MAPS™ ISDN SIGTRAN

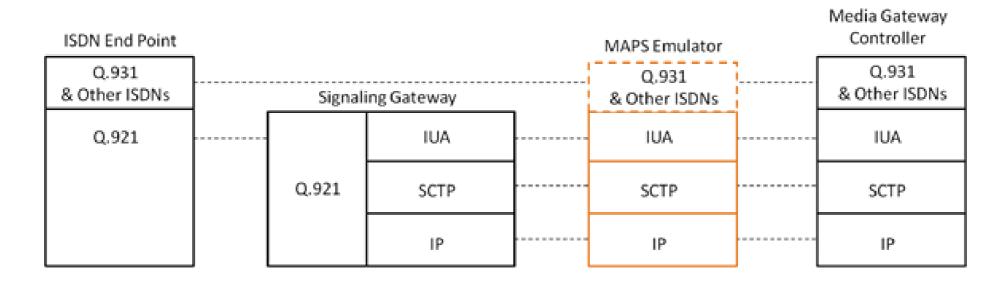## Scripted SIGTRAN ISDN over IP Emulation

ISDN SIGTRAN

Features

- Simulates ISDN signaling over IP (ISDN-SIGTRAN)

- Generates and process all ISDN messages such as Setup, Connect, Release messages, and more

- Switch and Subscriber Emulation

- Supports interfacing with both high-speed PRI (Primary Rate Interface or 23B +D) and low-speed BRI (Basic Rate Interface, or 2B + D) digital lines

- User controlled access to optional ISDN parameters such as timers

- Provides various release cause codes such as rejected, no user response, user busy, congested, and so on to troubleshoot the problems in ISDN

- Impairments can be applied to messages to simulate error conditions

- Supports TDM traffic (including digits, voice file, tones, IVR, FAX, Dynamic VF, IVR and Voice Quality Testing) over IP

- Supports Client-Server functionality requires additional license; clients supported are TCL, Python, VBScript, Java, and .Net

- Automation, Remote access, and Schedulers to run tests 24/7

- Supports customization of call flows and message templates using Script editor and Message editor

- Provides call statistics and associated captured events and error events during call simulation

- Supports Media (including Digits, Voice File, Tones, IVR, FAX, VQT, and Dynamic VF) over TDM lines for PRI

SIGTRAN Protocol Stack

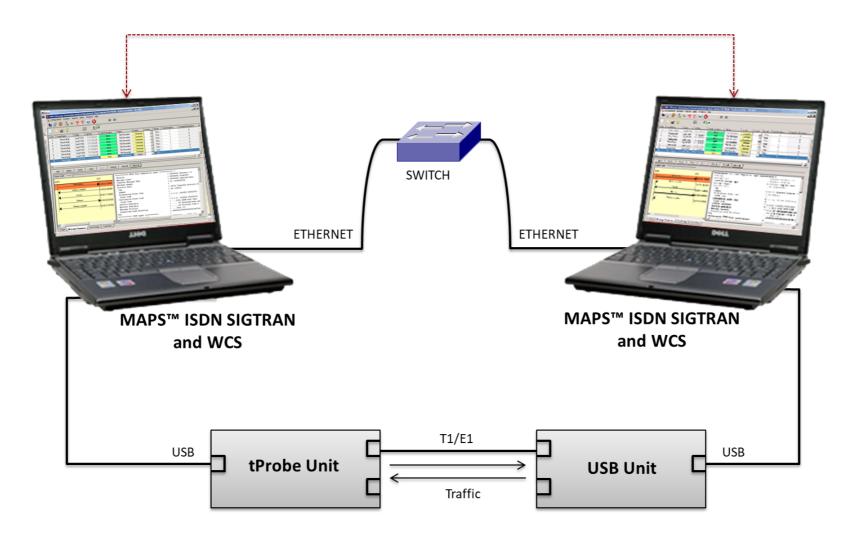| Supported Protocols	Standard / Specification Used
Q.931	ITU-T Q.931 / Q.932(Facility IE) / Q.955.3 (MLPP Procedures)
IUA	RFC 4233 Integrated Services Digital Network (ISDN) Q.921-User Adaptation Layer

