

---

# MAPS™ IUP EMULATOR

BT SS7 Interconnect User Part Protocol Simulation over T1/ E1

---



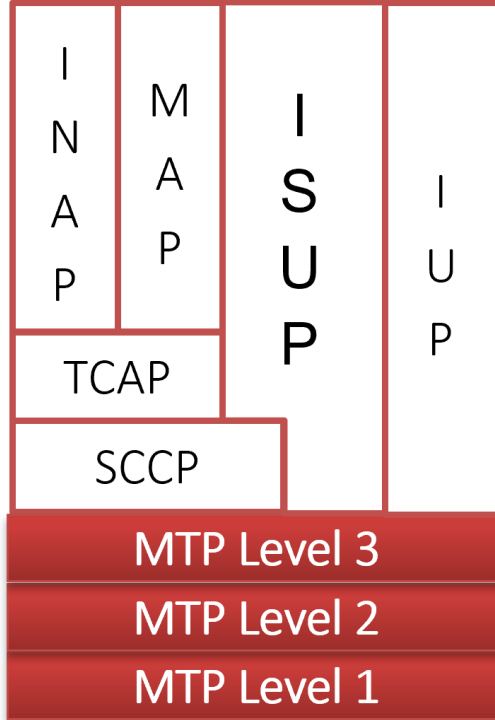
818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878  
Phone: (301) 670-4784 Fax: (301) 670-9187 Email: [info@gl.com](mailto:info@gl.com)  
Website: <https://www.gl.com>

# MAPS™ IUP

- IUP simulation over TDM (T1/E1)
- Multiple T1/E1 line interfaces supported
- Supported procedures include Basic Call Service protocol (IFAM, IAM, ACI, Bearer Establishment), Request Service protocol, Nodal End-to-End Data protocol, Enveloped ISUP Essential Service protocol, and ISDN Call Handling Service protocol
- Supports generation & detection of TDM traffic - Auto Traffic Voice, Digits, Tones, IVR, FAX, Dynamic VF, and User-defined traffic
- User-friendly GUI for configuring the SS7 MTP Layers
- User Configurable signaling Links
- User-configured Circuit Mapping, i.e., defines Circuit Identification Codes (CIC) and map these CICs to Timeslots/Trunks in order to enable Voice/Data traffic
- Supports MTP2 and MTP3 protocol machine
- Multiple MTP links



# Supported Protocol Standards



Supported Protocols	Standard / Specification Used
IUP	ND1006:2007/05 TSG/SPEC/006 (IUP) ND1104:2004/11 PNO-ISC/INFO/004 (Proprietary Extensions to IUP) ND1301:2001/03 DPNSS (Digital Private signaling System No 1 (DPNSS 1) ) ISDN User Part (ISUP) UK - ND1007:2001/07 PNO-ISC/SPEC/007
MTP3 UK	ITU-T Recommendation Q.703
MTP2 UK	T-REC-Q.703-199607

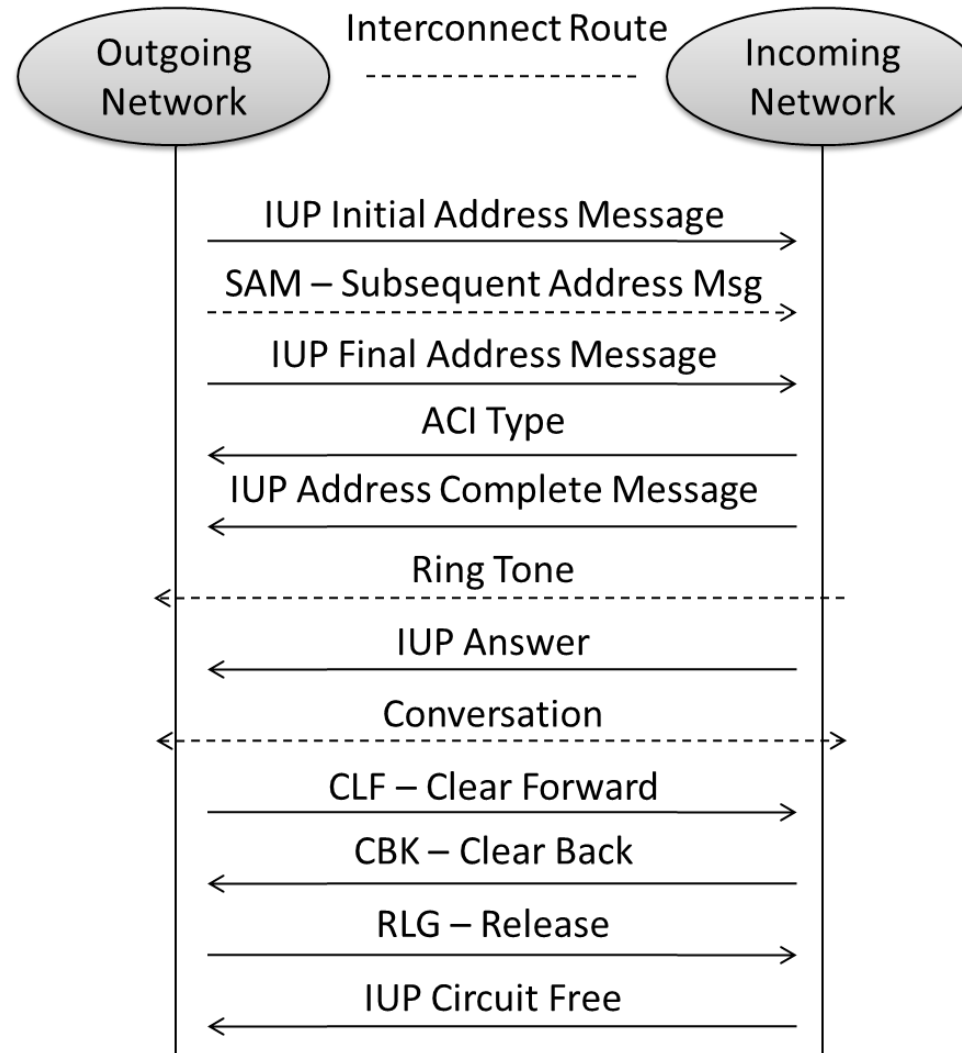
# Supported IUP Procedures

Listed below are the some of the IUP Procedures supported by MAPS™ IUP

- Basic Call Service: (Service Handling Protocol)
  - IFAM Protocol
  - IAM (SND) Protocol
  - IAM (SAD) Protocol
  - Subsequent Address Message (SAM)
  - Final Address Message (FAM)
- Call Establishment
  - IUP Basic Call Service: (Service Handling Protocol)
  - Request Service protocol (Service Handling Protocol 2)
  - SASUI Protocol (Supplementary Call Information)
  - ACI Protocol (Supplementary Call Information)
  - Nodal End-to-End Data Protocol (Service Handling Protocol 3)
  - ISDN Call Protocol (Service Handling Protocol 1)
  - Enveloped ISUP Essential (Service Handling Protocol 8)
- Call Supervision:
  - Connection not completed – SUBSCRIBER ENGAGED or SUBSCRIBER OUT
- Call Release Procedures
  - Connection not completed – CNA procedures
  - Connection not completed – RELEASE procedures
  - Bearer Release Protocols

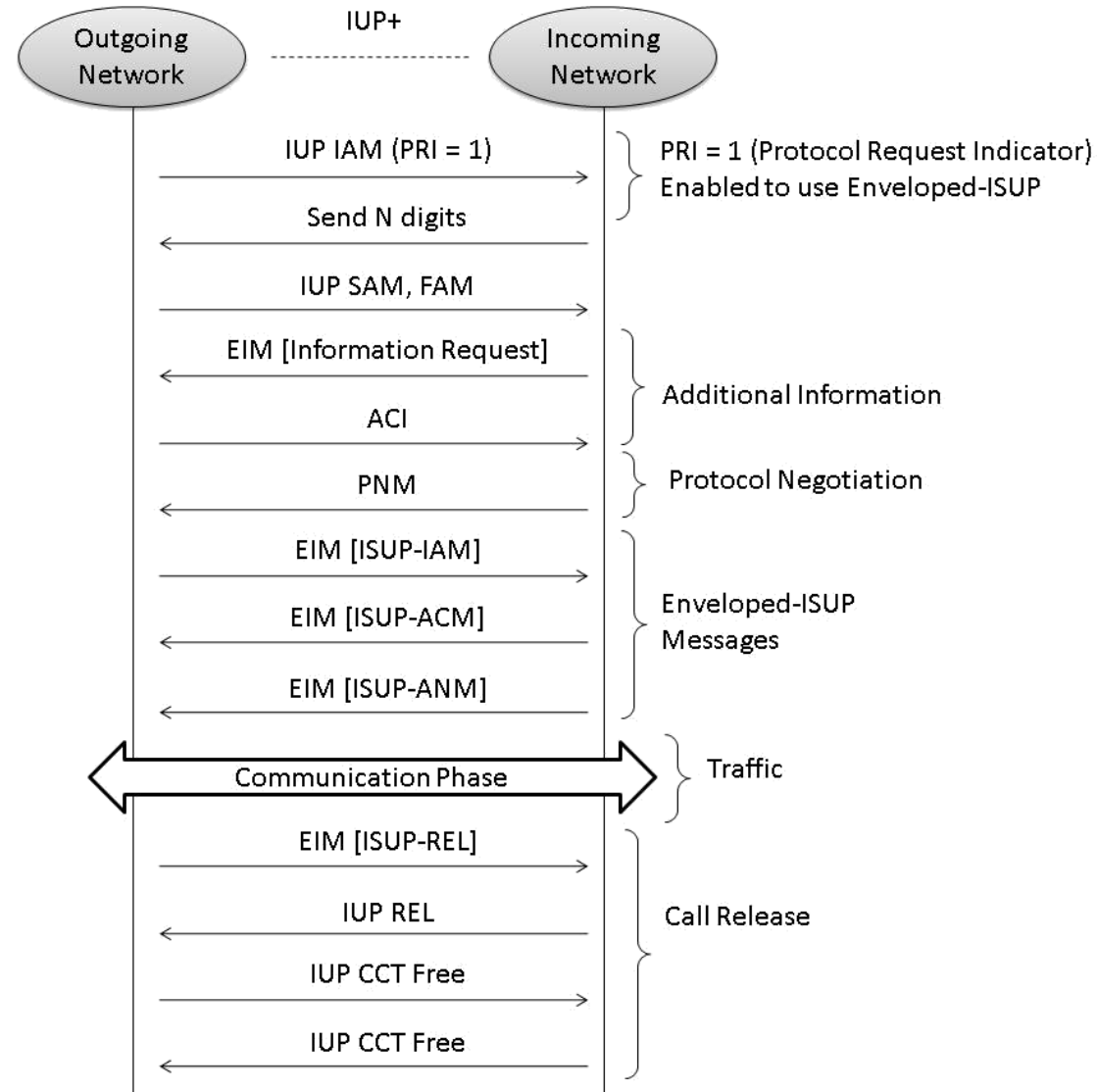
# IUP Call Flow Scenario

## Basic (telephony) Service Handling Protocol



# IUP Call Flow Scenario

## Enveloped ISUP Call Procedure



# Testbed Configuration

GL MAPS (Message Automation Protocol Simulation) (IUP UK) - [Testbed Setup - Card1]

