BroadSoft Partner Configuration Guide

AudioCodes Mediant Trunk

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BroadWorks® Guide

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Document Revision History

Version	Reason for Change
1.1	Released original document.
1.2	Edited document.
1.3	Edited document.
1.4	Changed document title in Overview and Reference section.
1.5	Edited document.

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1 Overview

This document describes the configuration procedures required for AudioCodes Mediant to make full use of the capabilities of BroadWorks in a trunking configuration. The following AudioCodes Mediant gateways support this task:

- Mediant 1000
- Mediant 2000

The Mediant is one of the many devices that interoperate with BroadWorks.

The Mediant is a registering gateway. It uses the Session Initiation Protocol (SIP) to communicate with BroadWorks for call control. It also translates voice to audio packets for transmission across a packet network.

This guide describes the configuration of the Mediant for use as an access trunking gateway in a BroadWorks deployment. In this configuration, the Mediant acts as an access device on the BroadWorks network, providing a Primary Rate Interface (PRI) front end for PRI devices, such as a Private Branch Exchange (PBX).

This guide describes the specific configuration items that are important for use with BroadWorks. It does not describe the purpose and use of all configuration items on the Mediant. For those details, see *LTRT-68804 Mediant & TP Series SIP Digital Gateways User's Manual Ver 4.8* [1] supplied by AudioCodes.

2 BroadWorks Validation Package Support Level

Devices are validated according to *BroadWorks Validation Packages*. Each package validates a subset of features or items. This section describes the device's support level for a *BroadWorks Validation Package* as well as the features or items in the package that are not supported. Packages not applicable to the device are marked "Not applicable" in the *Items Not Supported* column. For specific issues, see section *3.2 Interoperability Issues.* For a complete list of items validated per package, see *Appendix B: BroadWorks Validation Package Test Items*.

BroadWorks Package	Support Level	Items Not Supported
Basic Call	Full	
BroadWorks Enhanced Services	Full	
DUT Enhanced Services	Full	BroadWorks Authentication
Redundancy	Partial	DNS SRV Priorities
Session Border Controller Interface	Full	
TCP	Full	

3 Device Capabilities and Known Interoperability Issues

This section describes the features supported by the Mediant, as well as BroadWorks interoperability issues and impact. The following table describes capabilities.

Verified Revisions shows the results of testing a specific BroadWorks version with a specific partner's device under test (DUT) version.

Compatible Revisions indicates the maintenance versions that should interface properly with BroadWorks.

NOTE 1: BroadSoft validates that the device works properly with the BroadWorks SIP or MGCP interface. BroadSoft does not validate qualitative aspects of the device or other device capabilities, which are outside the scope of the SIP/MGCP signaling interface. For device feature and performance testing results, consult AudioCodes.

NOTE 2: BroadSoft generally tests only the latest generally available (GA) device firmware/software with latest GA BroadWorks release. If there is a need to use a non-validated mix of BroadWorks and device software versions, customers can mitigate their risk by self-testing the combination using the appropriate *BroadWorks Release Test Plan*.

3.1 Capabilities

Device Type	SIP PRI Gateway
Lines and Appearances	2000 max T1/E1: 8 1000 max T1/E1: hardware configurable
Speaker/Power/Bridge	N/A
Verified Revisions	BroadWorks Release 13.0 AudioCodes Version 4.80A.028.002 (BroadSoft validated)
Compatible Revisions	BroadWorks Release 13.0 Any maintenance release of 4.80A.028.002
DNS Lookup Types Supported (A, SRV, NAPTR)	SRV-records A-records
Redundancy Enabled	Yes
Outbound Proxy Configurable	Yes
Codec	G711u, G711a, G729, G726, G723
RFC 2833	Yes
T.38 Fax	Yes
Services	None (Transfer, Hold, Conference Services are PBX-controlled).
Shared Call Appearance	N/A
Enhanced IP Phone Configuration	N/A

3.2 Interoperability Issues

This section lists the known interoperability issues between BroadWorks and partner release(s). For more information on issues related to a particular software release, see the partner release notes.