Adaption Layers

SIGTRAN currently defines SIX adaption layers

- **M2UA:** It provides the services of MTP2 in a Client-Server Situation, such as SG to MGC. Its user would be MTP3

- **M2PA :** It provides the services of MTP2 in a Peer-to-Peer Situation, such as SG to SG Connections. Its user would be MTP3

- **M3UA:** It provides the services of MTP3 in both a Client-Server Situation (SG to MGC) & Peer-to-Peer Architecture, Its user would be SCCP and/or ISUP

- **SUA:** It provides the services of SCCP in a Peer-to-Peer Situation, such as SG to IP SCP Connections. Its user would be TCAP

- **IUA:** It provides the services of the ISDN Data Link Layer (LAPD), Its user would be an ISDN Layer 3 (Q.931) entity

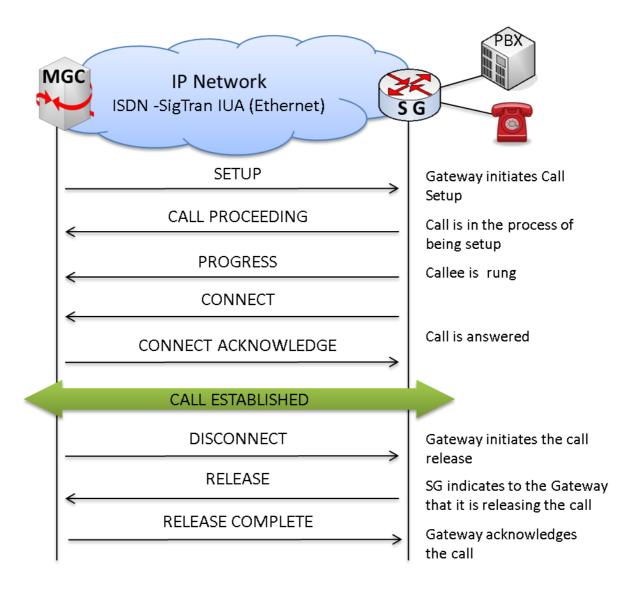- **V5UA:** It provides the services of the V.5.2 Protocol

Call Simulation over ISDN SIGTRAN

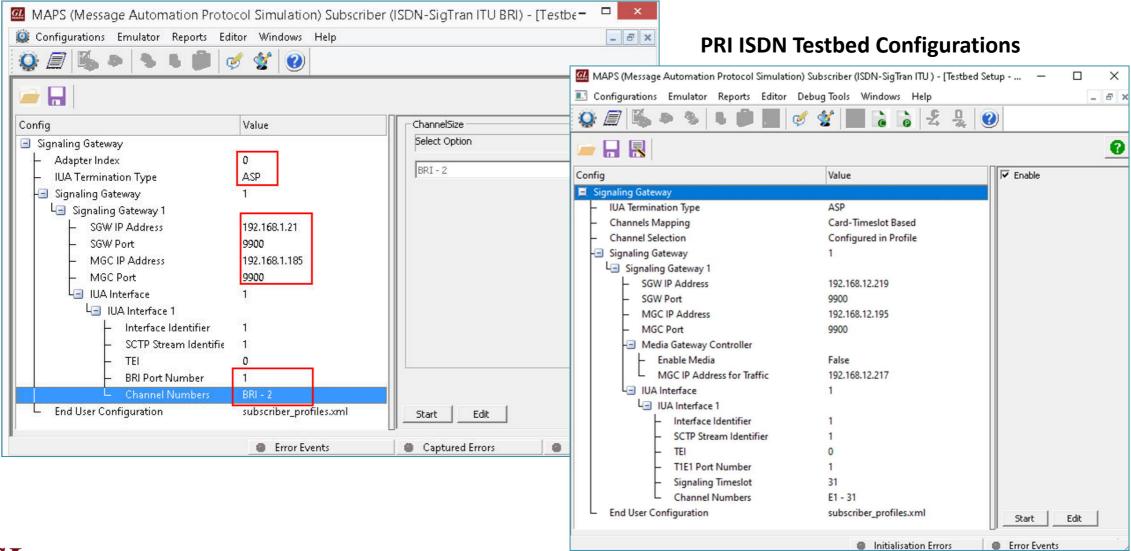MAPS™ ISDN SIGTRAN Configuration for Signal