Configurations Emulator Reports Editor Windows Help

Config Value

- Signalling Switching Point
  - Exchange Type Control
  - CIC to Circuit Mapping Timeslot Based
  - CIC Handling Method for CIC Based Mapping Configured in Profile
- SSP
  - SSP 1
    - SSP Point Code 1.1.1
    - Network Indicator National
    - Link Set Parameters 1
      - Link Set Parameters 1
        - Adjacent Destination Point Code 2.2.2
        - Link Set Id 1
        - Link 1
          - Signaling Port 1
          - Signaling Timeslot 31
          - Signaling Link Selection 1
    - Destination SSP 1
      - Destination SSP 1
        - Destination Point Code 2.2.2
        - Circuit Group 1
          - Circuit Group 1
            - Port Number 1
            - CIC 1
    - Routes 1
      - Routes 1
        - RoutingLinkSet 1
        - Routing Destination Point Code 2.2.2
- End User Configuration IUP\_Profiles.xml

\_CircuitSelection\_

Select Option

Timeslot Based

Help

Start Load Save Edit

Error Events Captured Errors Link S

# Profile Configuration

GL MAPS (Message Automation Protocol Simulation) (IUP UK) - [Profile Editor - TrafficProfile]

Configurations Emulator Reports Editor Windows Help

Profiles (Edit-F)

#	Profiles (Edit-F)	Config	Value
2	Card1TS01	Card1TS01	
3	Card1TS02	Enable Traffic	AutoTraffic - File
4	Card1TS03	Traffic Direction For AutoTraffic	Tx
5	Card1TS04	Enable File Recording	False
6	Card1TS05	IVR Type	Path Verification
7	Card1TS06	Digit Parameters	
8	Card1TS07	TypeOfDigit	DTMF
9	Card1TS08	Digits	1234567890
10	Card1TS09	Digit Power 1	-13.00
11	Card1TS10	Digit Power 2	-13.00
12	Card1TS11	On Time in msec	80
13	Card1TS12	Off Time in msec	80
14	Card1TS13	Tone Parameters	
15	Card1TS14	Transmit Tone Type	Dial Tone
16	Card1TS15	Dial Tone Parameters	
17	Card1TS16	Dial Tone Frequency 1 in Hz	440
18	Card1TS17	Dial Tone Frequency 2 in Hz	350
19	Card1TS18	Ringback Tone Parameters	
20	Card1TS19	Ringback Tone Frequency 1 in Hz	440
21	Card1TS20	Ringback Tone Frequency 2 in Hz	480
		Busy Tone Parameters	
		Busy Tone Frequency 1 in Hz	480
		Busy Tone Frequency 2 in Hz	620
		Userdefined Tone Parameters	
		Userdefined Test Tone Frequency 1 in Hz	1004
		Userdefined Test Tone Frequency 2 in Hz	0
		Tone Power	-10.00
		Transmit Tone Duration in msec	10000

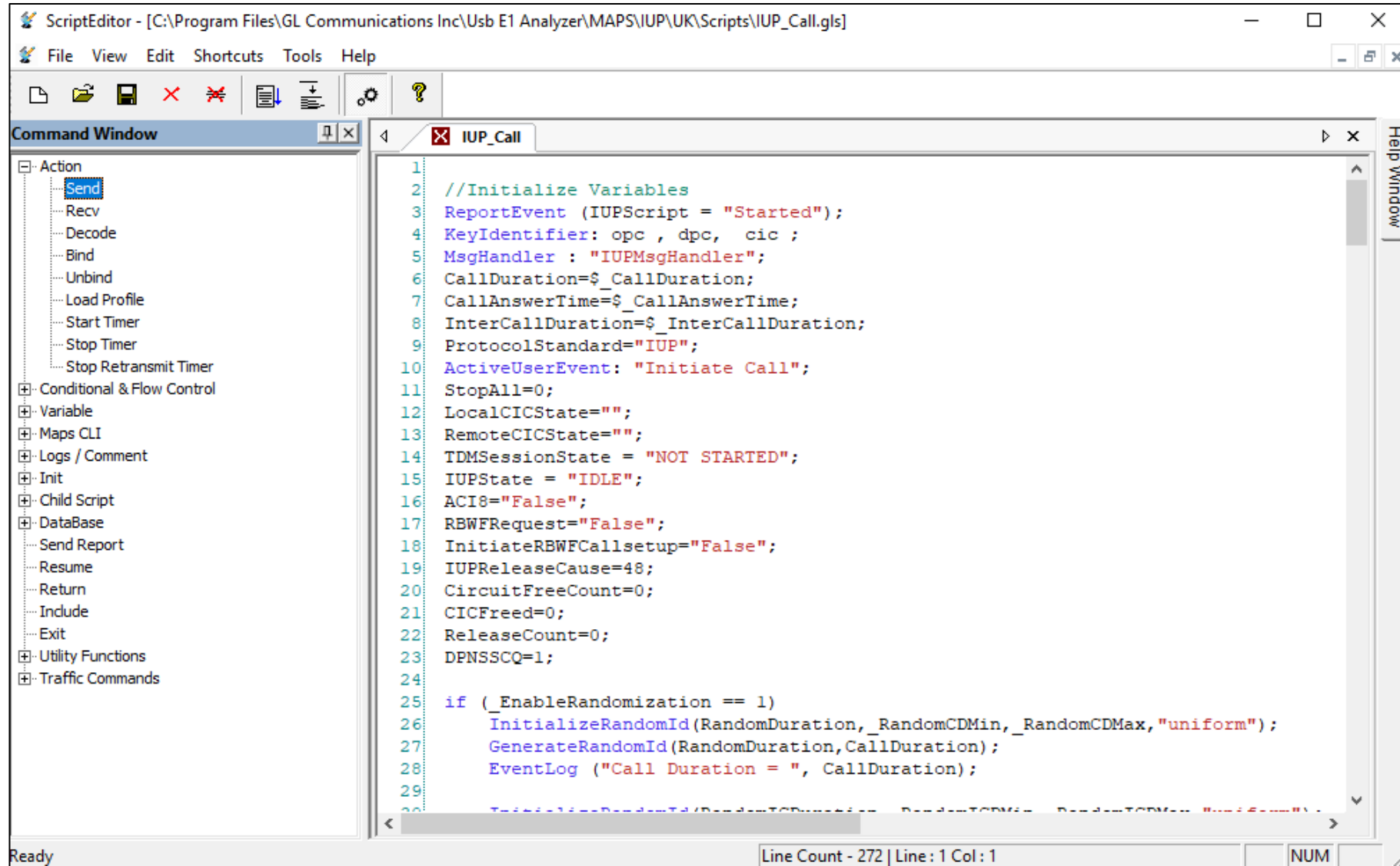
EnableTraffic  
Select Option  
AutoTraffic - File