ExtraView Issue	ExtraView Title and Description	Partner Release			
	All BroadWorks Releases	4.80A.028.002			
35332	**Mediant does not use DNS SRV for Application Server Redundancy** The Mediant uses SIP Option messages and priority settings. The SIP Option messages are sent constantly to both primary and secondary Application Servers, adding to the network overhead, and since both servers respond to the SIP Options, there may be confusion when the users migrates from the Secondary Application Server to the Primary Application Server after the Primary Application Server is restored to service.	X			

4 BroadWorks Device Types

The following BroadWorks device type should be used for the AudioCodes Mediant Trunk device:

- AudioCodes Mediant1000-Trunk Reg
- AudioCodes Mediant2000-Trunk Reg

The above device types are available starting from BroadWorks Release 13.0 MP 11. If the BroadWorks system is running MP 10 or below, use the following device types:

- Generic SIP Smart
- SIP Intelligent Gateway

5 Configuration

The AudioCodes Mediant can be configured using a configuration file or via the device's graphical user interface (GUI).

The Mediant is designed to operate in many different network environments. The capabilities of the Mediant have been verified for use with BroadWorks based on the settings described in the following tables. For more information on the meaning, purpose, and applicability of configuration items described or items beyond the scope of this document, see the *LTRT-68804 Mediant & TP Series SIP Digital Gateways User's Manual Ver 4.8* [1] supplied by AudioCodes.

Figure 1 shows a BroadWorks business trunking configuration with the Mediant acting as a trunking device from BroadWorks to a PBX.

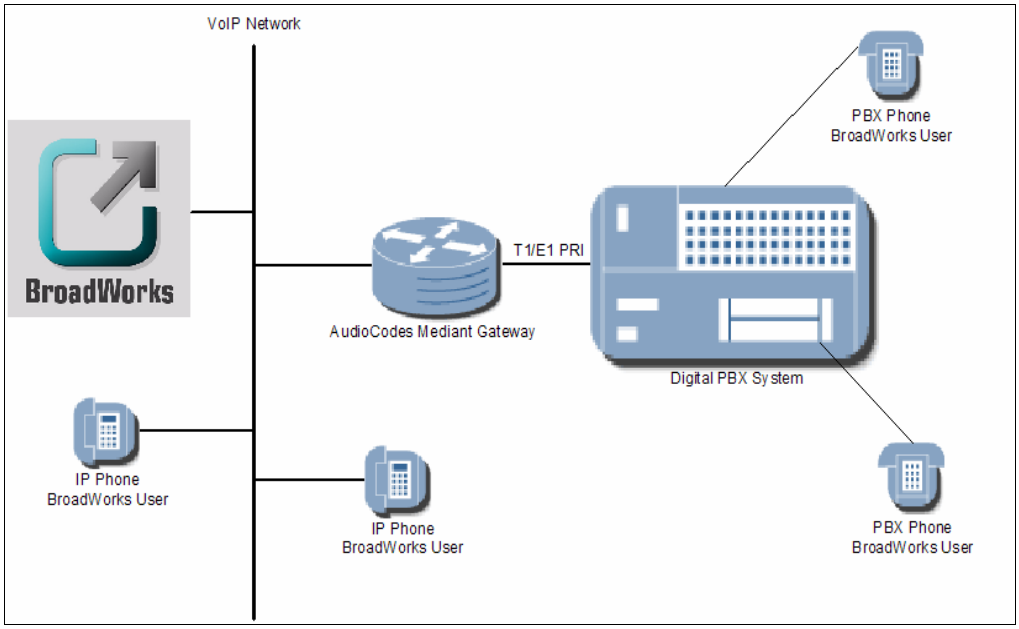

Figure 1 BroadWorks Business Trunking Configuration

5.1 System Level Configuration

The following examples describe how to set the parameters using a configuration file that is uploaded via the GUI. This description assumes the device has already been minimally configured so that it is network accessible before the configuration file can be uploaded.

For information on the initial setup, configuration parameters, and configuration file upload procedure, see the *LTRT-68804 Mediant & TP Series SIP Digital Gateways User's Manual Ver 4.8* [1]. This document should also be referred to for configuration via the Mediant GUI since the parameter names may be different.

5.1.1 DNS Server Configuration

Identify the DNS parameters.

Step	Command	Purpose
Step 1	**Identify the Primary DNS Server** DNSPriServerIP = 192.168.6.22	Configure the Mediant to find the Primary DNS Server.
Step 2	**Identify the Secondary DNS Server** DNSPriServerIP = 192.168.6.23	Configure the Mediant to find the Secondary DNS Server if available.

