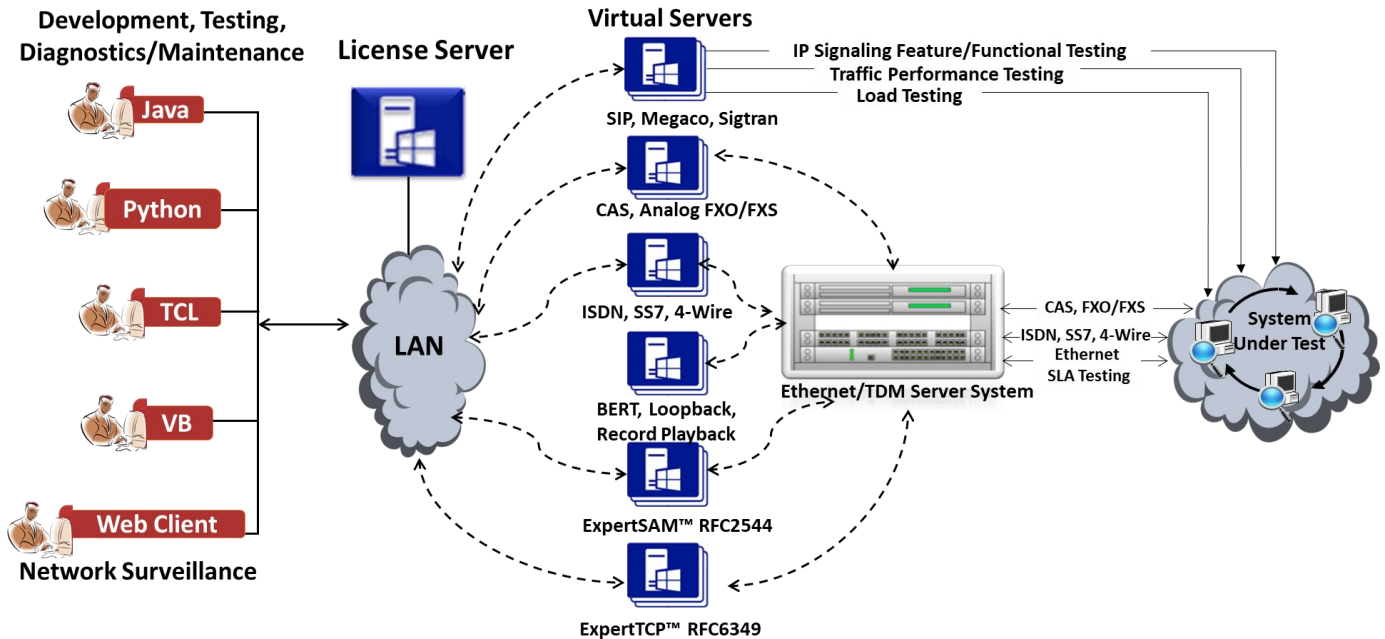# MAPS™ Remote Controller

Multiple MAPS™ controlled from Single Remote Client to perform Call Emulation over IP, Wireless, TDM Networks

Overview

The Remote MAPS™ application is a client server module, designed for multi-node multi-interface emulation from a single GUI. The application has the ability to remotely control multiple MAPS™ Servers running on different PCs from a single remote client application. It is also possible for multiple clients to remotely control MAPS™ applications running on single server, from any of the remote client application.

One or more MAPS™ applications can be installed on MAPS™ Server system. With this practically all the nodes (network elements) associated with a protocol, including protocol standards and subscriber profiles can be remotely controlled from a single remote client. The Remote MAPS™ client application communicates with the multiple MAPS™ Server via Listener over TCP/IP.

Each MAPS™ Server is configured with multiple users. The Admin user has the privileges to start the testbed setup and control the user access to configuration files. Other remote users can use the subscriber configuration files to emulate signaling and traffic. GL's MAPS™ provides an advanced full-fledged network environment that enables user to test their applications, devices, and services on emulated network environment prior to deployment on a real-time network. It can be used to emulate all or specific network elements using simple ready-to-use testbed setup.

