MAPS™ BICC over IP Emulator

(Bearer Independent Call Control Protocol - SS7 Protocol Suite)



Overview

GL's Message Automation & Protocol Simulation (MAPS[™]) architecture is a powerful Protocol Test platform supporting a wide range of protocols.

MAPS[™] BICC IP is a emulator for Bearer Independent Call Control (BICC) emulation over IP networks. Specifically, it can emulate BICC call control signaling as defined by the ITU-T standards between Mobile Switching Centre (MSC) and Gateway MSC (GMSC) server nodes. Functions supported includes testing network elements, error tracking, regression testing, conformance testing, load testing/call generation and generation of high volumes of traffic.

MAPS[™] BICC IP also supports transmission and detection of various RTP traffic such as, digits, voice file, tones, FAX, IVR, and User defined traffic over IP networks (requires additional RTP traffic licensing).

MAPS[™] BICCIP High Density supports generation of high volume of calls with traffic for load testing network using MAPS[™] RTP HD network appliance, specialized 1U rack mounted designed to easily achieve up to 20,000 endpoints per appliance (5000 simultaneous calls with duplex traffic per port). Network Simulation Appliance is available in the following appliance: 4x1GigE, 2x1/10 GigE, and 2x40/100 GigE.

MAPS[™] supports <u>Command Line Interface (CLI)</u> allowing remote controlling of the application through multiple command-line based clients

For more information, refer to <u>MAPS[™] BICC over IP Protocol Emulator</u> webpage.

🔊 GL Communications Inc.

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Main Features

- BICC emulation over IP network
- Supports BICC IP bearer control (call control or APM) messages
- Supported procedures includes Successful Basic Call, Additional Setup, Mid Call, Normal Call Release, Unsuccessful Call Setup, Codec modification/mid-call Codec Negotiation
- Access to all BICC Call Control Message Parameters OPC, DPC, calling number, called number, etc.
- Supports RTP traffic transmission and detection Digits, Voice, Tones, IVR, FAX
- High density of up to 20,000 calls with traffic is easily achievable per appliance (5000 calls per port)
- Simulate MSC and GMSC Nodes in the BICC over IP network
- CSV file configurations supporting multiple SCTP connections (up to 1024) scaling up the Serving Nodes client and server node configurations
- User-friendly GUI for configuring the M3UA, M2 PA Layers
- Supports Client-Server functionality with additional licensing. clients are "TCL", "Python", "VBScript" and ".Net"

Testbed Setup Configuration

Test Bed setup is provided to establish communication between MAPS[™] BICC IP and the DUT. It allows users to configure SCTP layer parameters to transmit and receive messages over M3UA and M2PA layers. It supports multiple Serving Nodes (SCTP connection) configuration using CSV file as SCTP configuration source. This feature considerably contributes to increased performance of MAPS[™] application.

End User is configured with default XML file, which defines a set of multiple profiles with varying parameter values allowing users to configure call instances in call generation and to receive calls.

MAPS Serving Node (BICC-IP UK M3UA) - [Testbed Setup -TestBed	Default] – 🗆 🗙
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🎯 🖉 🛸 🐐 💺 🗰 📰 🧭 🛣 📰	224
	0
Config	Value 🔽 Enable
Interface Serving Node	
- SCTP Mode	Server
 SCTP Configuration Source 	Testbed
SCTP CSV Configuration	
 SCTP Config CSV File 	ConfigureServerNodes.csv
 Max SCTP Connections 	1
Point Codes for Call Generation	Random
 M3UA Termination Type 	SGP
– Exchange Type	Non Control
 CIC Handling Method 	Most Idle
- Serving Node	1
Le Serving Node 1	
 Serving Node IP Address 	192.168.12.41
 Serving Node Port 	2905
 Remote Serving Node IP Address 	192.168.12.35
 Remote Serving Node Port 	2905
- M3UA Parameters	
 Routing Context Indicator 	Absent
 Routing Context 	1
 Signaling Link Selection 	1
 Network Indicator 	National
 Serving Node Point Code 	2.2.2
Remote Serving Node Point Code	1.1.1
La Call Instance	
- CIC Start	1
Number of CICs	4000
- Media Parameters	
 Enable RTP Simulation 	False
 RTP Hardware Interface Type 	PC NIC
-In NIC Card RTP Media Configuration	
└── Media IP Address	192.168.12.219
Let GL HD Card RTP Media Configuration	
L End User Configuration	MS_ProfilesEdit
r	Initialization Error M Error Events