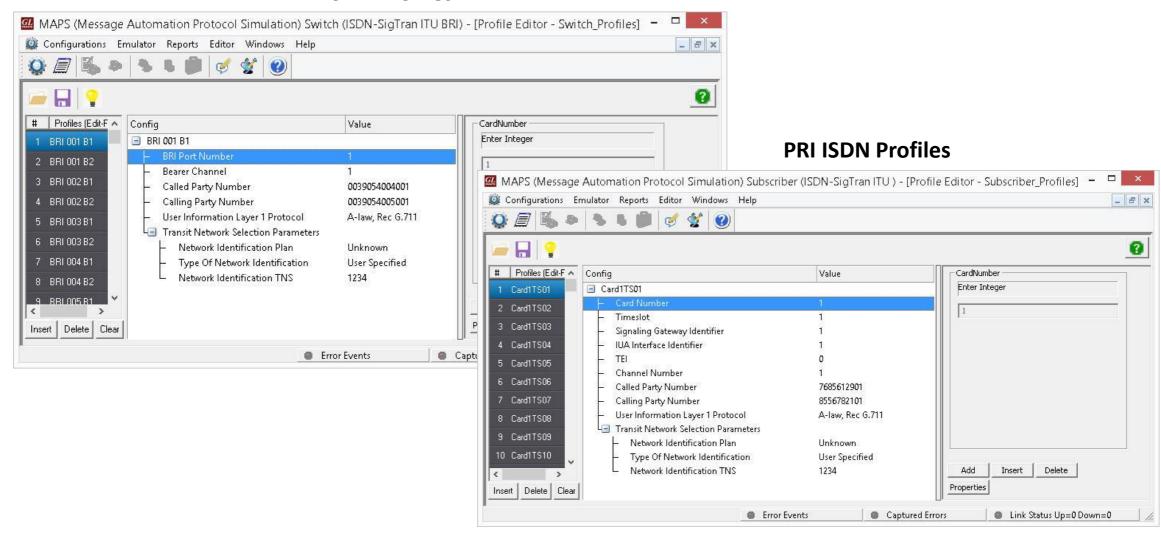# ISDN SIGTRAN Call Procedure

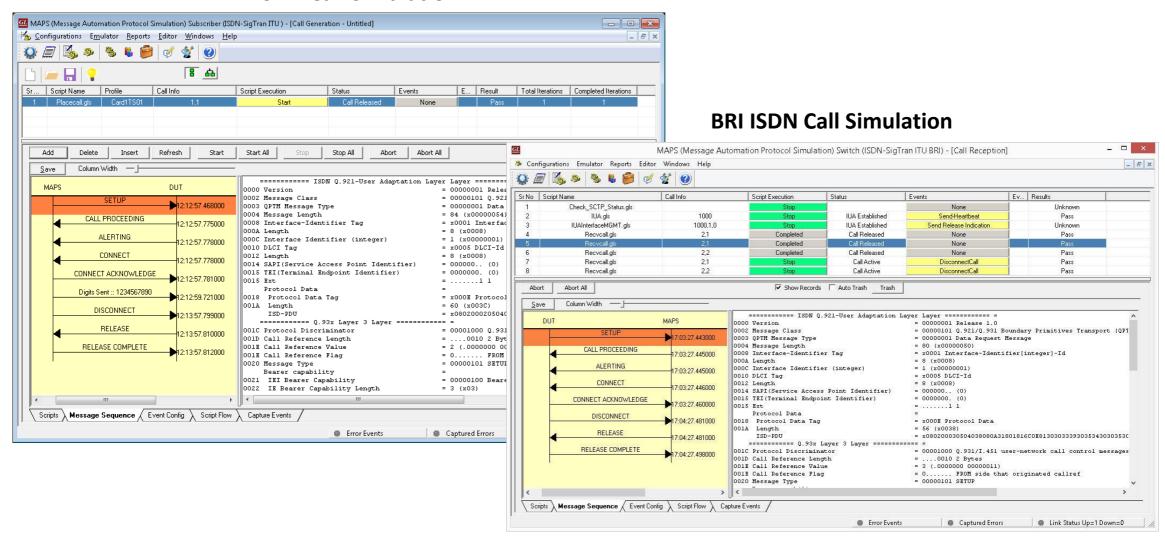# Testbed Configurations

BRI ISDN Testbed Configurations

PRI ISDN Testbed Configurations

Profiles

BRI ISDN Profiles

PRI ISDN Profiles

Call Generation

PRI ISDN Call Simulation

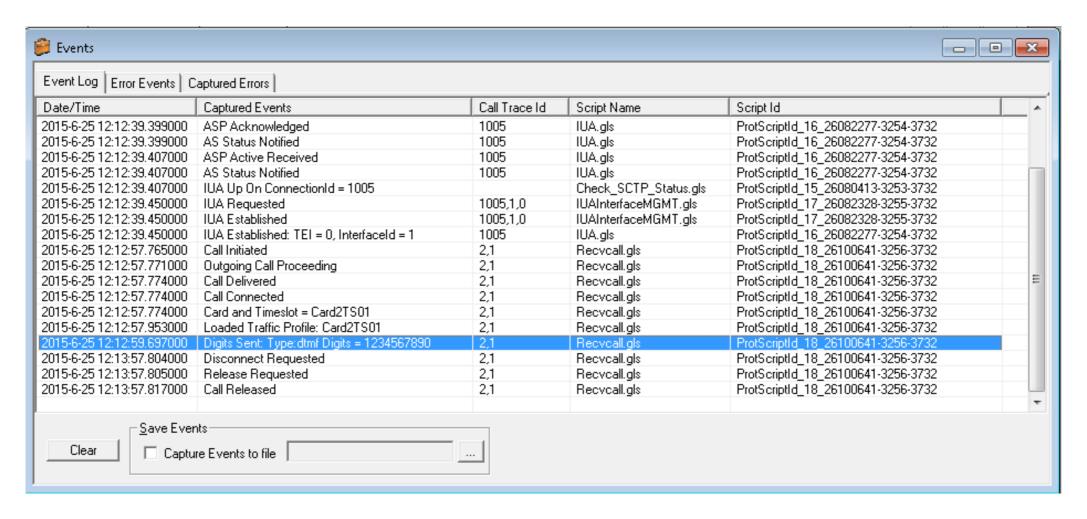**BRI ISDN Call Simulation**

Call Reception

PRI ISDN Call Reception

BRI ISDN Call Reception

ISDN Sigtran Events Log

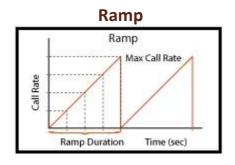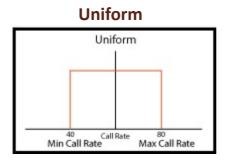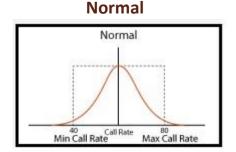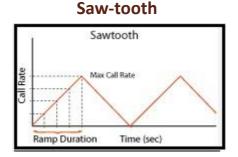| Date/Time	Captured Events	Call Trace Id	Script Name	Script Id
2015-6-25 12:12:39.399000	ASP Acknowledged	1005	IUA.gls	ProtScriptId_16_26082277-3254-3732
