | |
| Traffic Adapter Index | 1 |
| MME | 1 |
| MME 1 | |
| MME IP Address | 192.168.12.82 |
| MME Port | 2124 |
| PLMN Identities | |
| Mobile Country Code | 001 |
| Mobile Network Code | 01 |
| SGW Configuration | |
| SGW IP Address | 192.168.12.83 |
| SGW Port | 2124 |
| eNB IP Address for Traffic | 192.168.12.82 |
| GTP Port For Traffic | 2152 |
| Traffic Parameters | |
| Traffic | Enable |
| PacketLoad Traffic Type | HTTP Traffic |
| PacketLoad Management IP Address | 192.168.30.99 |
| PacketLoad Traffic Mode | GTP To GTP |
| End User Configuration | MS_Profiles.xml |
| Type Of UE Smulation | Profiles |
| CSV FileName | C:\Program Files\GL Communications Inc... |
| Auto Generated Users Info | |
| No Of Users To Be Simulated | 400000000 |
| Starting IMSI | 001013012041631 |
| MSISDN | 3012041631 |
| IMEI | 359877068325248 |
| Auto Generated End User Configuration | AutoGeneratedUser_Profile.xml |

Profile Configuration

The screenshot displays the 'Profile Editor -MS_Profiles' window in the MAPS MME (LTE eGTP RELEASE9) application. The interface is divided into several sections:

- Profiles List (Left):** A table listing 24 profiles (MSProfile0001 to MSProfile0024). MSProfile0001 is selected.
- Config Table (Center):** A table showing configuration parameters for MSProfile0001. The parameters are grouped into expandable sections.
- Enable Column (Right):** A column with a checked checkbox for MSProfile0001.
- Buttons (Bottom):** 'Insert', 'Delete', and 'Clear' buttons are located below the profiles list. 'Add', 'Insert', 'Delete', and 'Properties' buttons are located below the config table.

| # | Profiles (Edit-F2) | Config | Value | Enable |
|----|--------------------|---------------|-------|-------------------------------------|
| 1 | MSProfile0001 | MSProfile0001 | | <input checked="" type="checkbox"/> |
| 2 | MSProfile0002 | | | |
| 3 | MSProfile0003 | | | |
| 4 | MSProfile0004 | | | |
| 5 | MSProfile0005 | | | |
| 6 | MSProfile0006 | | | |
| 7 | MSProfile0007 | | | |
| 8 | MSProfile0008 | | | |
| 9 | MSProfile0009 | | | |
| 10 | MSProfile0010 | | | |
| 11 | MSProfile0011 | | | |
| 12 | MSProfile0012 | | | |
| 13 | MSProfile0013 | | | |
| 14 | MSProfile0014 | | | |
| 15 | MSProfile0015 | | | |
| 16 | MSProfile0016 | | | |
| 17 | MSProfile0017 | | | |
| 18 | MSProfile0018 | | | |
| 19 | MSProfile0019 | | | |
| 20 | MSProfile0020 | | | |
| 21 | MSProfile0021 | | | |
| 22 | MSProfile0022 | | | |
| 23 | MSProfile0023 | | | |
| 24 | MSProfile0024 | | | |

| Section | Parameter | Value |
|--------------------------------|--|----------------------------|
| Mobile Identity | IMSI | 001013012041631 |
| | IMEI | 359877068325248 |
| | MSISDN | 3012041631 |
| User Location Information | Tracking Area Code | 0003 |
| | Cell Identity | 1 |
| | PDN Type Value | IPv4 |
| Remote Server | Access Point Name | default |
| | Remote Server Address | 192.168.1.149 |
| | Remote Server Address IPV6 | 2001:1001:3001:4001:500... |
| RAT Type | EUTRAN | |
| ESM Message Parameters | ERABId | 1 |
| | Default Bearer Id | 5 |
| | Dedicated Bearer Id | 14 |
| Bearer Level QoS Parameters | | |
| Mobile Traffic Parameters | TCP Server Ip | 192.168.15.80 |
| | TCP port for HTTP | 80 |
| | Transmission Type | Once |
| | Start File Count | 1 |
| | Traffic File Name | www.etsi.org |
| | File Count For Concurrent and Sequential | 3 |
| | File Playback Count | 1 |
| | Tx File For Once Transmission From List | 5 |
| | OS Socket | Disable |
| | Traffic Type | MobileTraffic |
| PacketCheck Traffic Parameters | | |