Figure: Testbed setup configuration

Pre-processing Tools

Profile Editor

This feature allows loading profile to edit the values of the variables using GUI, replacing the original value of the variables in the message template. An XML file defines a set of multiple profiles with varying parameter values that allow users to configure call instances in call generation and to receive calls. Traffic profiles are available supporting RTP auto traffic types - Digits, File, Tones, IVR, FAX, and also User-defined traffic.



Figure: Profile editor

SCRIPT EDITOR

The script editor allows the user to create/edit scripts and access protocol fields as variables for the message template parameters. The script uses pre-defined message templates to perform send and receive actions.

🐒 ScriptEditor - [C:\Program Files\GL Communications Inc\MAPS-BICCIP\MAPS\BICC-IP\UK\Serving Node\M3UA\Scripts\BI						
🐒 File View Edit Shortcuts Tools Help						
🗅 🖨 🖌 🛪 🗐 🗄 🔊	2					
Command Window 😐 🗴	4 BICC_Call*					
	l //Initialize Variables					
Conditional & Flow Control	2 KeyIdentifier: opc , dpc, cic ;					
- Variable	3 RtpSessionState = "NULL" ;					
···· Variable Declaration/Assignment	<pre>4 BICCState = "IDLE";</pre>					
Increment	5 Result = "Unknown";					
Decrement	6 MsgHandler:"BICCMessageHandler";					
SizeOf	7 NotificationRequired=0;					
Initialize Unique ID	8 AcceptIPBCP=0;					
Allocate Unique ID	9 RequestIPBCP=0;					
···· Reserve Unique ID	<pre>10 COTReceived = 0;</pre>					
Free Unique ID	<pre>11 Cause=16;</pre>					
Key Identifier	<pre>12 ModifyCodecInitiated=0;</pre>					
- Maps CLI	13 MidCallCodecInitiated=0;					
Send Client Response	14 BICCScriptId="BICC";					
CLI Command	<pre>15 LocalCICState="";</pre>					
Report Event	<pre>16 RemoteCICState="";</pre>					
€-Logs / Comment	<pre>17 FreeCount = 0;</pre>					
🔁 - Init	<pre>18 IsReception = 0;</pre>					
🔁 - Child Script	19 RtpCoreId = 1;					
🔁 - DataBase	20 CICFreeCount = 0;					
Send Report	<pre>21 FreeCICError = "";</pre>					
Resume	22 ////CLI Parameters					
Return	<pre>23 LoopCount1 = 0;</pre>					
Include	<					

Figure: Script editor

Pre-processing Tools (Contd.)

MESSAGE EDITOR

With message editor, users can build a template for each protocol message type. The value for each field may be changed in the message template prior to testing. The protocol fields comprises of mandatory fixed parameters, mandatory variable parameters, and optional variable parameters.

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<u>File View Direction Tools H</u> elp	
🖻 🖶 📍 🗶	
BICC Call Instance Code Message Type Mandatory Fixed Parameters Nature 01 Connection Indicators Parameter Nature 01 Connection Indicators Parameter Statilite indicator Continuity check indicator Echo ctil dev ind[Nat Conn.Ind] Forward Call Indicators Parameter National/international call ind	 Initial address = 1 Initial address = 1 Information request = 3 Information request = 3 Information = 4 Continuity = 5 Address complete = 6 Connouty = 5 Address = 12 Suspend = 13 Resume = 14
	<pre></pre>
Nature Of Connection Indicators Paramete	· · · · · · · · · · · · · · · · · · ·
Ready	NUM

Figure: Message editor

Typical BICC Call Procedure

MAPS[™] BICC can be configured as MSC Server and also as GMSC Server nodes in the BICC IP network, initiating and processing the complete call procedure as indicated in the call flow below.