Add Insert Delete  
Properties

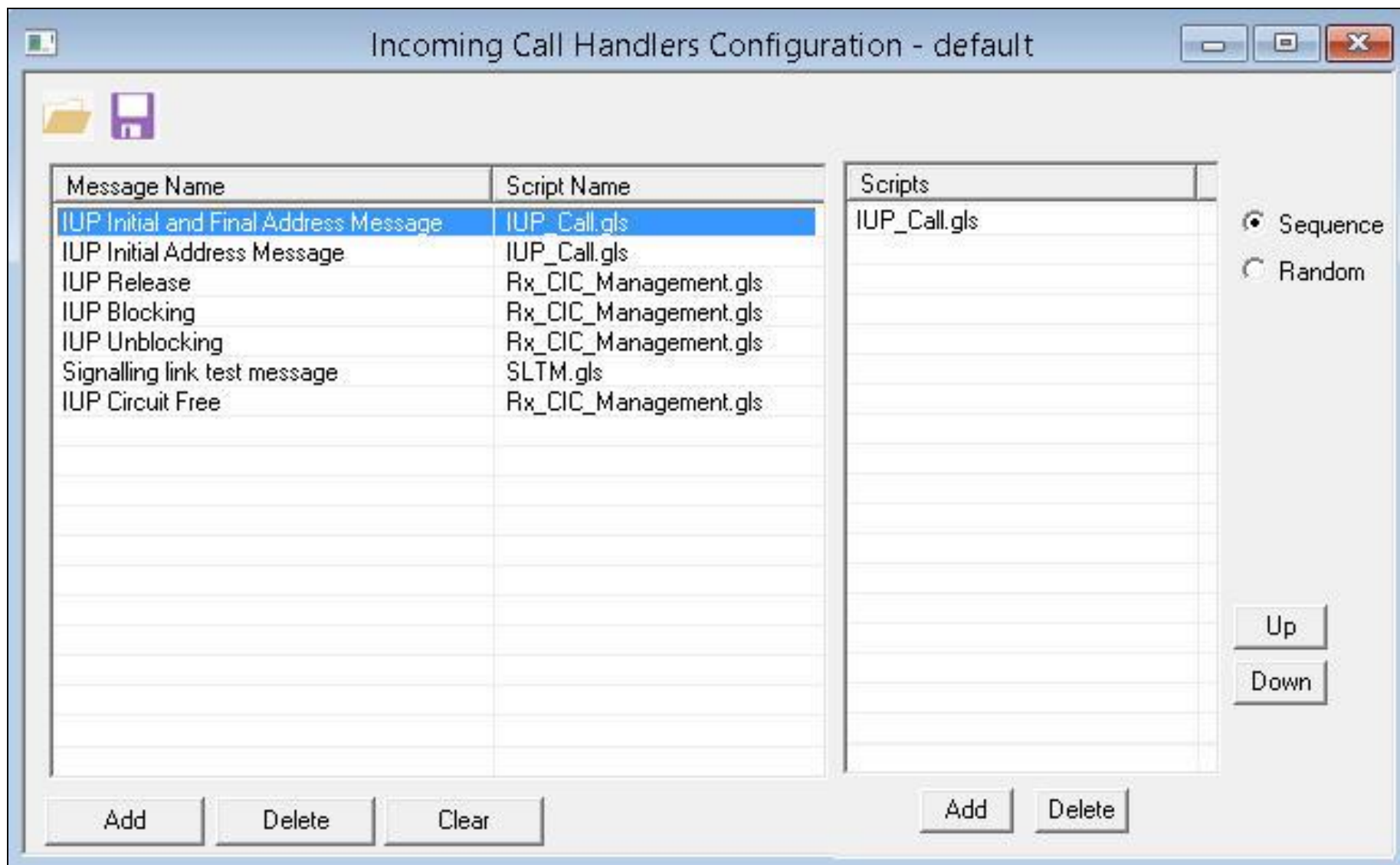
Error Events Captured Errors Link Status Up=0 Down=0



# Script Editor

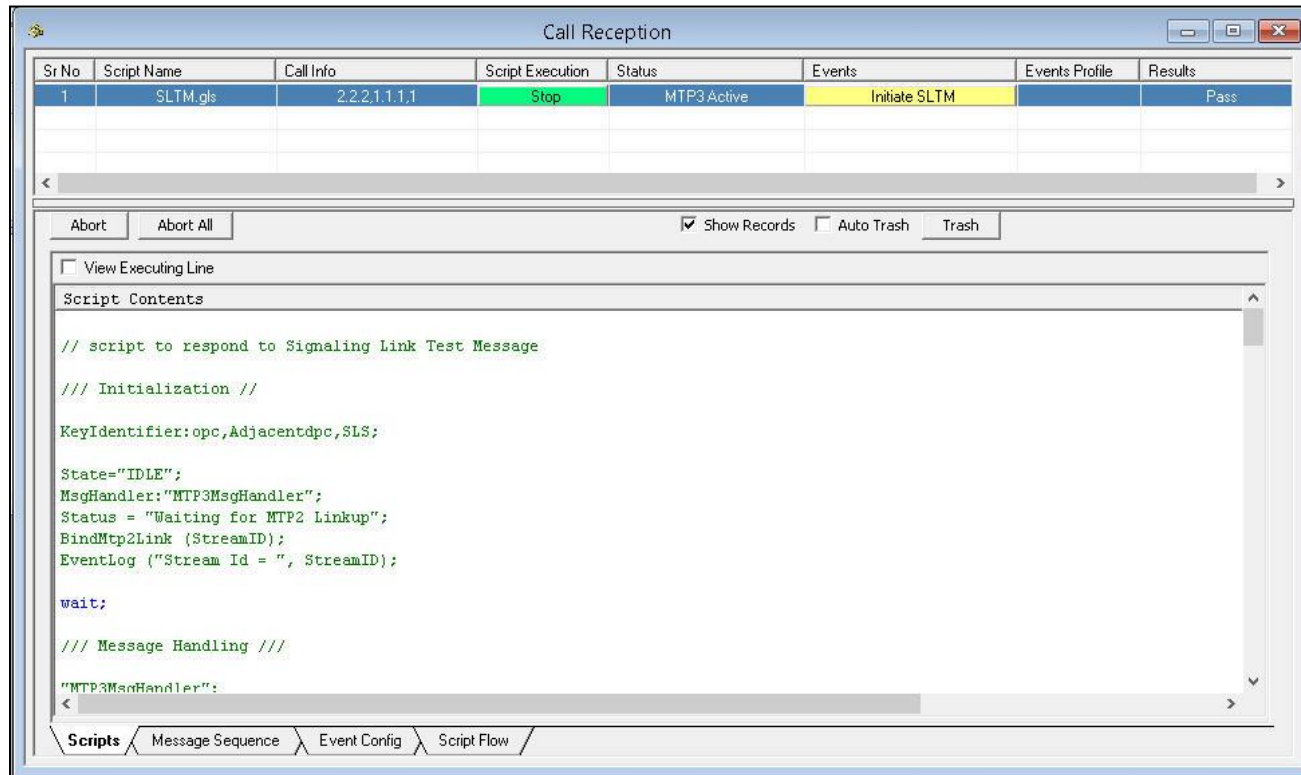


# Incoming Call Handler Configuration



# IUP Incoming Call Handler Configuration

## MTP3 Script



The screenshot shows a window titled "Call Reception" with a table of script execution records. The table has columns: Sr No, Script Name, Call Info, Script Execution, Status, Events, Events Profile, and Results. The first row shows a script named "SLTM.gls" with call info "2.2.2.1.1.1", status "MTP3 Active", and event "Initiate SLTM". Below the table are buttons for "Abort", "Abort All", "Show Records", "Auto Trash", and "Trash". A checkbox "View Executing Line" is also present. The "Script Contents" pane shows the following code:

```
// script to respond to Signaling Link Test Message
/// Initialization //
KeyIdentifier:opc,Adjacentdpc,SLS;

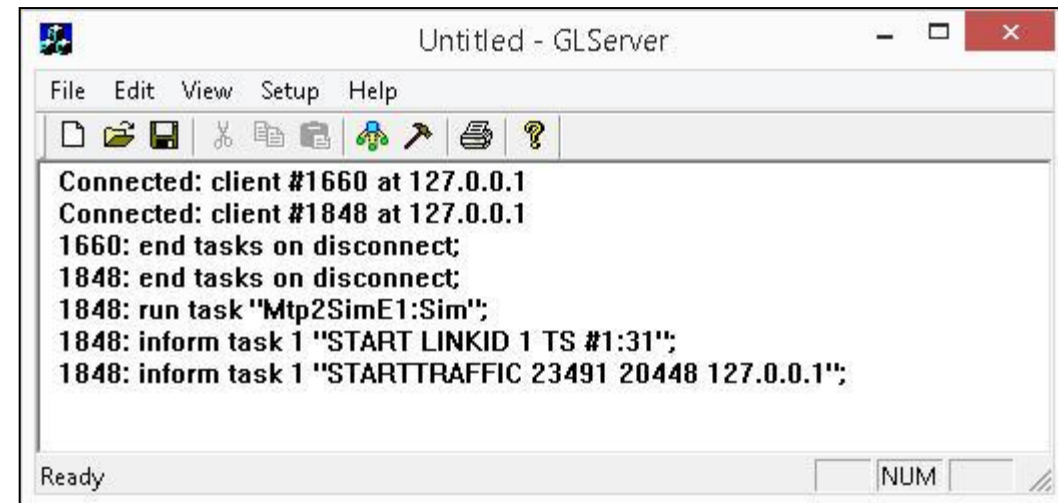
State="IDLE";
MsgHandler:"MTP3MsgHandler";
Status = "Waiting for MTP2 Linkup";
BindMtp2Link (StreamID);
EventLog ("Stream Id = ", StreamID);

wait;

/// Message Handling ///
"MTP3MsgHandler":
```

At the bottom, there are tabs for "Scripts", "Message Sequence", "Event Config", and "Script Flow".

## WCS Connection Log



The screenshot shows a window titled "Untitled - GLServer" with a menu bar (File, Edit, View, Setup, Help) and a toolbar. The log content is as follows:

```
Connected: client #1660 at 127.0.0.1
Connected: client #1848 at 127.0.0.1
1660: end tasks on disconnect;
1848: end tasks on disconnect;
1848: run task "Mtp2SimE1:Sim";
1848: inform task 1 "START LINKID 1 TS #1:31";
1848: inform task 1 "STARTTRAFFIC 23491 20448 127.0.0.1";
```

The status bar at the bottom shows "Ready" and a "NUM" field.