2015-6-25 12:12:39.399000	AS Status Notified	1005	IUA.gls	ProtScriptId_16_26082277-3254-3732
2015-6-25 12:12:39.407000	ASP Active Received	1005	IUA.gls	ProtScriptId_16_26082277-3254-3732
2015-6-25 12:12:39.407000	AS Status Notified	1005	IUA.gls	ProtScriptId_16_26082277-3254-3732
2015-6-25 12:12:39.407000	IUA Up On ConnectionId = 1005		Check_SCTP_Status.gls	ProtScriptId_15_26080413-3253-3732
2015-6-25 12:12:39.450000	IUA Requested	1005,1,0	IUAInterfaceMGMT.gls	ProtScriptId_17_26082328-3255-3732
2015-6-25 12:12:39.450000	IUA Established	1005,1,0	IUAInterfaceMGMT.gls	ProtScriptId_17_26082328-3255-3732
2015-6-25 12:12:39.450000	IUA Established: TEI = 0, InterfaceId = 1	1005	IUA.gls	ProtScriptId_16_26082277-3254-3732
2015-6-25 12:12:57.765000	Call Initiated	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:12:57.771000	Outgoing Call Proceeding	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:12:57.774000	Call Delivered	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:12:57.774000	Call Connected	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:12:57.774000	Card and Timeslot = Card2TS01	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:12:57.953000	Loaded Traffic Profile: Card2TS01	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:12:59.697000	Digits Sent: Type:dtmf Digits = 1234567890	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:13:57.804000	Disconnect Requested	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:13:57.805000	Release Requested	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732
2015-6-25 12:13:57.817000	Call Released	2,1	Recvcall.gls	ProtScriptId_18_26100641-3256-3732

