MAPS™ BICC over IP EMULATOR

Bearer Independent Call Control Protocol Emulation over IP



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MAPS™ BICC IP Emulator





Protocol Specific Features

- BICC emulation over IP network
- User-friendly GUI for configuring the BICC IP Layers
- 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, and more
- Simulate MSC and GMSC Nodes in the BICC over IP network
- User-friendly GUI for configuring the M3UA Layers
- Supports transmission and detection of various RTP traffic such as, digits, voice file, single tone, and dual tones
 over established calls.
- High density of up to 20,000 calls with traffic is easily achievable per appliance (5000 calls per port)
- Supports Client-Server functionality requires additional license; clients supported are TCL, Python, VBScript, Java, and .NET



Supported Protocol Standards



Supported Protocols	Standard / Specification Used
BICC	ITU-T Q.1902
IPBCP	RFC 2327
M3UA	RFC 3332
SCTP	RFC 4960



Supported BICC IP Procedures

- Successful Basic Call procedure with enBloc and Overlap operation includes
 - > IAM, SAM, ACM, ANM messages
- Mid Call Procedures
 - Suspend
 - > Resume
- Normal Call Release Procedures
- Unsuccessful call Setup
- Codec modification/mid-call Codec negotiation procedures

- Additional Setup procedures
 - Call progress
 - Information Messages
 - Echo Control procedures
 - signaling Procedures for Connection Type
 - Information message
 - Calling Geodetic Procedures
 - > Inter Nodal Traffic group Identification
 - Charging
 - Support for Temporary Alternative Routing (TAR)
 - Hop Counter Procedures



BICC over IP Call Procedure





Testbed Configuration

MAPS Serving Node (BICC-IP UK M3UA) - [Testbed Setup -TestBed])efault]	– 🗆 X
💵 Configurations Emulator Reports Editor Debug Tools Wir	ndows Help	_ & ×
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		0
Config	Value 🔽 E	nable
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	
La 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	
Call Instance		
 CIC Start 	1	
Number of CICs	4000	
- Media Parameters		
 Enable RTP Simulation 	False	
 RTP Hardware Interface Type 	PC NIC	
NIC Card RTP Media Configuration		
└ Media IP Address	192.168.12.219	
Let GL HD Card RTP Media Configuration		
L End User Configuration	MS_Profiles	tart Edit
	Initialisation Errors	Error Events



Profile Configuration

GL MAPS	Serving Node	(BICC-IP UK	M3U	JA) - (F	Profile Ed	itor -MS_F	Profiles]						_	
Confi	gurations Em	nulator Rep	orts	Edit	or Deb	ug Tools	Windows	Help						_ & ×
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-	8													0
# Pro	files (Edit-F2)		^	Config	9			Value			^ []	🔽 Enable		
1 Defa	ultProfile			Ξ M	ISProfile0	001								
2 MSP	rofile0001			F	Conne	ction Iden	tifier	1						
2 MCD	rofile0002			F	User Pr	ovided Cl	С	1						
o Mori	011120002			F	OPC			1.1.1						
4 MSP	rofile0003				DPC			2.2.2 De eleve						
5 MSP	rofile0004				BICC C	all lype Iddress M	errane Dara	Баскwa	ra					
6 MSP	rofile0005					ntinuity Cl	heck Indicat	. COT No	t Expec	ted				
7 MSP	rofile0006				– Cal	led Numb	er	9900990	011					
8 MSP	rofile0007				– Cal	ling Num	ber	8800880	011					
0 MCD	rofile0008				L Ap	pend F to	Called Num	. False						
5 MBF				-=	Receive	e Call Para	meters							
10 MSP	rofile0009				- IAN	1 Respons	е Туре	Answer	Call					
11 MSP	rofile0010				⊢ Rej	ect Cause		16 - No	rmal ca	ill				
12 MSP	rofile0011			Ē	Success	d Recurse	Darameter	U - User	(U) k Initist	ted				
13 MSP	rofile0012				SDP Pa	rameters	ralainetei	Netwon	K IIIIIai	leu				
14 MSP	rofile0013				⊢ IP A	Address Ty	pe	IP4						
	-6-0014				- Pac	ketization	Time in ms	. 20						
15 MSP	rofileUU14				L BIC	C IP Beare	er Control P							
16 MSP	rofile0015				F	IPBCP Re	quest Temp	maps\b	icc-ip\i	itu				
17 MSP	rofile0016				L	IPBCP Ac	cept Templ	maps\b	icc-ip\i	itu				
18 MSP	rofile0017			L_	Codec	Options a	nd Traffic C	DCMA						
19 MSP	rofile0018				Traf	fic Confic	ns I	PCIMA						
20 MSP	rofile0019					Traffic Typ	, pe	Auto Tra	affic Fil	e				
21 MSP	rofile0020				-	Traffic Dir	rection	TxOnly						
22 MOD	cofile0021				\vdash	Impairme	ent Type	None				Add	Insert	Delete
22 MSP	ronie0021		5		F	Traffic Pro	ofile Name	Profile0	001			Properties		
23 MSP Insert	Delete	Clear			L	Impairme	ent Profile N	. Profile0	001		~ []			
ander t	Derete	Cicul								Initi	alicat	ion Errors	A Fr	or Events