5.1.2 PRI Configuration

The Mediant can come optioned with 1 or more T1/E1 ports. The configuration options for each variant will be slightly different. For more information, see the *LTRT-68804 Mediant & TP Series SIP Digital Gateways User's Manual Ver 4.8* [1] for differences in the configuration setting between variants.

Set the PRI interface(s) parameters for a multiple PRI configuration.

Step	Command	Purpose
Step 1	**Set the PRI Protocol Type for PRI port 1** ProtocolType_0 = 21	Protocol types will include the following: E1 EURO ISDN = 1 T1 CAS = 2 T1 RAW CAS = 3 T1 TRANSPARENT = 4 E1 TRANSPARENT 31 = 5 E1 TRANSPARENT 30 = 6 E1 MFCR2 = 7 E1 CAS R2 = 8 E1 RAW CAS = 9 T1 NI2 ISDN = 10 T1 4ESS ISDN = 11 T1 5ESS 9 ISDN = 12 T1 5ESS 10 ISDN = 13 T1 DMS100 ISDN = 14 J1 TRANSPARENT = 15 T1 NTT ISDN = 16 (Japan - Nippon Telegraph) E1 AUSTEL ISDN = 17 (Australian Telecom) T1 HKT ISDN = 18 (Hong Kong – HKT) E1 KOR ISDN = 19 (Korean operator) T1 HKT ISDN = 20 (Hong Kong - HKT over T1) E1 QSIG = 21 (Basic call only) T1 QSIG = 23 (Basic call only) T1 DMS100 Meridian = 35
Step 2	**Set the ISDN Termination Side for PRI port 1** TerminationSide_0 = 1	Configure the Mediant PRI Termination Side for the following (normally opposite the connecting device): 0 = ISDN User Termination Side (TE) (default) 1 = ISDN Network Termination Side (NT)

Step	Command	Purpose
Step 3	**Set the Framing Method for PRI port 1** FramingMethod_0 = c	Configure the Mediant PRI Framing type to match the connecting device: **For E1** 0 = Multiframe with CRC4 (default, automatic mode, if CRC is identified in the Rx, CRC is sent in Tx, otherwise no CRC). a = Double frame c = Multiframe with CRC4 **For T1** 0 or D = Extended super frame with CRC6 (default) C = Extended super frame without CRC6 F = J1 - Japan (ESF with CRC6 and JT)
Step 4	**Set the Line Coding for PRI port 1** LineCode_0 = 2	Configure the Mediant PRI Line Code to match the connecting device: 0 = use B8ZS line code (for T1 trunks only) default. 2 = use HDB3 line code (for E1 trunks only).

5.1.3 SIP Configuration

Set the SIP parameters.

Step	Command	Purpose
Step 1	**Configure the proxy** ISPROXYUSED = 1 PROXYIP = 'intas.broadworks.net' PROXYNAME = 'intas.broadworks.net'	For the SIP Trunking environment use the Application Server FQDN and IP Address.
Step 2	**Enable reliable response** ISPRACKREQUIRED = 1 PRACKMODE = 1	Reliable provisional response Provisional Response ACKnowledgement (PRACK) should be enabled.
Step 3	**Enable early media** ENABLEEARLYMEDIA = 1	Configure the Mediant to enable early media.
Step 4	**Enable Mediant-generated ringback** PLAYRBTONE2TEL = 2	Configure the Mediant to play ringback to the PSTN originator if there is no remote ringback (that is, a 180 was received).