# IUP Call Generation (Outgoing Network)

GL  
Communications

MAPS (Message Automation Protocol Simulation) (IUP UK) - [Call Generation - CallGenDefault]

Configurations Emulator Reports Editor Windows Help

Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	Ev...	Result	Total Iterations	Completed Iterations
1	IUP_Call.gls	Card1TS01	1.1.1.2.2.2.1	Stop	File Sent	IUPTerminate		Pass	1	0

Add Delete Insert Refresh Start Start All Stop Stop All Abort Abort All

Save Column Width

MAPS DUT

IUP Initial Address Message 10:00:39.299000

IUP Send N Digits 10:00:39.887000

IUP Subsequent Address Message 10:00:39.887000

IUP Send N Digits 10:00:40.465000

IUP Final Address Message 10:00:40.466000

IUP Additional Call Information - ACI Type 7 10:00:41.038000

IUP Additional Call Information - ACI Type 1 10:00:41.038000

IUP Additional Call Information - ACI Type 7 10:00:41.620000

IUP Additional Call Information - ACI Type 1 10:00:41.621000

IUP Protocol Negotiation Message 10:00:42.205000

E-Initial address 10:00:42.208000

E-Information request 10:00:42.795000

IUP Additional Call Information - ACI Type 3 10:00:42.815000

E-Information 10:00:42.818000

E-Information request 10:00:43.395000

IUP Additional Call Information - ACI Type 5 10:00:43.397000

E-Information 10:00:43.400000

E-Address complete 10:00:43.967000

E-Answer 10:00:43.967000

File Transmitted :: a-law samples\count10.pcm 10:01:04.020000

E-Release 10:01:43.977000

E-Release 10:01:43.986000

IUP Release

\*\*\*\*\* MTP3 Layer \*\*\*\*\*

0000 Service Indicator = ...0100 Telephone User Part

0000 Priority Code = ...00... Priority Code 0

0000 Sub-service field = 10..... National Network

0001 DPC = 2.2.2(00010010 ..010000)

0002 OPC = 1.1.1(01..... 00000010 ....0010)

Higher Layer Data = x00000001008013022798877605

\*\*\*\*\* IUP Layer \*\*\*\*\*

0004 Circuit Identification Code = 1 (0001.... 000000000)

0006 Message Types = x0000 Initial Address Message

IAM/IFAM Message Indicators

0008 Calling Party Category (CPC) = ...000001 Ordinary (Residential)

0009 Calling Line Identity (CLI) Indicator = ...0... Calling Line Identity (CLI) not included

0009 CLI Blocking Indicator (CBI) = .....0... Network Number may not be disclosed to the call

0009 International Indicator (INT) = .....0... No further information on call origin

0009 Interworking (IW) Indicator = .....0... No interworking involved

0009 Priority Access Indicator (PA) = ...0... Not a Priority Access call

0009 Meter Delay Guard Timeout Indicator (MDG) = .0..... No MDG timeout required

0009 Protection Indicator (PROT) = 0..... Non-priority, non-protected call

000A Service Handling Protocol (SHP) = ...0000 Invoke Basic (telephony) call protocol

000A Release Protocol Indicator (RPI) = ...0..... Only CNA message supported

000A Long Propagation Delay Indicator-(LPD) = .0..... Long propagation delay path not included

000A NML-Call Type Indicator Bit = 1..... NML-Call Type Indicator Bit with 1

000B NML-Call Type Indicator (CTI) = .....11 CCSS call

000B Echo Control Device Indicator- (ECD) = .....0... Outgoing half echo control device not included

000B Network Translated Address (NTA) Indicator = .....0... No information

000B Interconnect Specific Information (ISI) = 0001.... (1)

000C Routing Control Indicator(RCI) = ...0010 (2)

000C Call Path Indicator(CPI) = .000.... Select any available route

000C Presentation Number Indicator(PNI) = 0..... PN not available

Called Address

000D PNI = 001..... Enveloped-ISUP protocol preferr

000D Number of Called Address Signals = ...00111 (7)

000E Address Signal = 8978675

Scripts Message Sequence Event Config Script Flow

Error Events Captured Errors Link Status Up=1 Down=0



# IUP Call Reception (Incoming Network)

GL  
MAPS (Message Automation Protocol Simulation) (IUP UK) - [Call Reception]

Configurations Emulator Reports Editor Windows Help

Sr No	Script Name	Call Info	Script Execution	Status	Events	Events Profile	Results
1	SLTM.gls	2.2.2.1.1.1	Stop	MTP3 Active	Initiate SLTM		Pass
2	IUP_Call.gls	2.2.2.1.1.1	Completed	CCF Received	None		Pass

Abort Abort All ☒ Show Records ☐ Auto Trash Trash

Save Column Width

DUT MAPS

IUP Initial Address Message 10:00:39.531000

IUP Send N Digits 10:00:39.593000

IUP Subsequent Address Message 10:00:40.173000

IUP Send N Digits 10:00:40.174000

IUP Final Address Message 10:00:40.755000

IUP Additional Call Information - ACI Type 7 10:00:40.756000

IUP Additional Call Information - ACI Type 1 10:00:41.329000

IUP Additional Call Information - ACI Type 7 10:00:41.330000

IUP Additional Call Information - ACI Type 1 10:00:41.910000

IUP Protocol Negotiation Message 10:00:41.912000

E-Initial address 10:00:42.493000

E-Information request 10:00:42.503000

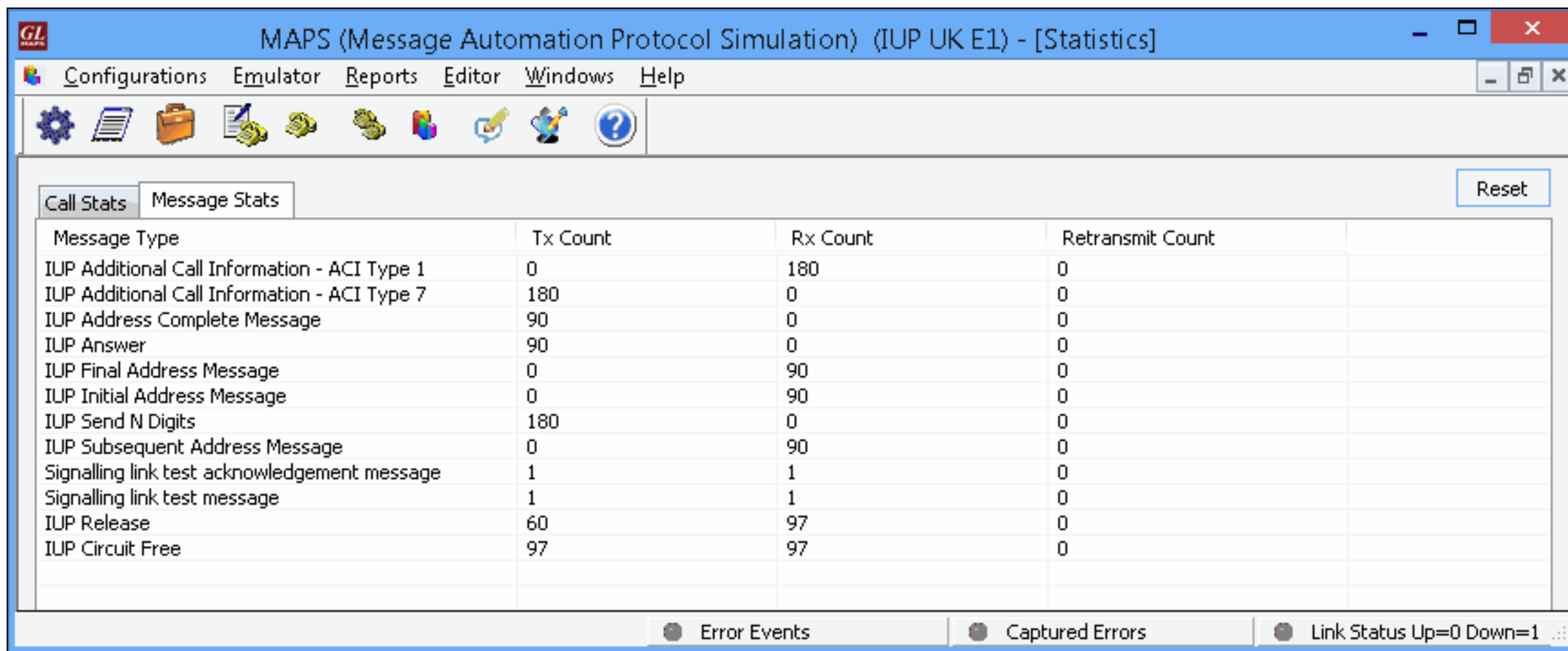
IUP Additional Call Information - ACI Type 3

```
===== MTP3 Layer =====
0000 Service Indicator      = ....0100 Telephone User Part
0000 Priority Code          = ..00.... Priority Code 0
0000 Sub-service field     = 10..... National Network
0001 DPC                   = 2.2.2(00010010 ..010000)
0002 OPC                   = 1.1.1(01..... 00000010 ....0010)
                           = x00000001008013022798877605
Higher Layer Data
===== IUP Layer =====
0004 Circuit Identification Code = 1 (0001.... 000000000)
0006 Message Types          = x0000 Initial Address Message
IAM/IFAM Message Indicators
0008 Calling Party Category (CPC) = ..000001 Ordinary (Residential)
0009 Calling Line Identity (CLI) Indicator = ....0... Calling Line Identity (CLI) not included
0009 CLI Blocking Indicator (CBI) = .....0.. Network Number may not be disclosed to the
0009 International Indicator (INT) = .....0. No further information on call origin
0009 Interworking (IW) Indicator = .....0 No interworking involved
0009 Priority Access Indicator (PA) = ...0.... Not a Priority Access call
0009 Meter Delay Guard Timeout Indicator (MDG) = .0..... No MDG timeout required
0009 Protection Indicator (PROT) = 0..... Non-priority, non-protected call
000A Service Handling Protocol (SHP) = ....0000 Invoke Basic (telephony) call protocol
000A Release Protocol Indicator (RPI) = ...0.... Only CNA message supported
000A Long Propagation Delay Indicator-(LPD) = .0..... Long propagation delay path not included
000A NML-Call Type Indicator Bit = 1..... NML-Call Type Indicator Bit with 1
000B NML-Call Type Indicator(CTI) = .....11 CCSS call
000B Echo Control Device Indicator- (ECD)) = .....0.. Outgoing half echo control device not incl
000B Network Translated Address (NTA) Indicator = ....0... No information
000B Interconnect Specific Information(ISI) = 0001.... (1)
000C Routing Control Indicator(RCI) = ....0010 (2)
000C Call Path Indicator(CPI) = .000.... Select any available route
000C
```