BICC IP Call Generation





BICC IP Call Reception

	🔐 MAPS	Serving Node (BICC-IP UK	VI3UA) - [Call Re	ception]					- 🗆 ×	1
	<u> <u> </u> <u> </u> <u> </u> <u> </u> onfi </u>	gurations E <u>m</u> ulator <u>R</u> ep	orts <u>E</u> ditor <u>D</u>	ebug Tools <u>W</u> indows <u>H</u> elp					_ & ×	<u>.</u>
	Q 🖉	7 💫 🧆 🦠 🖡	📁 🌆 💜	' 🔮 🚡 🚡 😤	💂 🕜 🔇					
	SrNo	Script Name	Profile	Call Info	Script Execution) Status	Events	Events Profile	Results 🔥	
	111	Tx GRS.als		2.2.2.1.1.1.3489	 Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	112	Tx_GRS.gls		2.2.2,1.1.1,3521	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	113	Tx_GRS.gls		2.2.2,1.1.1,3553	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	114	Tx_GRS.gls		2.2.2,1.1.1,3585	Compl	eted Circuit Group Reset Ack F	Received None		Pass	Call Results
	115	Tx_GRS.gls		2.2.2,1.1.1,3617	Compl	eted Circuit Group Reset Ack F	Received None		Pass	Can recourte
	116	Tx_GRS.gls		2.2.2,1.1.1,3649	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	117	Tx_GRS.gls		2.2.2,1.1.1,3681	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	118	Tx_GRS.gls		2.2.2,1.1.1,3713	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	119	Tx_GRS.gls		2.2.2,1.1.1,3745	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	120	Tx_GRS.gls		2.2.2,1.1.1,3777	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	121	Tx_GRS.gls		2.2.2,1.1.1,3809	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	122	Tx_GRS.gls		2.2.2,1.1.1,3841	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	123	Tx_GRS.gls		2.2.2,1.1.1,3873	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	124	Tx_GRS.gls		2.2.2,1.1.1,3905	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	125	Tx_GRS.gls		2.2.2,1.1.1,3937	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	126	Tx_GRS.gls		2.2.2,1.1.1,3969	Compl	eted Circuit Group Reset Ack F	Received None		Pass	
	127	BICC_Call.gls		2.2.2,1.1.1,4000	Compl	eted BICC Call Release	ed None		Pass 🗸	
	<								>	
ſ		e Column Width	-j 「」 Initial Applicatio	Show Latest Address In Transport	ng Node	Find Find	Adaptation Layer ===== = =	00000001 Releas 00000001 Transf 00000001 Paylog	e 1.0 er d Data	
			Applicatio	on Transport	15:31:27.770000	0004 Message Length Protocol Data	=	88 (x00000058)		
		•	Applicatio	on Transport	15:31:27.772000	0008 Tag 000A Length	=	x0210 Transfer 1 78 (x004E)	Protocol Data	
			Address	: Complete	15:31:27.799000	Originating Point Code 000E Point Code	• =	1.1.1(001000 (00001001)	
wessage Sequence \prec		•		· ·	15:31:27.803000	Destination Point Code	2 =	2 2 27 010000 1	000100101	
•		4	An	iswer	15/31/27 803000	0014 Service Indicator	=	1101 BICC		Decode Message
					13.31.21.003000	0015 Network Indicator	=	10 Nation:	al Network	
		File Frans	mitted :: VoiceFiles	SSend\G7TT\ALAW\vijay.glw	15:31:52.813000	0016 Message Priority		00 Priorit	ty Code O	
		· · · · · · · · · · · · · · · · · · ·	Re	lease	15:32:57.828000	Pdu Paramater Padding	= = =	xA00F0000011020	0100030209077 E 105	
			Release	, Complete		========= BICC Layer		20000		
l			nelease	Complete	15:32:57.831000	0018 Call Instance Code 001C Message Type	=	4000 (xA00F0000) 00000001 Initia) 1 address	
						Nature Of Connection I 001D Satellite indicator 001D Continuity check indi	ters = Indicators Parameter = = icator =	00 no sat: 00 continu	ellite circuit in uity check not re	
						001D Echo ctrl dev.ind(Nat Forward Call Indicator	t.Conn.Ind) = rs Parameter =	l outgoin	ng echo control (
	<					<pre>Notional/international</pre>	- apil ind	0 trooto	i or o notionol j	-
	Serie		Event Config	Script Flow		U				
		V Message Sequence	Liven coning ,							
					Initialisation Errors	Error Events	Captured Errors	📋 😑 Link Status Up	p=1Down=0	2