Step	Command	Purpose
Step 5	**Configure DTMF transport** **Option 1: RFC2833** ISDTMFUSED = 0 RXDTMFOPTION = 3 TXDTMFOPTION = 4 RFC2833PAYLOADTYPE = 101 **Option 2: Inband** ISDTMFUSED = 0 RXDTMFOPTION = 0 TXDTMFOPTION = 0	Configure the Mediant to send RFC 2833 or inband DTMF. **NOTE**: Mediant sends DTMF either inband or RFC 2833 (whatever it is configured to do). It does not negotiate the method.
Step 6	**Enable T.38 FAX** ISFAXUSED = 1 FAXTRANSPORTMODE = 1	Enable T.38 FAX. To use FAX passthrough, set ISFAXUSED to 0, FAXTRANSPORTMODE = 0. For more information on additional fax parameters, refer to *LTRT-68804 Mediant & TP Series SIP Digital Gateways User's Manual Ver 4.8* [1].
Step 7	**Configure Codecs** Example CODERNAME = g729,20,0,$$,0 CODERNAME = g711Ulaw64k,20,0,$$,0 CODERNAME = g7231,30,0,$$,0 CODERNAME = g711Alaw64k,20,0,$$,0	Configure codec precedence/use for your network. List codecs in order of precedence.
Step 8	**Enable Services** ENABLEHOLD = 1 ENABLETRANSFER = 1 SENDINVITETOPROXY = 0	Enable Mediant state machine for *Hold* and *Transfer* services.
Step 9	**Disable the Broken Connection flag** DISCONNECTONBROKENCONNECTION = 0	Disable the Mediant ability to kill a connection due to no RTP packets received from remote end.
Step 10	**Configure the redundancy mode** PROXYREDUNDANCYMODE = 1	Configure the redundancy mode to Homing so the gateway always tries the primary Application Server first. This setting is used in conjunction with the keep-alive timer.
Step 11	**Configure secondary application server** PROXYIP = 12.39.208.252	Configure the IP for the secondary Application Server. This is an additional PROXYIP entry in the configuration file; the second entry is the secondary Application Server.
Step 12	**Configure proxy keep alive** ENABLEPROXYKEEPALIVE = 1 PROXYKEEPALIVETIME = 60	Enable proxy keep-alive so the gateway fails back to the primary when it is available.

Step	Command	Purpose
Step 13	**Enable proxy hot swap** ISPROXYHOTSWAP = 1 PROXYHOTSWAPRTX = 3	Enable the Mediant to failover the INVITE to the other server if no response is received after three retries.

5.2 Subscriber Level Configuration

The Mediant can be used to send multiple SIP Registrations for specific BroadWorks users that are part of a Business Trunk/PBX scenario. The users are configured on a PBX system and also as regular BroadWorks users. The configuration requires that a *UserInfo* file is sent to the Mediant, and the configuration file parameters set to enable the SIP Registrations to be completed.

5.2.1 UserInfo Example Text File for SIP Registrations

The text file contains a single line for each user that will be registered with the Application Server. The text file contains the following from left to right with each value separated by a comma:

PBX #: PBX Extension, maximum length 10 numbers

Global Telephone #: The full BroadWorks number, maximum length 20 numbers

Display name: Caller ID, maximum length 30 characters

Username: The SIP User Name as part of the Authentication Settings in BroadWorks. Maximum length 20 characters

Password: The SIP Password as part of the Authentication Settings in BroadWorks. Maximum length 20 characters

```
3641002,2403641002,2403641002,2403641001,changeme
3641001,2403641001,2403641001,2403641001,changeme
3641005,2403641005,2403641005,2403641001,changeme
3641006,2403641006,2403641006,2403641001,changeme
```

5.2.2 UserInfo Configuration Options

UserInfo setting

Step	Command	Purpose
Step 1	**Configure the Mediant to use the UserInfo File** ENABLEUSERINFOUSAGE = 1	Configures the Mediant to reference the UserInfo file when sending Registration Requests to the Application Server.
Step 2	**Sets the Authentication Mode** AUTHENTICATIONMODE = 0	Configures the Mediant to send Registration Requests based on the UserInfo settings.

6 Appendix A: Sample AudioCodes Mediant 2000 Configuration

The following sample configuration shows a T1 Integrated Services Digital Network (ISDN) network interface configuration. This may not apply to your network. For configuration details for the network interface appropriate to your network, see the *LTRT-68804 Mediant & TP Series SIP Digital Gateways User's Manual Ver 4.8* [1].