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.
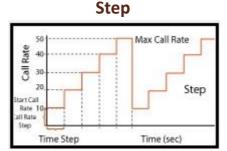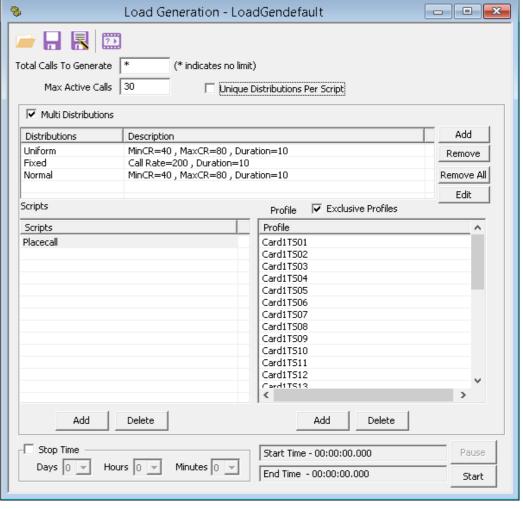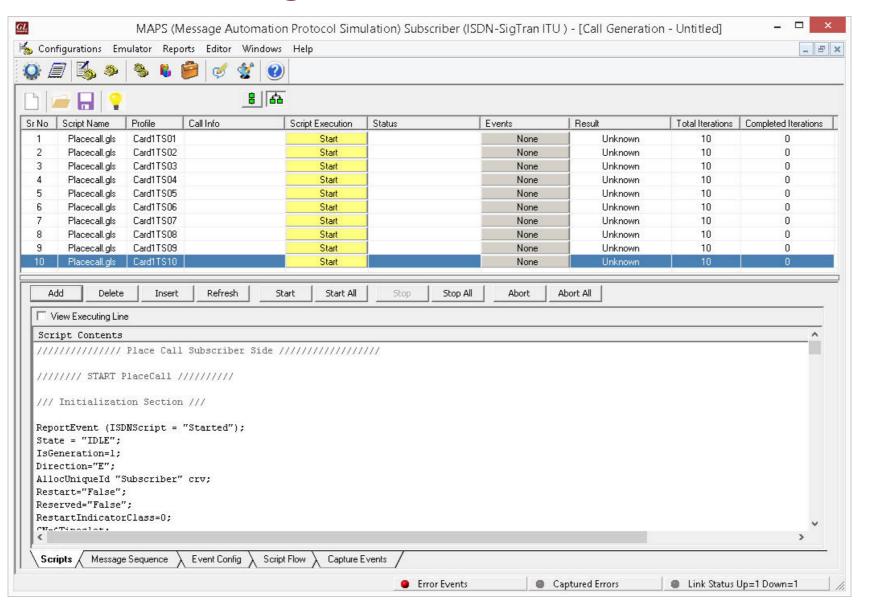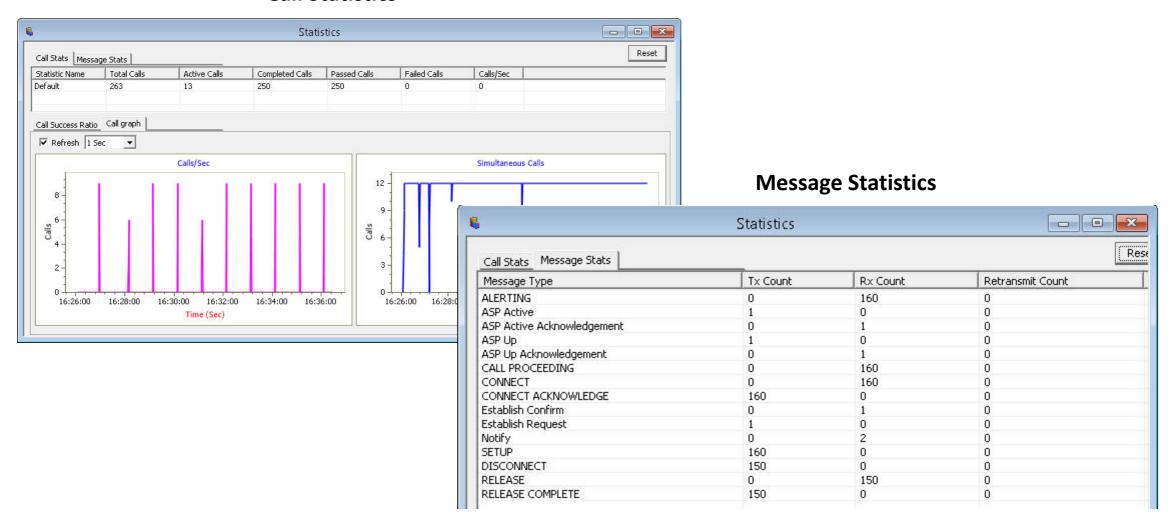