Scripts Message Sequence Event Config Script Flow

Error Events Captured Errors Link Status Up=1 Down=0

# IUP Message Statistics



Message Type	Tx Count	Rx Count	Retransmit Count
IUP Additional Call Information - ACI Type 1	0	180	0
IUP Additional Call Information - ACI Type 7	180	0	0
IUP Address Complete Message	90	0	0
IUP Answer	90	0	0
IUP Final Address Message	0	90	0
IUP Initial Address Message	0	90	0
IUP Send N Digits	180	0	0
IUP Subsequent Address Message	0	90	0
Signalling link test acknowledgement message	1	1	0
Signalling link test message	1	1	0
IUP Release	60	97	0
IUP Circuit Free	97	97	0

# IUP Call Event Log

## Event Log

Events				
Event Log   Error Events   Captured Errors				
Date/Time	Captured Events	Call Trace Id	Script Name	Script Id
2015-5-7 10:00:34.396000	MTP3 Status :: _SSP[0].LinkSet[0].Link[0].MTP3Status = Active	1.1.1.2.2.2.1	SLTM_gls	ProtScriptId_1_81352163-3788-5352
2015-5-7 10:00:39.296000	CardNumber = 1, Timeslot = 1	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:39.296000	LinkSetSize = 1	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:39.297000	CTI = 3	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:39.297000	CPC =	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:39.299000	Initial Address Message Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:39.887000	SAM Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:40.466000	FAM Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:41.038000	ACI Type7 Received	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:41.038000	ACI Type 1 with ICC 1 Response Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:41.620000	ACI Type7 Received	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:41.620000	ACI Type 1 with ICC 12 Response Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:42.206000	Protocol Negotiation Message Received	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:42.208000	Call Initiated	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:42.809000	Information Requested	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:42.809000	ACI Type 3 with ICC 5 Response Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:43.395000	Information Requested	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:43.395000	ACI Type 5 with ICC 8 Response Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:43.967000	Call Connected	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:43.967000	Card and Timeslot = Card1TS01	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:00:43.968000	Loaded Traffic Profile: Card1TS01	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:01:04.020000	File Sending Complete	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:01:43.976000	Call Duration Timer Expired	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:01:43.986000	E-Release Received	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:01:43.988000	REL Requested	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:01:44.544000	Release Received	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444
2015-5-7 10:01:44.545000	CCF Sent	1.1.1.2.2.2.1	IUP_Call.gls	CGProtScriptId_1_81373656-3790-444

Clear

Save Events

☐ Capture Events to file

## WCS Server Traffic Log

Untitled - GLServer

File Edit View Setup Help

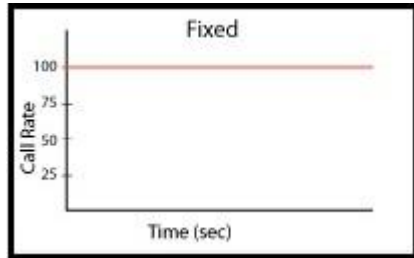
Connected: client #1660 at 127.0.0.1  
Connected: client #1848 at 127.0.0.1  
1660: end tasks on disconnect;  
1848: end tasks on disconnect;  
1848: run task "Mtp2SimE1:Sim";  
1848: inform task 1 "START LINKID 1 TS #1:31";  
1848: inform task 1 "STARTTRAFFIC 23491 20448 127.0.0.1";  
1660: tx server file "a-law samples\count10.pcm" #1:1 20000 msec;

Ready NUM

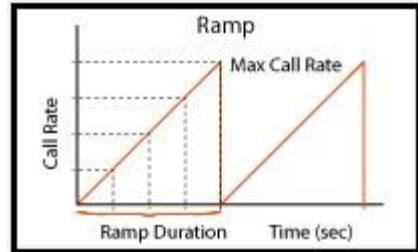
# Load Generation

- 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.

**Fixed**



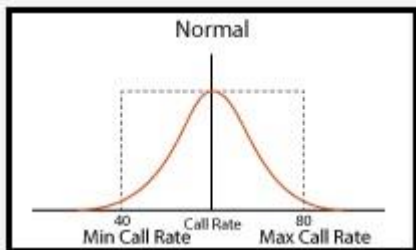
**Ramp**



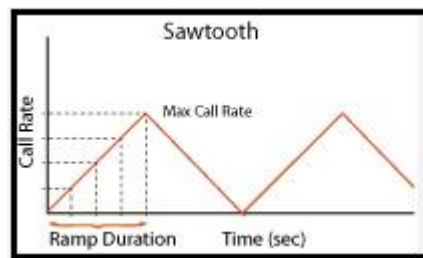
**Uniform**



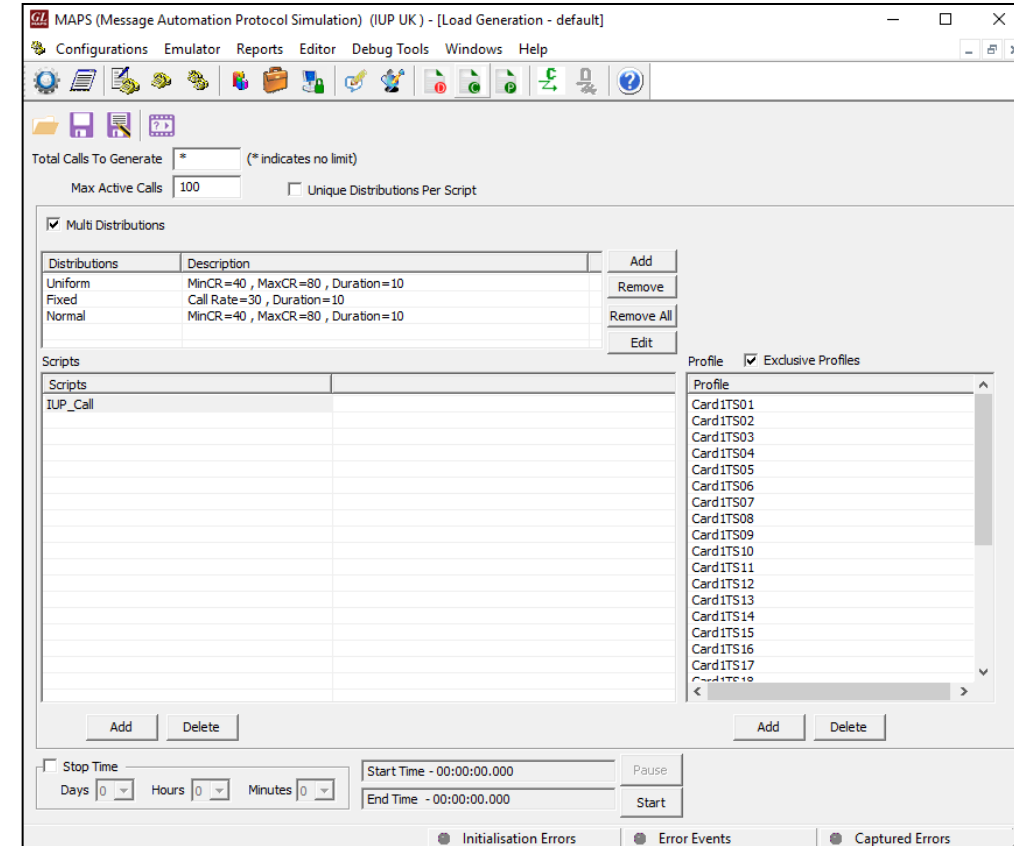
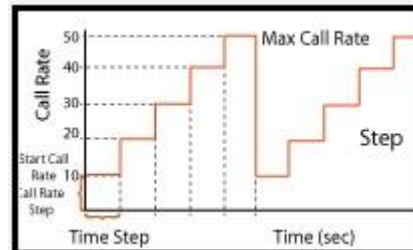
**Normal**



**Saw-tooth**



**Step**





# IUP Bulk Call Generation

MAPS (Message Automation Protocol Simulation) (IUP UK) - [Call Generation - CallGenDefault]

Configurations Emulator Reports Editor Windows Help

Icons: File Explorer, Print, Save, Run, Stop, Refresh, Start, Start All, Stop, Stop All, Abort, Abort All

Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	E...	Result	Total Iterations	Completed Iterations
1	IUP_Call.gls	Card1TS01		Start		None	...	Unknown	10	0
2	IUP_Call.gls	Card1TS02		Start		None	...	Unknown	10	0
3	IUP_Call.gls	Card1TS03		Start		None	...	Unknown	10	0
4	IUP_Call.gls	Card1TS04		Start		None	...	Unknown	10	0
5	IUP_Call.gls	Card1TS05		Start		None	...	Unknown	10	0
6	IUP_Call.gls	Card1TS06		Start		None	...	Unknown	10	0
7	IUP_Call.gls	Card1TS07		Start		None	...	Unknown	10	0
8	IUP_Call.gls	Card1TS08		Start		None	...	Unknown	10	0
9	IUP_Call.gls	Card1TS09		Start		None	...	Unknown	10	0
10	IUP_Call.gls	Card1TS10		Start		None	...	Unknown	10	0

☐ View Executing Line

Script Contents

```
//Initialize Variables
ReportEvent (IUPScript = "Started");
KeyIdentifier: opc , dpc, cic ;
MsgHandler : "IUPMsgHandler";
CallDuration=$_CallDuration;
CallAnswerTime=$_CallAnswerTime;
InterCallDuration=$_InterCallDuration;
ProtocolStandard="IUP";
ActiveUserEvent: "Initiate Call";
StopAll=0;
LocalCICState="";
RemoteCICState="";
```

Scripts | Message Sequence | Event Config | Script Flow

Error Events | Captured Errors | Link Status Up=1 Down=0

# Message Editor

Message Editor - Untitled

File View Direction Tools Help

BTSM

- T-bit
- Message Group
- Message Type
- InformationElements
  - Channel number
    - IE Identifier(Ch No)
    - Channel Type
    - Sub-Channel #(T bits)
    - Time Slot #
  - Link Identifier
    - IE Identifier(LinkId)

