# BroadSoft Partner Configuration Guide

Grandstream HT286/386/486/488/496
Analog Telephone Adapter
&
BT100 SIP Phone

October 2007

Document Version 1.2

# BroadWorks® Guide

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## Trademarks

## Document Revision History

| Version | Reason for Change |
|---------|-------------------|
| 1.1 | Introduced document for HT496 version 1.0.3.96 validation with BroadWorks R14.SP2 |
| 1.2 | Added HT286/386/486/488/BT-100 models. |
| | |

## Table of Contents

# 1 Overview

This document describes the configuration procedures required for a Grandstream HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 to make full use of the capabilities of BroadWorks.

The HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 is one of the many access devices that interoperate with BroadWorks.

The HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 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 specific configuration items that are important for use with BroadWorks.  It does not describe the purpose and use of all configuration items on the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100.  For those details, see the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 *User Manual* supplied by Grandstream **Error! Reference source not found.**.

## 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. 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 | Partial | Ring Splash<br>Priority Alerting<br>Priority Call Waiting<br>Alternate Numbers<br>Advanced Call Control |
| DUT Services – Call Control | Partial | Network Conference 3-Way<br>Network Conference N-Way |
| DUT Services – Registration and Authentication | Partial | BroadWorks Authentication |
| DUT Services – FAX | Full | |
| DUT Services – Busy Lamp Field | None | |
| Redundancy | Partial | Call Setup Failover<br>Mid-Call Failover |
| SBC/ALG | Full | |
| Shared Call Appearance | None | |
| Feature Key Synchronization | None | |
| Video | None | |
| TCP | None | |

# 3 Device Capabilities and Known Interoperability Issues

This section describes the features supported by the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100, as well as BroadWorks interoperability issues and impact. The following table describes capabilities.

*Verified Revisions* shows the results of partner (vendor) testing of 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.

## 3.1 Capabilities

| Device Type | SIP ATA |
|---|---|
| **Lines and Appearances** | HT-286: 1 line    1 appearance per line<br>HT-386: 2 lines    1 appearance per line<br>HT-486: 1 line    1 appearance per line<br>HT-486: 1 line    1 appearance per line<br>HT-496: 2 lines    1 appearance per line<br>BT-100: 1 line    1 appearance per line |
| **Speaker/Power/Bridge** | HT-286: No/No/Yes<br>HT-386: No/No/Yes<br>HT-486: No/No/Yes<br>HT-488: No/No/Yes<br>HT-496: No/No/Yes<br>BT-100: Yes/No/Yes<br>*Indicates speaker phone, in-line power, device bridge/conference.* |
| **Verified Revisions** | BroadWorks Release: 14.SP2<br>Grandstream HT-286: 1.1.0.8<br>Grandstream HT-386: 1.0.3.96<br>Grandstream HT-486: 1.1.0.8<br>Grandstream HT-488: 1.0.3.96<br>Grandstream HT-496: 1.0.3.96<br>Grandstream BT-100: 1.1.0.8 |
| **Compatible Revisions** | BroadWorks Release: 14.SP2<br>Grandstream HT-286: any maintenance version of 1.1.0.8<br>Grandstream HT-386: any maintenance version of 1.0.3.96<br>Grandstream HT-486: any maintenance version of 1.1.0.8<br>Grandstream HT-488: any maintenance version of 1.0.3.96<br>Grandstream HT496: any maintenance version of |

| | |
|---|---|
| | 1.0.3.96<br><br>Grandstream BT-100: any maintenance version of 1.1.0.8 |
| **SIP Proxy FQDN DNS Lookup**<br><br>**(A, SRV, NAPTR)** | A, SRV |
| **Outbound Proxy Configurable** | Yes |
| **Outbound Proxy FQDN DNS Lookup**<br><br>**(A, SRV, NAPTR)** | A, SRV |
| **BroadWorks Redundancy Enabled** | No |
| **BroadWorks Shared Call Appearance** | N/A |
| **BroadWorks Enhanced IP Phone Configuration** | No |
| **Device Services** | Call Forwarding, Call Transfer, 3-Way Conference, Call Waiting, Call Hold |
| **Device Call Control**<br><br>**(Device-Controlled or Flash INFO-based)** | Device-Controlled |
| **Codecs** | PCMU, PCMA, G723.1 G729A/B, iLBC, G726-32 |
| **RFC 2833 DTMF** | Yes |
| **T.38 Fax** | Yes |
| **TCP** | No |
| **TLS** | No |

## 3.2 Interoperability Issues

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

None.