Fixed

Ramp

Uniform

Normal

Saw-tooth

Step

ISDN Sigtran Bulk Call Generation

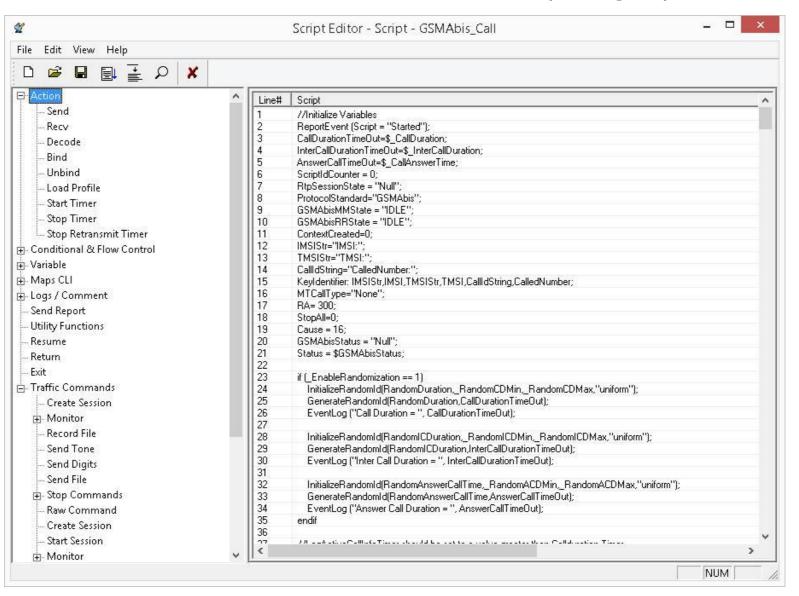# Call and Message Statistics

Call Statistics

Message Statistics

MAPS™ Sigtran Test System

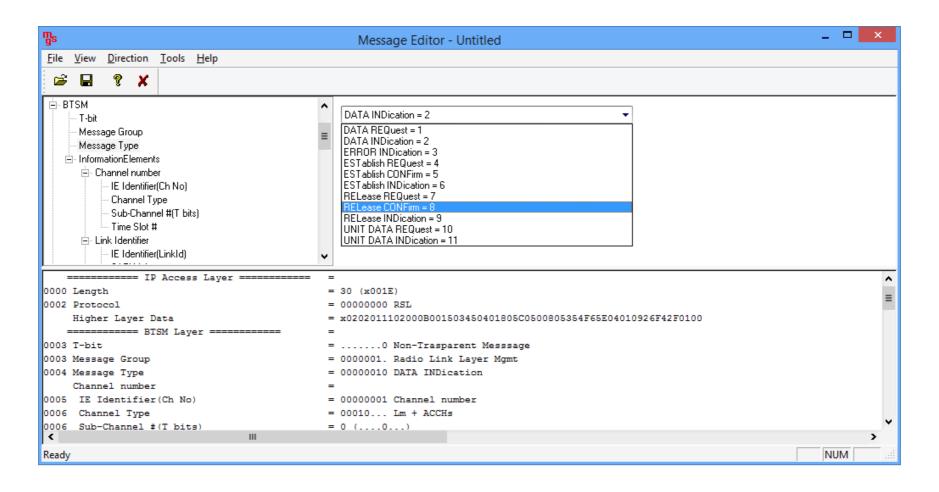# Schedule Test to Run Automatically

Customizations - Call Flow (Scripts)

Customizations - Protocol Messages

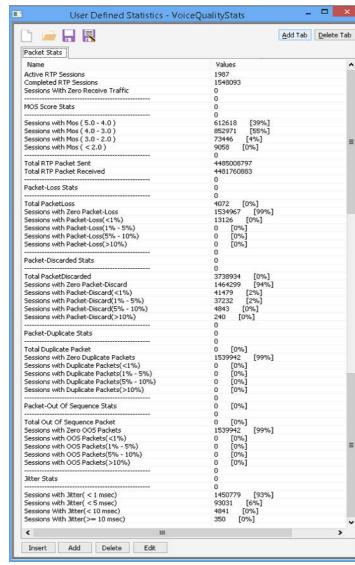# Customizations - Statistics and Reports

