# BroadSoft Partner Configuration Guide

## Sonus Networks, Inc. SBC 1000 / SBC 2000

September 2014

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9737 Washingtonian Boulevard, Suite 350
Gaithersburg, MD USA 20878
Tel +1 301.977.9440

**WWW.BROADSOFT.COM**

# BroadWorks® Guide

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## Document Revision History

| Version | Reason for Change |
|---|---|
| 1.0 | Example: Introduced document for SONUS SBC 1000 / SONUS SBC 2000 version 4.1.0 validation with BroadWorks Release 20.sp1. |
| | |
| | |



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# 1 Overview

This guide describes the configuration procedures required for the SONUS SBC 1000 / SONUS SBC 2000 for interoperability with BroadWorks.

The SONUS SBC 1000 / SONUS SBC 2000 is an Enterprise SBC with Analog and Digital Interfaces that uses the Session Initiation Protocol (SIP) to communicate with BroadWorks for call control.

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 SONUS SBC 1000 / SONUS SBC 2000. For those details, see the Refer to the SBC 4.0 User's Guide **Error! Reference source not found.** supplied by Sonus Network, Inc.



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# 2 Interoperability Status

This section provides the known interoperability status of the SONUS SBC 1000 / SONUS SBC 2000 with BroadWorks. This includes the version(s) tested, the capabilities supported, and known issues.

Interoperability testing validates that the device interfaces properly with BroadWorks via the SIP interface. Qualitative aspects of the device or device capabilities not affecting the SIP interface such as display features, performance, and audio qualities are not covered by interoperability testing. Requests for information and/or issues regarding these aspects should be directed to SONUS.

## 2.1 Verified Versions

The following table identifies the verified SONUS SBC 1000 / SONUS SBC 2000 and BroadWorks versions and the month/year the testing occurred. If the device has undergone more than one test cycle, versions for each test cycle are listed, with the most recent listed first.

*Compatible Versions* in the following table identify specific SONUS SBC 1000 / SONUS SBC 2000 versions, which the partner has identified as compatible and they should interface properly with BroadWorks. Generally, maintenance releases of the validated version are considered compatible and may not be specifically listed here. For any questions concerning maintenance and compatible releases, contact <partner name>.

**NOTE**: Interoperability testing is usually performed with the latest generally available (GA) device firmware/software and the latest GA BroadWorks release and service pack at the time the testing occurs. If there is a need to use a non-verified mix of BroadWorks and device software versions, customers can mitigate their risk by self-testing the combination themselves using the *BroadWorks SIP Access Device Interoperability Test Plan* [5].

**Verified Versions**

| Date (mm/yyyy) | BroadWorks Release | SONUS SBC 1000 / SONUS SBC 2000 Verified Version | SONUS SBC 1000 / SONUS SBC 2000 Compatible Versions |
|---|---|---|---|
| 09/2014 | Release R20.0 | Release 4.1.0 b15 | N/A |
| | | | |
| | | | |

## 2.2 Interface Capabilities Supported

This section identifies interface capabilities that have been verified through testing as supported by SONUS SBC 1000 / SONUS SBC 2000.

The *Supported* column in the tables in this section identifies the SONUS SBC 1000 / SONUS SBC 2000's support for each of the items covered in the test plan, with the following designations:

- Yes Test item is supported.



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- No Test item is not supported.
- NA Test item is not applicable to the device type.
- NT Test item was not tested.

Caveats and clarifications are identified in the *Comments* column.

### 2.2.1 SIP Interface Capabilities

The Sonus Networks, Inc. SONUS SBC 1000 / SONUS SBC 2000 has completed interoperability testing with BroadWorks using the *BroadWorks SIP Access Device Interoperability Test Plan* [5]. The results are summarized in the following table.

The BroadWorks test plan is composed of packages, each covering distinct interoperability areas, such as "Basic" call scenarios and "Redundancy" scenarios. Each package is composed of one or more test items, which in turn, are composed of one or more test cases. The test plan exercises the SIP interface between the device and BroadWorks with the intent to ensure interoperability sufficient to support the BroadWorks feature set.

**NOTE**: *DUT* in the following table refers to the *Device Under Test,* which in this case is the Sonus Networks, Inc. SONUS SBC 1000 / SONUS SBC 2000.

**BroadWorks SIP Access Device Interoperability Test Plan Support Table**

| Test Plan Package | Test Plan Package Items | Supported | Comments |
|---|---|---|---|
| **Basic** | Call Origination | Yes | |
| | Call Termination | Yes | |
| | Session Audit | Yes | |
| | Session Timer | Yes | |
| | Ringback | Yes | |
| | Forked Dialog | Yes | |
| | Early UPDATE | Yes | No support for sending early update. |
| | Early-Session | No | |
| | 181 Call Being Forwarded | Yes | |
| | Dial Plan | Yes | |
| | DTMF – Inband | Yes | |
| | DTMF – RFC 2833 | Yes | |
| | DTMF – DTMF Relay | No | |
| | Codec Negotiation | Yes | |
| | Codec Renegotiation | Yes | |
| **BroadWorks Services** | Third-Party Call Control – Basic | Yes | |
| | Voice Message Deposit and Retrieval | Yes | |
| | Message Waiting Indicator | No | |
| | Voice Portal Outcall | Yes | |
| | Advanced Alerting - Ringing | No | |
| | Advanced Alerting – Call Waiting | No | |
| | Advanced Alerting – Ring Splash | No | |
| | Calling Line ID | Yes | |
| | Calling Line ID with Unicode Characters | No | |
| | Connected Line ID | No | |
| | Connected Line ID with Unicode Characters | No | |
| | Connected Line ID on UPDATE | No | |



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| | | | |
|---|---|---|---|
| | Connected Line ID on Re-INVITE | No | |
| | Diversion Header | Yes | |
| | History-Info Header | No | |
| | Advice of Charge | No | |
| | Meet-Me Conferencing | Yes | |
| | Meet-Me Conferencing – G722 | No | |
| | Meet-Me Conferencing – AMR-WB | No | |
| **DUT Services – Call Control Services** | Call Waiting | Yes | |
| | Call Hold | Yes | |
| | Call Transfer | No | |
| | Three-Way Calling | No | |
| | Network-Based Conference | No | |
| **DUT Services – Registration and Authentication** | Register Authentication | No | |
| | Maximum Registration | No | |
| | Minimum Registration | No | |
| | Invite Authentication | No | |
| | Re-Invite/Update Authentication | No | |
| | Refer Authentication | No | |
| | Device Authenticating BroadWorks | No | |
| **DUT Services – Fax** | G711 Fax Passthrough | Yes | |
| | G711 Fax Fallback | Yes | |
| | T38 Fax Messaging | Yes | |
| **DUT Services – Emergency Call** | Emergency Call | No | |
| | Emergency Call with Ringback | No | |
| **DUT Services – Miscellaneous** | Do Not Disturb | No | |
| | Call Forwarding Always | No | |
| | Call Forwarding Always Diversion Inhibitor | No | |
| | Anonymous Call | No | |
| | Anonymous Call Block | No | |
| | Remote Restart Via Notify | No | |
| **Redundancy** | DNS SRV Lookup | No | |
| | Register Failover/Failback | No | |
| | Invite Failover/Failback | No | |
| | Bye Failover | No | |
| **Session Border Controller (SBC)/Application Layer Gateway (ALG)** | Register | Yes | |
| | Outgoing Invite | Yes | |
| | Incoming Invite | Yes | |
| **TCP** | Register | Yes | |
| | Outgoing Invite | Yes | |
| | Incoming Invite | Yes | |
| **IPV6** | Call Origination | No | |
| | Call Termination | No | |
| | Session Audit | No | |
| | Ringback | No | |
| | Codec Negotiation/Renegotiation | No | |
| | Voice Message Deposit/Retrieval | No | |
| | Call Control | No | |
| | Registration with Authentication | No | |
| | T38 Fax Messaging | No | |
| | Redundancy | No | |
| | SBC | No | |
| | Dual Stack with Alternate Connectivity | No | |



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## 2.3 Known Issues

This section lists the known interoperability issues between BroadWorks and specific partner release(s). Issues identified during interoperability testing and known issues identified in the field are listed.

The following table provides a description of each issue and, where possible, identifies a workaround. The verified partner device versions are listed with an "X" indicating that the issue occurs in the specific release. The issues identified are device deficiencies or bugs, and are typically not BroadWorks release dependent.

If the testing was performed by BroadSoft, then the *Issue Number* is a BroadSoft ExtraView partner issue number. If the testing was performed by the partner or a third party, then the partner may or may not supply a tracking number.

For more information on any issues related to the particular partner device release, see the partner release notes.

| Issue Number | Issue Description | Partner Version | | | |
|---|---|---|---|---|---|
| | | 4.1.0 | | | |
| ----- | None | | | | |
| | | | | | |



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# 3 BroadWorks Configuration

This section identifies the required BroadWorks device profile type for the SONUS SBC 1000 / SONUS SBC 2000 as well as any other unique BroadWorks configuration required for interoperability with the SONUS SBC 1000 / SONUS SBC 2000 .

## 3.1 BroadWorks Device Profile Type Configuration

This section identifies the device profile type settings to use when deploying the SONUS SBC 1000 / SONUS SBC 2000 with BroadWorks.

Create a device profile type for the SONUS SBC 1000 / SONUS SBC 2000 as shown in the following example. A separate device profile type should be created for each SONUS SBC 1000 / SONUS SBC 2000 model. The settings shown are recommended for use when deploying the SONUS SBC 1000 / SONUS SBC 2000 with BroadWorks. For an explanation of the profile parameters, see the *BroadWorks Device Management Configuration Guide* [1].

The device profile type shown below provides the *Number of Ports* (number of SIP lines) setting for SONUS SBC 1000 / SONUS SBC 2000. For other SONUS SBC 1000 / SONUS SBC 2000 models, create a new device profile type and set the *Number of Ports* to match the available number of SIP lines per model according to the table below.

| Model | Number of Lines |
|---|---|
| SONUS SBC 1000 | 24 |
| SONUS SBC 2000 | 48 |



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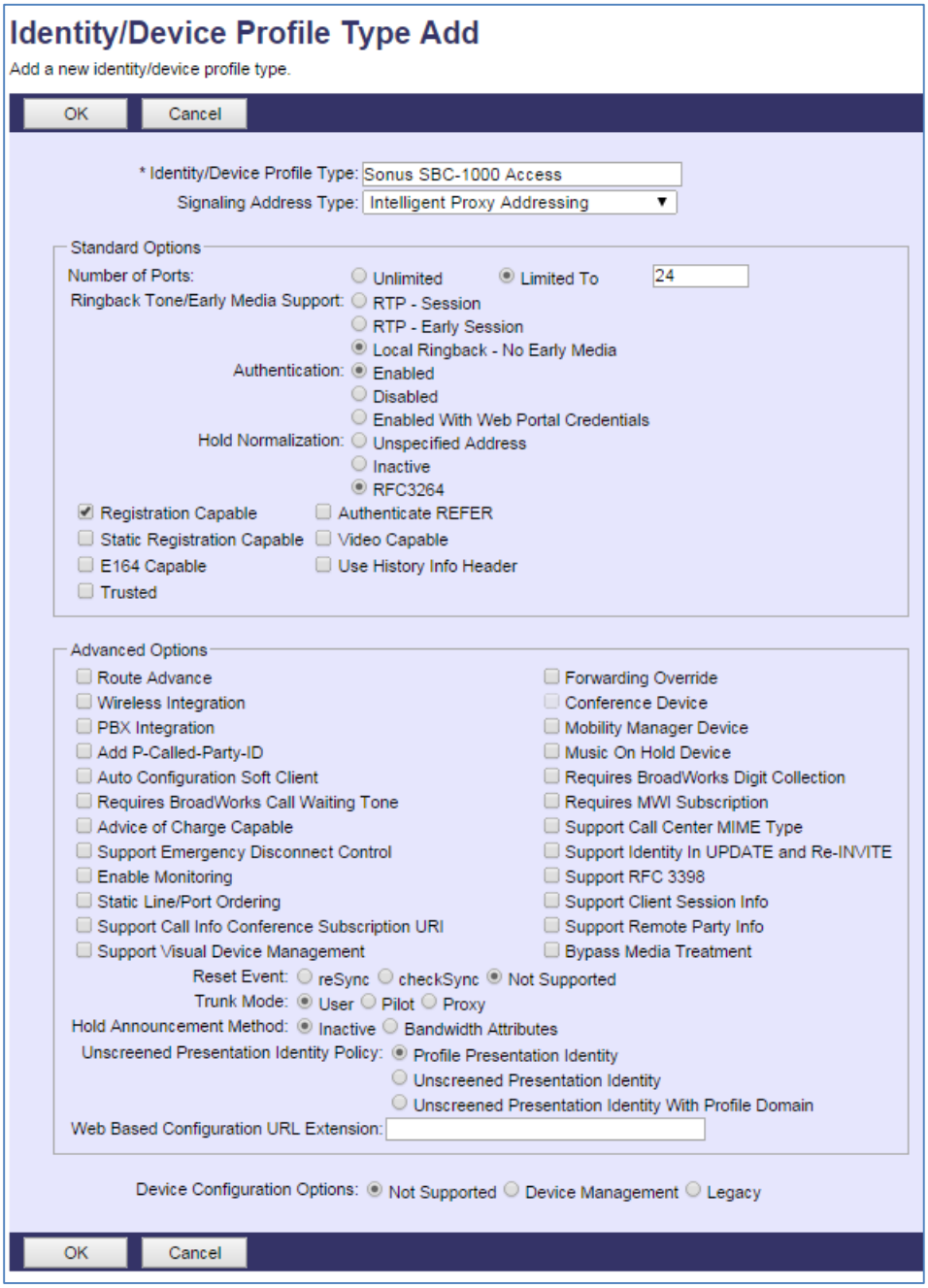


## 3.2 BroadWorks Configuration Steps

There are no additional BroadWorks configurations needed.