6.1 BOARD.ini

```
;**************
;** Ini File **
;**************

;Board: TrunkPack 1610
;Serial Number: 223800
;Slot Number: 1
;Software Version: 4.80A.028.002
;Board IP Address: 192.168.6.40
;Board Subnet Mask: 255.255.255.0
;Board Default Gateway: 192.168.6.1
;Ram size: 128M   Flash size: 8M
;Num DSPs: 40  Num DSP channels: 240
;Profile: NONE
;License Key limits aren't active full features capabilities
are available !;
;------------------------------


[SYSTEM Params]

DNSPriServerIP = 192.168.6.22
DNSSecServerIP = 192.168.6.23

[BSP Params]

PCMLawSelect = 1
TDMBusClockSource = 4
EnableMultipleIPs = 0
NETWORKSERVICECLASSDIFFSERV = 48
PREMIUMSERVICECLASSMEDIADIFFSERV = 46
PREMIUMSERVICECLASSCONTROLDIFFSERV = 46
GOLDSERVICECLASSDIFFSERV = 26
BRONZESERVICECLASSDIFFSERV = 10
LocalOAMIPAddress = 192.168.6.40
RoutingTableHopsCountColumn = 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

[ATM Params]


[Analog Params]

FarEndDisconnectSilenceMethod = 0

[ControlProtocols Params]


[MGCP Params]
```

```
[MEGACO Params]

EP_Num_0 = 0
EP_Num_1 = 1
EP_Num_2 = 0
EP_Num_3 = 0
EP_Num_4 = 0

[PSTN Params]

TraceLevel_0 = 2
TraceLevel_1 = 0
TraceLevel_2 = 0
TraceLevel_3 = 0
TraceLevel_4 = 0
TraceLevel_5 = 0
TraceLevel_6 = 0
TraceLevel_7 = 0
ProtocolType_0 = 21
ProtocolType_1 = 0
ProtocolType_2 = 0
ProtocolType_3 = 0
ProtocolType_4 = 0
ProtocolType_5 = 0
ProtocolType_6 = 0
ProtocolType_7 = 0
TerminationSide_0 = 1
TerminationSide_1 = 0
TerminationSide_2 = 0
TerminationSide_3 = 0
TerminationSide_4 = 0
TerminationSide_5 = 0
TerminationSide_6 = 0
TerminationSide_7 = 0
FramingMethod_0 = c
FramingMethod_1 = 0
FramingMethod_2 = 0
FramingMethod_3 = 0
FramingMethod_4 = 0
FramingMethod_5 = 0
FramingMethod_6 = 0
FramingMethod_7 = 0
LineCode_0 = 2
LineCode_1 = 0
LineCode_2 = 0
LineCode_3 = 0
LineCode_4 = 0
LineCode_5 = 0
LineCode_6 = 0
LineCode_7 = 0

[SS7 Params]


[Voice Engine Params]

IdlePCMPattern = 85
EnableEchoCanceller = 0
DTMFTransportType = 2
RFC2833PayloadType = 101
```



```
[WEB Params]

LogoWidth = '339'

[SIP Params]

LOCALSIPPORT = 5060
PLAYRBTONE2IP = 0
REGISTRATIONTIME = 3600
USERADLOG = 1
SIPT1RTX = 500
SIPT2RTX = 4000
ISPROXYUSED = 1
ISREGISTERNEEDED = 1
AUTHENTICATIONMODE = 0
SIPDESTINATIONPORT = 5060
PLAYRBTONE2TEL = 2
DETFAXONANSWERTONE = 0
RADDEBLEVEL = 2
CHANNELSELECTMODE = 1
RADLOGOUTPUT = 1
GWDEBUGLEVEL = 6
ENABLEPROXYKEEPALIVE = 1
ENABLERPIHEADER = 0
ENABLEEARLYMEDIA = 0
ISUSERPHONE = 1
SIPSESSIONEXPIRES = 0
PROXYNAME = 'intas.broadworks.net'
SIPGATEWAYNAME = 'intas.broadworks.net'
STATICNATIP = 0.0.0.0
PROGRESSINDICATOR2IP = 1
ALWAYSSENDTOPROXY = 1
ISPROXYHOTSWAP = 1
PROXYKEEPALIVETIME = 30
PROXYREDUNDANCYMODE = 1
PRACKMODE = 2
PROXYHOTSWAPRTX = 1
SIPMAXRTX = 7
SENDINVITETOPROXY = 1
ASSERTEDIDMODE = 0
ISUSERPHONEINFROM = 0
ADDTON2RPI = 1
USESOURCENUMBERASDISPLAYNAME = 0
MINSE = 90
IPALERTTIMEOUT = 180
ISFAXUSED = 1
SIPTRANSPORTTYPE = 0
TCPLOCALSIPPORT = 5060
ENABLEPROXYSRVQUERY = 1
SIP183BEHAVIOUR = 0
PLAYBUSYTONE2ISDN = 0
TLSLOCALSIPPORT = 5061
ENABLESRVQUERY = 1
ENABLESIPS = 0
USERAGENTDISPLAYINFO = ''
SESSIONEXPIRESMETHOD = 0
USEDISPLAYNAMEASSOURCENUMBER = 0
USETELURIFORASSERTEDID = 0
PLAYRBTONE2TRUNK_0 = 0
PLAYRBTONE2TRUNK_1 = -1
PLAYRBTONE2TRUNK_2 = -1
PLAYRBTONE2TRUNK_3 = -1
```



```
PLAYRBTONE2TRUNK_4 = -1
PLAYRBTONE2TRUNK_5 = -1
PLAYRBTONE2TRUNK_6 = -1
PLAYRBTONE2TRUNK_7 = -1
ENABLEUSERINFOUSAGE = 1
USERINFOFILENAME = 'UserInfo.txt'
USESIPTGRP = 0
SIPSUBJECT = ''
CODERNAME = g711Ulaw64k,20,0,$$,0
CODERNAME = g711Alaw64k,20,0,$$,0
CODERNAME_1 = g711Ulaw64k,20,0,$$,0
CODERNAME_1 = g711Alaw64k,20,0,$$,0
PSTNPREFIX = *,1,*,*,1
TRUNKGROUP_1 = 0-0/1-30,,1
PROXYIP = intas.broadworks.net
PROXYIP = 192.168.6.21
TXDTMFOPTION = 4
;TelProfile: ProfileName, Preference, CodersGroupID,
IsFaxUsed, DJBufMinDelay, JBufOptFactor, IPDiffServ,
SigIPDiffServ, DtmfVolume, InputGain, VoiceVolume,
EnableReversePolarity, EnableCurrentDisconnect,
EnableDigitDelivery, ECE, MWIAnalog, MWIDisplay,
FlashHookPeriod, EnableEarlyMedia, ProgressIndicator2IP
TELPROFILE_1 = Default Tel Profile,1,0,1,70,7,46,46,-
11,0,0,0,0,0,1,0,0,400,1,1
;IpProfile: ProfileName, Preference, CodersGroupID,
IsFaxUsed, DJBufMinDelay, JBufOptFactor, IPDiffServ,
SigIPDiffServ, SCE, RTPRedundancyDepth, RemoteBaseUDPPort,
CNGmode, VxxTransportType, NSEMode, IsDTMFUsed,
PlayRBTone2IP, EnableEarlyMedia, ProgressIndicator2IP
IPPROFILE_1 = Default Ip
Profile,1,0,1,70,7,46,46,0,0,0,0,2,0,0,0,0,0

[SCTP Params]


[VXML Params]


[IPsec Params]


[Audio Staging Params]


[PSTN-SDH Params]
```