MOS, R-Factor
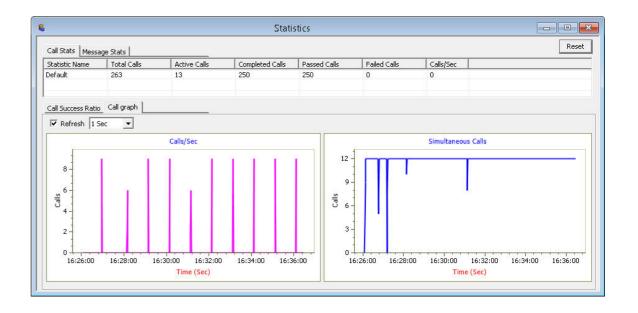
Packet Loss

Packets Discarded

Duplicate Packets

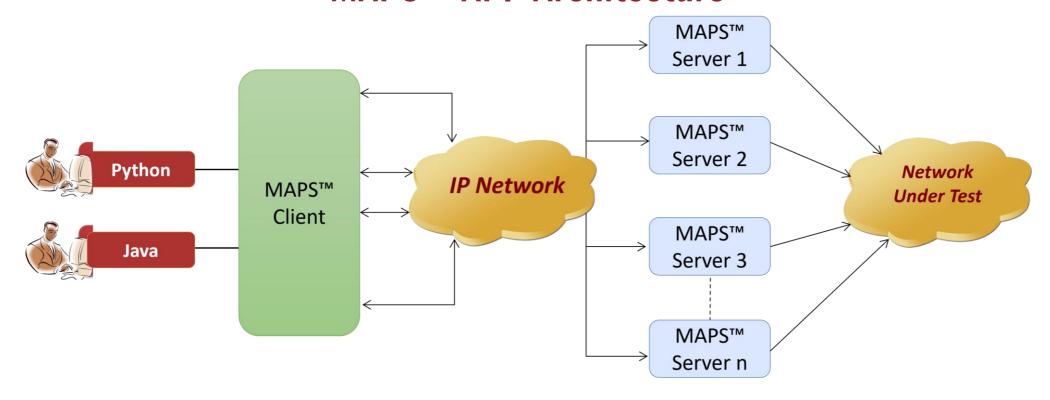Out-Of-Sequence

Packets

Jitter Statistics

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
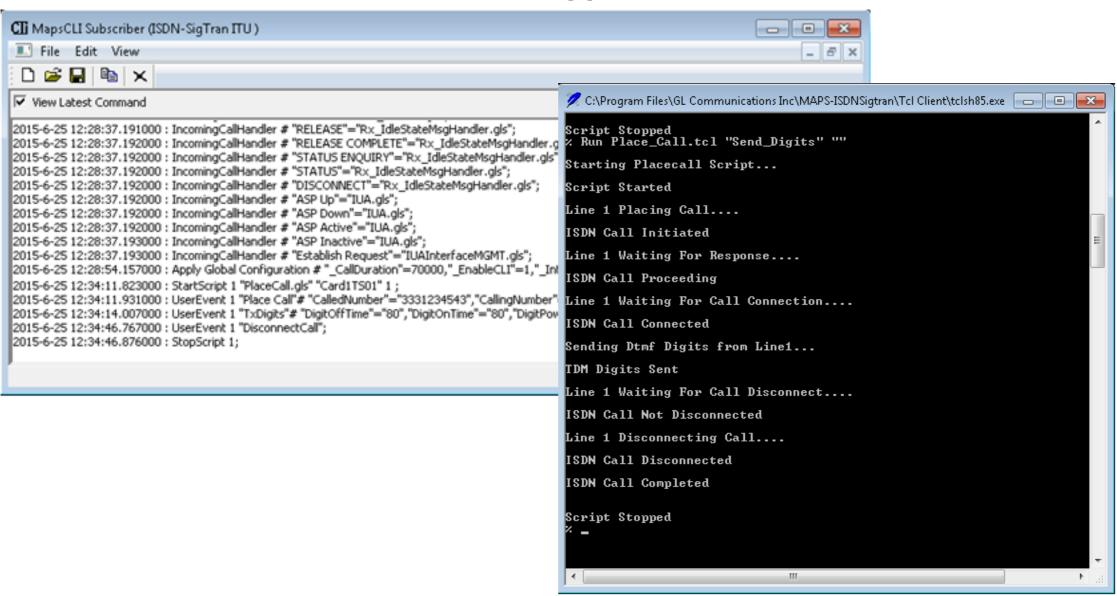
MAPS™ API Architecture

- API wraps our proprietary scripting language in standard languages familiar to the user:
  - ➢ Python
  - ➢ Java
- Clients and Servers support a "Many-to-Many" relationship, making it very easy for users to develop complex test cases involving multiple signaling protocols

CLI Support

THANK YOU