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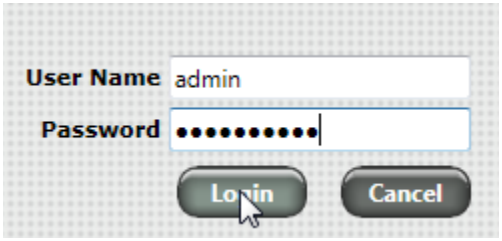
# 4 SONUS SBC 1000 / SONUS SBC 2000 Configuration

This section describes the configuration settings required for the SONUS SBC 1000 / SONUS SBC 2000 integration with BroadWorks, primarily focusing on the SIP interface configuration. The SONUS SBC 1000 / SONUS SBC 2000 configuration settings identified in this section have been derived and verified through interoperability testing with BroadWorks. Refer to the Refer to the SBC 4.0 User's Guide **Error! Reference source not found.** for SONUS SBC 1000 / SONUS SBC 2000 configuration details not covered in this section.

## 4.1 Configuration Method

Out of the box, the Sonus SONUS SBC 1000/2000 is configured primarily using a web browser via a web interface hosted on the Sonus SONUS SBC 1000/2000 system.



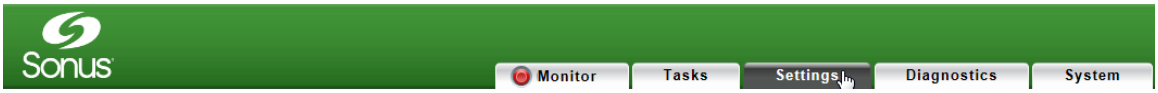

The WebUI provides a full range of configuration options to end-users. To list a few, the ability to configure IP interfaces, setting the telephony ports, configuring routes and digit manipulation, and managing Users and Groups.

## 4.2 System Level Configuration

This section describes system-wide configuration items that are generally required for each SONUS SBC 1000 / SONUS SBC 2000 to work with BroadWorks. Subscriber-specific settings are described in the next section.

### 4.2.1 Configuration Settings

The Tabs across the top of the Sonus SBC WebUI permit the user to access various configuration subsystems. Within this document, all configurations will be performed under the SETTINGS tab.



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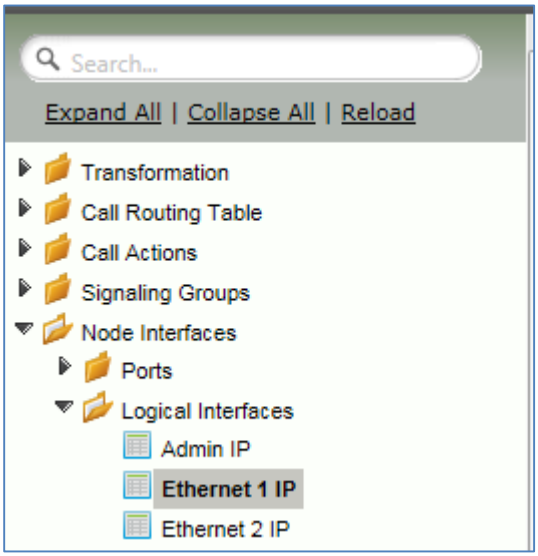
### 4.2.2 Configure Network Settings

Configure the SBC's basic network connectivity items to permit the SBC to interoperate with the Broadsoft Server as well as Enterprise network.

- In the Navigation tree, click on *Ethernet 1 IP*



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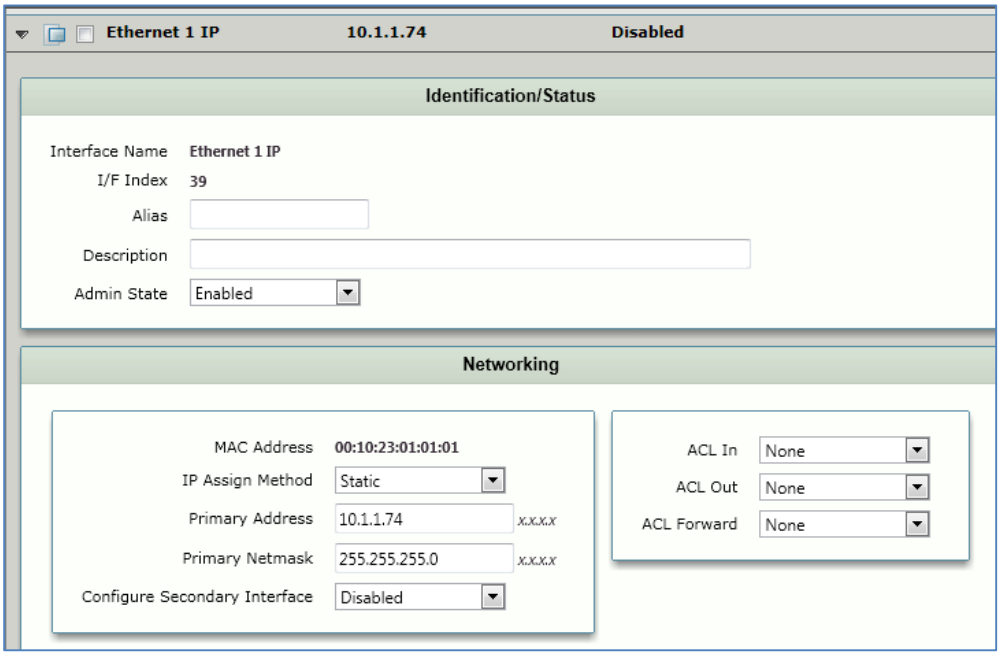
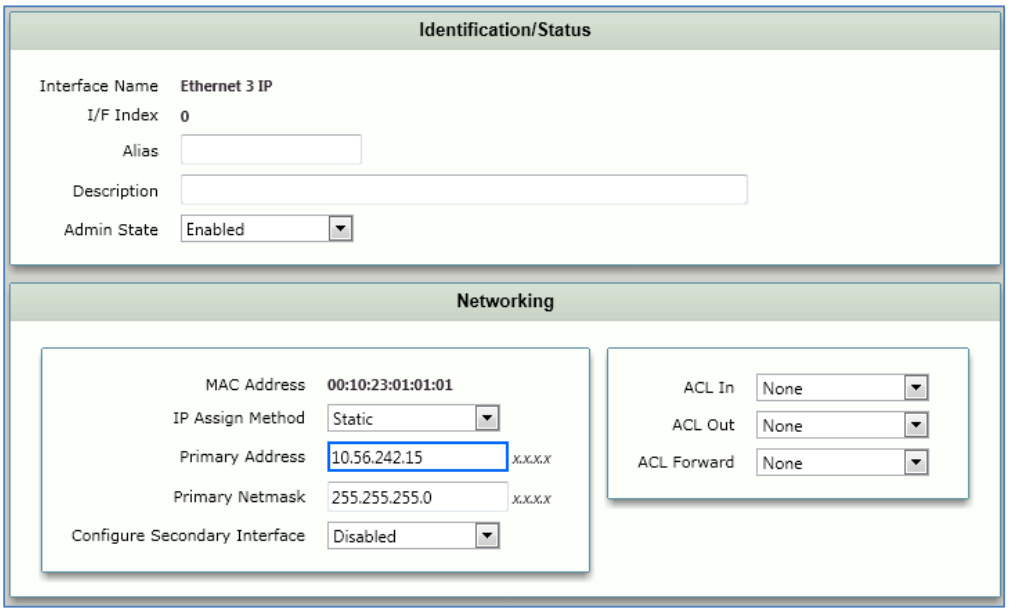
- Configure the Ethernet IP 1 port as necessary to connect to the Broadsoft server.




- Configure an additional Ethernet Port for connection to the Enterprise LAN.



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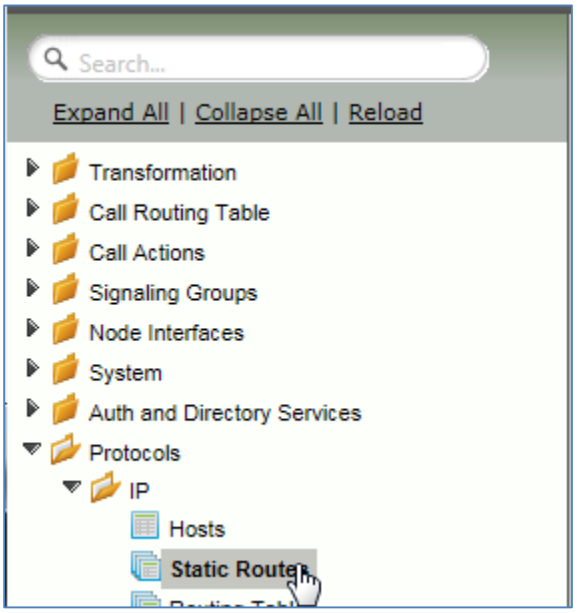
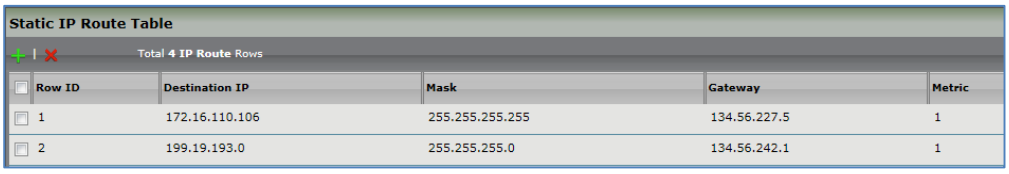
- In the Navigation Tree, click on *Static Routes*




- Configure any IP routes required to provide connectivity between the SBC and the Broadsoft server, as well as any IP routes required to provide connectivity to the Enterprise LAN.




| Row ID | Destination IP | Mask | Gateway | Metric |
|---|---|---|---|---|
| 1 | 172.16.110.106 | 255.255.255.255 | 134.56.227.5 | 1 |
| 2 | 199.19.193.0 | 255.255.255.0 | 134.56.242.1 | 1 |



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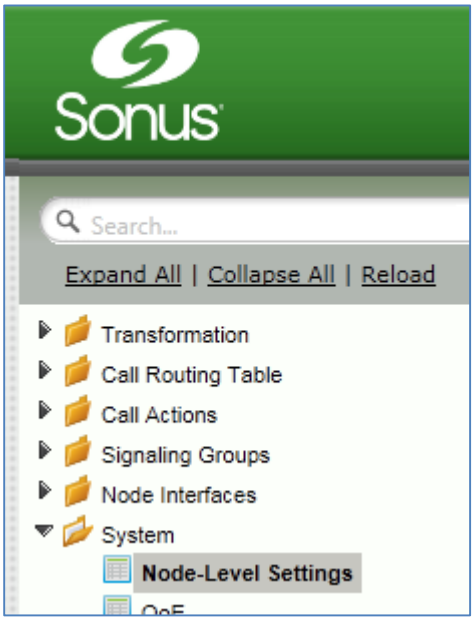
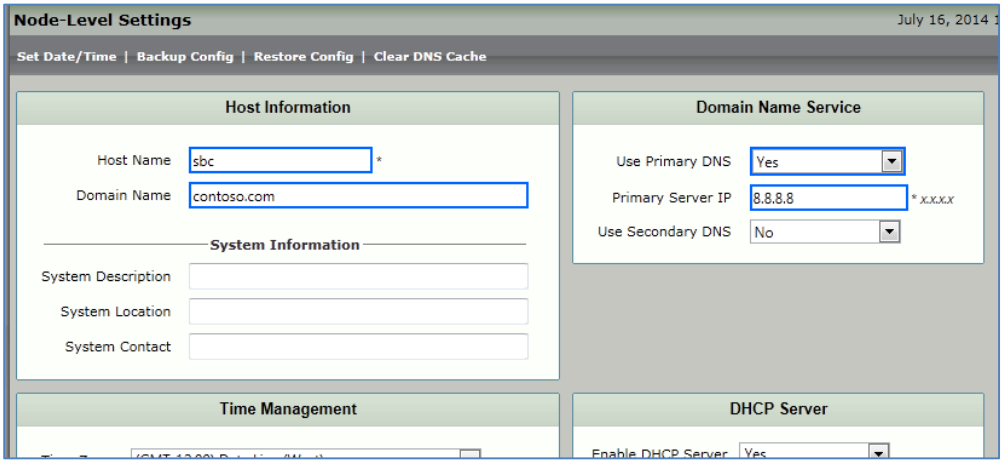
- In the Navigation Tree, click on *System* | *Node-Level Settings*




Verify or add the following information to the Node-Level Settings:

- Ensure the SBC has a configured Host Name
- Ensure the SBC has a configured Domain Name
- Ensure Primary DNS Server IP is set to an appropriate DNS server
- Click Apply