For more information, please visit MAPS™ Remote Controller webpage.

Features

- A single Remote Client GUI to remotely control/monitor all the network interfaces and elements emulated by MAPS™ Servers; one or more MAPS™ applications can be installed in a single Sever.
- Allows integrated testing of different networks - Wireless, IP, TDM, and Analog (CAS, FXO, SIP, IMS, UMTS, and so on).
- Suitable for testing any core network, access network, and inter-operability functions.
- Remote MAPS™ provides access to all the functions of MAPS™ such as Testbed, Call generation, Call reception, Statistics and Results.
- Client-server communication is facilitated through a Listener over TCP/IP.
- Each Listener equates an independent instance of MAPS™ application at the server side.
- Each Listener is associated with an Admin user.
- Unlimited number of Remote client users can be defined at the server.
- Single licensing server option available for controlling number of MAPS™ Server licenses as well as client licenses (no of users).
- Option to license multiple clients either at Remote client systems (MAPS™ Remote Client to control one or more MAPS™ Server - PKS111) or at the MAPS™ Server systems (MAPS™ Server with Multi-user capability - PKS113).
- Remote Client invoked by "Admin" user has privileges to start /stop Testbed setup access. Remote Client invoked by "Remote Users" has privileges to certain set of subscriber profiles, using which he can edit scripts, profiles, messages, perform call simulation, and view test results.

Working Principle
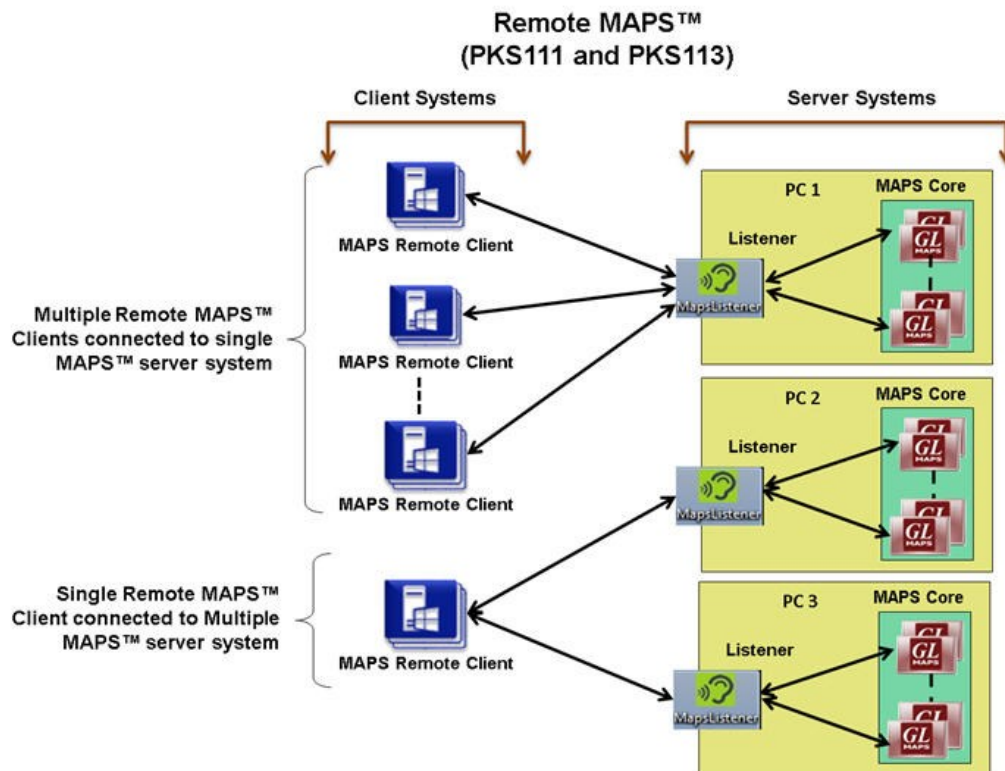
- MAPS™ Sever system has one or more MAPS™ applications installed.
- Each MAPS™ application has ability to emulate one or more network elements (nodes) communicating using protocol standards defined by international bodies.
- MAPS™ Remote Client application can be installed on multiple PCs. Option to license multiple clients either at Remote client systems (MAPS™ Remote Client to control one or more MAPS™ Server - PKS111) or at the MAPS™ Server systems (MAPS™ Server with Multi-user capability - PKS113).
- Each instance of MAPS™ application is associated with a Listener application running on server systems. The Listener facilitates the client-server communication over TCP/IP.