## 4    BroadWorks Device Identity/Profile

BroadWorks configurable device identify/profile is introduced in BroadWorks Release 14.0.  **This section applies only to BroadWorks Release 14.0 and later**.

The following table identifies the required BroadWorks device identity/profile settings for interoperability between the HT496 and BroadWorks.  For an explanation of the profile parameters, refer to the *BroadWorks Device Inventory Guide* [4].

For most of the parameters below, an "X" indicates the parameter function is supported and/or required.   If the item is blank, it is not supported.

| Grandstream HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 Identify/Device Profile | |
| --- | --- |
| Signaling Address Type | Intelligent Proxy Addressing |
| Number of Lines | HT-286/HT-486/BT-100: 1 line <br> HT-386/HT-488/HT-496: 2 lines |
| Ringback Tone/ Early Media Support | Local Ringback – No Early Media |
| Authentication | Enabled |
| Registration Capable | X |
| Static Registration Capable | |
| E.164 Capable | |
| Trusted | |
| Authenticate REFER | X |
| Authentication Override | |
| Video Capable | |
| RFC 3264 Hold | X |
| Route Advance | |
| Wireless Integration | |
| PBX Integration | |
| Use Business Trunking Contact | |
| Forwarding Override | |
| Conference Device | |
| Music On Hold Device | |
| Auto Configuration Soft Client | |
| Web Based Configuration URL | http//:%BWIPADDRESS% |
| Auto Configuration Type | 2 Config File |
| Reset Event | checkSync |
| Enable Monitoring | |
| CPE System File Name | ataSystem.txt/bt100System.txt |

| Device File Format | %BWMACADDRESS%.txt |
|---|---|

# 5 BroadWorks Device Type

**This section applies to BroadWorks Release 13.0 and before.**

The following BroadWorks device type should be used for Grandstream HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100.

- Grandstream HT-286

- Grandstream HT-386

- Grandstream HT-486

- Grandstream HT-488

- Grandstream HT-496

- Grandstream BT-100

The above device types require BroadWorks Release 13 MP<patch number>. If the BroadWorks system is currently at a lower patch level, either apply the necessary patch or use the following generic device type until the system can be patched accordingly.

- Generic SIP Smart (Proxy Addr)

# 6    Configuration

Grandstream HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 can be configured via Web GUI Interface as well as via Configuration File through TFTP or HTTP.

The HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 accepts configuration files in a proprietary binary format which is produced by the Grandstream configuration tool.  The configuration tool creates a device configuration file based on a configuration template and the device's MAC address.  All Grandstream products' sample configuration templates are available on Grandstream's web site.  A configuration template file contains all configuration parameters available for a product, with comments describing allowed values of the parameters.  For a detailed parameter list, please refer to the corresponding firmware release configuration template [2].

When Grandstream device boots up or reboots, it will issue request for a binary configuration file named "cfgxxxxxxxxxxxx", where "xxxxxxxxxxxx" is the MAC address of the device, i.e., "cfg000b820102ab".  The configuration file name should be in lower cases.

Grandstream offers free Configuration File generator software in both Linux/Unix and Windows platform.  Both Configuration File Generators can be downloaded from Grandstream official web site at http://www.grandstream.com/configurationtool.html  [2].

The HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 can be configured with a configuration file using the Trivial File Transfer Protocol (TFTP) or through its embedded web server.  The following examples describe how to set the parameters using a configuration file.  This configuration description assumes the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 will use the Dynamic Host Configuration Protocol (DHCP) to obtain an IP address and other network settings.  The HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 should be configured to load the configuration file each time it resets or re-synchronizes.  For detailed information on automated provisioning, please check the *HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 User Manual* **Error! Reference source not found.**.

The capabilities of the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 have been verified for use with BroadWorks based on the settings described in the following table.  For more information on the meaning, purpose, and applicability of the individual configuration items, see the *HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 configuration template [2]* .

**Configuration Files**

| Files Provided by Partner | Level | Description |
|---|---|---|
| HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 Configuration Template<br><br>Example:  sipp1_config_1.1.0.8.txt<br><br>            sipp2_config_1.0.3.96.txt | System and Subscriber | Contains configurable parameters that apply to an individual device in a deployment. |
| cfgMAC<br><br>Example: cfg000b82000000 | System and Subscriber | Binary configuration file generated from configuration template and an individual device's MAC address. |

## 6.1 System Level Configuration

This section describes system-wide configuration items that are generally required for each HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 to work with BroadWorks. Subscriber-specific settings are described in the next section.