Event Log

🔐 MAPS Serving Node (I	BICC-IP UK M3UA) - [Events]			- 0	×						
📁 <u>C</u> onfigurations E <u>m</u> u	ılator <u>R</u> eports <u>E</u> ditor <u>D</u> ebug Tools <u>W</u> indows <u>H</u> elp				- 8 ×						
🎯 🗐 🖄 🧆 🦄 🖡 🥩 🐒 🗟 🔓 🔓 🤽 👢 🥝 🛇											
Event Log Error Events Captured Errors											
Date/Time	Captured Events	Call Trace Id	Script Name	Script Id	^						
2022-5-12 15:31:00.883000	RTP Stats Query Script started		RTP Stats Display.gls	ProtScriptId-1-80619569-4284-8724							
2022-5-12 15:31:05.887000	SCTP Up On ConnectionId = 1000		Check SCTP Status.gls	ProtScriptId-0-80613663-4282-8724							
2022-5-12 15:31:05.989000	ASP Up Received	1000	M3UA.als	ProtScriptId-2-80625727-4286-8724							
2022-5-12 15:31:05.990000	ASP Acknowledged	1000	M3UA.als	ProtScriptId-2-80625727-4286-8724							
2022-5-12 15:31:05.991000	AS Status Notified	1000	M3UA.als	ProtScriptId-2-80625727-4286-8724							
2022-5-12 15:31:06.003000	ASP Active Received	1000	M3UA.als	ProtScriptId-2-80625727-4286-8724							
2022-5-12 15:31:06.004000	AS Status Notified	1000	M3UA.als	ProtScriptId-2-80625727-4286-8724							
2022-5-12 15:31:06.004000	M3UA Up On ConnectionId = 1000		Check SCTP Status.gls	ProtScriptId-0-80613663-4282-8724							
2022-5-12 15:31:06.150000	Number of CICs for 2.2.2:1.1.1 = 4000		Check SCTP Status.gls	ProtScriptId-0-80613663-4282-8724							
2022-5-12 15:31:06 150000	Number of CICs for $222111 = 0$		Check SCTP Status dis	ProtScriptId-0-80613663-4282-8724							
2022-5-12 15:31:06 150000	Number of CICs for $222111 = 0$		Check_SCTP_Status.gls	ProtScriptId-0-80613663-4282-8724							
2022-5-12 15:31:06 293000	CIC = 1 & Bange = 31	2221111	Tx GBS als	ProtScriptId-3-80625969-4289-8724							
2022-5-12 15:31:06 293000	Status bits =	2221111	Tx GBS ds	ProtScriptId-3-80625969-4289-8724							
2022-5-12 15:31:06 294000	CIC = 33 & Bange = 31	22211133	Tx GBS ds	ProtScriptId-4-80625970-4290-8724							
2022-5-12 15:31:06 294000	Status bits =	22211133	Tx_GBS_ds	ProtScriptId-4-80625970-4290-8724							
2022-5-12 15:31:06 295000	CIC = 65 & Bange = 31	22211165	Tx GBS de	ProtScriptId-5-80625971-4291-8724							
2022.5.12 15:31:06:295000	Statue bite –	22211165	Tv GBS de	ProtScriptId-5-80625971-4291-8724							
2022.5.12.15:31:06.296000	CIC - 97 & Bange - 31	22211197	Tv GBS de	ProtScriptId:6:80625971-4297-8724							
2022-5-12 15:31:00:230000	Statue bite –	2.2.2,1.1.1,57	Tv GBS de	ProtScriptId:6:00025071-4202-0724							
2022-5-12 15:31:00:230000	CIC - 129 & Range - 21	2.2.2,1.1.1,57	Tv GRS de	ProtScriptId-7.90625972-4292-9724							
2022-5-12 15:31:00:237000	Crohus bits -	2.2.2,1.1.1,123	Tu GPS de	DrokCoripHd 7 00025372-4253-0724							
2022-5-12 15:51:06:237000	Dialus Dis = CIC = 191 % Denge = 21	2.2.2,1.1.1,123	Tu GPS de	DrotCoripHel 0 00025372-4253-6724							
2022-5-12 15:51:06:236000	Cicle foi « nange = 5) Status bits =	2.2.2,1.1.1,101	Tu GPS de	DrokCoriolid 0 00025372-4234-0724							
2022-0-12 10:31:06:200000	Status Dits = CIC = 193 % Barren = 31	2.2.2,1.1,1,101	Tu CBC ala	Protectional 0 00020372-4234-0724 Deck estimated 0 00020672 4205 0724							
2022-3-12 15:31:06.233000	Cicle 133 & hange = 31	2.2.2,1.1,1,133	Tu CRC ala	Protectional 0 00020373-4233-0724 Deck estimated 0 00020073 4205 0724							
2022-3-12 15:31:06.233000	Status bits =	2.2.2,1.1.1,133	Tx_GDCb	Protochpilo-3-0062037 3-4230-6724							
2022-5-12 15:31:06.299000	UL = 220 & Hange = 31 Chatra bits	2.2.2,1.1,1,225	Tx_GRS.gls	Protocriptid-10-80620373-4236-8724							
2022-5-12 15:31:06.299000		2.2.2,1.1.1,225		ProtScriptid-10-80625973-4296-8724							
2022-5-12 15:31:06.300000	UL = 257 & Hange = 31	2.2.2,1.1.1,257		ProtScriptid-11-80625974-4297-8724							
2022-5-12 15:31:06.300000		2.2.2,1.1.1,257		ProtScriptid-11-80625974-4297-8724							
2022-5-12 15:31:06.301000	LIL = 289 & Hange = 31	2.2.2,1.1.1,289		ProtScriptid-12-80625974-4298-8724							
2022-5-12 15:31:06.301000	Status bits =	2.2.2,1.1.1,289	TX_GRS.gls	ProtScriptId-12-80625974-4298-8724	×						
<					>						
Save Eve	nts										
Clear Capto	ure Events to file										
1		Initialisation Errors	Error Events	Captured Errors	k Statı 🅢						