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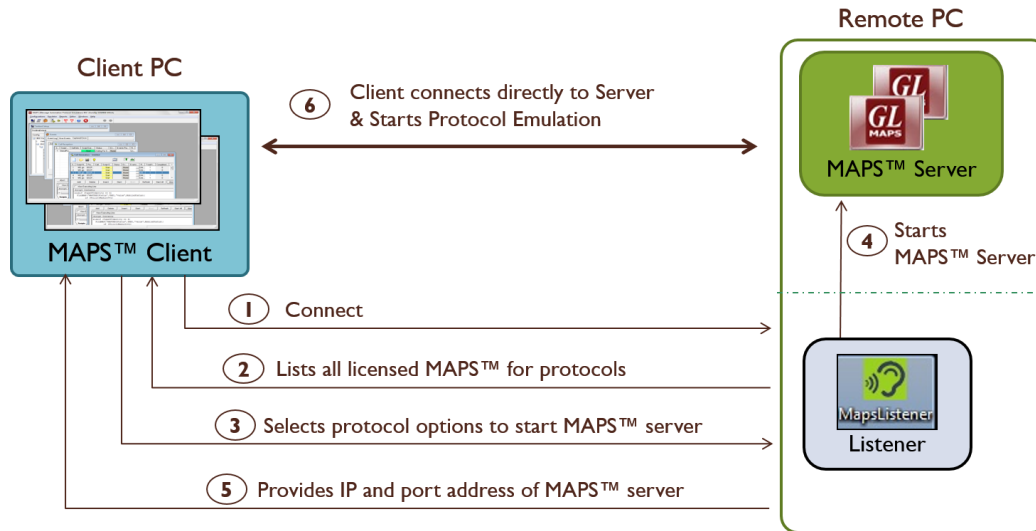
Working Principle *(Contd.)*

Figure: Remote MAPS™ Client-Server Communication Flow

- Within the installation directory of MAPS™ application on the server, you choose which protocol version, node and transport to be enabled for remote access. One also needs to create an Admin user and other Remote users using the user configuration option. Then start the Listener on the server by configuring with respective IP address and UDP ports. Any number of Listeners can be configured, each using different UDP ports (equates multiple instances of MAPS™ application instances).
- The Listener is then started on the server on respective IP address and UDP ports. This enables the Listener on the specified port to wait for commands from the Remote client.
- The Remote Client system consists of server configuration window that allows necessary parameters to add and control multiple MAPS™ applications running on one or more MAPS™ Server systems
- Admin user creates and starts testbed setup on the Remote Client system. Only Admin can start/stop the testbed setup.
- When remote users invoke the Remote MAPS Client GUI, they can view testbed configurations available to them. Once the testbed setup is started, remote users can create their own subscriber profiles. They then register their subscriber profiles so that these resources are only allocated to them and not available to other users. Once the Testbed setup is started, registered users can call each other. For example, user 1 (on Card#1-TS#1) can call user 2 (on Card#2-TS#1) as Card#1 profiles are registered to user 1 and Card#2 profiles are registered to user 2.
- All the configured nodes can be started or stopped simultaneously. Server node configuration can be saved to a file and later readily reloaded to perform testing from some other location. Users can also modify Protocol specific parameters and Listener's IP address and the port using the edit server option.
- Remote Client invoked by "Admin" user has privileges to start /stop Testbed setup access. Remote Client invoked by "Remote Users" has privileges to certain set of subscriber profiles, using which he can edit scripts, profiles, messages, perform call emulation, and view test results.