#### 4.2.2.1 Configure IPV6 Settings

*Not Supported.*



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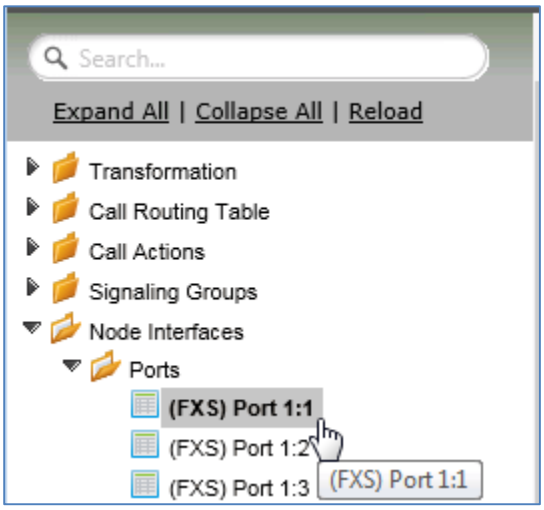
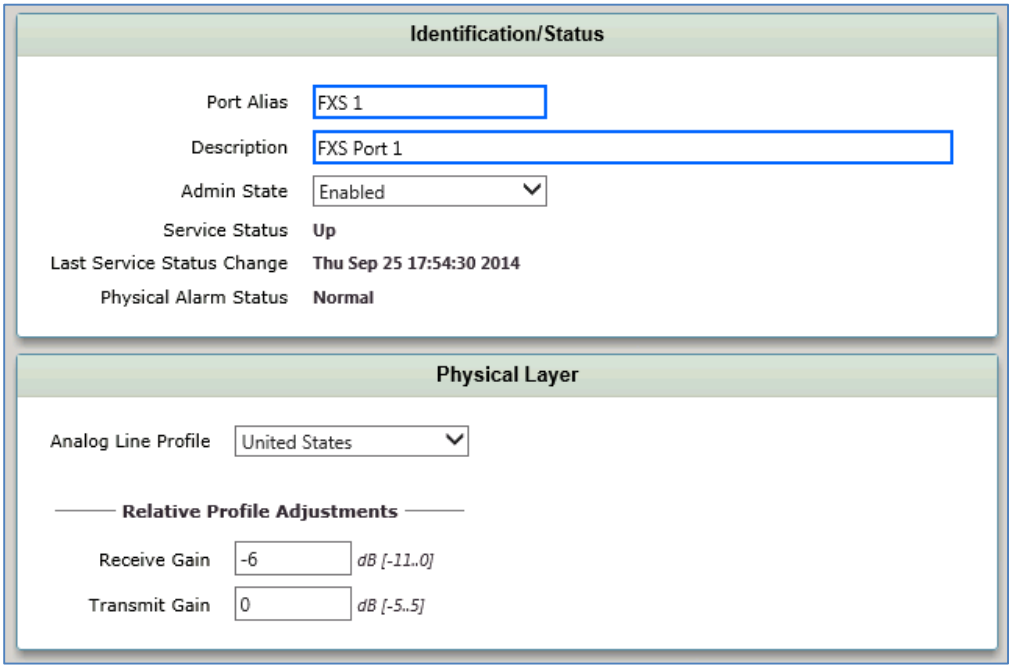
### 4.2.3 Configure an FXS Port

Create an *FXS Port* as noted below.

- In the Navigation Tree, click on *Settings Tab* | *Node Interfaces* | *Ports* | *FXS Port*




- Set the FXS Port as shown below and click *Apply*



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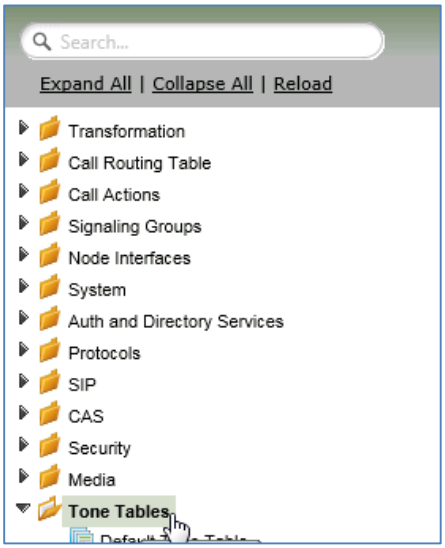
### 4.2.4 Configure a FXS Tone Table

Tone tables allow the Sonus SONUS SBC 1000/2000 Administrator to customize the tones a user hears when placing a call. You can modify the tone to match your local PSTN or PBX. The default tone table is configured for the values used in the United States for the following categories: Ringback, Dial, Busy, Congestion, Call Waiting, Disconnect, and Confirmation.

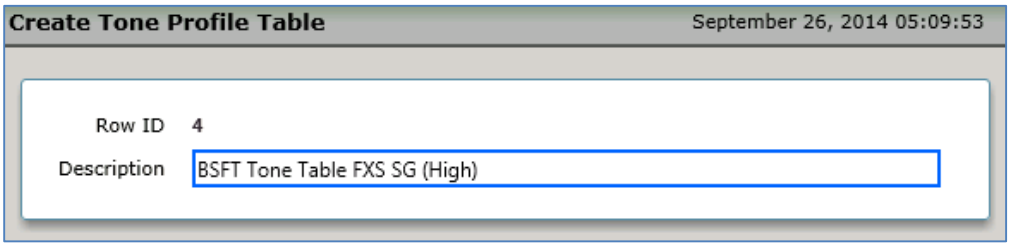
- In the Navigation tree, click on Tone Table




Add a Tone Profile Table:

- Click the + to add a Tone Table

- Type of name of the Table




- Click OK



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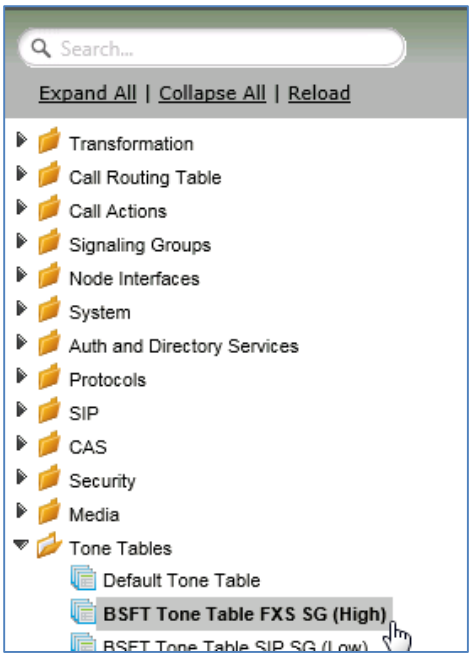
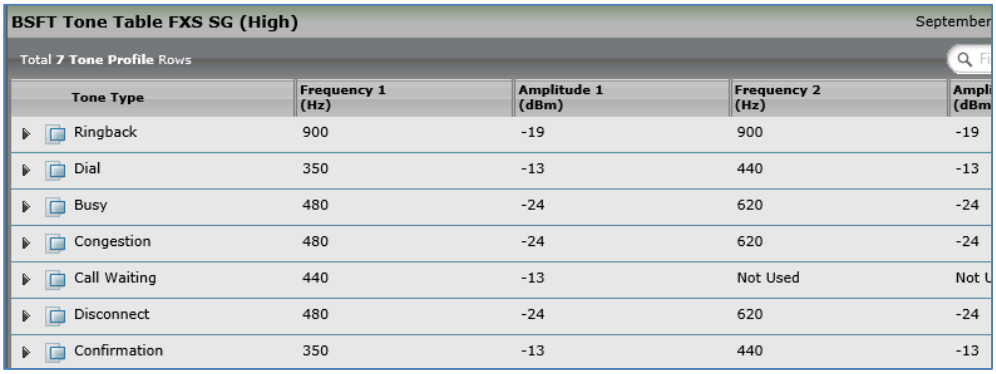
- In the Navigation tree, click on the name of the new Tone Table that you just added




- Set each Tone Table entry as noted below



**BSFT Tone Table FXS SG (High)** September

Total **7 Tone Profile** Rows

| Tone Type | Frequency 1 (Hz) | Amplitude 1 (dBm) | Frequency 2 (Hz) | Ampli (dBm |
|---|---|---|---|---|
| Ringback | 900 | -19 | 900 | -19 |
| Dial | 350 | -13 | 440 | -13 |
| Busy | 480 | -24 | 620 | -24 |
| Congestion | 480 | -24 | 620 | -24 |
| Call Waiting | 440 | -13 | Not Used | Not U |
| Disconnect | 480 | -24 | 620 | -24 |
| Confirmation | 350 | -13 | 440 | -13 |



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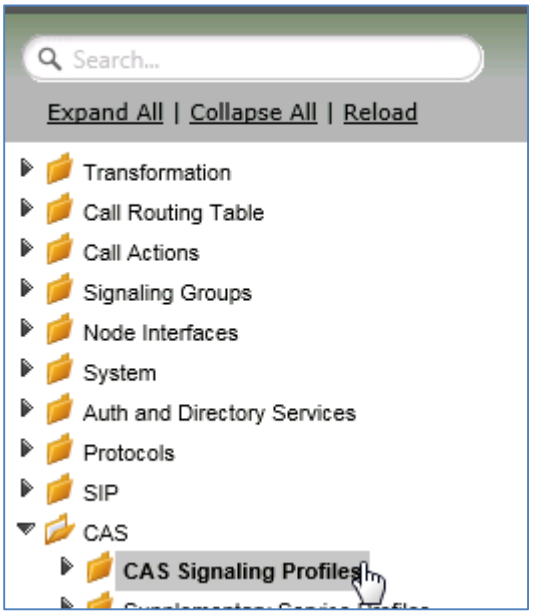
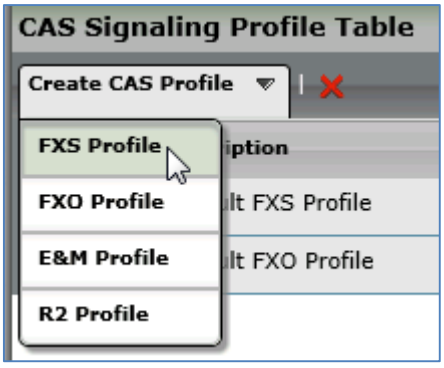
### 4.2.5 Configure a CAS Signaling Profile

- In the Navigation tree, click on *CAS Signaling Profile*




- From the *Create CAS Profile* pulldown, select *FXS Profile*

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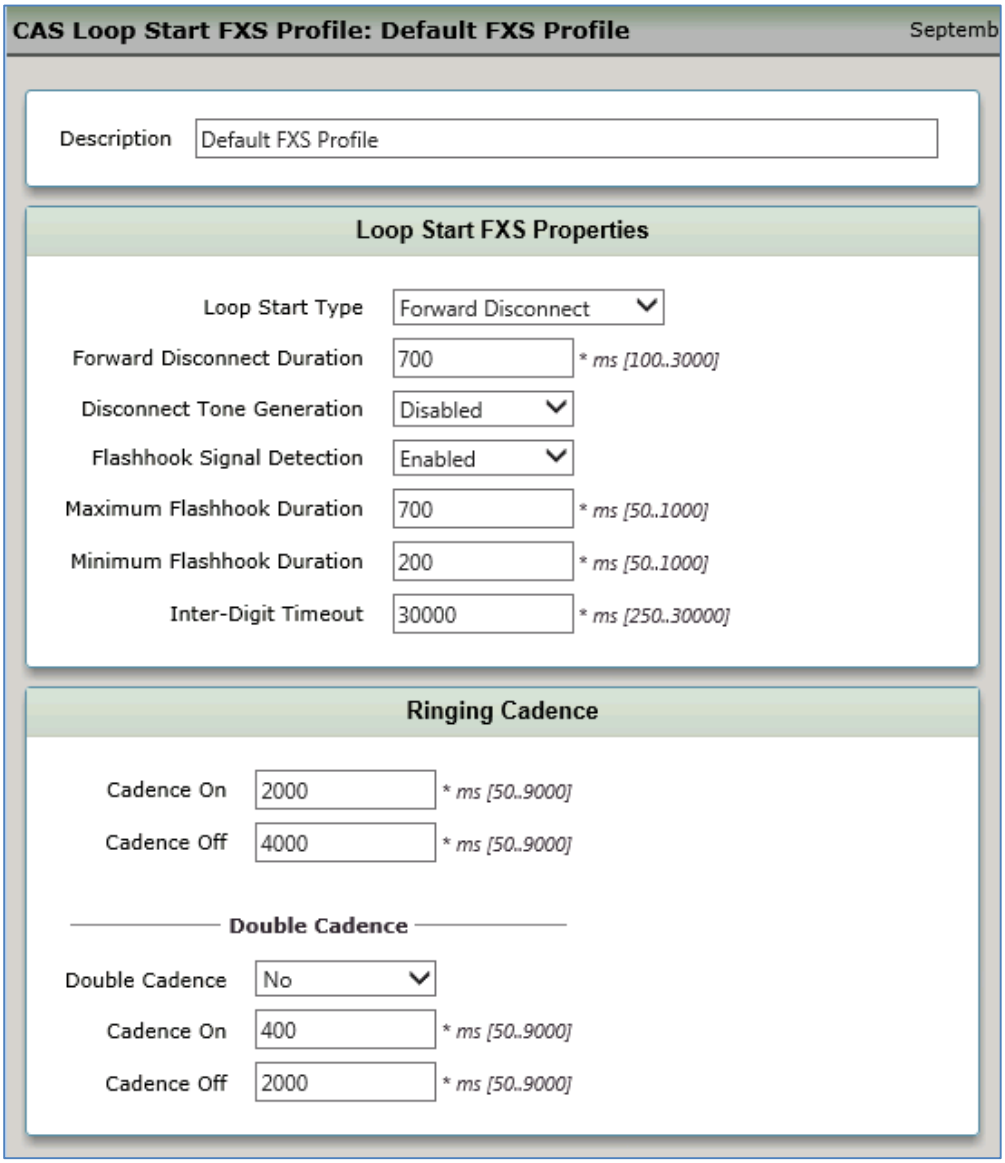
Enter the CAS Profile information as noted below. Click OK.