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.



ا 🌜	oad Generation - Load	dGendefault	_ 🗆 🗙								
Total Calls To Generate * (* indicates no limit)											
Max Active Calls 2000 Unique Distributions Per Script											
Multi Distributions	Multi Distributions										
Distributions	Description		Add								
Uniform	MinCR=40, MaxCR=80, Dur	ation=10	Remove								
Fixed	Call Rate=250 , Duration=10 MinCR=40 , MaxCR=80 , Dur	ation=10	Remove All								
Scripts Dysfiles Exclusive Profiles											
Caviata											
BICC Call		MSProfile01									
bree_ean		MSProfile02									
		MSProfile03									
		MSProfile04									
		MSProfile05									
		MSProfile07									
		MSProfile08									
		MSProfile09									
		MSProfile10									
<	Ⅲ >										
Add	Delete	Add Delete									
Stop Time		Start Time - 00:00:00.000	Pause								
Days 0 - Hou	rs 0 - Minutes 0 -	End Time - 00:00:00.000	Start								

BICC IP HD Call Reception



Communications

High Density (HD) RTP Traffic Simulation



- Rackmount network appliance with 4x1GigE NIC
- Transport over UDP and TCP, IPv4 and IPv6, and TLS for secure transport
- Easily achieve up to 20,000 endpoints per appliance (5000 per port)
- Up to 250 calls per second (with RTP traffic)
- Scales to around 100,000 to 200,000 endpoints with use of Master Controller for single point of control
- Manage 10+ MAPS^{™™} systems with single point of control from Master Controller

BICC IP HD Testbed Configuration

MAPS Serving Node (BICC-IP UK M3UA) - [Testbed	Setup - TestBedDefault		- 0 ×
Configurations Emulator Reports Editor Debug Too	Is Windows Help		- 6
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Config	Value 🗸	<u>^</u>	
 Interface Serving Node 		SctpTransactionType	
- SCTP Mode	Server	perect option	
SCTP Configuration Source	lestbed	Server	•
L 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		
C⊡ Serving Node 1	103.1/0.13.3/0		
- Serving Node IP Address	2015		
Berrote Serving Node IP Address	192.168.12.161		
Remote Serving Node Port	2905		
M3UA Parameters		-	
Routing Context	12512		
 Signaling Link Selection 	1		
 Network Indicator 	National		
 Serving Node Point Code 			
Remote Serving Node Point Code	1.1.1		
Call Instance			
- Cic start	1		
Media Parameters	2000		
- Enable RTP Simulation	True		
 RTP Hardware Interface Type 	GI's High Density Interface Card		
 NIC Card RTP Media Configuration 			
Le GL HD Card RTP Media Configuration			
I RTP Cores	4		
PTP Part lader			
RTP Media IP Address	192.168.12.76	- 11	
L Default Gateway Configuration			
Subnet Mask	255.255.255.0		
Gateway IP Address	192.168.12.1		
- RTP Cores 2			
- RTP Port Index			
- RTP Media IP Address	192.168.12.77		
Configuration	255 255 255 0		
Gateway ID Address	233,233,233,0		
= RTP Cores 3	176.100.16.1		
- RTP Port Index			
- RTP Media IP Address	192.168.12.78		
L Default Gateway Configuration			
 Subnet Mask 	255.255.255.0		
Gateway IP Address	192.168.12.1		
Le RTP Cores 4			
 RTP Port Index 			
- RTP Media IP Address	192.168.12.79		
C Default Gateway Configuration	255 255 255 0		
Gateway IP Address	192 168 12 1		
End User Configuration	MS Profiles	Start Edit	
		~ [] <u> </u>	