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Remote MAPS™ for IMS Network

In this example, we use Remote MAPS™ to emulate multiple nodes in IMS network such as UE, P-CSCF, S-CSCF, I-CSCF, and HSS situated at remote locations. The client application connects to these servers, starts testbed, and remotely accesses the MAPS™ functionalities to perform call emulation.
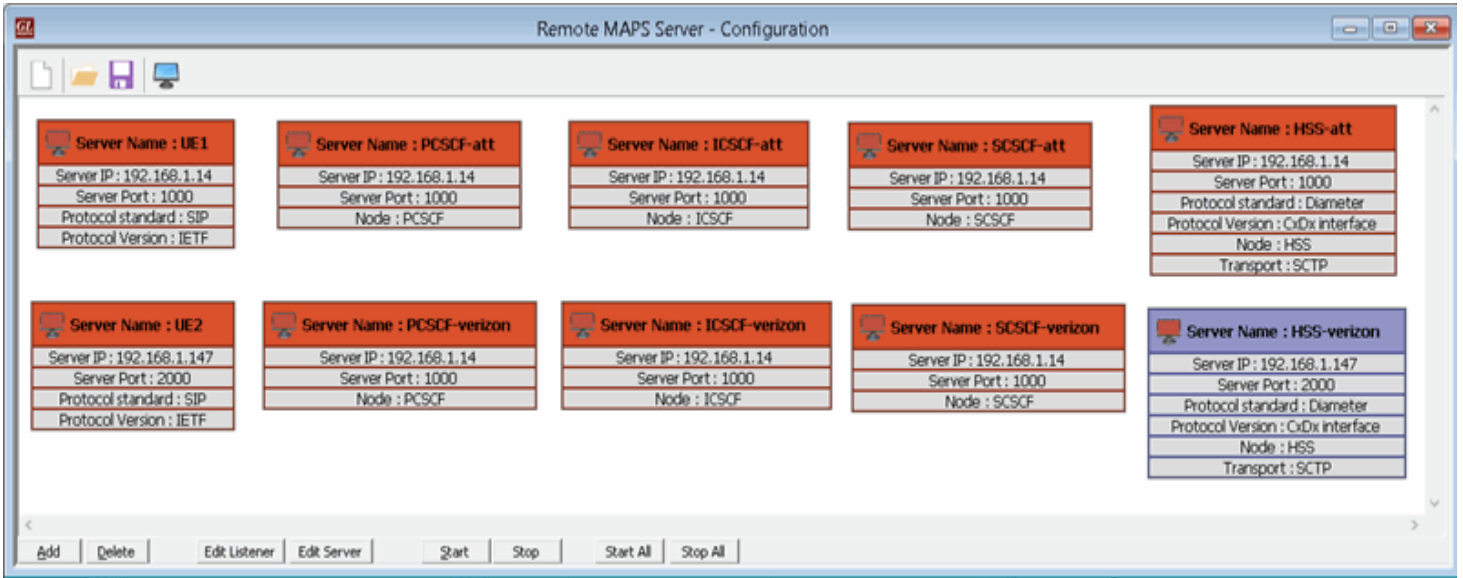

Figure: Remote MAPS Server Configuration for IMS Network Emulation

As shown in the figure alongside, Remote MAPS™ can emulate UE1 (User Equipment 1) registered at ATT network to place a call to UE2 (User Equipment 2) registered at Verizon network. Once the preconditions are met and resource reservations are made, call will be established between the users.

The following network is an illustration of a call emulation from Non-Roaming User to another Non-Roaming User across different LTE – IMS Network (UE1 in ATT network to UE2 in Verizon network).