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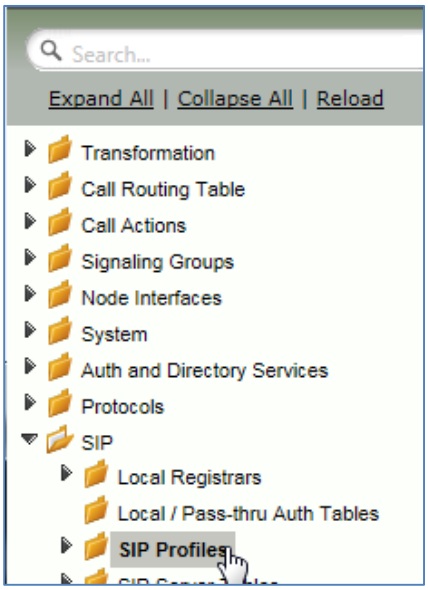
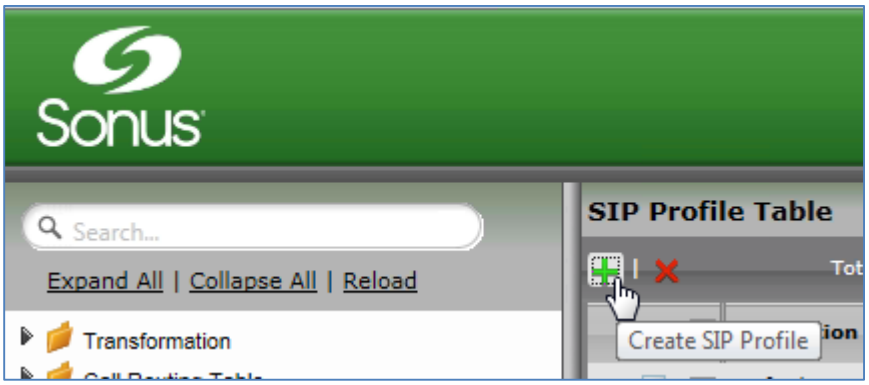
### 4.2.6 Configure SIP Interface Settings for Broadworks

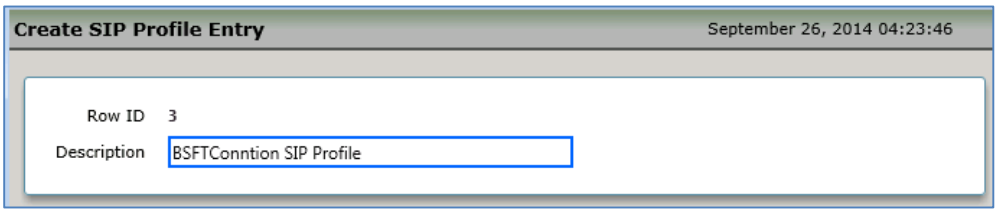
Create the *Broadworks SIP Profile* as noted below.

- In the Navigation Tree, click on *SIP Profiles*




- Create a SIP Profile by clicking +.



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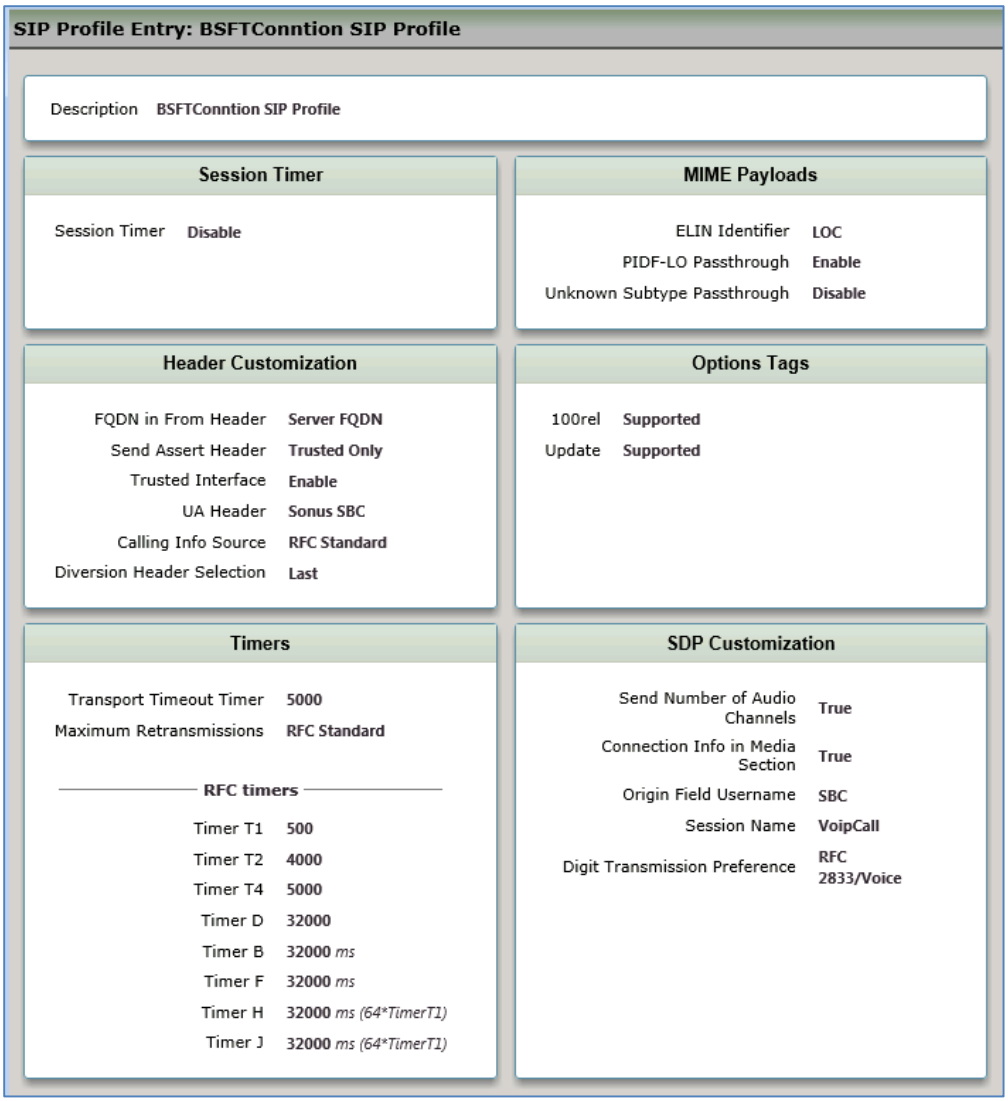
- Configure the SIP Profile as noted below to permit proper connectivity to the Broadsoft Server.



**SIP Profile Entry: BSFTConntion SIP Profile**

Description **BSFTConntion SIP Profile**

**Session Timer**

| | |
|---|---|
| Session Timer | **Disable** |

**MIME Payloads**

| | |
|---|---|
| ELIN Identifier | **LOC** |
| PIDF-LO Passthrough | **Enable** |
| Unknown Subtype Passthrough | **Disable** |

**Header Customization**

| | |
|---|---|
| FQDN in From Header | **Server FQDN** |
| Send Assert Header | **Trusted Only** |
| Trusted Interface | **Enable** |
| UA Header | **Sonus SBC** |
| Calling Info Source | **RFC Standard** |
| Diversion Header Selection | **Last** |

**Options Tags**

| | |
|---|---|
| 100rel | **Supported** |
| Update | **Supported** |

**Timers**

| | |
|---|---|
| Transport Timeout Timer | **5000** |
| Maximum Retransmissions | **RFC Standard** |

**RFC timers**

| | |
|---|---|
| Timer T1 | **500** |
| Timer T2 | **4000** |
| Timer T4 | **5000** |
| Timer D | **32000** |
| Timer B | **32000** *ms* |
| Timer F | **32000** *ms* |
| Timer H | **32000** *ms (64*TimerT1)* |
| Timer J | **32000** *ms (64*TimerT1)* |

**SDP Customization**

| | |
|---|---|
| Send Number of Audio Channels | **True** |
| Connection Info in Media Section | **True** |
| Origin Field Username | **SBC** |
| Session Name | **VoipCall** |
| Digit Transmission Preference | **RFC 2833/Voice** |



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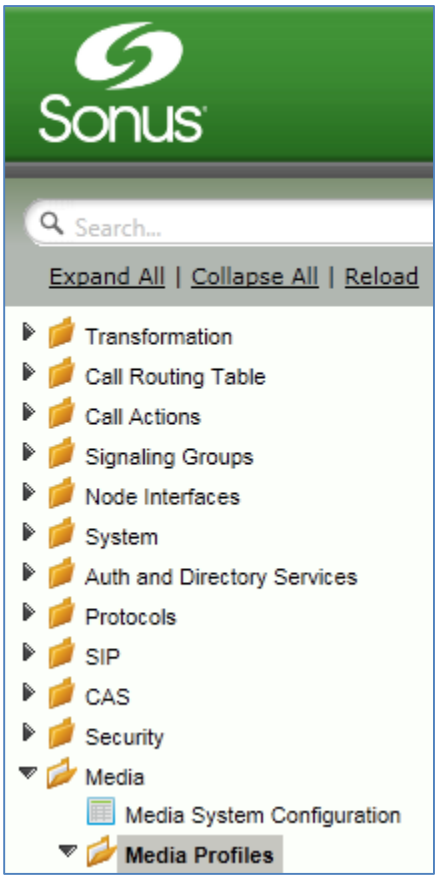
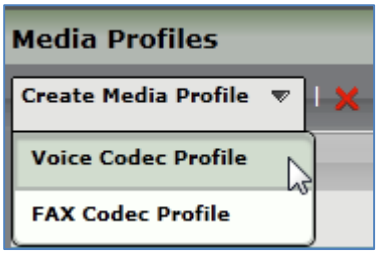
### 4.2.7 Configure Media Settings

Media Profiles allow you to specify the individual voice and fax compression codecs and their associated settings, for inclusion in a Media List. Different codecs provide varying levels of compression, allowing one to reduce bandwidth requirements at the expense of voice quality.

- In the Navigation Tree, click on *Media Profiles*.




- Create a *Voice Codec Profile*.



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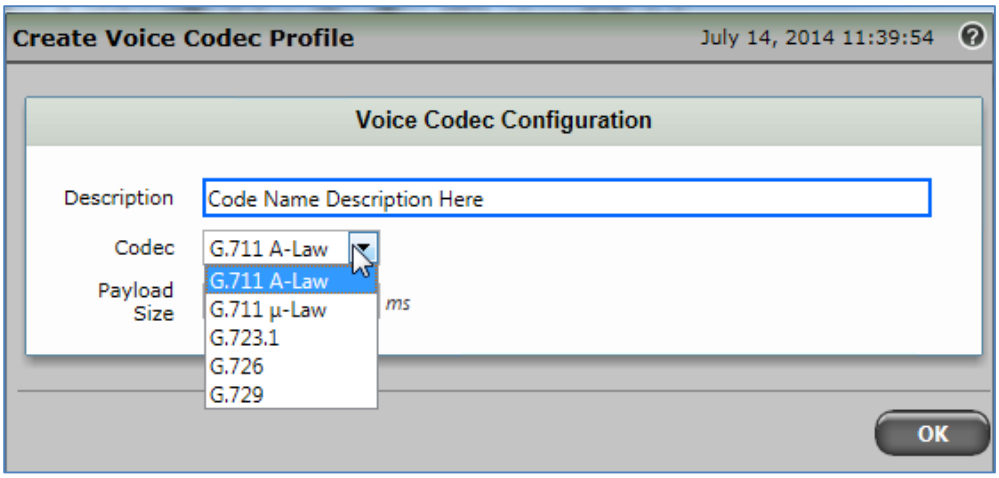
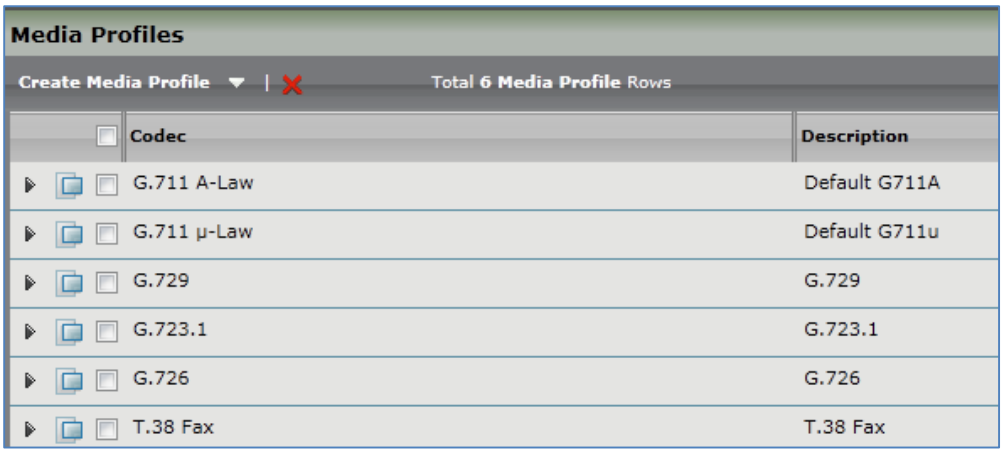
- Add any codecs required for your configuration Broadworks or Enterprise applications. Repeat these steps until all the desired codecs are added.




- When completed, your codec configuration will list all the codecs you've created.