BICC IP HD Profile Configuration

GL	MAPS S	erving N	ode (l	BICC-IP	UK	M3U	IA) - [Profi	le Edi	tor -M	IS_Profi	iles]							_		×
	Configu	rations	Emu	lator	Rep	orts	Edr	tor	Debu	ig loo	Is Wi	ndows H	lelp	-			1			-	8 X
0	🗐	1	þ	%]		<u>y</u>	1		è è	2	뭧	0	0					
			?																		0
#	Profile	es (Edit-F	2)			^	Confi	g					Value				Enable				
	Default	Profile				huuud	🖃 D	efau	ltProf	ile											
2	MSProf	ile0001					F	Co	nneo	tion lo	lentifie	r	1								
3	MSProf	ile0002					F	Us	er Pro	ovided	CIC		1								
							F	OF	PC				1.1.1								
4	MSProf	ile0003					F	DF		- U T	_		Z.Z.Z								
5	MSProf	ile0004						ni Ini	tial Δ	ddress	e : Messa	ge Dara	DACKW	ara							
6	MSProf	ile0005					1		Cor	ntinuit	v Check	c Indicator	COTIN	lot Exp	ected						
7	MSProf	ile0006							Call	ed Nu	mber		990099	90011							
8	MSProf	ile0007						╞	Call	ing Nu	umber		880088	30011							
č	MCDuef	1-0000						L	Арр	end F	to Call	ed Num	False								
9	MOPTOI	lieuuus					-6	Re	ceive	Call P	aramet	ers									
10	MSProf	ile0009						\vdash	IAN	1 Resp	onse Ty	pe	Answe	er Call							
11	MSProf	ile0010						L	Reje	ect Cau	use		16 - N	ormal	call c						
12	MSProf	ile0011					F	Re	lease	Locat	ion		0 - Use	er(U)							
13	MSProf	ile0012						Su I SD	ispeni D Dar	a Kesu ramete	me Par	ameter	Netwo	ork init	lated						
14	MSProf	lo0013						Ļ	IP A	ddres	s Type		IP4								
14	MOFIOI	10013							Pac	ketizat	ion Tim	ne in msec	20								
15	MSProf	ile0014						L	BIC	C IP Be	earer Co	ontrol Pr									
16	MSProf	ile0015							\vdash	IPBCP	Reque	st Templ	maps\	bicc-i	p\itu						
17	MSProf	ile0016							L	IPBCP	Accept	t Template	maps\	bicc-i	p∖itu						
18	MSProf	ile0017					L[-	Co	odec (Option	is and T	fraffic Co									
19	MSProf	ile0018						E	Cod	lec Op	tions		РСМА								
20	MCDr-4	1-0010						4	iraf	Traffic	Tupe		Auto 1	Fraffic I	File						
20	MISPTOT									Traffic	Directi	on	TxOnh	/	ine i						
21	MSProf	ile0020							L	Impair	ment T	Type	None	,							
22	MSProf	ile0021							F	Traffic	Profile	Name	Profile	0001			Add	Inse	ert De	lete	
23	MSProf	ile0022		1		~			L	Impaii	rment P	Profile Na.	. Profile	0001		Pr	operties				
T	ncert	I Dole	ate		opr																