*{THIS IS JUST AN EXAMPLE AND IS NOT INTENDED AS A COMPLETE OR SUFFICIENT TABLE OF PARAMETERS.  EACH DEVICE WILL VARY AND MAY BE COMPLETELY DIFFERENT.  IF YOUR DEVICE DOES NOT SUPPORT CONFIG FILES USE GUI CAPTURES OR OTHER METHODS TO DESCRIBE THE CONFIGURATION.}*

| Step | Command | Purpose |
|------|---------|---------|
| **System Configuration Items** | | |
| Step 1 | **Set SIP Proxy/Domain.**<br>`sipProxy = as.broadworks.net` | Set the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 SIP server to the Fully Qualified Domain Name (FQDN) for the BroadWorks Application Server cluster.<br><br>The domain must match the domain configured for the BroadWorks subscriber's line/port domain. |
| Step 2 | **Set Outbound Proxy.**<br>`outBoundProxy = sbc.broadworks.net` | Set the outbound proxy to the session border controller (SBC) if one is deployed between the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 and BroadWorks.<br><br>If there are redundant SBCs, set it to the FQDN for the SBC cluster. |
| Step 3 | **Enable DNS SRV lookup.**<br>`Use_DNS_SRV = "Yes" ;` | Enable DNS SRV lookups. |
| Step 4 | **Set register mode.**<br>`SIP Registration = "Yes"` | Enable SIP register. |
| Step 5 | **Set SIP Timers.**<br>`Register Expiration = 60` | The default registration period is 60 minutes. |
| Step 6 | **Enable negotiated DTMF type.**<br>`Send DTMF = "via RTP (RFC2833)"` | Set the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 to enable inband or RFC 2833 negotiated DTMF. |
| Step 7 | **Disable local feature code services.**<br>`Enable Call Features = "No"` | Disable feature access codes controlled by the device. |
| Step 8 | **Enable BroadSoft mode.**<br>`Special Feature = "Broadsoft"` | Set the HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 in BroadSoft mode. |

## 6.2 Subscriber Level Configuration Parameters

This section identifies the device-specific parameters, including registration and authentication. These settings must be unique across devices in order to be matched with the settings for a BroadWorks subscriber.

Provisioning a subscriber to register with BroadWorks allows calls to terminate to the subscriber's line. Registration requires that a unique address of record (AoR) is provisioned on BroadWorks and the phone; provisioning an AoR on BroadWorks consists of setting the line/port parameter to a unique value within the Application Server cluster.

Grandstream HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 supports one SIP accounts (lines), two SIP accounts, one SIP account, two SIP accounts, two SIP accounts, and 1 SIP account, respectively. The follow example shows how to configure subscriber elements for an account.

| Step | Command | Purpose |
|------|---------|---------|
| **Subscriber Configuration Items** | | |
| Step 1 | **Set Register User ID for each line.**<br><br>Example:<br><br>`SIP User_ID = "2405551111" ;` | The register user ID must correspond with the line/port setting on BroadWorks. |
| Step 2 | **Enable SIP Authentication for each line.**<br><br>Example:<br><br>Authenticate ID = `"1111@as.mycompany.com" ;`<br><br>Authenticate Password = `"welcome" ;` | If the Authentication service is configured on BroadWorks, these parameters must be configured to match the BroadWorks settings. |
| Step 3 | **Configure display name for each line.**<br><br>**Example:**<br><br>`Name = "Claire Smith" ;` | For each line, configure the name to be displayed on the device. |

# 7    Enhanced IP Phone Configuration

Enhanced IP Phone Configuration is a BroadWorks feature that enables automatic generation of device configuration files, given administrator-supplied templates.

For more information on the Enhanced IP Phone Configuration feature, see the *Enhanced IP Phone Configuration Guide* [3].

The HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 uses only a phone-specific file to configure the device.  However, the Enhanced IP Phone Configuration feature requires a system and a phone-specific file for each device.  To satisfy the system file requirement, an empty file (*ataDefault.txt, bt100Desfult.txt)* will need to be uploaded to BroadWorks as the system file.  This file will be sent to the FTP server but will not actually be used for the configuration file generation.  The group template file is used to build the configuration files for the devices of this device type assigned to the group.  For a sample HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 group template file, see Appendix A.