DATA INDication = 2

DATA REQuest = 1

DATA INDication = 2

ERROR INDication = 3

ESTablish REQuest = 4

ESTablish CONFirm = 5

ESTablish INDication = 6

RELease REQuest = 7

**RELease CONFirm = 8**

RELease INDication = 9

UNIT DATA REQuest = 10

UNIT DATA INDication = 11

===== IP Access Layer =====

0000 Length = 30 (x001E)

0002 Protocol = 00000000 RSL

Higher Layer Data = x0202011102000B001503450401805C0500805354F65E04010926F42F0100

===== BTSM Layer =====

0003 T-bit = .....0 Non-Transparent Messsage

0003 Message Group = 00000001. Radio Link Layer Mgmt

0004 Message Type = 00000010 DATA INDication

Channel number =

0005 IE Identifier(Ch No) = 00000001 Channel number

0006 Channel Type = 00010... Lm + ACCHs

0006 Sub-Channel #(T bits) = 0 (....0...)

Ready NUM

# Customizations - User Events

MAPS (Message Automation Protocol Simulation) [Call Generation - CallGenDefault]

Configurations Emulator Reports Editor Windows Help

Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	Events ...	Result	Total Iterations	Completed Iterations
1	Isup_Call.gls	Card1TS01	1.1.1.2.2.2.1	Abort	File Sent	Retrieve		Pass	1	0
2	Call.gls	Card1TS02		Start		None				0
3	Call.gls	Card1TS03		Start		None				0
4	Call.gls	Card1TS04		Start		None				0
5	Call.gls	Card1TS05		Start		None				0
6	Call.gls	Card1TS06		Start		None				0
7	Call.gls	Card1TS07		Start		None				0
8	Call.gls	Card1TS08		Start		None		Unknown	1	0

Add Delete Insert Refresh Start Start All Stop Stop All Abort Abort All

☐ View Executing Line

Script Contents

```
"Hold":
  CallHoldInitiated = 1;
  (ISUPScriptId) goto "Hold";
  resume;

"Retrieve":
  CallHoldInitiated = 0;
  (ISUPScriptId) goto "Retrieve";
  resume;

"Suspend":
  SuspendInitiated = 1;
  (ISUPScriptId) goto "Suspend Call";
  resume;
```

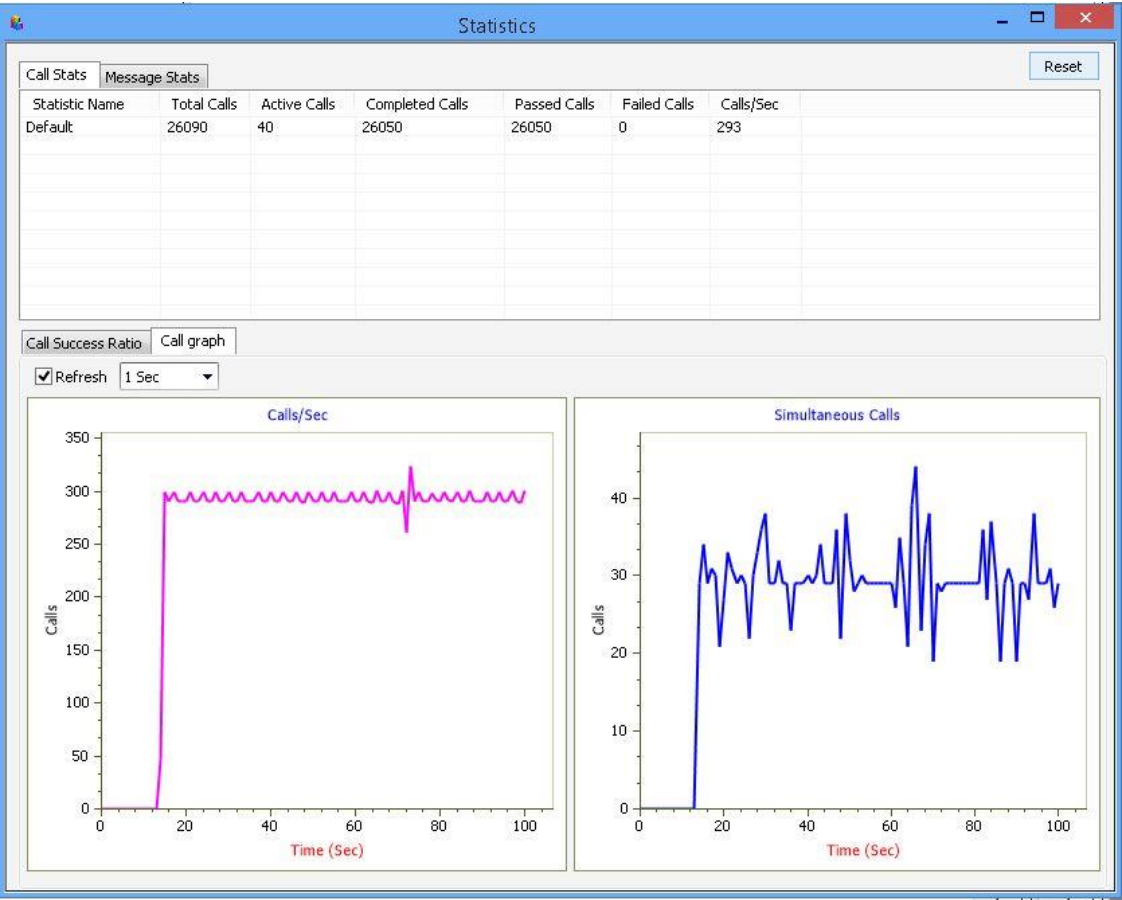
Scripts Message Sequence Event Config Script Flow

Error Events Captured Errors Link Status Up=1 Down=0

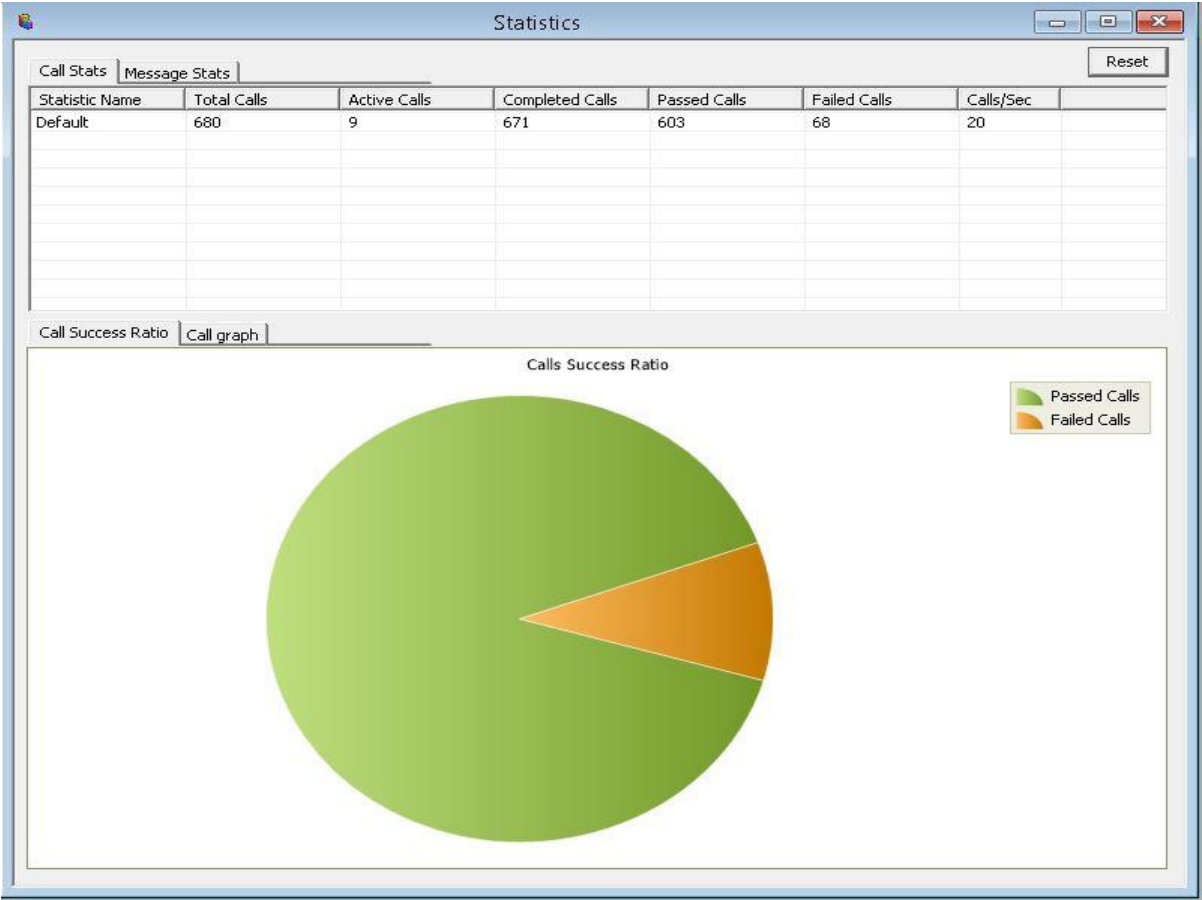
Control moves to "Retrieve" section, after selecting the "Retrieve" User Event