Customizations - Call Flow (Scripts)

```
ScriptEditor - [C:\Program Files\GL Communications Inc\MAPS-LTEeGTP\MAPS\LTE eGTP\RELEASE9\Serving G...
File View Edit Shortcuts Tools Help
Command Wind...
Action
  Send
  Recv
  Decode
  Bind
  Unbind
  Load Profile
  Start Timer
  Stop Timer
  Stop Retransmit Tir
  Conditional & Flow Con
  Variable
  Maps CLI
  Logs / Comment
  Init
  Child Script
  DataBase
  Send Report
  Resume
  Return
  Include
  Exit
  Utility Functions
S11SessionControl*
1 //*****Initializing Parameters*****
2 LTEeGTPScriptId = "Null" ;
3 MsgHandler:"eGTPMessageHandler";
4 Traffic = "Unsuccessful";
5 ProfileLoaded=0;
6 TxCount=0;
7 RxCount=0;
8 File_TxCount=0;
9 File_RxCount=0;
10 TrafficState="Null";
11 UEStatus="idle";
12
13 "LTEeGTPInitialization":
14   SequenceNo=0;
15   IsReception=1;
16   LTEeGTPScriptId = "LTEeGTP";
17   IMSIstr="IMSI:";
18   LogActiveCallInfoTimeOut = (_SessionDurationTimeOut + 120000);
19   starttimer LogActiveCallInfoTimer LogActiveCallInfoTimeOut msec;
20   StartChildScript (LTEeGTPScriptId,"LTEeGTP","SessionCreationS11.
21   wait;
22
23 //*****S11 Procedures Section Star
24 "OnCreateSessionRequest" (IMSI,GTPVersion,eNBTrafficIPAddress,eNBDate
25   KeyIdentifier:IMSIstr,IMSI;
26   Status = "CREATE-SESSION-REQUESTED";
Ready
Line Count - 294 | Line : 12 Col : 1
```

Customizations - Protocol Messages

The screenshot shows the 'Message Editor - CreateSessionRequest' window. The interface includes a menu bar (File, View, Direction, Tools, Help), a toolbar with icons for file operations, and a main workspace. The workspace is divided into three main sections:

- Frame No:** A list on the left showing '1'.
- eGTP Tree:** A tree view on the left showing fields like Version, Piggybacking (P), TEID, Message Type (highlighted), Message Length, Tunnel Endpoint Identifier, and Sequence Number.
- Message List:** A list on the right showing various message types and their values, with 'Create Session Request = 32' selected.
- Hex/ASCII View:** A large text area at the bottom showing the hex and ASCII representation of the message.

The hex/ASCII view shows the following details:

```
===== eGTP Layer =====  
0000 Version = 010..... GTP-C  
0000 Piggybacking (P) = ...0.... No piggybacked message  
0000 TEID = ....1... TEID Present  
0001 Message Type = 00100000 Create Session Request  
0002 Message Length = 227 (x00E3)  
0004 Tunnel Endpoint Identifier = 1 (x00000001)  
0008 Sequence Number = 1 (x000001)  
IMSI =  
000C Information Element Id = 00000001 International Mobile Subscriber Identity (I  
000D Length = 5 (x0005)  
000F Instance = ....0000 (0)  
IMSI = 9480010087  
MSISDN =  
0015 Information Element Id = 01001100 MSISDN  
0016 Length = 5 (x0005)  
0018 Instance = ....0000 (0)  
MSISDN = 9480010087  
User Location Info (ULI) =  
001E Information Element Id = 01010110 User Location Info(ULI)  
001F Length = 34 (x0022)
```


Incoming Call Handler Configuration

MAPS MME (LTE eGTP RELEASE9) - [Incoming Call Handlers Configuration - default]

Configurations Emulator Reports Editor Debug Tools Windows Help

| Message Name | Script Name |
|------------------------|--------------------------------|
| Create Session Request | S11SessionControl.gls |
| Echo Request | Path Management Procedures.gls |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Scripts