BICC IP HD Incoming Call Handler Configuration

Incomir	ng Call Handlers Configuration	n - default	
- 🔒 🔣			
Message Name	Script Name	Scripts	
Initial Address	BICC Call.gls	BICC_Call.gls	Sequence
Circuit Group Reset	Rx CIC Management.gls		0
Circuit Group Blocking	Rx CIC Management.gls		⊖ Random
Circuit Group Unblocking	Rx CIC Management.gls		
Release	Rx_IdleStateMsgHandler.gls		
Circuit Group Blocking Acknowledgement	Rx_CIC_Management.gls		
Circuit Group Unblocking Acknowledge	Rx_CIC_Management.gls		
Circuit Group Reset Acknowledgement	Rx_CIC_Management.gls		
Release Complete	Rx_IdleStateMsgHandler.gls		
Reset Circuit	Rx_CIC_Management.gls		
ASP Up	M3UA.gls		
ASP Down	M3UA.gls		
ASP Active	M3UA.gls		
ASP Inactive	M3UA.gls		
Address Complete	Rx_IdleStateMsgHandler.gls		Up
Connect	Rx_IdleStateMsgHandler.gls		Down
Answer	Rx_IdleStateMsgHandler.gls		DOWN
Suspend	Rx_IdleStateMsgHandler.gls		
Resume	Rx_IdleStateMsgHandler.gls		
Application Transport	Rx_IdleStateMsgHandler.gls		
Add Dalata Class		Add Delete	



Bulk Call Simulation Results

Call Statistics



Circuit Group Reset Acknowledgement

Initial Address

Release Complete

Notify

Release



Customizations - Call Flow (Scripts)

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Action Conditional & Flow Control I Statements </td <td></td> <td></td> <td>1 2 3 4 5 6 7 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 6 7 7 28 29 30 31 32 33 34 4 35 5 6 7 7 7 8 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 10 11 12 13 14 15 16 7 7 8 9 10 11 12 13 14 15 16 7 7 8 9 20 21 22 23 24 25 26 7 7 8 8 9 20 21 22 23 24 25 26 7 7 8 8 9 20 21 22 23 24 25 26 7 7 7 8 8 9 20 21 22 23 30 31 32 33 34 34 35 36 37 37 38 39 30 31 32 33 34 34 35 36 37 37 38 37 38 39 30 31 32 33 34 34 35 37 38 39 30 31 32 33 34 34 35 37 38 39 30 30 31 32 33 34 34 35 37 37 38 37 39 30 31 32 33 34 34 35 37 37 38 33 34 34 32 33 33 34 34 35 37 37 38 37 39 31 32 33 34 34 35 37 37 37 38 37 37 37 37 37 37 37 37 37 37 37 37 37</td> <td><pre>//Initial KeyIdenti RtpSessio BICCState Result = MsgHandle Notificat AcceptIPB RequestIP COTReceiv Cause=16; ModifyCod MidCallCo BICCScrip LocalCICS RemoteCIC FreeCount IsRecepti RtpCoreId CICFreeCo FreeCICEr ///CLI P LoopCount ReportEve if (_SCTP SLS = NetIn Strea snint endif //***** //_Defaul //_Defaul //IPBCPRe //IPBCPAc</pre></td> <td><pre>ize Variables fier: opc , dpc, cic ; nState = "NULL"; = "IDLE"; "Unknown"; r:"BICCMessageHandler"; ionRequired=0; CP=0; ed = 0; ecInitiated=0; decInitiated=0; tId="BICC"; tate=""; state=""; = 0; on = 0; = 1; unt = 0; ror = ""; arameters 1 = 0; nt (Script = "Running"); Source == "CSV File") 1; d = 2; mID = 1; erfaceid = 0; Uncomment below variables tIPBCPRequestPath = "maps\tipe: icc-ip ceptPath = "maps\bicc-ip\tipe: Line Count - 798 [Line: 36 Col: 1]</pre></td> <td>//Used to known if Global profile \bicc-ip\itu\serving bicc-ip\itu\serving if MS profile from \itu\serving node\m3 itu\serving node\m3 ></td> <td></td> <td>3 Window</td>			1 2 3 4 5 6 7 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 6 7 7 28 29 30 31 32 33 34 4 35 5 6 7 7 7 8 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 9 10 11 12 13 14 15 16 7 7 8 9 10 11 12 13 14 15 16 7 7 8 9 10 11 12 13 14 15 16 7 7 8 9 20 21 22 23 24 25 26 7 7 8 8 9 20 21 22 23 24 25 26 7 7 8 8 9 20 21 22 23 24 25 26 7 7 7 8 8 9 20 21 22 23 30 31 32 33 34 34 35 36 37 37 38 39 30 31 32 33 34 34 35 36 37 37 38 37 38 39 30 31 32 33 34 34 35 37 38 39 30 31 32 33 34 34 35 37 38 39 30 30 31 32 33 34 34 35 37 37 38 37 39 30 31 32 33 34 34 35 37 37 38 33 34 34 32 33 33 34 34 35 37 37 38 37 39 31 32 33 34 34 35 37 37 37 38 37 37 37 37 37 37 37 37 37 37 37 37 37	<pre>//Initial KeyIdenti RtpSessio BICCState Result = MsgHandle Notificat AcceptIPB RequestIP COTReceiv Cause=16; ModifyCod MidCallCo BICCScrip LocalCICS RemoteCIC FreeCount IsRecepti RtpCoreId CICFreeCo FreeCICEr ///CLI P LoopCount ReportEve if (_SCTP SLS = NetIn Strea snint endif //***** //_Defaul //_Defaul //IPBCPRe //IPBCPAc</pre>	<pre>ize Variables fier: opc , dpc, cic ; nState = "NULL"; = "IDLE"; "Unknown"; r:"BICCMessageHandler"; ionRequired=0; CP=0; ed = 0; ecInitiated=0; decInitiated=0; tId="BICC"; tate=""; state=""; = 0; on = 0; = 1; unt = 0; ror = ""; arameters 1 = 0; nt (Script = "Running"); Source == "CSV File") 1; d = 2; mID = 1; erfaceid = 0; Uncomment below variables tIPBCPRequestPath = "maps\tipe: icc-ip ceptPath = "maps\bicc-ip\tipe: Line Count - 798 [Line: 36 Col: 1]</pre>	//Used to known if Global profile \bicc-ip\itu\serving bicc-ip\itu\serving if MS profile from \itu\serving node\m3 itu\serving node\m3 >		3 Window