Call Generation and Reception

In call generation, MAPS[™] is configured for the out going messages, while in call receive mode, it is configured to respond to incoming messages. Tests can be configured to run once, multiple iterations and continuously. Also, allows users to create multiple entries using quick configuration feature.

The editor allows to run the added scripts sequentially (order in which the scripts are added in the window) or randomly (any script from the list of added script as per the call flow requirements). The test scripts may be started manually or they can be automatically triggered by incoming messages.

WAPS Serving Node (BICC-IP UK M3UA) - [Call Generation -CallGenDefault]		– 🗆 X
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Sr No Script Name Profile Call Info Script Execution Status	Events Events Profile Result	Total Iterations Completed Iterations
1 BICC_Call.gls MSProfile0001 1.1.1,2.2.2,4000 Start BICC Cal	Released None Pass	1 1
		>
Add Delete Insert Refresh Start Start All Stop V Stop All V Abort Abort A	A	Terminate Call
Save Column Width —] — Show Latest		
Consiste Marda	Find	
Serving Node Hemote Serving Node	MTP3 User Adaptation Layer =	· · · ·
Initial Address 15:31:27.273000	0000 Version	= 00000001 Release 1.0
Application Transport 15.21.27 770000	0002 Message Class 0003 Transfer Message Type	= 00000001 Transfer = 00000001 Payload Data
10:31:27.778000	0004 Message Length	= 88 (x0000058)
Application Transport 15:31:27.780000	Protocol Data 0008 Tag	= = x0210 Transfer Protocol D
Application Transport	000A Length	= 78 (x004E)
15:31:27.788000	Originating Point Code 000E Point Code	= = 1.1.1(001000 00001001)
Address Lomplete 15:31:27.810000	Destination Point Code	=
Answer 15.31.37.010000	0012 Point Code 0014 Service Indicator	= 2.2.2(010000 00010010) =1101 BICC
10.31.27.810000	0015 Network Indicator	=10 National Network
File Transmitted :: VoiceFiles\Send\G/TT\ALAW\Vijay.giv 15:31:52.829000	0016 Message Priority 0017 Signalling Link Selection	=00 Priority Code 0 = 1 (x01)
Release		
10:32:07.813000	Parameter Padding	= x0000
Helease Complete 15:32:57.840000	0018 Call Instance Code	= 4000 (xA00F0000)
	001C Message Type	= 00000001 Initial address
	<	
Scripte Message Sequence / Event Config Script Flow	U'	
Scilut Flow		
Initialisation	Errors 🛛 🕲 Error Events 🖉 Captured E	rrors 🛛 😑 Link Status Up=1 Down=C 🎢