NOTE:  BroadSoft does not manage or distribute template files for use with the Enhanced IP Phone Configuration feature.  Obtain template files from Grandstream or use the configuration files obtained from Grandstream for the specific Grandstream firmware release to create template files appropriate for your installation.

Since HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 require the configuration files be converted into a binary format, an extra step must be performed when using this feature.  After the configuration files have been sent to the TFTP server and before the phone is reset, the configuration files must be converted to binary format using Grandstream's configuration tool.  For detailed information on automated provisioning, please check the Grandstream configuration tool user guide [2].

## Appendix A: Sample HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 Configuration Files

> NOTE: The following samples are examples and should be used as a reference only. DO NOT CUT AND PASTE THESE EXAMPLES TO GENERATE YOUR CONFIGURATION FILES. Use the configuration files obtained from Grandstream with the specific release to generate your configuration files.

### System Default Parameters:

> NOTE: This is an example file and should be used for reference only.

```
# SIP Default Generic Configuration File

##################################################
# Account 1                                      #
# HT-286 / HT-486 / BT-100 supports Account 1 only #
##################################################

# SIP Server
P47 = as.broadworks.net

# Outbound Proxy
P48 = sbc.broadworks.net

# Use DNS SRV. 0 - no, 1 - yes.
P103 = 1

# SIP Registration. 0 - no, 1 - yes
P31 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P32 = 60

# Send DTMF. 8 - in audio, 1 - via RTP, 2 - via SIP INFO
# 11 - In Audio & RTP & SIP INFO, 9 - In Audio & RTP
# 10 - IN Audio & SIP INFO, 3 - RTP & SIP INFO
P73 = 1

# Enable Call Features. 0 - no, 1 - yes
P191 = 0

# Special Feature. 102 - BroadSoft
P198 = 102

##################################################
# Account 2                                      #
#                                                #
##################################################

# SIP Server
P747 = as.broadworks.net
```

```
# Outbound Proxy
P748 = sbc.broadworks.net

# Use DNS SRV. 0 - no, 1 - yes.
P702 = 1

# SIP Registration. 0 - no, 1 – yes
P731 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P732 = 60

# Send DTMF. 8 - in audio, 1 - via RTP, 2 - via SIP INFO
# 11 - In Audio & RTP & SIP INFO, 9 - In Audio & RTP
# 10 – IN Audio & SIP INFO, 3 – RTP & SIP INFO
P773 = 1

# Enable Call Features. 0 – no, 1 – yes
P751 = 0

# Special Feature. 102 – BroadSoft
P767 = 102
```

**Phone-Specific Parameters:**

NOTE: This is an example file and should be used for reference only.

```
# SIP Device-specific Configuration File

####################################################
# Account 1                                        #
# HT-286 / HT-486 / BT-100 supports Account 1 only #
####################################################

# SIP User ID
P35 = 2405551111

# Authenticate ID
P36 = 1111@as.mycompany.com

# Authenticate password
P34 = welcome

# Display Name
P3 = Claire Smith

####################################################
# Account 2                                        #
#                                                  #
####################################################

# SIP User ID
P735 =

# Authenticate ID
P736 =
```

```
# Authenticate Password
P734 =

# Display Name
P703 =
```