- S11SessionControl.gls

Sequence
 Random

Up
Down

Add Delete

Add Delete Apply Scripts Clear Scripts

Initialisation Errors Error Events

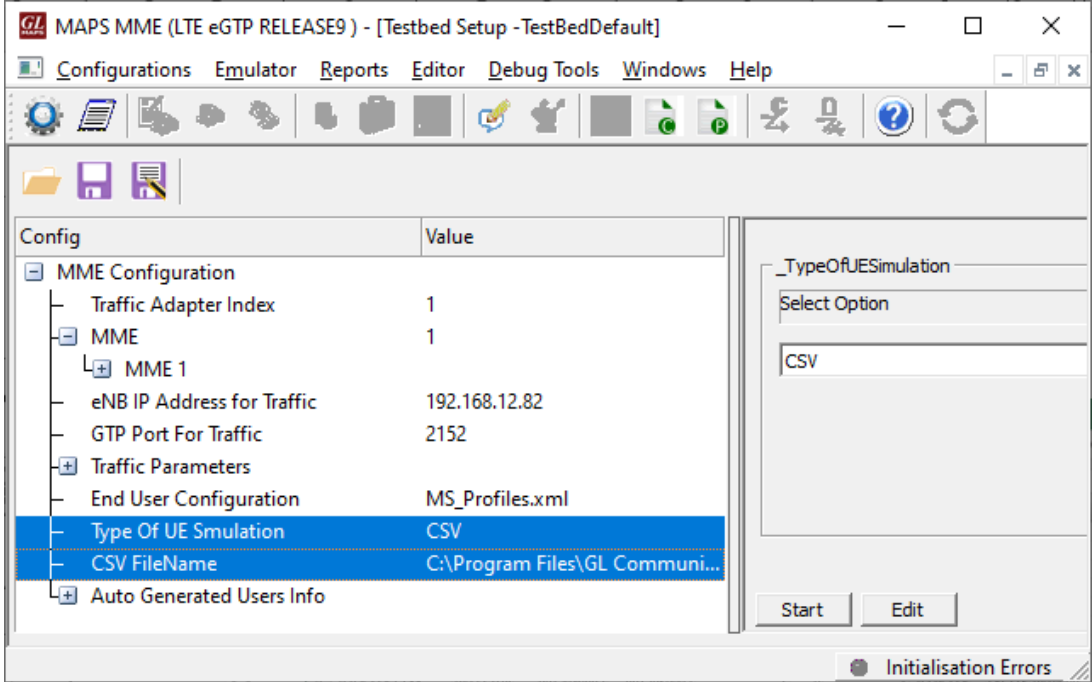
Bulk Call Generation

| Sr No | Script Name | Profile | Call Info | Script Execution | Status | Events | Result | Total Iterations | Completed Iterations |
|-------|-----------------------|----------------|-----------|------------------|--------|--------|---------|------------------|----------------------|
| 1 | S11SessionControl.gls | MSPProfile0001 | | Start | | None | Unknown | 10 | 0 |
| 2 | S11SessionControl.gls | MSPProfile0002 | | Start | | None | Unknown | 10 | 0 |
| 3 | S11SessionControl.gls | MSPProfile0003 | | Start | | None | Unknown | 10 | 0 |
| 4 | S11SessionControl.gls | MSPProfile0004 | | Start | | None | Unknown | 10 | 0 |
| 5 | S11SessionControl.gls | MSPProfile0005 | | Start | | None | Unknown | 10 | 0 |
| 6 | S11SessionControl.gls | MSPProfile0006 | | Start | | None | Unknown | 10 | 0 |
| 7 | S11SessionControl.gls | MSPProfile0007 | | Start | | None | Unknown | 10 | 0 |

```
//*****Initializing Parameters*****  
LTeGTPScriptId = "LTeGTP";  
MsgHandler:"eGTPMessageHandler";  
SequenceNo = 0;  
StopAll = 0;  
TrafficVerification = "Unsuccessful";  
TxCount=0;  
RxCount=0;  
nFileCount=1;  
TrafficState="Null";  
File_TxCount=0;  
File_RxCount=0;  
LocalRestartCounter=$_LocalRestartCounter;  
State="Null";  
ReTimeExpiry="False";  
CreateBearer="FALSE";
```

CSV Profiles

TestBed Configuration

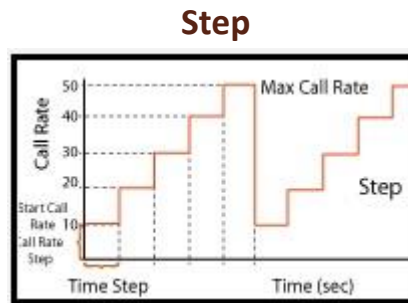
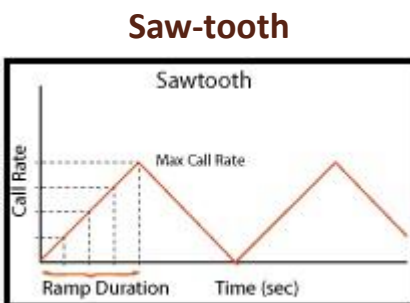
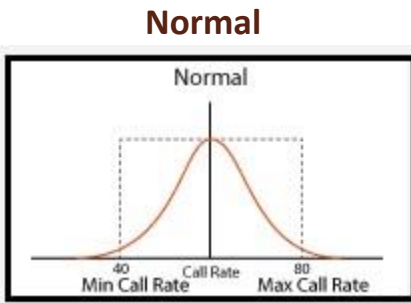
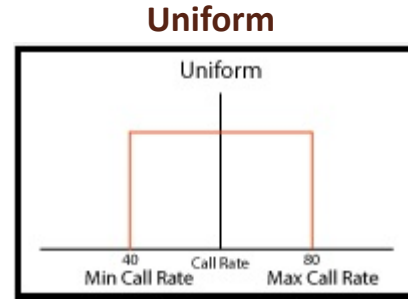
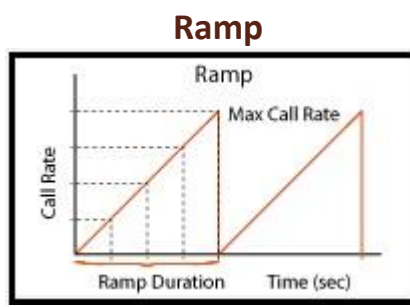
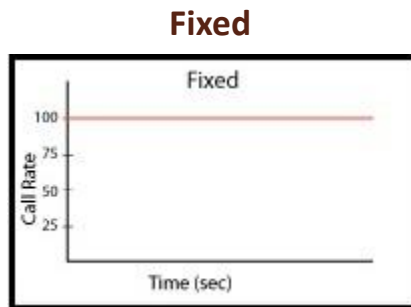