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Customizations - Protocol Messages

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- e	GTP Version Piggybacking (P) TEID Message Type Message Length Tunnel Endpoint Identifier Sequence Number InformationElements III III	 Create Session Request = 32 Create Session Response = 32 Create Session Response = 33 Modify Bearer Response = 35 Delete Session Request = 36 Delete Session Response = 37 Change Notification Request = 38 Change Notification Response = 39 Modify Bearer Command = 64 Modify Bearer Command = 65 Delete Bearer Command = 66 	
	========== eGTP Layer ===		^
0000	Version	= 010 GTP-C	
0000	Piggybacking (P)	=0 No piggybacked message	=
0000	TEID	=l TEID Present	
0001	Message Type	= 00100000 Create Session Request	
0002	Message Length	= 210 (x00D2)	
0004	Tunnel Endpoint Identifier	r = 1 (x0000001)	
0008	Sequence Number IMSI	= 1 (x000001) =	
0000	Information Element Id	= 00000001 International Mobile Subscriber Identity (IMSI)	
0000	Length	= 5 (x0005)	
OOOF	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)	=	
OOLE	Information Element Id	= 01010110 User Lacation Info(ULI)	
001F	Length	= 6 (x0006)	
0021	Instance	=0000 (0)	
0022	CGI	=O Not Present	
		2	·
Ready	,	NUM	



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

Command Line Interface

Serving Node Client

Python 3.7.5 Shell	– 🗆 X								
File Edit Shell Debug Options Window Help									
Type copyright, creates or ficense() for	more información.								
>>>									
RESTART: C:\Program Files\GL Communications]	Inc\MAPS-BICCIP\MAPSCLI\Python Client\examples								
\BiccIp_PlaceCall.py									
BICC IP Server Connection True									
BICC IP Testbed Starting True									
BICC IP Profile Loading True									
Link Status Checking True									
Link is UP True									
Set OPC: 0									
Set DPC: 0									
Set Called Number: 0									
Set Calling Number: 0									
Set Traffic Type: 0									
BICC IP Call Placing True									
BICC IP Call Connecting True									
BICC IP Call StatusBICC CALL CONNECTED									
Send File started									
BICC IP Call Hold True									
BICC IP Call Retrieve True									
BICC IP Call Suspend True									
BICC IP Call Resume True									
BICC IP Call Terminating True									
BICC IP Call MsgCount: 13									
BICC IP Call's LastMSGRcv									
Time Stamp Route Message									
10:37:40.123 <- Release Complete									
***** BICC IP Call Message Flow *****									
CLI <> DUT									
Time Stamp Route Message									
10:37:15.739 -> Initial Address									
10:37:15.739 -> Initial Address									
============= MTP3 User Adaptation Layer ==									
0000 Version	= 00000001 Release 1.0								
0002 Message Class	= 00000001 Transfer								
0003 Transfer Message Type = 00000001 Payload Data									
0004 Message Length	= 88 (x00000058)								