7 Appendix B: BroadWorks Validation Package Test Items

The following table describes the items tested in each *BroadWorks Validation Package*.

BroadWorks Validation Package	Items Supported
Basic Call	Basic Call Call Failure Codes Session Audit Dial Plan In-band DTMF RFC 2833/Negotiation Codec Renegotiation
BroadWorks Enhanced Services	Basic CommPilot Functions Voice Messaging Audio MWI Voice Messaging Visual MWI Priority Alerting Priority Call Waiting Alternate Numbers Ring Splash Blocked Calling Line ID
DUT Enhanced Services	Call Waiting Call Hold Blind Transfer Attended Transfer Call Conference Authenticated Registration BroadWorks Shortened Registration Rejected Registration BroadWorks Authentication FAX Passthrough FAX T38
Redundancy	Registration Failover Call Setup Failover
Session Border Controller Interface	Registration Call Origination Call Termination
TCP	Basic

8 References

[1] AudioCodes Ltd. *LTRT-68804 Mediant & TP Series SIP Digital Gateways User's Manual Ver 4.8.pdf*. Available from AudioCodes.

[2] BroadSoft, Inc. 2005. *BroadWorks Redundancy Guide, Release 13.0*. Available from the BroadSoft KnowledgeBase at www.broadsoft.com/KnowledgeBase.