Sample CSV Profile

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|----|----------|-----------|-----------|---------------|--------------|---------------|-----|---------------|--------|----------|---------|---------|-------------|-------|-------------|-------------|
| 1 | IMSI | Subscribe | TMSI | CallingNumber | CalledNumber | CMServiceType | LUT | TypeOfIdentit | IMEI | IMEISV | LAC | SAC | CellIdentit | RNCID | RoamingDest | binary bina |
| 2 | binary | string | hex | binary | binary | int | int | | binary | binary | hex | hex | hex | int | binary | bina |
| 3 | 9.02E+14 | GSM | 0x111310C | 9017040001 | 9017050001 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 4 | 9.02E+14 | GSM | 0x111310C | 9017040002 | 9017050002 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 5 | 9.02E+14 | GSM | 0x111310C | 9017040003 | 9017050003 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 6 | 9.02E+14 | GSM | 0x111310C | 9017040004 | 9017050004 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 7 | 9.02E+14 | GSM | 0x111310C | 9017040005 | 9017050005 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 8 | 9.02E+14 | GSM | 0x111310C | 9017040006 | 9017050006 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 9 | 9.02E+14 | GSM | 0x111310C | 9017040007 | 9017050007 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 10 | 9.02E+14 | GSM | 0x111310C | 9017040008 | 9017050008 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 11 | 9.02E+14 | GSM | 0x111310C | 9017040009 | 9017050009 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 12 | 9.02E+14 | GSM | 0x1113101 | 9017040010 | 9017050010 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 13 | 9.02E+14 | GSM | 0x1113101 | 9017040011 | 9017050011 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 14 | 9.02E+14 | GSM | 0x1113101 | 9017040012 | 9017050012 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 15 | 9.02E+14 | GSM | 0x1113101 | 9017040013 | 9017050013 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 16 | 9.02E+14 | GSM | 0x1113101 | 9017040014 | 9017050014 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 17 | 9.02E+14 | GSM | 0x1113101 | 9017040015 | 9017050015 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 18 | 9.02E+14 | GSM | 0x1113101 | 9017040016 | 9017050016 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 19 | 9.02E+14 | GSM | 0x1113101 | 9017040017 | 9017050017 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 20 | 9.02E+14 | GSM | 0x1113101 | 9017040018 | 9017050018 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 21 | 9.02E+14 | GSM | 0x1113101 | 9017040019 | 9017050019 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 22 | 9.02E+14 | GSM | 0x1113102 | 9017040020 | 9017050020 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 23 | 9.02E+14 | GSM | 0x1113102 | 9017040021 | 9017050021 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |
| 24 | 9.02E+14 | GSM | 0x1113102 | 9017040022 | 9017050022 | | 1 | 0 | 1 | 8.68E+14 | 3.5E+15 | 0x10000 | 0x10000 | 0x3 | 3 | 5.56E+10 |

Load Generation

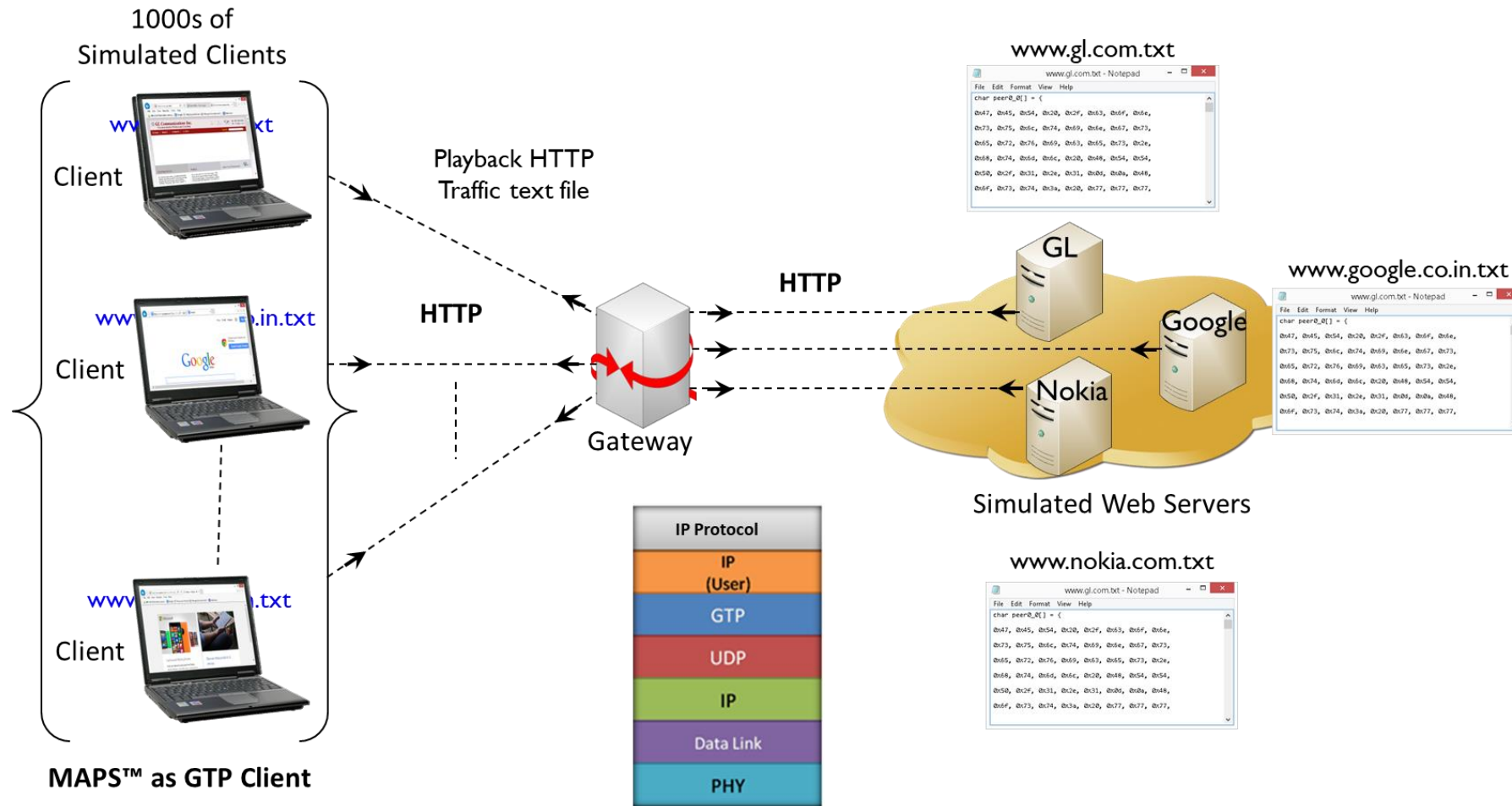
- Stability/Stress and Performance testing using Load Generation
- Different types of Load patterns to distribute load
- User can load multiple patterns for selected script
- User configurable Test Duration, CPS, Maximum and Minimum Call Rate etc