Figure: Call Generation at Client Node

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No	Script Name	Profile	Call Info		Script Execution	Status	Events	Events Profile	Results	
111	Tx_GRS.gls		2.2.2,1.1.1,3489		Completed	Circuit Group Reset Ack Received	None		Pass	
112	Tx_GRS.gls		2.2.2,1.1.1,3521		Completed	Circuit Group Reset Ack Received	None		Pass	
113	Tx_GRS.gls		2.2.2,1.1.1,3553		Completed	Circuit Group Reset Ack Received	None		Pass	
114	Tx_GRS.gls		2.2.2,1.1.1,3585		Completed	Circuit Group Reset Ack Received	None		Pass	
115	Tx_GRS.gls		2.2.2,1.1.1,3617		Completed	Circuit Group Reset Ack Received	None		Pass	
116	Tx_GRS.gls		2.2.2,1.1.1,3649		Completed	Circuit Group Reset Ack Received	None		Pass	
117	Tx_GRS.gls		2.2.2,1.1.1,3681		Completed	Circuit Group Reset Ack Received	None		Pass	
118	Tx_GRS.gls		2.2.2,1.1.1,3713		Completed	Circuit Group Reset Ack Received	None		Pass	
119	Tx_GRS.gls		2.2.2,1.1.1,3745		Completed	Circuit Group Reset Ack Received	None		Pass	
120	Tx_GRS.gls		2.2.2,1.1.1,3777		Completed	Circuit Group Reset Ack Received	None		Pass	
121	Tx_GRS.gls		2.2.2,1.1.1,3809		Completed	Circuit Group Reset Ack Received	None		Pass	
122	Tx_GRS.gls		2.2.2,1.1.1,3841		Completed	Circuit Group Reset Ack Received	None		Pass	
123	Tx_GRS.gls		2.2.2,1.1.1,3873		Completed	Circuit Group Reset Ack Received	None		Pass	
124	Tx_GRS.gls		2.2.2,1.1.1,3905		Completed	Circuit Group Reset Ack Received	None		Pass	
25	Tx_GRS.gls		2.2.2,1.1.1,3937		Completed	Circuit Group Reset Ack Received	None		Pass	
26	Tx_GRS.gls	_	2.2.2,1.1.1,3969		Completed	Circuit Group Reset Ack Received	None		Pass	
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Figure: Call Reception at Server Node

Multiple Serving Nodes Configurations

MAPS[™] now supports multiple Serving Nodes (SCTP connection) configuration using CSV file as SCTP configuration source. A single MAPS[™] Server Node can be configured to scale-up the multiple (up to 1024) Client Nodes configuration. Multiple clients can be configured with a unique IP address and varying UDP port numbers (or) varying IP addresses with unique port creating multiple connections.



When MAPS[™] is configured with multiple Serving nodes, it accesses the SCTP and M3UA layer parameters from CSV file.

The CSV file includes the following necessary Serving Node parameters, which can be manually configured and saved. The Data Types of all the parameters are as per the specification. Some the parameters are - Connectionid, SourceIPAddress, SourcePort, DestinationIPAddress, DestinationPort, Opc, Dpc, and MediaIPAddress.

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							4		Answer	17:36:03.4	86000		0010 Tag 0012 Length	Data		= 2	0210 Transfer 8 (x004E)	Protocol Dat	.a
													Originat 0016 Point C	ting Point Cod	de	= 1	.3.1(001000	00011001)	
													Destinat 001A Point C	sion Point Cod Code	de	= 2	.3.1(010000	00011001)	
													001C Service 001D Network	Indicator Indicator			1101 BICC 10 Natio	nal Network	
													001E Message 001F Signalli	Priority ing Link Selec	ction	= 1	00 Prior (x01)	ity Code 0	
													Paramete	r Padding		= ×	0000		~
												>	<	Dicc Dayer					>
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Initialisation Errors
 Error Events
 Captured Errors
 Link Status Up=100 Down=0

Command Line Interface (CLI)

MAPS[™] can be configured as server-side application, to enable remote controlling of the application through multiple command-line based clients. Supported clients include TCL, Python, VBScript, Java, and .Net.

Clients can remotely perform all functions such as start testbed setup, load scripts, and profiles, apply user events such as send digits/ file/tones, detect digits/file/tones, dial, originate call, terminate call, start and stop traffic and so on. User can also generate and receive calls through commands. This client application is distributed along with MAPS[™] Server application