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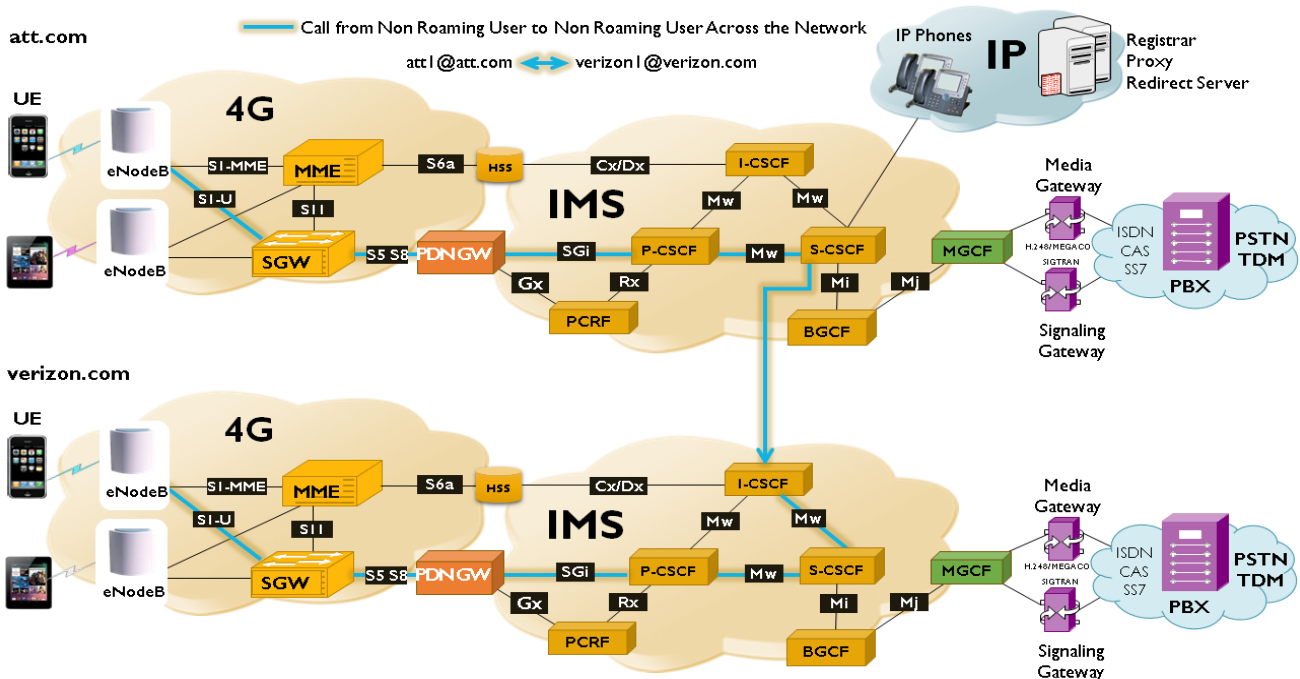
Remote MAPS™ for IMS Network Call Generation and Reception

The screenshot alongside shows the Registration flow at S-CSCF which handles SIP Registrations for ATT Network interacting with I-CSCF and HSS. And the call flow at I-CSCF interacting with S-CSCF of ATT network, and HSS and S-CSCF of Verizon network.
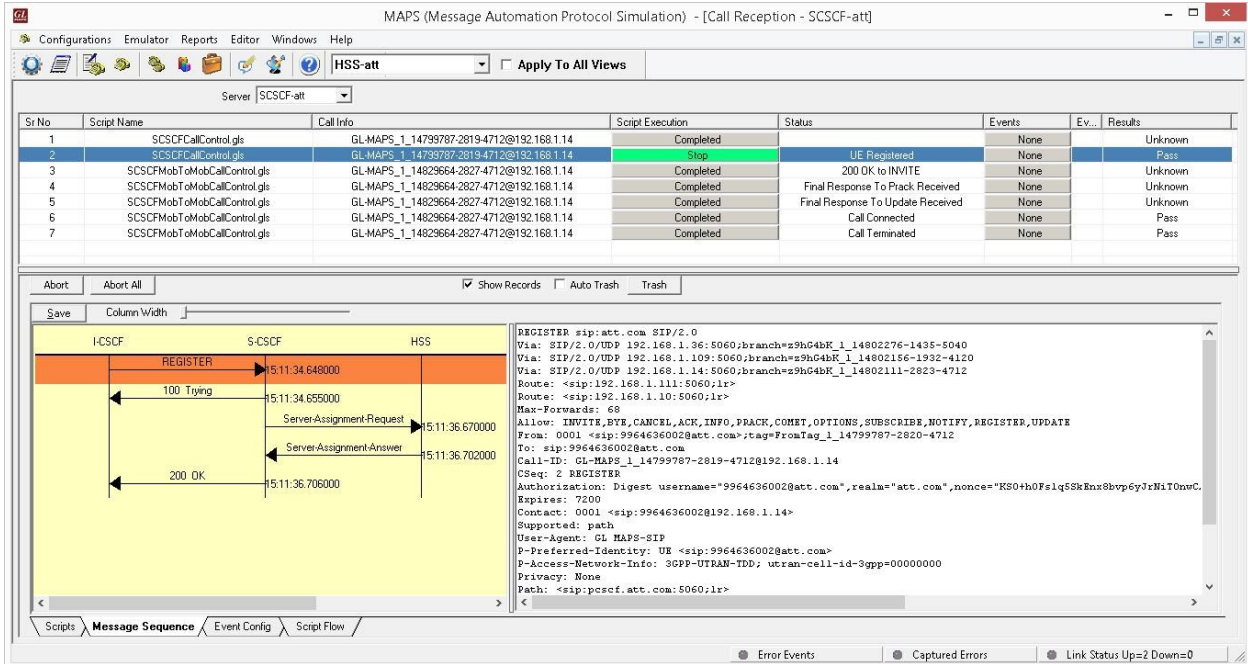