The screenshot shows the 'Load Generation - LoadGendefault' window. It includes fields for 'Total Calls To Generate' (set to *), 'Max Active Calls' (set to 2000), and a checkbox for 'Unique Distributions Per Script'. A table lists distributions: Uniform (MinCR=40, MaxCR=80, Duration=10), Fixed (Call Rate=300, Duration=10), and Normal (MinCR=40, MaxCR=80, Duration=10). A list of scripts is shown, with 'S11SessionControl' selected. A list of profiles is also visible, ranging from MSProfile0001 to MSProfile0014. At the bottom, there are controls for 'Stop Time' (Days, Hours, Minutes) and 'Start Time' (00:00:00.000) and 'End Time' (00:00:00.000).

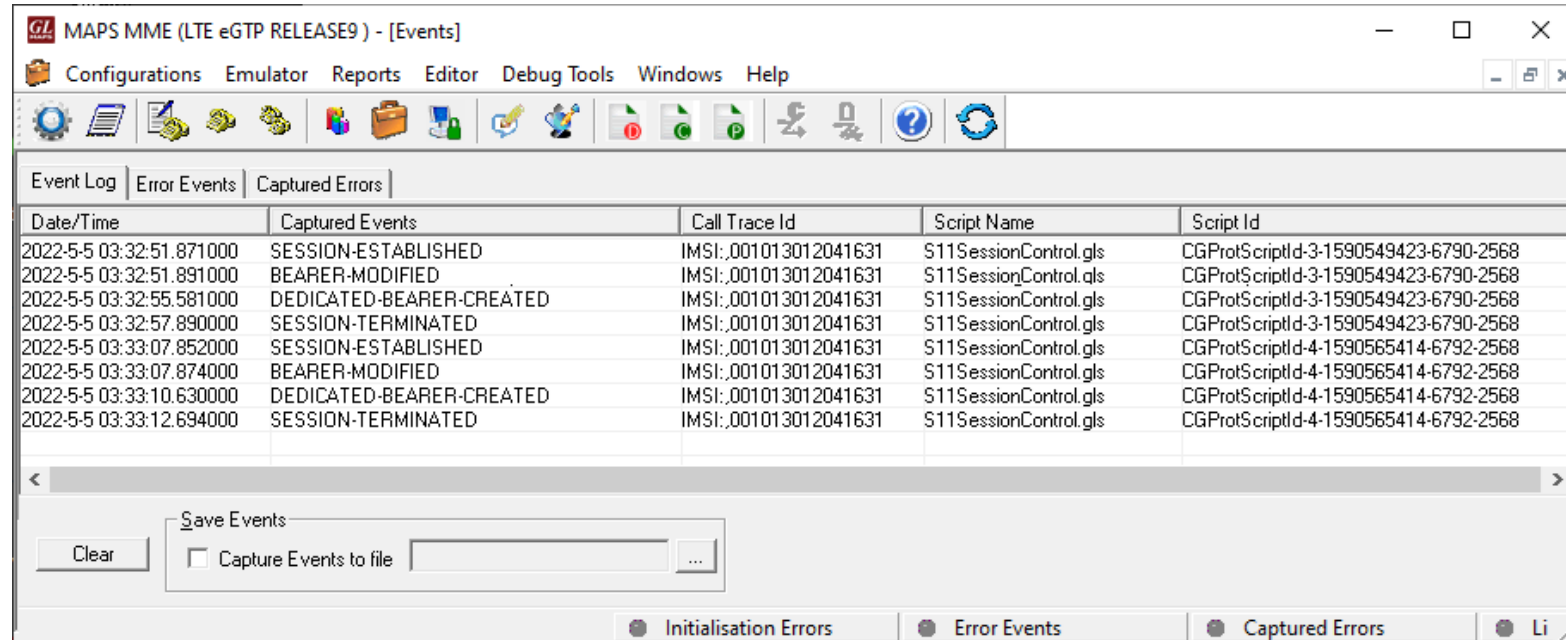
Traffic Simulation in Packet Switched Network

Mobile Traffic over GTP



Event and Traffic Log

Event Log



GL MAPS MME (LTE eGTP RELEASE9) - [Events]