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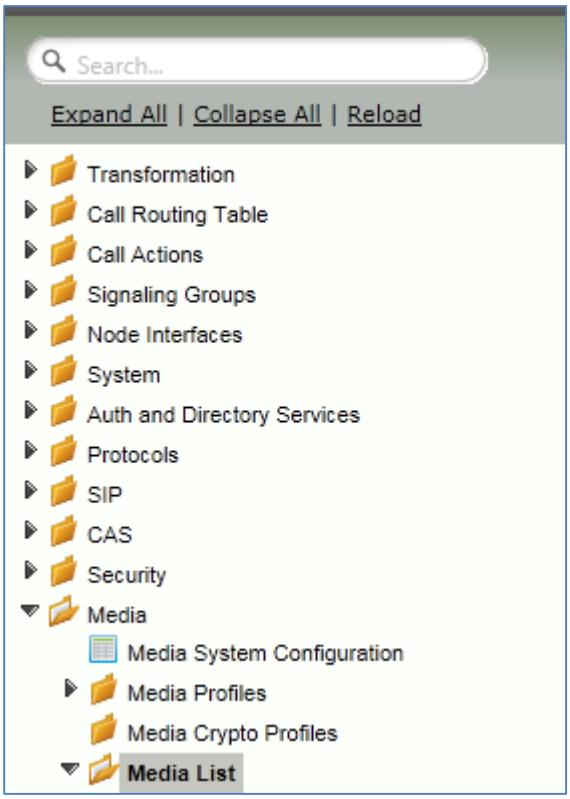
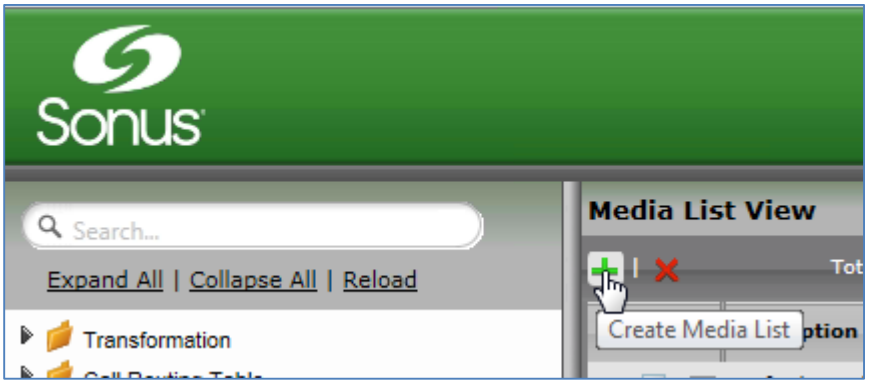
### 4.2.8 Configure Media Lists

Media Lists allow you to specify a set of codecs and fax profiles that are allowed on a given SIP Signaling Group. They contain one or more Media Profiles, which must first be defined in Media Profiles. These lists allow you to accommodate specific transmission requirements, and SIP devices that only implement a subset of the available voice codecs.

- In the Navigation Tree, click on *Media List*




- Create a Media List for the Broadsoft application



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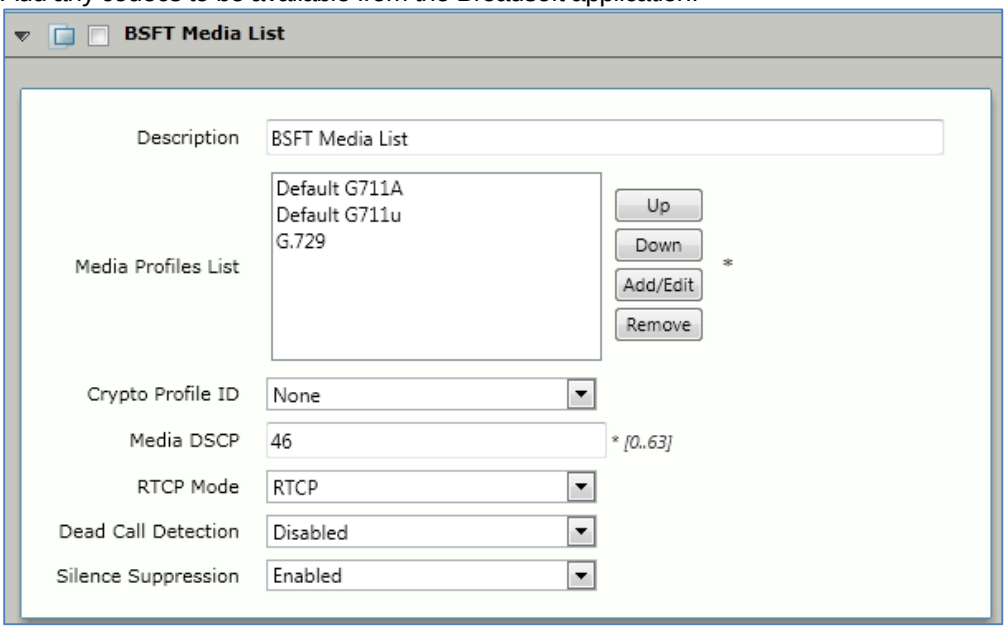
- Add any codecs to be available from the Broadsoft application.




***NOTE: You will need to repeat the steps above to create another Media List for the Enterprise network if the codec list for Enterprise devices is different than those you added to the Media List above.***



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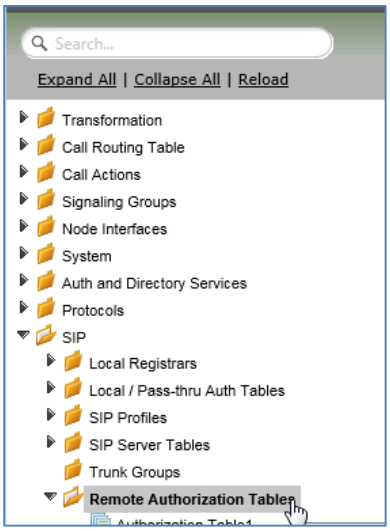
### 4.2.9 Configure a Remote Authorization Table

Remote Authorization Tables and their entries contain information used to respond to request message challenges by an upstream server. The Remote Authorization tables defined in this page appear as options in the Remote Authorization and Contacts Panel for SIP Servers.

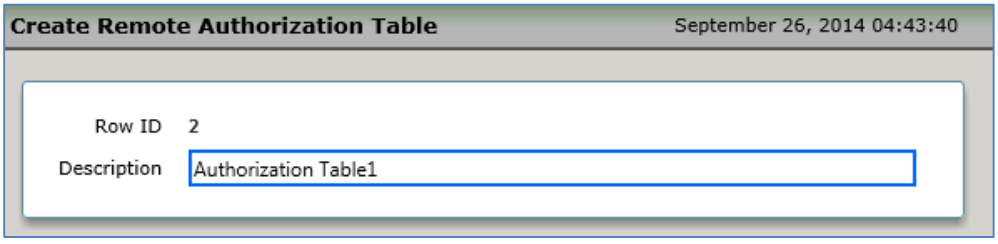
- In the Navigation tree, click on *Remote Authorization Table*




Add a Remote Authorization Table:

- Click the + to add a SIP Server Table

- Type of name of the Table




- Click OK



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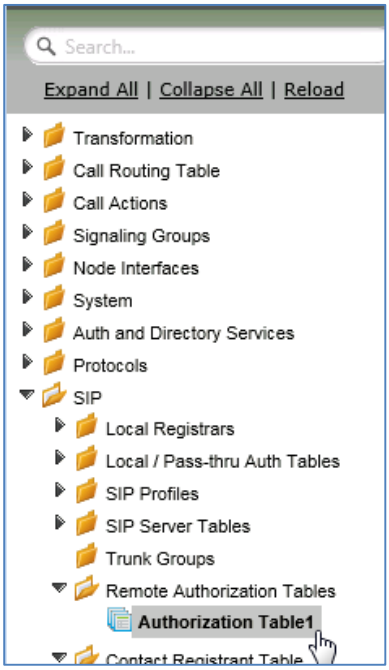
- In the Navigation tree, click on the name of the new Remote Authorization Table that you just added.




- Click the + to add a Remote Authorization entry

- Create the Remote Authorization entries as desired for your installation. Click OK.



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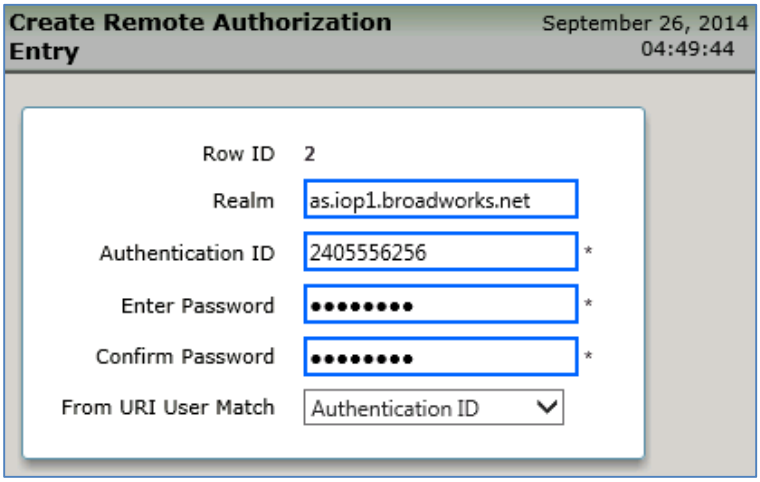
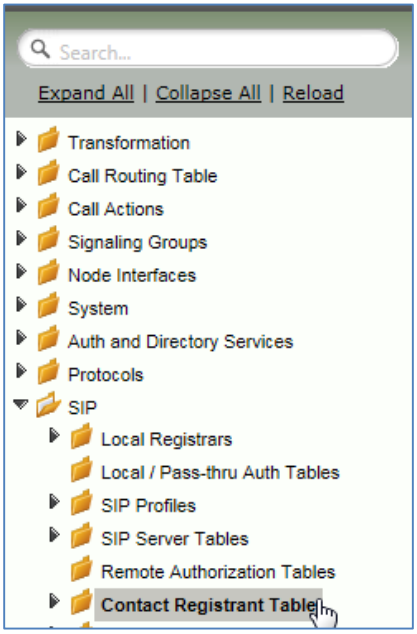



## 4.3 Subscriber Level Configuration

### 4.3.1 Configure the Broadsoft Subscriber Information

The Contact Registrant Table is used to provide user authentication to the Broadsoft server when calls are made.

- In the Navigation Tree, click on *Contact Registrant Table*




Add a Contact Registrant Table to hold the Broadsoft subscriber information.

- Click the + to add a Contact Registrant Table
- Type of name of the Table
- Click OK



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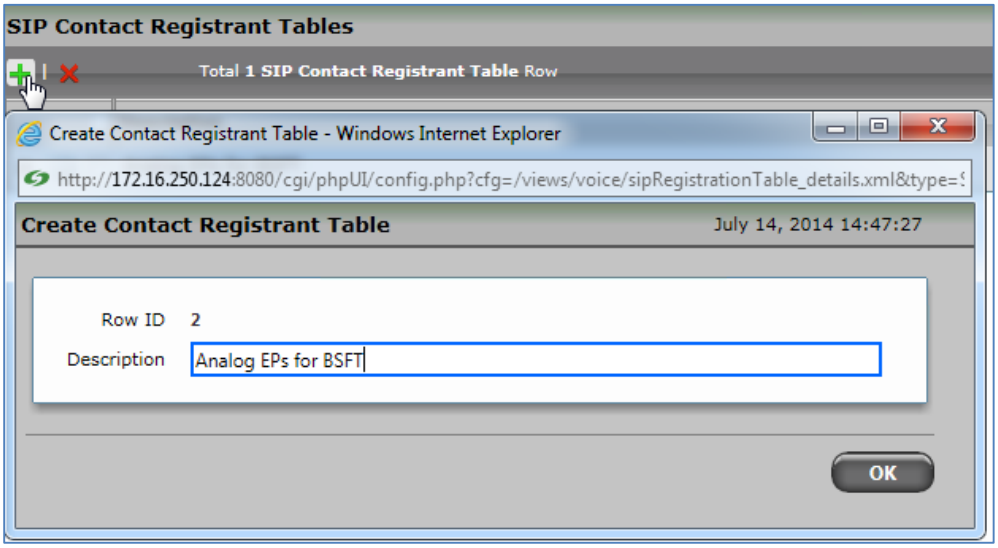
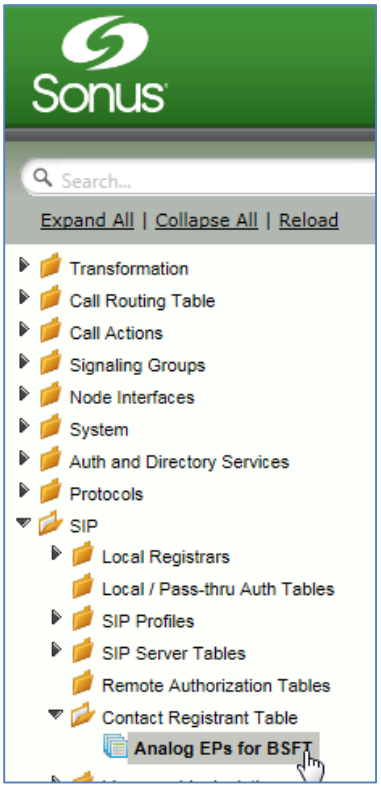



- Click the newly added Contact Registrant Table in the Navigation Tree.