# IUP Call Ratio Statistics

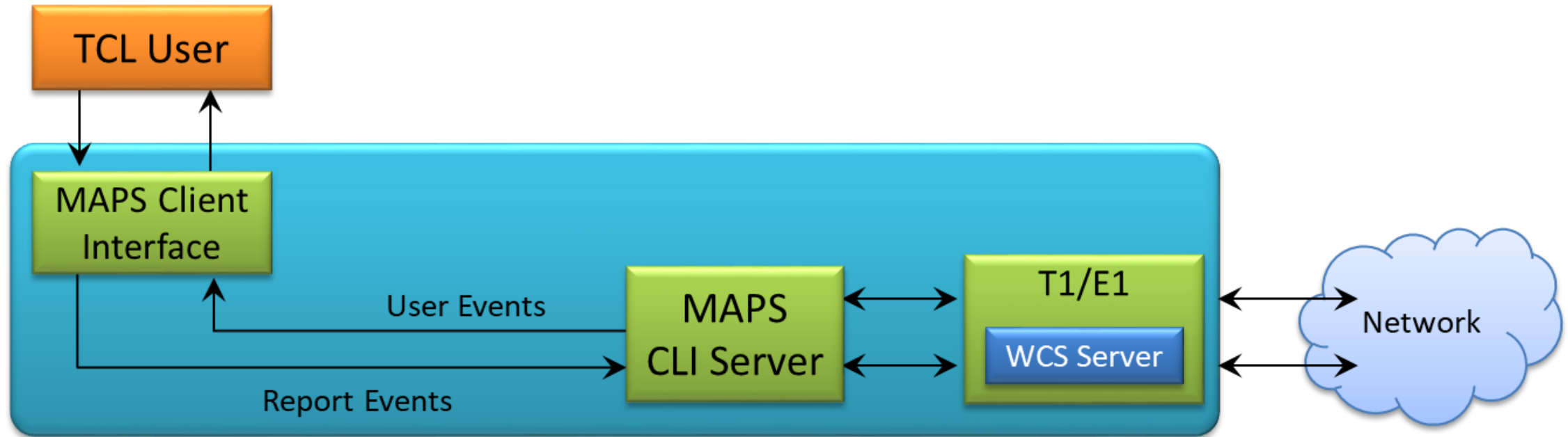
Call Graph



Call Stats



# IUP Command Line Interface



# IUP CLI Network Node and Server

## Incoming Network Node

```
C:\Program Files (x86)\GL Communications Inc\USB E1 Analyzer\MAPS Tcl Client\tclsh85.exe
% load "mapsclientfc.dll"
% source Starttestbed.tcl
Connection Established

Test Bed Started
% Run Incoming_NW.tcl "Detect_Digits" ""

Waiting For Incoming Call...

Script Started

Triggered Script : IUP_Call.gls

IUP Call Received

IUP Additional Call Information - ACI Type 1

IUP Address Complete Sent

Line 1 Answering the call...

IUP Call Answered

Waiting for Digits Detection...

TDM Digits Detected

Type:: DTMF Detected Digits:: 67890

Line 1 Waiting For Call Release....

IUP Release Received

IUP Call Released

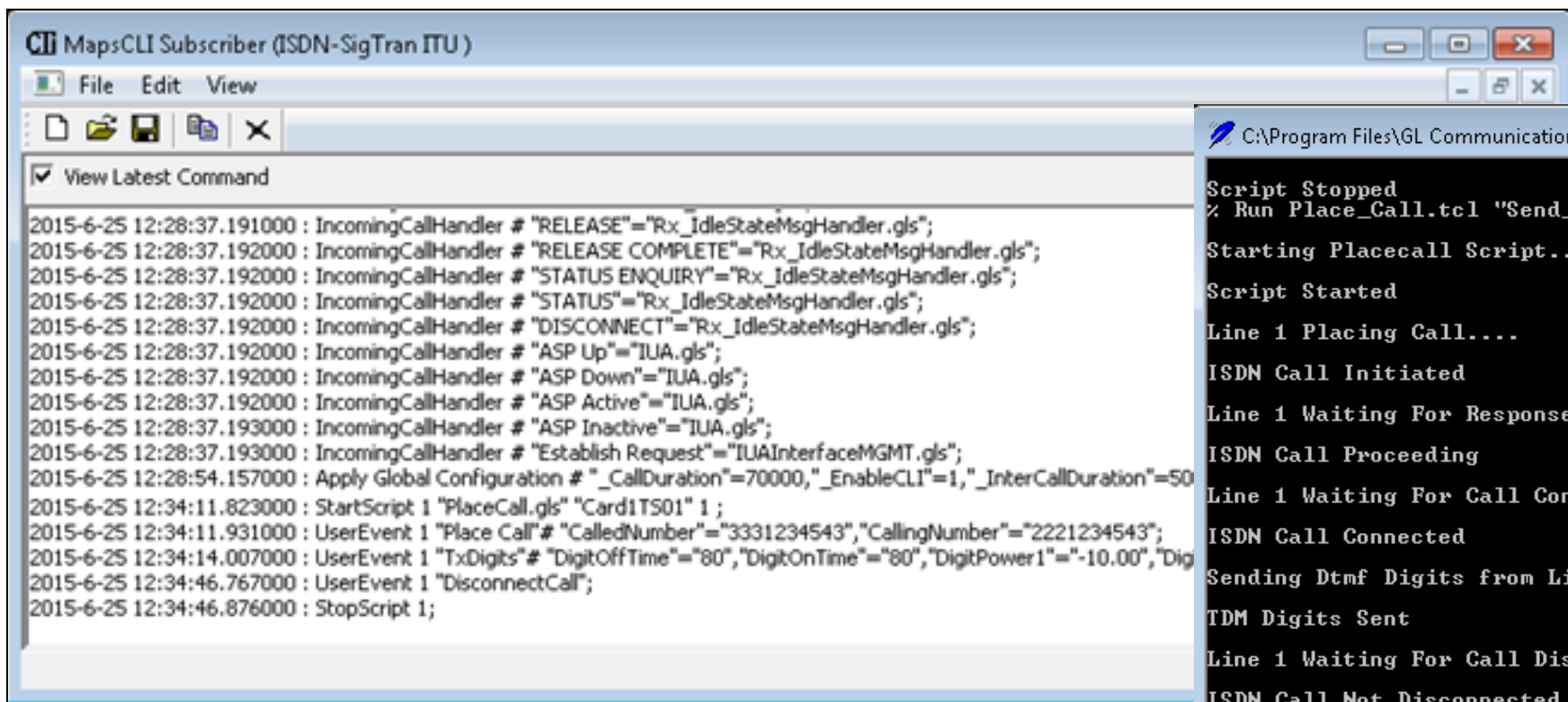
Script Stopped
% _
```

## MAPS CLI Server

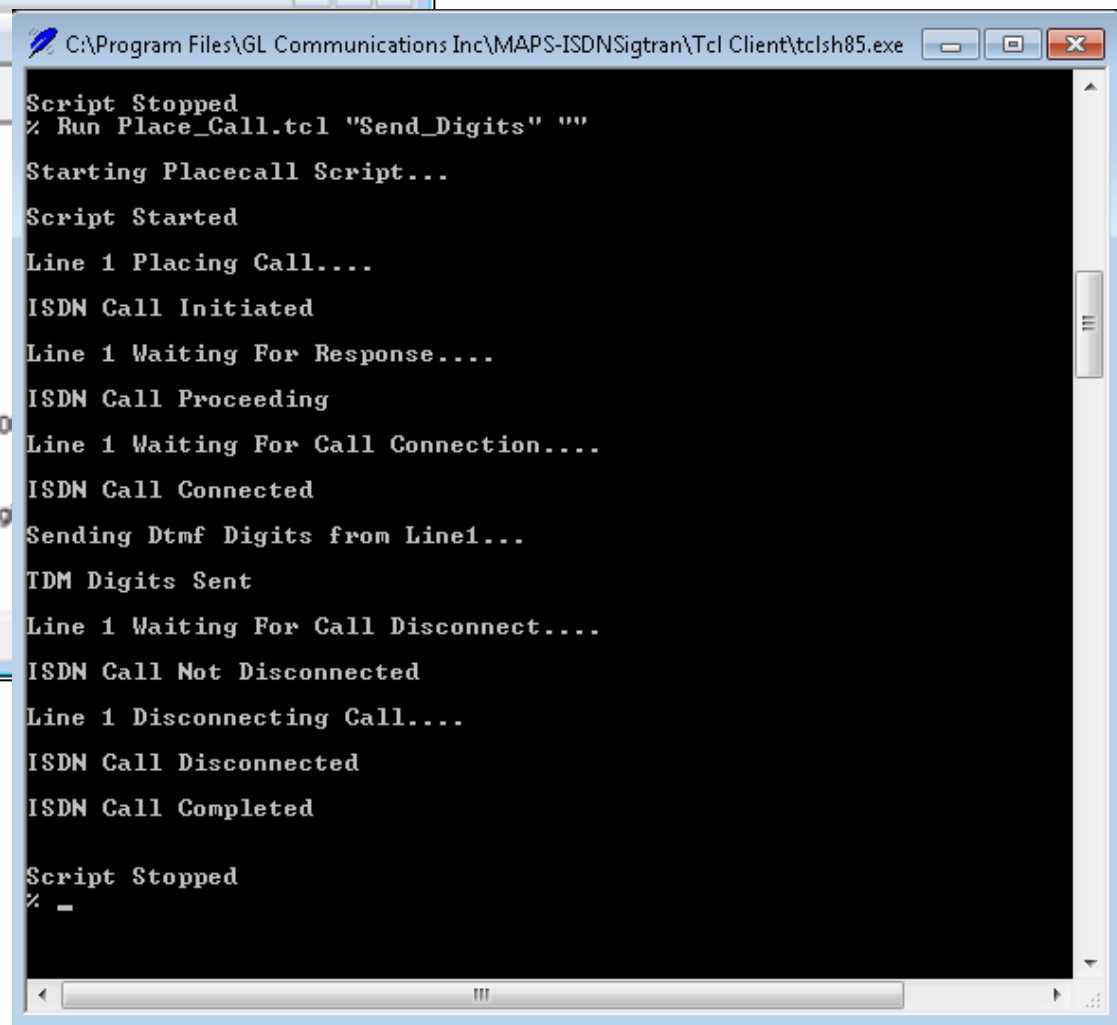
```
MapsCLI (IUP UK)
File Edit View
View Latest Command

2014-8-13 12:37:21.046000 : Apply Global Configuration # "_CallDuration"=70000,"_IAMProtocol"="SND","_MaxRequestedDigitsinSendnDigits"=2,"_RequiredNoOfDigits"=10;
2014-8-13 12:37:21.047000 : IncomingCallHandler # "IUP Initial Address Message"="IUP_Call.gls";
2014-8-13 12:37:21.047000 : IncomingCallHandler # "IUP Initial and Final Address Message"="IUP_Call.gls";
2014-8-13 12:37:27.812000 : UserEvent 2147483651 "Send IUP Answer" # "TypeOfAnswer"=1;
2014-8-13 12:37:27.813000 : UserEvent 2147483651 "MonitorDigits";
2014-8-13 12:37:58.171000 : UserEvent 2147483651 "IUPTerminate";
2014-8-13 12:37:59.592000 : StopScript 2147483651;
2014-8-13 12:39:15.925000 : Apply Global Configuration # "_CallDuration"=70000,"_IAMProtocol"="SND","_MaxRequestedDigitsinSendnDigits"=2,"_RequiredNoOfDigits"=10;
2014-8-13 12:39:15.926000 : IncomingCallHandler # "IUP Initial Address Message"="IUP_Call.gls";
2014-8-13 12:39:15.926000 : IncomingCallHandler # "IUP Initial and Final Address Message"="IUP_Call.gls";
2014-8-13 12:39:24.769000 : UserEvent 2147483652 "Send IUP Answer" # "TypeOfAnswer"=1;
2014-8-13 12:39:24.769000 : UserEvent 2147483652 "MonitorDigits";
2014-8-13 12:39:29.244000 : StopScript 2147483652;
```