Configurations Emulator Reports Editor Debug Tools Windows Help

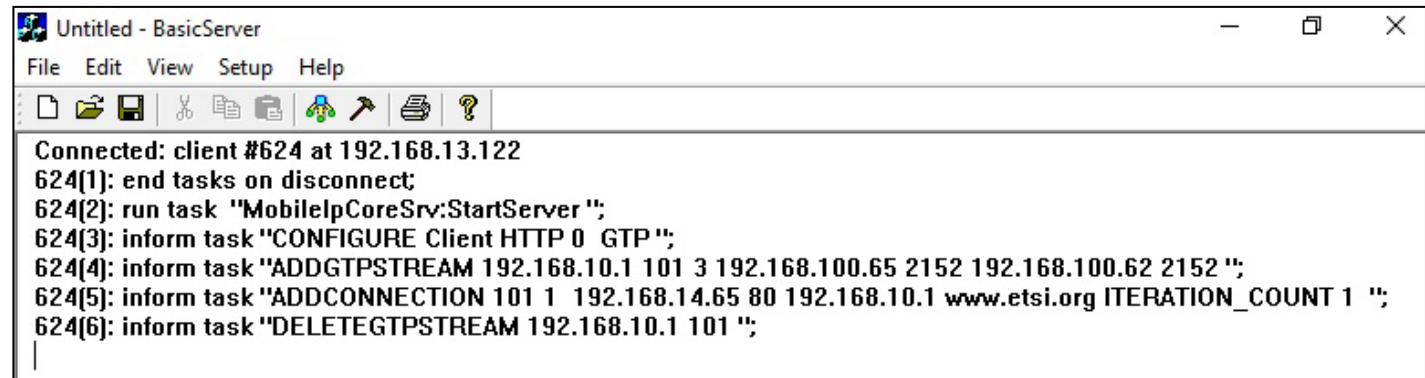
Event Log | Error Events | Captured Errors

| Date/Time | Captured Events | Call Trace Id | Script Name | Script Id |
|--------------------------|--------------------------|-----------------------|-----------------------|---------------------------------------|
| 2022-5-5 03:32:51.871000 | SESSION-ESTABLISHED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-3-1590549423-6790-2568 |
| 2022-5-5 03:32:51.891000 | BEARER-MODIFIED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-3-1590549423-6790-2568 |
| 2022-5-5 03:32:55.581000 | DEDICATED-BEARER-CREATED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-3-1590549423-6790-2568 |
| 2022-5-5 03:32:57.890000 | SESSION-TERMINATED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-3-1590549423-6790-2568 |
| 2022-5-5 03:33:07.852000 | SESSION-ESTABLISHED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-4-1590565414-6792-2568 |
| 2022-5-5 03:33:07.874000 | BEARER-MODIFIED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-4-1590565414-6792-2568 |
| 2022-5-5 03:33:10.630000 | DEDICATED-BEARER-CREATED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-4-1590565414-6792-2568 |
| 2022-5-5 03:33:12.694000 | SESSION-TERMINATED | IMSI:;001013012041631 | S11SessionControl.gls | CGProtScriptId-4-1590565414-6792-2568 |