Image: Section 2010; Sectio	CI Maps	CLI Serving Node (BICC-IP ITU I	M3UA) —		×
Image: Image	File	Edit View		- ć	F ×
✓ Vew Latest Command 1:: 2019-3-8 10:37:00.327000 : Start "TestBedDefault.xml"; 1:: 2019-3-8 10:37:00.6673000 : LoadProfile "MS_Profiles.xml"; 1:: 2019-3-8 10:37:14.810600 : StartScript 1 'BICC Call.gls' "MSProfile0001" 1 # "EnableCLI"=1; 1:: 2019-3-8 10:37:14.806000 : UserEvent 1 'SetVariable "# 'OPC"=1.1.1"; 1:: 2019-3-8 10:37:15.503000 : UserEvent 1 'SetVariable "# 'OPC"="2.2.2?; 1:: 2019-3-8 10:37:15.503000 : UserEvent 1 'SetVariable "# 'OPC"="2.2.2?; 1:: 2019-3-8 10:37:15.550000 : UserEvent 1 'SetVariable "# 'CallelQhumber"=(binarystring)8800880011; 1:: 2019-3-8 10:37:15.550000 : UserEvent 1 'SetVariable "# 'CallelQhumber"=(binarystring)8900990011; 1:: 2019-3-8 10:37:15.550000 : UserEvent 1 'SetVariable "# 'TaffleTipe"="AutoTrafflcFile"; 1:: 2019-3-8 10:37:15.755000 : UserEvent 1 'GetCallStatus"; 1:: 2019-3-8 10:37:16.755000 : UserEvent 1 'GetCallStatus"; 1:: 2019-3-8 10:37:18.775000 : UserEvent 1 'SetVariable "# 'TraffleVane"= voicefiles (Send/G711/ULAW/\v(yay.glw", "TxFleDuration"=10; 1:: 2019-3-8 10:37:40.2000 : UserEvent 1 'GetCallStatus"; 1:: 2019-3-8 10:37:40.2000 : UserEvent 1 'GetCallStatus"; 1:: 2019-3-8 10:37:40.2000 : UserEvent 1 'GetMessageCount"; 1:: 2019-3-8 10:37:41.212000 : U	D 🚅	🖬 🖻 🗙		111	
1:: 2019-3-8 10:37:00.327000 : Start "TestBedDefault.xml"; 1:: 2019-3-8 10:37:10.47 8100 : ServerHSRequest; 1:: 2019-3-8 10:37:14.80600 : StartScript 1 BICC_Call.gls "MSProfile001" 1 # "EnableCLI"=1; 1:: 2019-3-8 10:37:15.50300 : UserEvent 1 TsTransportUp"; 1:: 2019-3-8 10:37:15.50300 : UserEvent 1 SetVariable # "OPC"="1.1.1"; 1:: 2019-3-8 10:37:15.553000 : UserEvent 1 SetVariable # "CalledNumber"=(binarystring)8800880011; 1:: 2019-3-8 10:37:15.553000 : UserEvent 1 SetVariable # "CalledNumber"=(binarystring)9800990011; 1:: 2019-3-8 10:37:15.553000 : UserEvent 1 SetVariable # "TaffEType"=AutoTrafficFile"; 1:: 2019-3-8 10:37:15.553000 : UserEvent 1 SetVariable # "TaffEType"=AutoTrafficFile"; 1:: 2019-3-8 10:37:15.575000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:16.758000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:18.775000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:18.775000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:19.870000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:19.870000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:39.840000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:39.840000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:19.10000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:19.07000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:41.70000 : UserEvent 1 'GetCallStatus'; 1:: 2019-3-8 10:37:41.70000 : UserEvent 1 'GetMessageCount'; 1:: 2019-3-8 10:37:41.145000 : UserEvent 1 'GetMessageCount'; 1:: 2019-3-8 10:37:41.212000 : UserEvent 1 'GetMessageCount'; 1:: 2019-3-8 10:37:41.212000 : UserEvent 1 'GetMessageInfo' # 'Index'=0; 1:: 2019-3-8 10:37:41.212000 : UserEvent 1 'GetMessageInfo' # 'Index'=1; 1:: 2019-3-8 10:37:41.212000 : UserEvent 1 'GetMessageInfo' # 'Index'=1; 1:: 2019-3-8 10:37:41.212000 : UserEvent 1 'GetMessageInfo' # 'Index'=1; 1:: 2019-3-8 10:37:41.212000 : UserEvent 1 'GetMessageInfo' # 'Index'=2; 1:: 2019-3-8 10:37:41.212000 : UserEvent 1 'GetMessageInfo' # 'Index'=3; 1:: 2019-3-8 10:37:41.212000 : UserEve	View La	test Command			