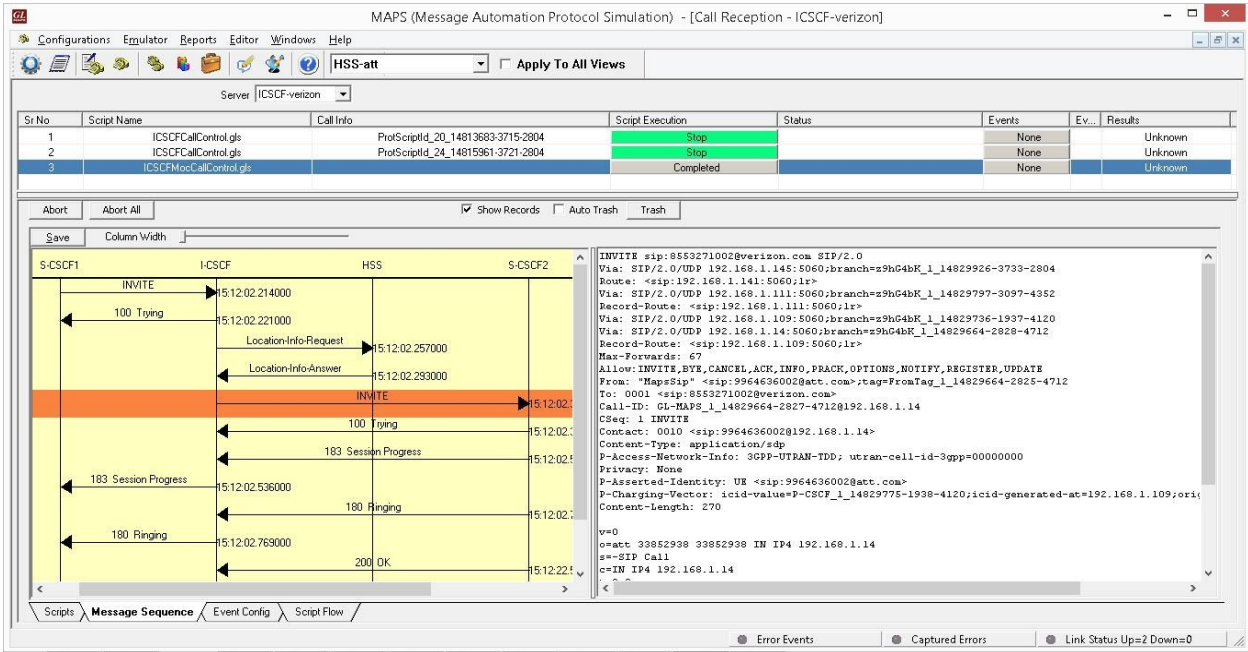**Figure: End-to-end Registration and Call Control Procedures (Call Generation at SC-SCF))**