- Click the + to add a Contact Registrant



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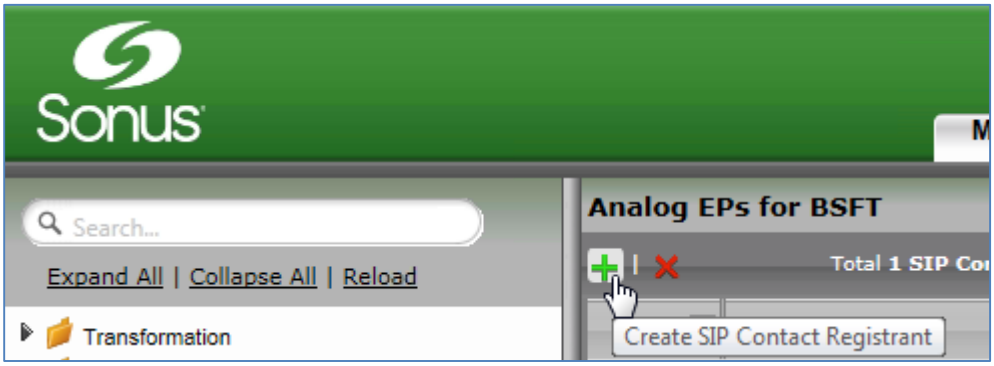




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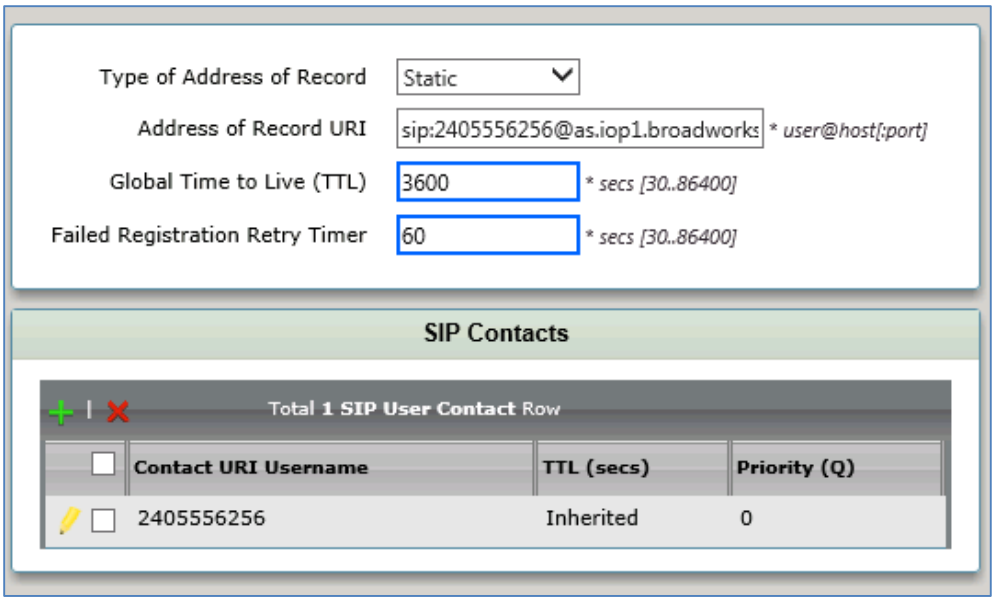
- Add the Broadsoft subscription user in the *Address of Record URI* box. This information will be supplied by your service provider.



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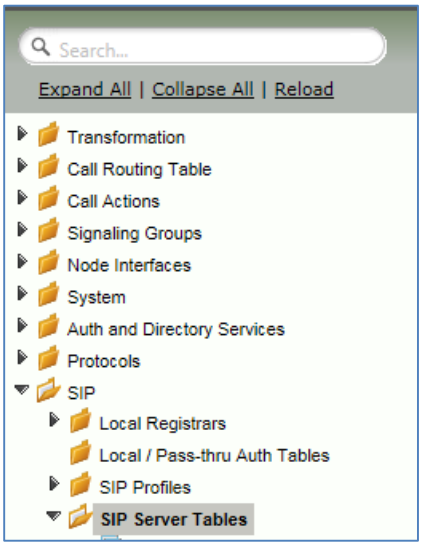
### 4.3.2 Configure a SIP Server Table and Entry for the Broadsoft Server

SIP Server Tables contain information about the SIP devices connected to the SONUS SBC 1000 / SONUS SBC 2000. The entries in the tables provide information about the IP Addresses, ports, and protocols used to communicate with each server. The Table Entries also contain links to counters that are useful for troubleshooting.

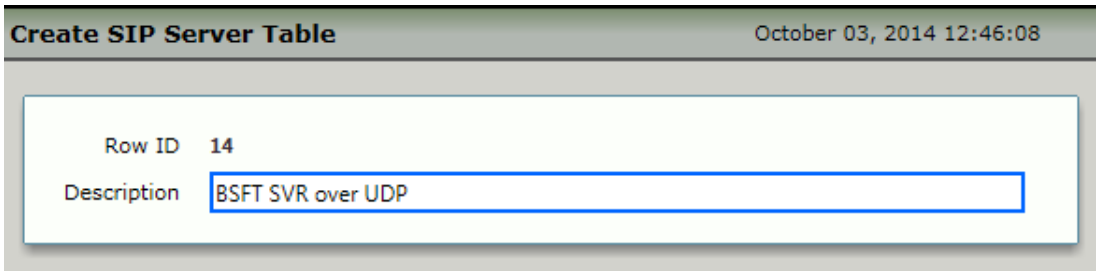
- In the Navigation tree, click on SIP Server Table




Add a SIP Server Table:

- Click the + to add a SIP Server Table

- Type of name of the Table
- Click OK



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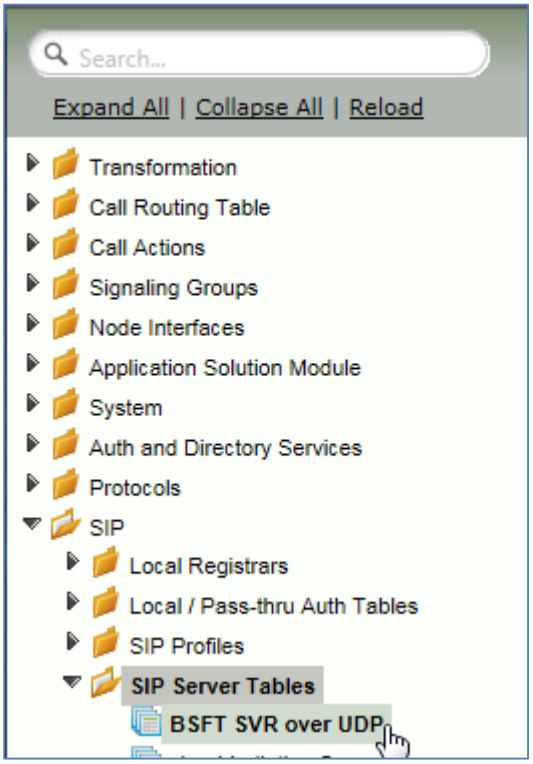
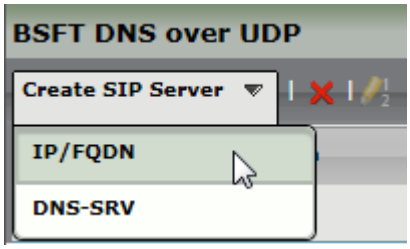
- In the Navigation tree, click on the name of the new *SIP Server Table* that you just added.




- From the *Create SIP Server* pull down, select *DNS-SRV.* This will place a SIP Server Entry in the newly created SIP Server Table.



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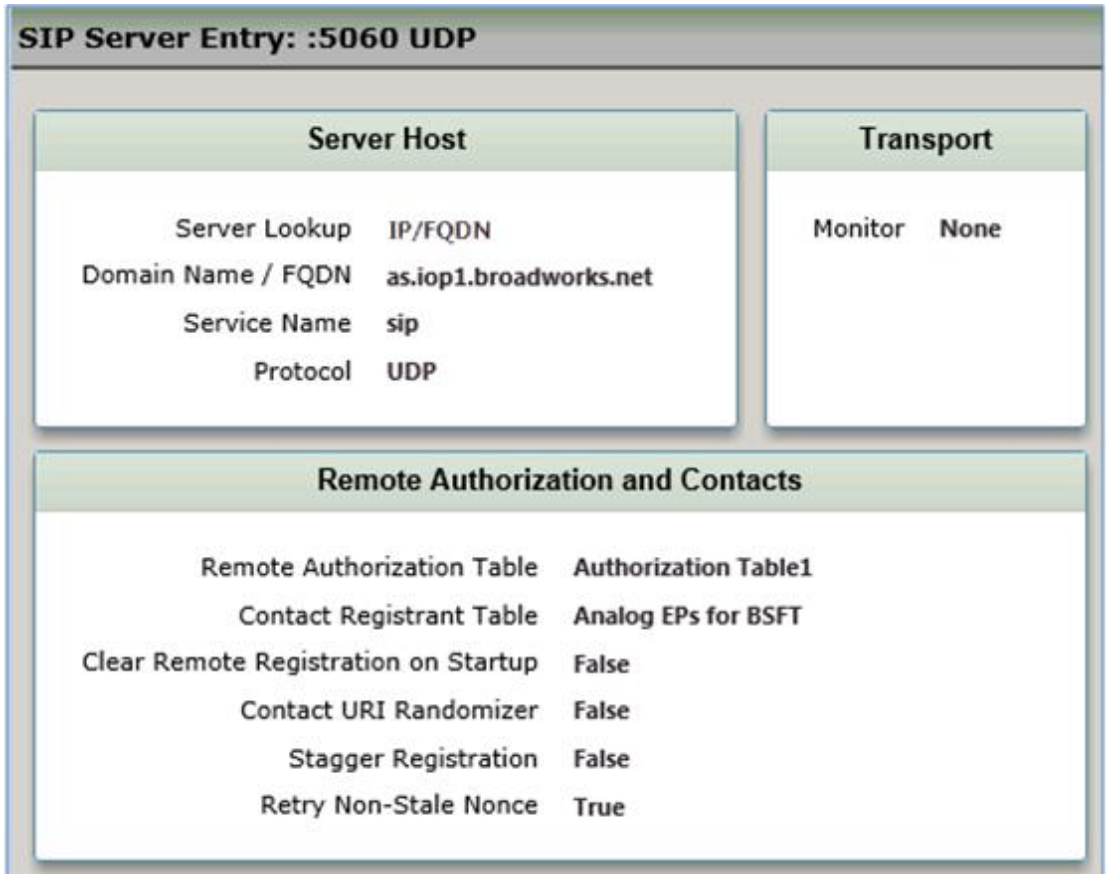
Enter the SIP Server information as noted below:

- Enter the FQDN of the **Broadworks** Server
- Verify the Protocol



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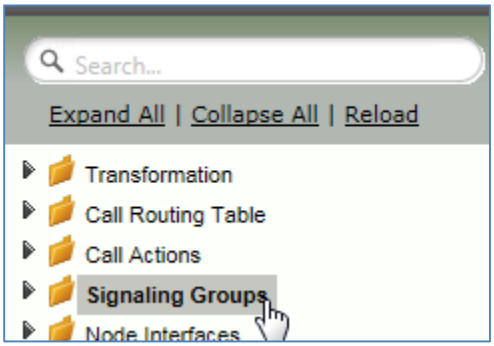
### 4.3.3 Configure a Signaling Group for the Broadsoft Server

Signaling groups allow telephony channels to be grouped together for the purposes of routing and shared configuration. They are the entity to which calls are routed, as well as the location from which Call Routes are selected. In the case of SIP, they specify protocol settings and link to server, media and mapping tables

- In the Navigation Tree, click *Signaling Groups*




- From the *Create Signaling Group* pulldown, select *SIP Signaling Group*

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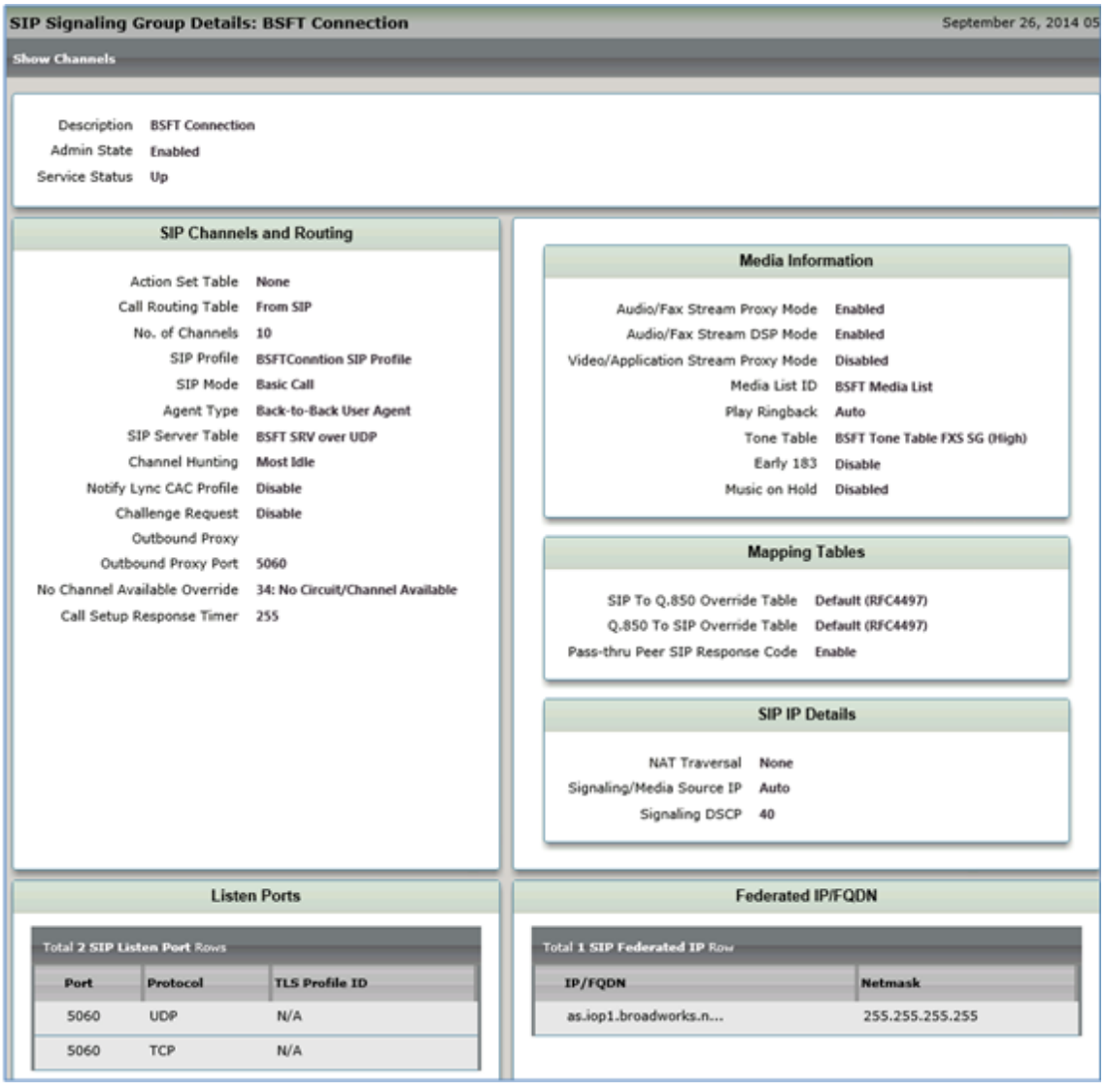
Enter the Broadsoft Signaling Group information as noted below:

- Select the *SIP Profile* you created earlier
- Select the Broadsoft *SIP Server Table*
- Verify/Delete/Create *Listening Ports* that the SBC will use to receive SIP from the Broadsoft Server
- Set all Media Modes to *Enable*
- Add the Broadsoft Server FQDNs in the *Federated IP* with a netmask of 255.255.255.255. **The list of servers to add to as Federated IPs will be provided by your ISP provider**.



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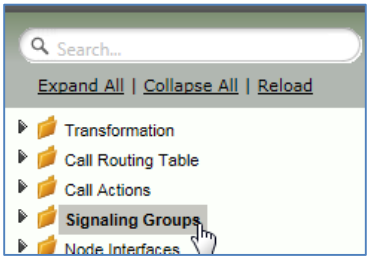
### 4.3.4 Configure a Signaling Group for the FXS

- In the Navigation Tree, click *Signaling Groups*




- From the *Create Signaling Group* pulldown, select *CAS Signaling Group*

Enter the FXS Signaling Group information as noted below:

- Select the *Tone Table* you created earlier
- Select the *CAS Signaling Profile*
- Add the FXS Channels to assign to this Signaling Group (Assigned Channels)



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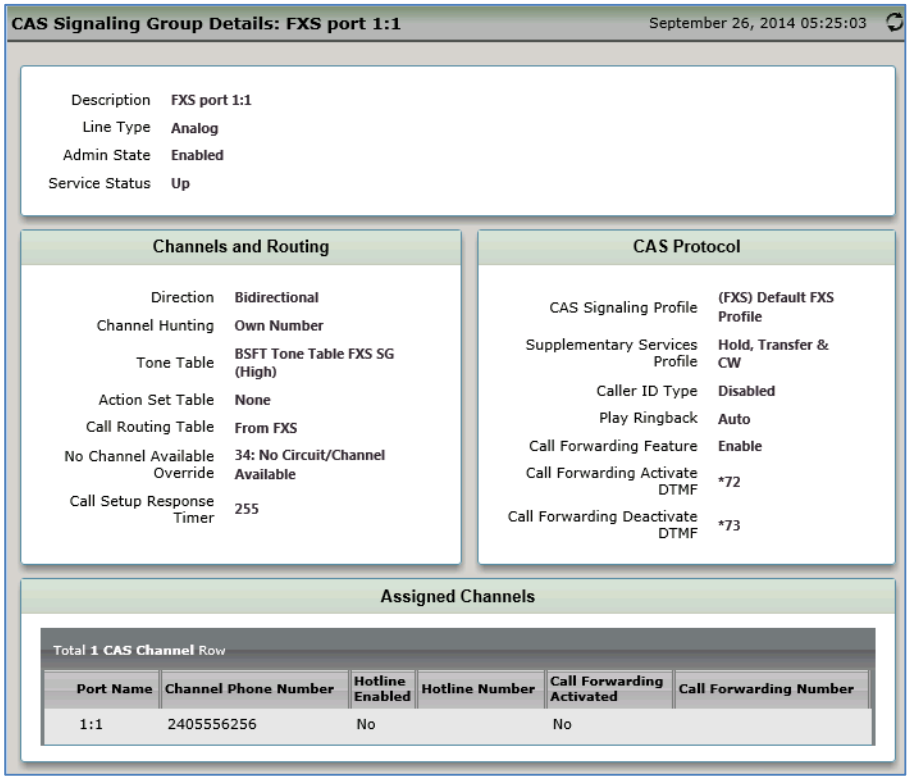




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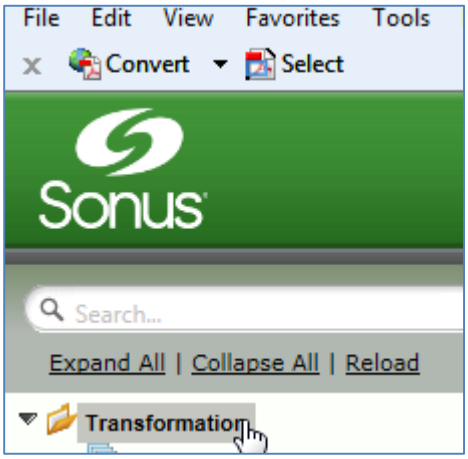
### 4.3.5 Configure a Transformation Table

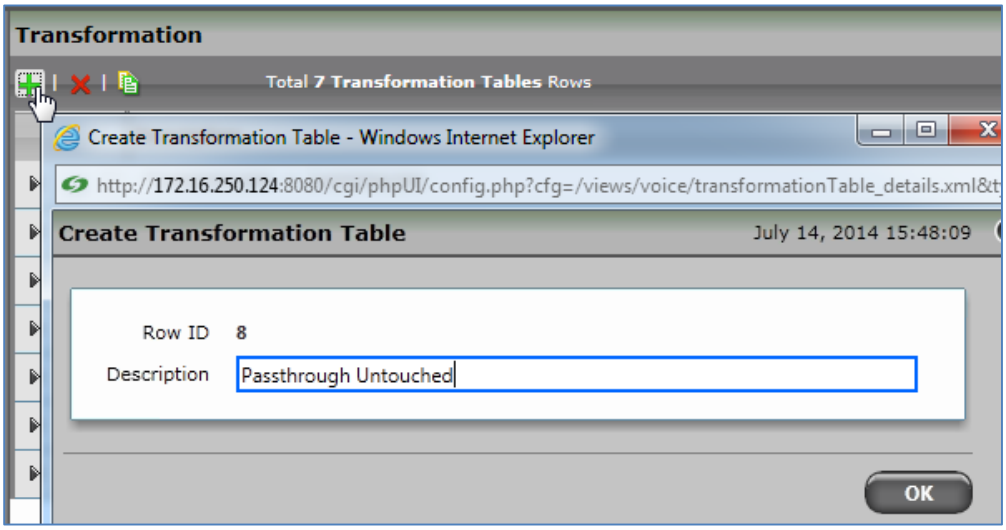
Transformation Tables facilitate the conversion of names, numbers and other fields when routing a call. They can, for example, convert a public PSTN number into a private extension number, or into a SIP address (URI). Every Call Routing Table Entry requires a Transformation Table.

- In the Navigation tree, click on Transformations




Create a new Transformation Table:

- Click the + to add a Transformation Table
- Type the desired name of the Table
- Click OK



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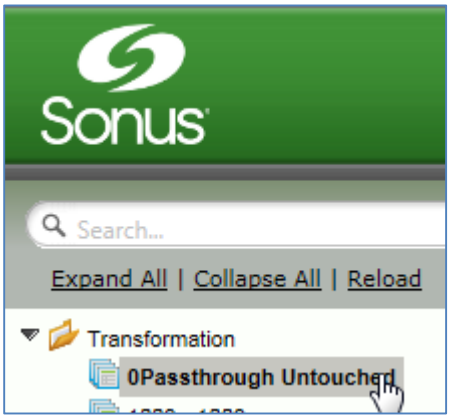
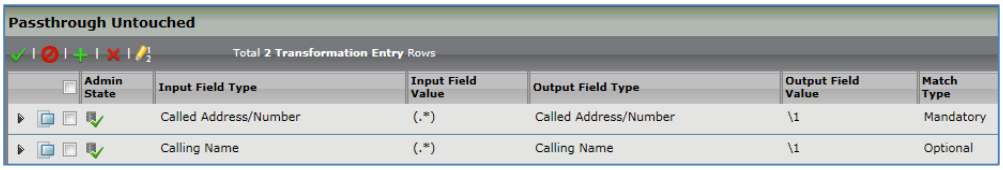
- In the Navigation tree, click on the name of the new Transformation Table that you just added.




- Use the + to create the Transformation Entries as desired for your installation.




***NOTE: You will likely need to create a separate Transformation Table for each Enterprise-based SIP Server or TDM destination.***

***The sample transformation above simply passes the calling and called number unchanged through the SBC. Modify the (number) transformations to properly manipulate the called and calling number for your installation.***



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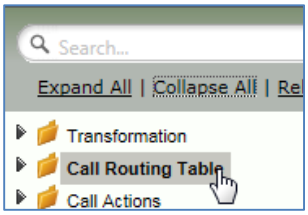
### 4.3.6 Configure a Call Routing Table to the Broadsoft Server

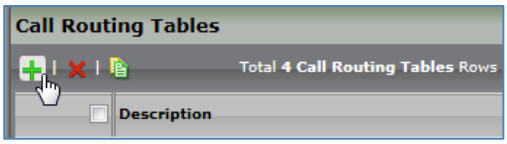
Call Routing allows calls to be carried between signaling groups, thus allowing calls to be carried between ports and between protocols (like ISDN to SIP). Call Routes are grouped into Call Routing Tables.

- In the Navigation tree, click on *Call Routing Table*

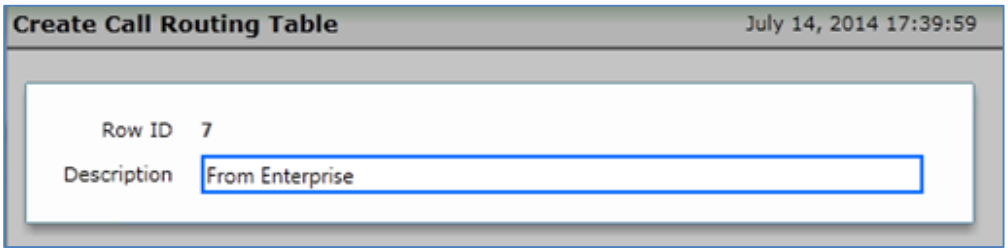



Create a new Call Routing Table. This call routing will take call from the Enterprise and route them to the Broadsoft server:

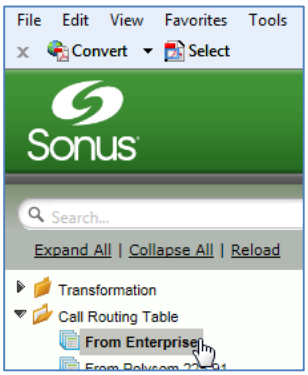
- Click the + to add a Call Routing Table




- Type the desired name of the Table
- Click OK




- In the Navigation tree, click on the name of the new Call Routing Table that you just added.