# CLI Support



```
MapsCLI Subscriber (ISDN-SigTran ITU)
File Edit View
View Latest Command
2015-6-25 12:28:37.191000 : IncomingCallHandler # "RELEASE"="Rx_IdleStateMsgHandler.gls";
2015-6-25 12:28:37.192000 : IncomingCallHandler # "RELEASE COMPLETE"="Rx_IdleStateMsgHandler.gls";
2015-6-25 12:28:37.192000 : IncomingCallHandler # "STATUS ENQUIRY"="Rx_IdleStateMsgHandler.gls";
2015-6-25 12:28:37.192000 : IncomingCallHandler # "STATUS"="Rx_IdleStateMsgHandler.gls";
2015-6-25 12:28:37.192000 : IncomingCallHandler # "DISCONNECT"="Rx_IdleStateMsgHandler.gls";
2015-6-25 12:28:37.192000 : IncomingCallHandler # "ASP Up"="IUA.gls";
2015-6-25 12:28:37.192000 : IncomingCallHandler # "ASP Down"="IUA.gls";
2015-6-25 12:28:37.192000 : IncomingCallHandler # "ASP Active"="IUA.gls";
2015-6-25 12:28:37.193000 : IncomingCallHandler # "ASP Inactive"="IUA.gls";
2015-6-25 12:28:37.193000 : IncomingCallHandler # "Establish Request"="IUAInterfaceMGMT.gls";
2015-6-25 12:28:54.157000 : Apply Global Configuration # "_CallDuration"=70000,"_EnableCLI"=1,"_InterCallDuration"=50
2015-6-25 12:34:11.823000 : StartScript 1 "PlaceCall.gls" "Card1TS01" 1;
2015-6-25 12:34:11.931000 : UserEvent 1 "Place Call" # "CalledNumber"="3331234543","CallingNumber"="2221234543";
2015-6-25 12:34:14.007000 : UserEvent 1 "TxDigits" # "DigitOffTime"="80","DigitOnTime"="80","DigitPower1"="-10.00","Dig
2015-6-25 12:34:46.767000 : UserEvent 1 "DisconnectCall";
2015-6-25 12:34:46.876000 : StopScript 1;
```



```
C:\Program Files\GL Communications Inc\MAPS-ISDN\Sigtran\Tcl Client\tclsh85.exe
Script Stopped
% Run Place_Call.tcl "Send_Digits" ""
Starting Placecall Script...
Script Started
Line 1 Placing Call....
ISDN Call Initiated
Line 1 Waiting For Response....
ISDN Call Proceeding
Line 1 Waiting For Call Connection....
ISDN Call Connected
Sending Dtmf Digits from Line1...
TDM Digits Sent
Line 1 Waiting For Call Disconnect....
ISDN Call Not Disconnected
Line 1 Disconnecting Call....
ISDN Call Disconnected
ISDN Call Completed
Script Stopped
% _
```



# Customizations - Statistics and Reports

MOS, R-Factor

Packet Loss

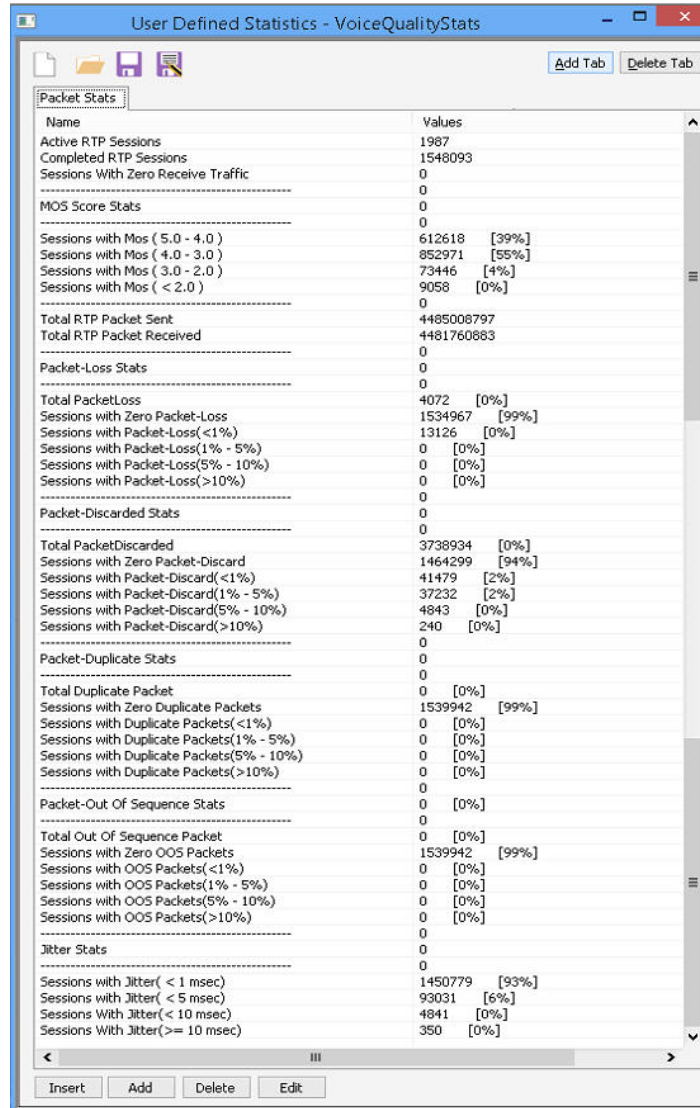
Packets Discarded

Duplicate Packets

Out-Of-Sequence

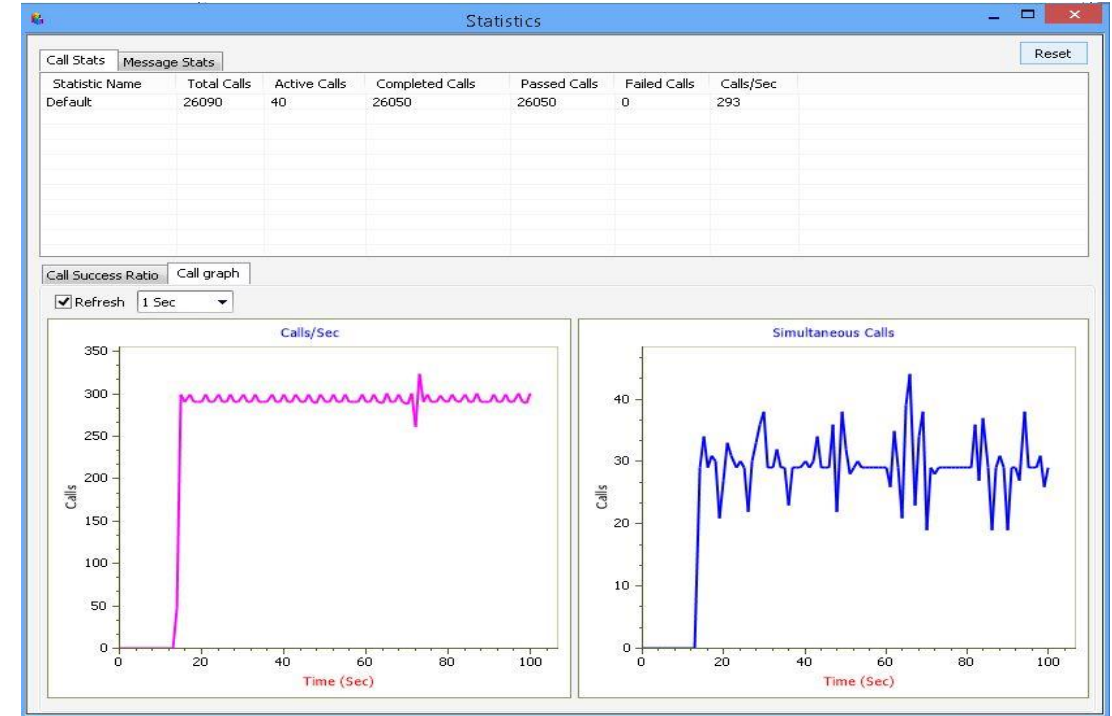
Packets

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 Calls, Instantaneous Calls/Sec



Thank you