Figure: End-to-end Registration and Call Control Procedures (Call Reception at IC-SCF)

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Remote MAPS™ for TDM Network

In this example, we use Remote MAPS™ to show how multiple users share the channel resources on a single T1 E1 Server to emulate calls. On the MAPS™ server system, Octal T1/E1 Analyzer is installed and 2 listeners are started with different port number 4000 and 6000 respectively. Admin 1, Admin 2, User 1, and User 2 are also created on the server system. Each listener is associated with a Admin user. Consider Card# 1 is connected in loopback to Card# 2. Similarly, Card# 3 is connected in loopback to Card# 4.

MAPS™ Remote Client may be installed on any PC except the Octal T1/E1 Analyzer system. With this setup, Admin-1 can start testbed setup on Card# 1-3, and Admin-2 can start testbed setup on Card# 2-4. Once the testbed setup is started User 1 registers subscriber profiles on Card# 1-3-5-7, and User 1 registers subscriber profiles on Card# 2-4-6-8.

Now, ISUP calls can be placed and received between User 1 (ex: Card#1 TS00) and User 2 (ex: Card#2TS00).
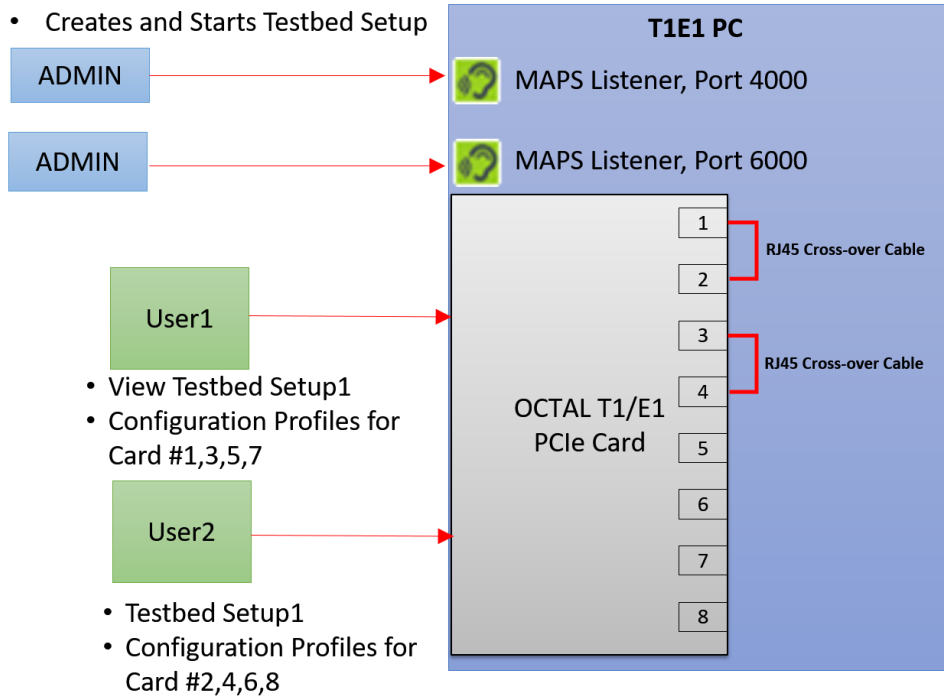

Figure: Remote MAPS Server Configuration for T1/E1

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Buyer's Guide

Item No	Product Description
PKS111	MAPS™ Remote Controller
PKS113	MAPS™ Server with Multi User Capability
PKS127	MAPS™ IMS Emulator
PKS140	MAPS™ LTE S1 Emulator
PKS142	MAPS™ LTE eGTP (S3, S4, S5, S8, S10, S11 & S16) Emulator
PKS120	MAPS™ SIP Emulator
PKS130	MAPS™ SIGTRAN Emulator
PKS301	MAPS™ IMS Multi Interface (S-CSCF)
XX651	MAPS™ CAS Emulator

For more information, please visit MAPS™ Remote Controller webpage.