MAPS™CLI Server

CI	Мар	sCLI S	Servir	ng No	Je (BICC-IP ITU M3UA) —	×
E	File	Edit	Vi	ew		5.2
P	1 63		Ba.			 1.00
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IV.	view L	atest	Comm	hand		
1 ::	2019-	3-8 10	:37:0	0.327	000 : Start "TestBedDefault.xml" ;	^
1::	2019-	3-8 10):37:0	06.673	000 : LoadProfile "MS_Profiles.xml"	
1::	2019-	3-8 10	:37:1	14.781	000 : ServerHSRequest ;	
1::	2019-	3-8 10	:37:1	14.806	000 : StartScript 1 "BICC_Call.gls" "MSProfile0001" 1 # "EnableCLI"=1;	
1::	2019-	3-8 10	:37:1	15.481	000 : UserEvent 1 IsTransportUp";	
1::	2019-	3-8 10	:37:1	15.503	000 : UserEvent 1 "SetVariable"# "OPC"="1.1.1";	
1::	2019-	3-8 10	:37:1	15.526	000 : UserEvent 1 "SetVariable"# "DPC"="2.2.2";	
1::	2019-	3-8 10	:37:3	15.538	000 : UserEvent 1 "SetVariable"# "CalledNumber"=(binarystring)8800880011;	
1 ::	2019-	3-8 10	:37:1	15.551	000 : UserEvent 1 "SetVariable"# "CallingNumber"=(binarystring)9900990011;	
1::	2019-	3-8 10	:37:1	15.563	000 : UserEvent 1 "SetVariable"# "Traffic Type"="AutoTrafficFile";	
1::	2019-	3-8 10	:37:1	15.575	000 : UserEvent 1 "Place Call";	
1::	2019-	3-8 10	:37:1	15.706	000 : UserEvent 1 "GetCallStatus";	
1 ::	2019-	3-8 10	:37:1	16.758	000 : UserEvent 1 "GetCallStatus";	
1::	2019-	3-8 10	:37:1	17.765	000 : UserEvent 1 "GetCallStatus";	
1::	2019-	3-8 10	:37:1	18.775	000 : UserEvent 1 "GetCallStatus";	
1::	2019-	3-8 10	:37:1	18.787	000 : UserEvent 1 "GetCallStatus";	
1::	2019-	3-8 10	:37:1	19.804	000 : UserEvent 1 "SendFile"# "TxFileName"="voicefiles\Send\G711\ULAW\Vijay.glw", "TxFileDuration"=10;	
1::	2019-	3-8 10	:37:2	29.840	000 : UserEvent 1 "Hold";	
1::	2019-	3-8 10	:37:3	31.904	000 : UserEvent 1 "Retrieve";	
1::	2019-	3-8 10	:37:3	33.968	000 : UserEvent 1 "Suspend";	
1 ::	2019-	3-8 10	:37:3	36.028	000 : UserEvent 1 "Resume";	
1::	2019-	3-8 10	:37:4	10.029	000 : UserEvent 1 "Terminate Call";	
1::	2019-	3-8 10	:37:4	41.145	000 : UserEvent 1 "GetMessageCount";	
1::	2019-	3-8 10	:37:4	41.178	000 : UserEvent 1 "GetLastReceivedMessage";	
1 ::	2019-	3-8 10	:37:4	41.212	000 : UserEvent 1 "GetMessageCount";	
1 ::	2019-	3-8 10	:37:4	41.224	000 : UserEvent 1 "GetMessageInfo"# "Index"=0;	
1::	2019-	3-8 10	:37:4	41.258	000 : UserEvent 1 "GetMessageInfo"# "Index"=0;	
1::	2019-	3-8 10	:37:4	41.437	000 : UserEvent 1 "GetMessageInfo"# "Index"=1;	
1 ::	2019-	3-8 10	:37:4	41.481	000 : UserEvent 1 "GetMessageInfo"# "Index"=1;	
1::	2019-	3-8 10	:37:4	41,658	000 : UserEvent 1 "GetMessageInfo"# "Index"=2;	
1::	2019-	3-8 10	:37:4	41.693	000 : UserEvent 1 "GetMessageInfo"# "Index"=2;	
1::	2019-	3-8 10	:37:4	41.791	000 : UserEvent 1 "GetMessageInfo"# "Index"=3;	
1::	2019-	3-8 10	:37:4	41.825	000 : UserEvent 1 "GetMessageInfo"# "Index"=3;	
1::	2019-	3-8 10	:37:4	41.932	000 : UserEvent 1 "GetMessageInfo"# "Index"=4;	
1 ::	2019-	3-8 10	:37:4	41.966	000 : UserEvent 1 "GetMessageInfo"# "Index"=4;	
1::	2019-	3-8 10	:37:4	42.132	000 : UserEvent 1 "GetMessageInfo"# "Index"=5;	
1 ::	2019-	3-8 10	:37:4	42,180	000 : UserEvent 1 "GetMessageInfo" # "Index"=5:	Y



Thank you