Save Events
Clear Capture Events to file

● Initialisation Errors ● Error Events ● Captured Errors ● Li

Traffic Log



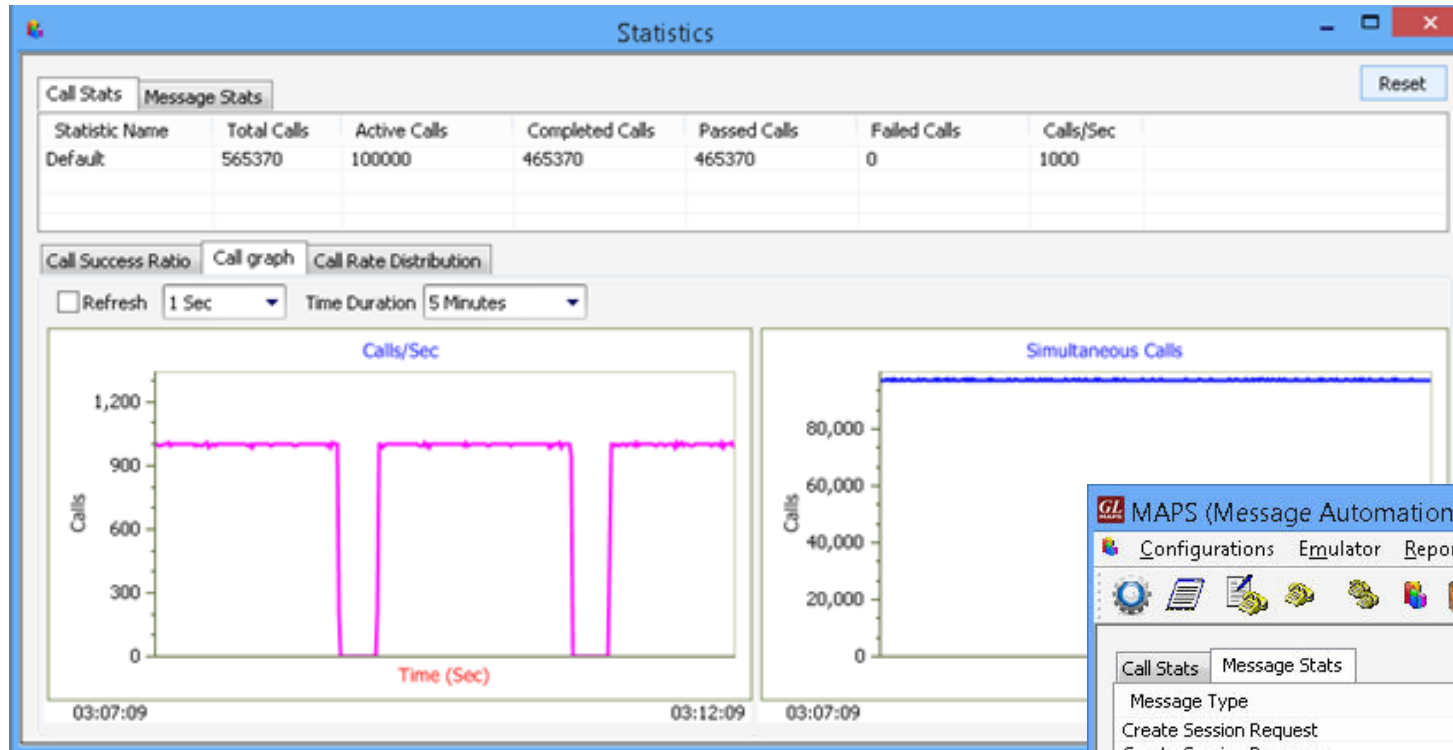
Untitled - BasicServer

File Edit View Setup Help

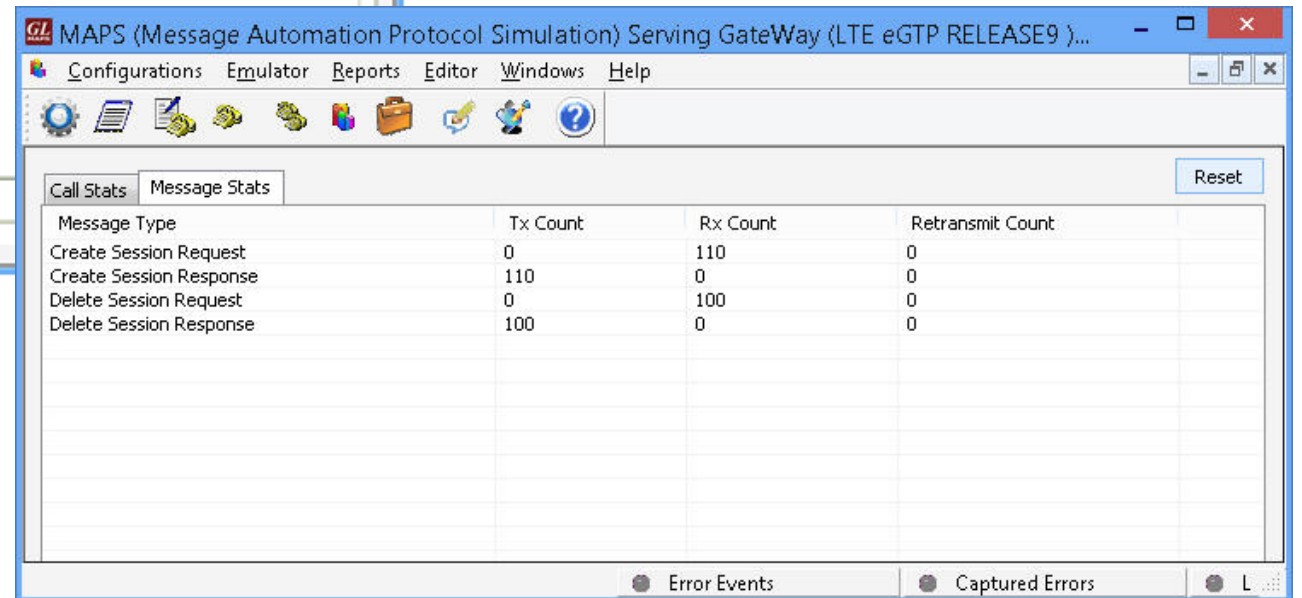
```
Connected: client #624 at 192.168.13.122
624[1]: end tasks on disconnect;
624[2]: run task "MobileIpCoreSrv:StartServer ";
624[3]: inform task "CONFIGURE Client HTTP 0 GTP ";
624[4]: inform task "ADDGTPSTREAM 192.168.10.1 101 3 192.168.100.65 2152 192.168.100.62 2152 ";
624[5]: inform task "ADDCONNECTION 101 1 192.168.14.65 80 192.168.10.1 www.etsi.org ITERATION_COUNT 1 ";
624[6]: inform task "DELETEGTPSTREAM 192.168.10.1 101 ";
```