1 :: 2019-3-8 10:37:41.966000 : UserEvent 1 "GetMessageInfo"# "Index"=4; 1 :: 2019-3-8 10:37:42.132000 : UserEvent 1 "GetMessageInfo"# "Index"=5; 1 :: 2019-3-8 10:37:42.180000 : UserEvent 1 "GetMessageInfo"# "Index"=5: NUM	1 :: 2019-3 1 ::	 A 10:37:00.327000 : Start "TestB -8 10:37:06.673000 : LoadFrofile A 10:37:14.781000 : ServerHSRe -8 10:37:14.806000 : Start Start -7 A 10:37:15.481000 : UserEvent 1 A 10:37:15.526000 : UserEvent 1 A 10:37:15.555000 : UserEvent 1 A 10:37:15.755000 : UserEvent 1 A 10:37:15.755000 : UserEvent 1 A 10:37:15.755000 : UserEvent 1 A 10:37:16.755000 : UserEvent 1 A 10:37:16.755000 : UserEvent 1 A 10:37:18.755000 : UserEvent 1 A 10:37:18.75000 : UserEvent 1 A 10:37:19.804000 : UserEvent 1 A 10:37:30.968000 : UserEvent 1 A 10:37:30.968000 : UserEvent 1 A 10:37:41.75000 : UserEvent 1 A 10:37:41.75000 : UserEvent 1 A 10:37:41.212000 : UserEvent 1 A 10:37:41.248000 : UserEvent 1 A 10:37:41.248000 : UserEvent 1 A 10:37:41.248000 : UserEvent 1 A 10:37:41.258000 : UserEvent 1 A 10:37:41.258000 : UserEvent 1 A 10:37:41.458000 : UserEvent 1 A 10:37:41.458000 : UserEvent 1 A 10:37:41.258000 : UserEvent 1 	<pre>edDefault.xml"; MS_Profiles.xml" quest; IBICC_Call.gis "MSProfile0001" 1 # "EnableCLI"=1; ITsTransportUp"; I'sEtVariable" # "OPC"="1.1.1; 'SetVariable" # "OPC"="2.2.2'; 'SetVariable" # "CalledNumber"=(binarystring)9800880011; I'SetVariable" # "CalledNumber"=(binarystring)9800890011; I'SetVariable" # "CalledNumber"=(binarystring)9800890011; I'SetVariable" # "CallingNumber"=(binarystring)9800890011; I'SetVariable" # "CallingNumber"=(binarystring)9800890011; I'SetVariable" # "CallingNumber"=(binarystring)9800890011; I'SetCallStatus"; I'GetCallStatus"; I'GetCallStatus"; I'GetCallStatus"; I'GetCallStatus"; I'GetCallStatus"; I'GetMessageCount"; I'GetMessageCount"; I'GetMessageCount"; I'GetMessageCount"; I'GetMessageInfo" # Index"=0; 'GetMessageInfo" # Index"=1; I'GetMessageInfo" # Index"=1; I'GetMessageInfo" # Index"=2; 'GetMessageInfo" # Index"=3; I'GetMessageInfo" # Index"=3; I'GetMessageInfo" # Index"=3; I'GetMessageInfo" # Index"=3; 'GetMessageInfo" # Index"=4; 'GetMessageInfo" # Index"=4; 'GetMessageInfo" # Index"=4; 'GetMessageInfo" # Index"=3; 'GetMessageInfo" # Index"=3; 'GetMessageInfo" # Index"=4; 'GetMessageInfo" # Index"=4; 'GetMessageInfo</pre>		
11: 2015-5-0 10:37:42, 100000 , Oser Vent 1 Genessadenio # Index = 5.	1:: 2019-3	-8 10:37:41.966000 : UserEvent 1 -8 10:37:42.132000 : UserEvent 1 -8 10:37:42.180000 : UserEvent 1	L "GetMessageInfo" # "Index" = 4; L"GetMessageInfo" # "Index" = 5; L"GetMessageInfo" # "Index" = 5;		~
	11. 2019-3	-0 10.07.42.100000 . UserEvent 1	Genessaderno # Index =5.	NUM	- /