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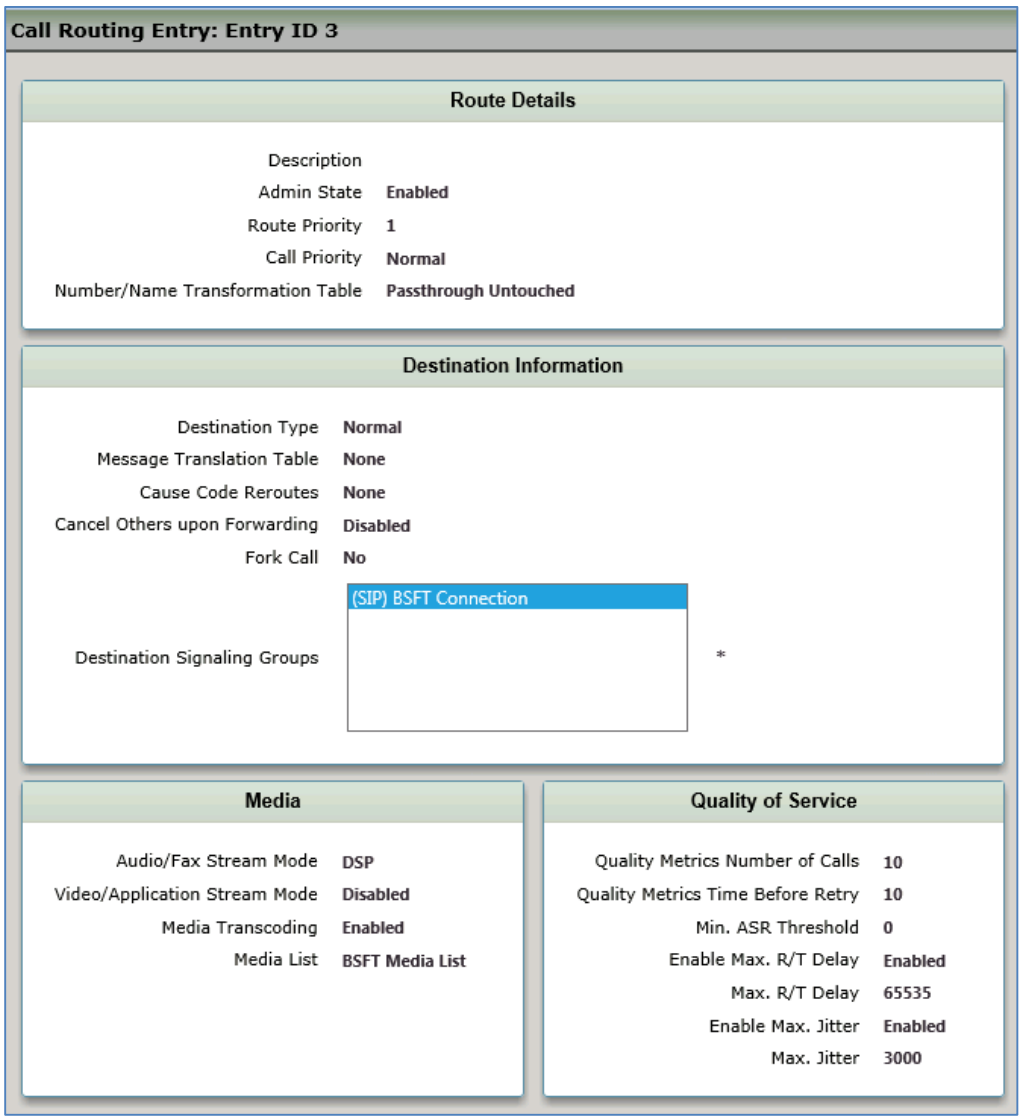
- Use the + to create the Call Routing Entries as desired for your installation

- Select the *Transformation Table* created in the previous step
- Set the *Destination Signaling Group* to the Broadsoft Signaling Group
- Set the *Media Modes* as noted below
- Click OK



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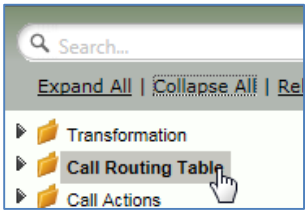
### 4.3.7 Configure a Call Routing Table to the FXS

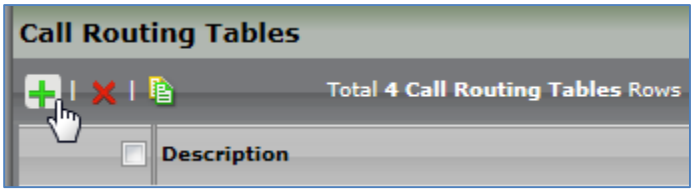
Call Routing allows calls to be carried between signaling groups, thus allowing calls to be carried between ports and between protocols (like ISDN to SIP). Call Routes are grouped into Call Routing Tables.

- In the Navigation tree, click on *Call Routing Table*

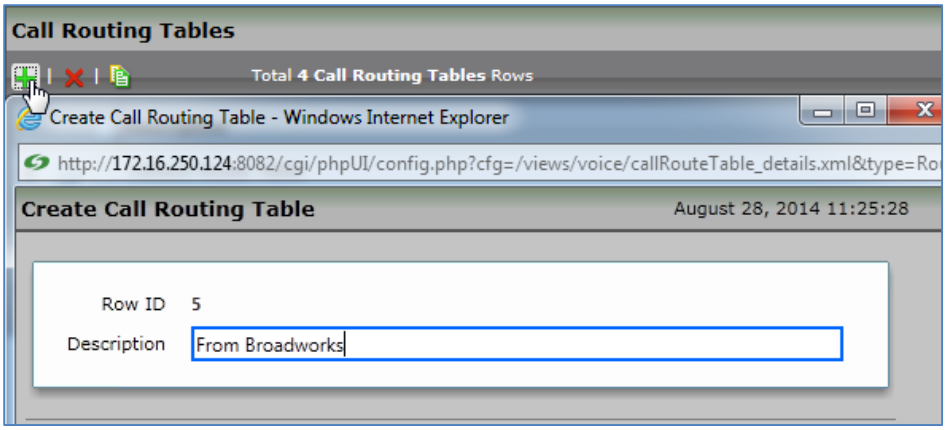



Create a new Call Routing Table. This call routing will take call from the Broadsoft and route them to the Enterprise:

- Click the + to add a Call Routing Table




- Type the desired name of the Table
- Click OK



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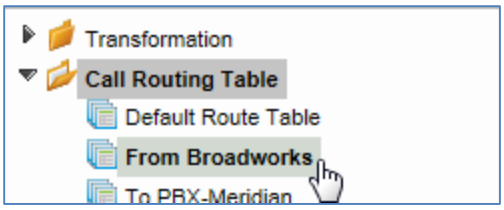
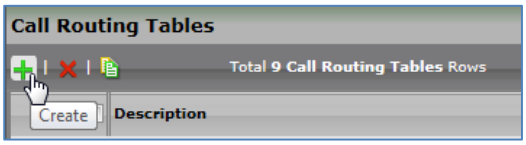
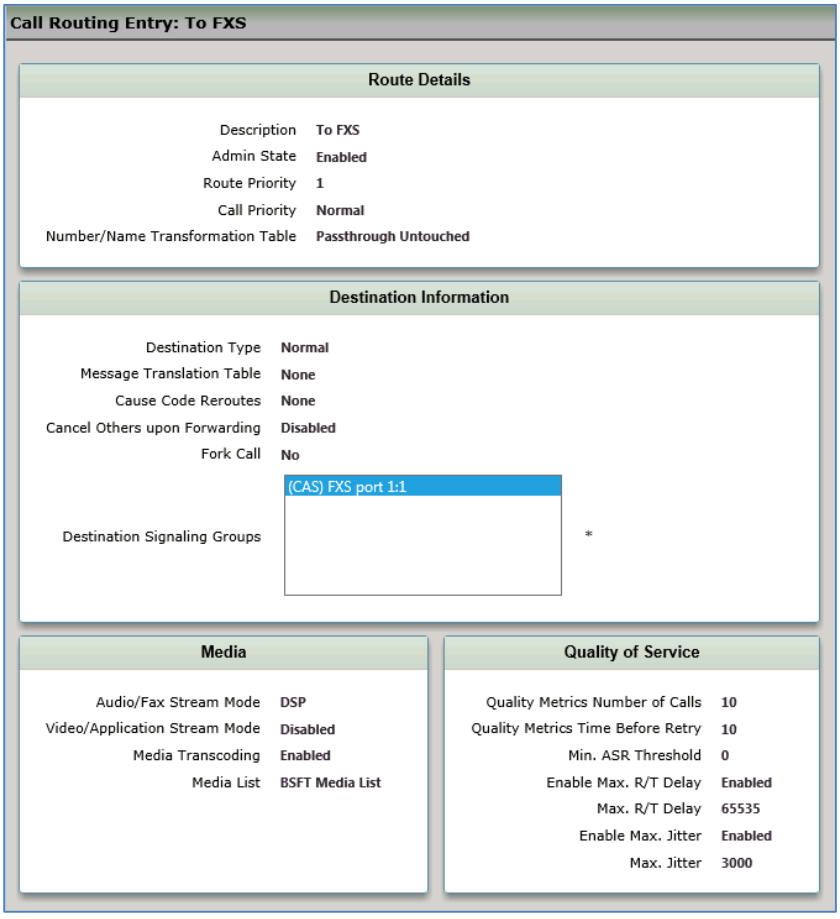
- In the Navigation tree, click on the name of the new Call Routing Table that you just added.




- Use the + to create the Call Routing Entries as desired for your installation




- Select the *Transformation Table* created in the previous step
- Set the *Destination Signaling Group* to the FXS Signaling Group
- Set the *Media Modes* as noted below
- Click OK



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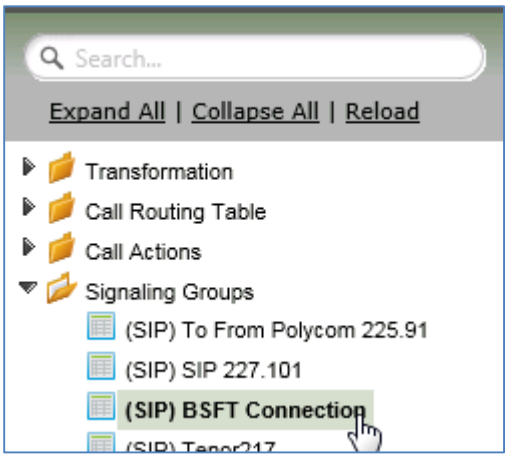
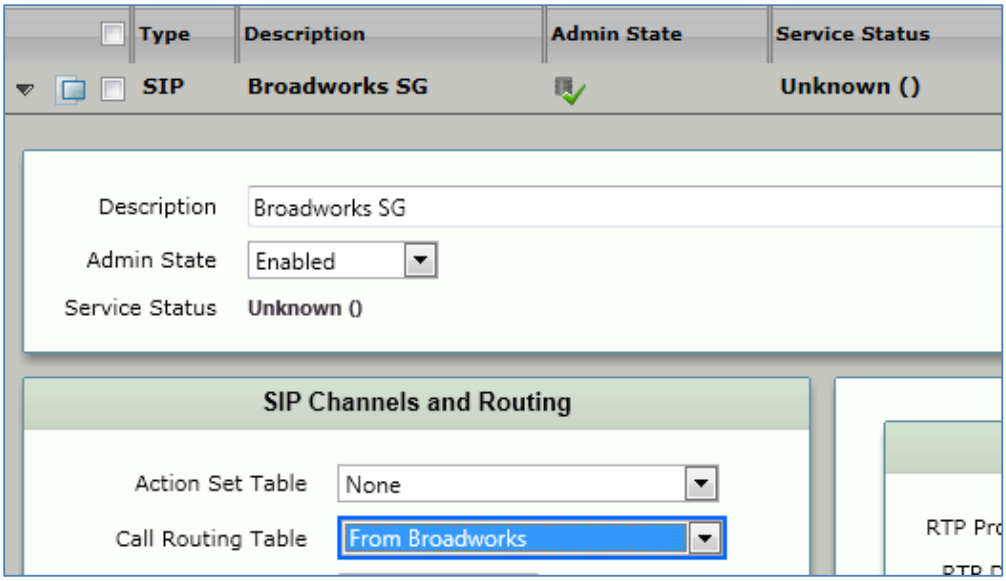
### 4.3.8 Set/Verify the Call Routing Table in the Broadsoft Signaling Group

Ensure that each Signaling Group is configured using an appropriate Call Route Table.

- In the Navigation Tree, click the *Broadworks SG* Signaling Group




- The Broadsoft Signaling Group must be configured to use the *From Broadworks* Call Routing Table



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## 4.4 SIP Feature Configuration

### 4.4.1 Emergency Call Configuration

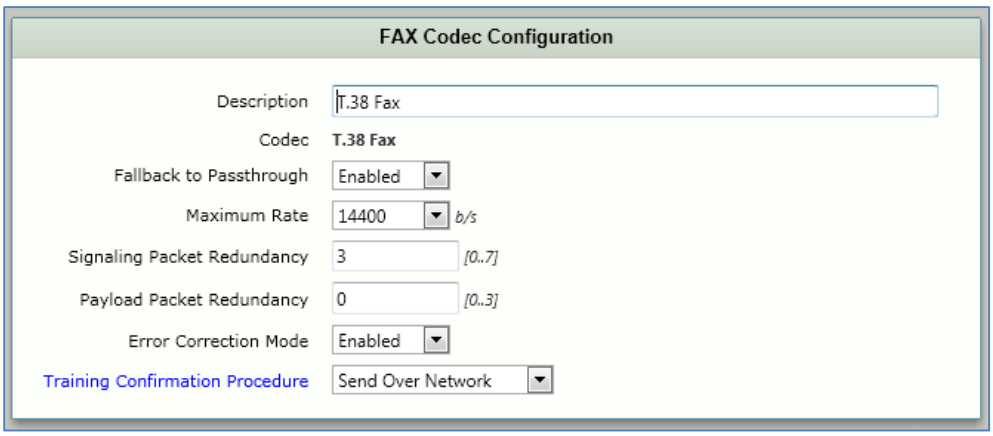
Not supported.

### 4.4.2 Advice of Charge Configuration

Not supported.

### 4.4.3 Fax Configuration

This section provides configuration instructions for configuring the device to enable fax.



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## References


[1] Sonus Networks 2014 SBC 4.0 User's Guide , available at https://support.sonus.net/display/ALLDOC/SBC+1000-2000+Documentation

[2] BroadSoft, Inc. 2013. *BroadWorks Device Management Configuration Guide*, *Release 20.0*. Available from BroadSoft at xchange.broadsoft.com.

[3] BroadSoft, Inc. 2013. *BroadWorks Redundancy Guide, Release 20.0*. Available from BroadSoft at xchange.broadsoft.com.

[4] BroadSoft, Inc. 2013. *BroadWorks SIP Access Interface Interworking Guide, Release 20.0.* Available from BroadSoft at xchange.broadsoft.com.

[5] BroadSoft, Inc. 2014. *BroadWorks SIP Access Device Interoperability Test Plan, Release 20.0*. Available from BroadSoft at xchange.broadsoft.com.

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