Statistics

Call Statistics



Message Statistics



Statistics and Reports

MOS, R-Factor

Packet Loss

Packets Discarded

Duplicate Packets

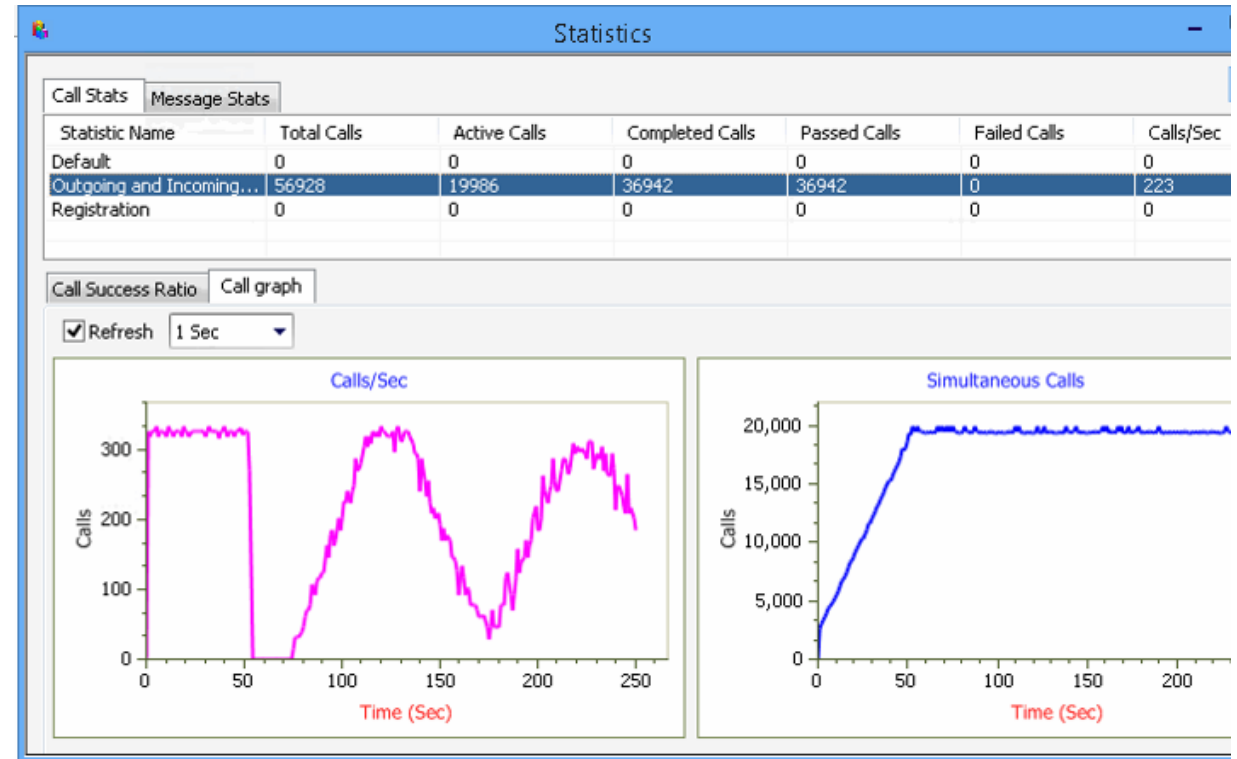
Out-Of-Sequence

Packets

Jitter Statistics

User Defined Statistics - VoiceQualityStats

| Name | Values |
|---|---------------|
| Active RTP Sessions | 1987 |
| Completed RTP Sessions | 1548093 |
| Sessions With Zero Receive Traffic | 0 |
| MOS Score Stats | 0 |
| Sessions with Mos (5.0 - 4.0) | 612618 [39%] |
| Sessions with Mos (4.0 - 3.0) | 852971 [55%] |
| Sessions with Mos (3.0 - 2.0) | 73446 [4%] |
| Sessions with Mos (< 2.0) | 9058 [0%] |
| Total RTP Packet Sent | 4485008797 |
| Total RTP Packet Received | 4481760883 |
| Packet-Loss Stats | 0 |
| Total PacketLoss | 4072 [0%] |
| Sessions with Zero Packet-Loss | 1534967 [99%] |
| Sessions with Packet-Loss(<1%) | 13126 [0%] |
| Sessions with Packet-Loss(1% - 5%) | 0 [0%] |
| Sessions with Packet-Loss(5% - 10%) | 0 [0%] |
| Sessions with Packet-Loss(>10%) | 0 [0%] |
| Packet-Discarded Stats | 0 |
| Total PacketDiscarded | 3738934 [0%] |
| Sessions with Zero Packet-Discard | 1464299 [94%] |
| Sessions with Packet-Discard(<1%) | 41479 [2%] |
| Sessions with Packet-Discard(1% - 5%) | 37232 [2%] |
| Sessions with Packet-Discard(5% - 10%) | 4843 [0%] |
| Sessions with Packet-Discard(>10%) | 240 [0%] |
| Packet-Duplicate Stats | 0 |
| Total Duplicate Packet | 0 [0%] |
| Sessions with Zero Duplicate Packets | 1539942 [99%] |
| Sessions with Duplicate Packets(<1%) | 0 [0%] |
| Sessions with Duplicate Packets(1% - 5%) | 0 [0%] |
| Sessions with Duplicate Packets(5% - 10%) | 0 [0%] |
| Sessions with Duplicate Packets(>10%) | 0 [0%] |
| Packet-Out Of Sequence Stats | 0 |
| Total Out Of Sequence Packet | 0 [0%] |
| Sessions with Zero OOS Packets | 1539942 [99%] |
| Sessions with OOS Packets(<1%) | 0 [0%] |
| Sessions with OOS Packets(1% - 5%) | 0 [0%] |
| Sessions with OOS Packets(5% - 10%) | 0 [0%] |
| Sessions with OOS Packets(>10%) | 0 [0%] |
| Jitter Stats | 0 |
| Sessions with Jitter(< 1 msec) | 1450779 [93%] |
| Sessions with Jitter(< 5 msec) | 93031 [6%] |
| Sessions With Jitter(< 10 msec) | 4841 [0%] |
| Sessions With Jitter(>= 10 msec) | 350 [0%] |



Call Stats provide a running tabular log of system level stats, tracked stats include: Total Calls, Active Calls, Completed Calls, Passed Calls, Failed Call and Instantaneous Calls/Sec.

Thank you