Figure: MAPS[™] CLI Server

🌛 Python 3.7.5 She	ell -		%		\times
File Edit Shell [Debug Opti	ons Window Help			
Type "copyrigh	nt", "cre	dits" or "license()" for more information.			
>>>					
RESTART: C:\E	Program F	iles\GL Communications Inc\MAPS-BICCIP\MAPSCLI\Python	1 Client\exam	ples\B	icc
Ip_RecvCall.py	7				
BICC IP Server	Connect	ion True			
BICC IP Testbe	ed Starti	ng True			
BICC IP Profil	le Loadin	g True			
Waiting for BI	ICC IP Ca	11 BICC CALL RECEIVED			
Set Traffic Ty	npe: 0				
BICC IP Call A	Answer	True			
BICC IP Call S	Status	BICC CALL CONNECTED			
BICC IP Call H	Hold T	rue			
BICC IP Call F	Retrieve.	True			
BICC IP Call S	Suspend	. True			
BICC IP Call F	Resume	True			
BICC IP Call 1	[erminati	ng True			
BICC IP Call M	isgCount:	11			
BICC IP Call's	a LastMSG	Rcv			
Time Stamp	Route	Message			
10:43:20.774	<-	Release Complete			
***** BICC IP	Call Mes	sage Flow *****			
CLI	<> D	JT			
Time Stamp	Route	Message			
10:43:10.239	<-	Initial Address			
10:43:10.311	->	Application Transport			
10:43:10.332	<-	Application Transport			
10:43:10.380	->	Address Complete			
10:43:10.450	->	Answer			
10:43:10.487	->	Call Progress			
10:43:12.557	->	Call Progress			
10:43:14.630	->	Suspend			
10:43:16.706	->	Resume			

Figure: Sample Python Client CLI Script

Supported Protocol and Specifications

	BICC	
M		
M2PA	M2UA	M3UA
	SCTP	
	IP 1	

Supported Protocols	Standards Used
BICC	ITU-T Q.1902
ІР ВСР	RFC 2327
MTP3	ITU-T Q.782
M2PA	RFC 4165
M3UA	RFC 3332
SCTP	RFC 4960



Buyer's Guide

Item No	Product Description
<u>PKS155</u>	MAPS [™] BICC over IP Protocol Emulator
<u>PKS109</u>	MAPS™ RTP HD
<u>PKS102</u>	RTP Traffic Option
<u>PKS108</u>	RTP Voice Quality Measurements
<u>PKS106</u>	RTP Video Traffic Generation
<u>PKS200</u>	RTP Pass Through Fax Emulation
Item No	Related Software
<u>XX649</u>	MAPS™ SS7
<u>XX647</u>	MAPS [™] SS7 Conformance Test Suite (Test Scripts)
<u>XX649</u>	MAPS [™] MAP Protocol Emulator
<u>PKS132</u>	MAPS [™] MAP over IP Protocol Emulator
<u>XX648</u>	MAPS™ ISDN
<u>XX692</u>	MAPS™ GSM -A Interface Emulator
<u>XX693</u>	MAPS™ GSM- Abis Interface Emulator
<u>PKS130</u>	MAPS™ SIGTRAN (SS7 over IP)
<u>PKS135</u>	MAPS™ ISDN -SIGTRAN (ISDN over IP)
<u>XX100</u>	ISDN Analyzer Software
<u>XX120</u>	SS7 Analysis Software

For more information, please visit <u>Signaling and traffic simulator</u> webpage.



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