## Group Template File:  ATA-GroupTemplate.txt /BT100- GroupTemplate.txt

NOTE:  This is an example file and should be used for reference only.

```
###################################################
# SIP Default Generic Configuration Parameters    #
###################################################


###################################################
# Account 1                                       #
# HT-286 / HT-486 / BT-100 supports Account 1 only #
###################################################

# SIP Server
P47 = as.broadworks.net

# Outbound Proxy
P48 = sbc.broadworks.net

# Use DNS SRV. 0 - no, 1 - yes.
P103 = 1

# SIP Registration. 0 - no, 1 - yes
P31 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P32 = 60

# Send DTMF. 8 - in audio, 1 - via RTP, 2 - via SIP INFO
# 11 - In Audio & RTP & SIP INFO, 9 - In Audio & RTP
# 10 - IN Audio & SIP INFO, 3 - RTP & SIP INFO
P73 = 1

# Enable Call Features. 0 - no, 1 - yes
P191 = 0

# Special Feature. 102 - BroadSoft
P198 = 102

###################################################
# Account 2                                       #
#                                                 #
###################################################

# SIP Server
P747 = as.broadworks.net

# Outbound Proxy
```

```
P748 = sbc.broadworks.net

# Use DNS SRV. 0 - no, 1 - yes.
P702 = 1

# SIP Registration. 0 - no, 1 - yes
P731 = 1

# Register Expiration (in minutes. default 1 hour, max 45 days)
P732 = 60

# Send DTMF. 8 - in audio, 1 - via RTP, 2 - via SIP INFO
# 11 - In Audio & RTP & SIP INFO, 9 - In Audio & RTP
# 10 - IN Audio & SIP INFO, 3 - RTP & SIP INFO
P773 = 1

# Enable Call Features. 0 - no, 1 - yes
P751 = 0

# Special Feature. 102 - BroadSoft
P767 = 102

####################################################
# SIP Device-specific Configuration Parameters     #
####################################################

####################################################
# Account 1                                        #
# HT-286 / HT-486 / BT-100 supports Account 1 only #
####################################################

# SIP User ID
P35 = %BWLINEPORT-1%

# Authenticate ID
P36 = %BWAUTHUSER-1%

# Authenticate password
P34 = %BWAUTHPASSWORD-1%

# Display Name (John Doe)
P3 = %BWCLID-1%

####################################################
# Account 2                                        #
#                                                  #
####################################################

# SIP User ID
P735 = %BWLINEPORT-2%

# Authenticate ID
P736 = %BWAUTHUSER-2%

# Authenticate Password
P734 = %BWAUTHPASSWORD-2%

# Display Name (John Doe)
P703 = %BWCLID-2%
```

## 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 Origination / Termination |
| | Call Failure Codes |
| | Session Audit |
| | Ringback |
| | Dial Plan |
| | Inband DTMF |
| | RFC 2833/Negotiation |
| | DTMF Relay |
| | Codec Renegotiation |
| BroadWorks Enhanced Services | Basic CommPilot Call Manager Functions |
| | Voice Messaging Audio MWI |
| | Voice Messaging Visual MWI |
| | Ring Splash |
| | Priority Alerting |
| | Priority Call Waiting |
| | Alternate Numbers |
| | Advanced Call Control |
| | Anonymous Call |
| | Remote Restart |
| | Call Park Retrieve – Answer with Hold |
| DUT Services – Call Control | Call Waiting |
| | Call Hold |
| | Blind Transfer |
| | Attended Transfer |
| | 3-Way Call |
| | Network Conference 3-Way |
| | Network Conference N-Way |
| DUT Services – Registration and Authentication | Authenticated Registration |
| | Maximum Registration |
| | Minimum Registration |
| | Rejected Registration |
| | Authenticated Origination |
| | Authenticated Re-INVITE |
| | Authenticated REFER |
| | BroadWorks Authentication |

| BroadWorks Validation Package | Items Supported |
|---|---|
| DUT Services - FAX | FAX Passthrough<br>FAX T38 |
| DUT Services – Busy Lamp Field | Basic BLF |
| Redundancy | DNS<br>Registration Failover<br>Call Setup Failover<br>Mid-Call Failover |
| SBC/ALG | Registration<br>Call Origination<br>Call Termination |
| Shared Call Appearance | Line Seize<br>Line Lamp Management<br>Line Hold/Retrieve<br>Multiple Call Arrangement<br>SCA Bridging |
| Feature Key Synchronization | Feature Key Synchronization |
| Video | Integrated Video Phone<br>Video Services<br>Video Add-On |
| TCP | Basic |

## References

[1]  Grandstream Networks, Inc. 2007. HT-286 / HT-386 / HT-486 / HT-488 / HT-496 / BT-100 User Manual.  Download at:

http://www.grandstream.com/user_manuals/

AND GUI Interfaces:

http://www.grandstream.com/user_manuals/GUI/.

[2]  Grandstream Networks, Inc. 2007.  Grandstream Configuration Tool and Templates.  Available from http://www.grandstream.com/configurationtool.html.

[3]  BroadSoft, Inc.  2006.  *BroadWorks Enhanced IP Phone Configuration Guide,* Release 14.0.  Available from BroadSoft at www.broadsoft.com/boulevard.

[4]  BroadSoft, Inc.  2006.  *BroadWorks Device Inventory Guide*, Release 14.0.  Available from BroadSoft at www.broadsoft.com/boulevard.

[5]  BroadSoft, Inc.  2006.  *BroadWorks Redundancy Guide,* Release 14.0.  Available from BroadSoft at www.broadsoft.com/boulevard.