

AN-10080
April 16, 2008

Setting up Cisco 7940/7960 IP Phones as SIP devices

This application note provides the details on adding the Cisco 7940/7960 SIP phone to the ShoreTel Unified Communications system as a SIP device configured as a system extension. This information applies to ShoreTel Release 8.0 only.

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Requirements

The following requirements are necessary to integrate a Cisco® 7940/7960 phone to the ShoreTel® Unified Communications systems.

ShoreTel Requirements

- ShoreWare® Server Software, ShoreTel release 8.0.
- A single ShoreWare SIP device license is required in addition to an extension only or extension and mailbox license for each Cisco phone to be added.
- The Cisco 7940/7960 phone must be running SIP firmware version 7.5 (POS3-07-5-00). ShoreTel does not provide this firmware.

Installation of Cisco Phone Firmware

- a. ShoreTel Systems running Release 8 only supports Cisco Phone Firmware POS3-07-5-00. Contact Cisco for the download location.
- b. Copy these files to the root directory of your TFTP server. If you do not have a TFTP server there are many free applications available. <http://support.solarwinds.com/updates/New-CustomerFree.cfm?ProdID=52>.
- c. SIP<MAC Address>.cnf and SIPDefault.cnf are files that need to be created with a text editor and placed in the root directory of the TFTP server. These files are not included in the Cisco Firmware.
- d. Modify the SIP<MAC Address>.CNF template file as shown in Step 7.

- e. Depending on the version of firmware that is on the phone you are working with there are two ways to unlock the configuration. Older phones/firmware use the command **#. With the newer phones/firmware you will need to go to "Settings" scroll down to "Unlock Config" you will be prompted for a password, the default password is "cisco".

If the Cisco Phone is not already running SIP protocol, then please go through Step 1. If it is running SIP, then start from Step 4.

Step 1: Erase the current configuration

By default Cisco Phones run SCCP (aka "SKINNY"), a proprietary Cisco Protocol. The first step would be to erase the current configuration as follows:

- a. Power up the phone without connecting the network cable.
- b. Unlock configuration, Settings, Network Configuration.
- c. Scroll down to "Erase Configuration": yes.
- d. Press Save, then Cancel and then Exit.

Step 2: Point to an alternative TFTP server

- a. Unlock configuration, Settings and Network Configuration.
- b. Scroll down to TFTP server.
- c. Enter the TFTP server IP address here.

Step 3: Reboot the phone

- a. Remove power, connect network, add power and wait. If it eventually says “anonymous”, then it is running SIP.

Step 4: Setup proxy resources

Once the Cisco Phone is running the SIP protocol it is ready to be setup on a ShoreTel 8 system. Let us say, we want to deploy these phones on the HQ site. Then allocate proxy resources on the HQ site as follows:

- a. Allocate 100 SIP Proxy resources (either built in or through drop down list) on any switch in HQ site as shown below.

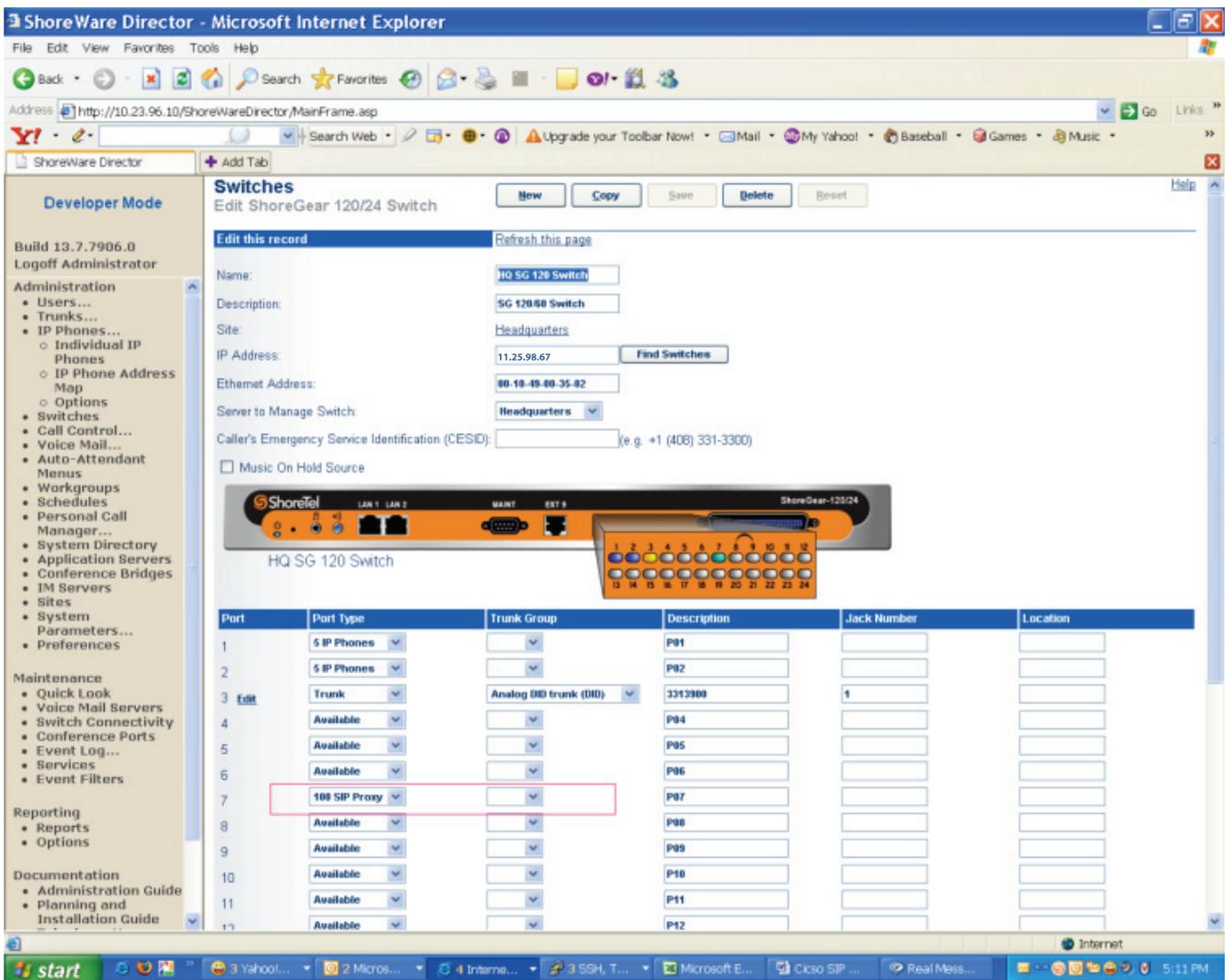


Figure 1

b. Go to Sites page and click on HQ site. Assign this switch as the Site Proxy as shown below.

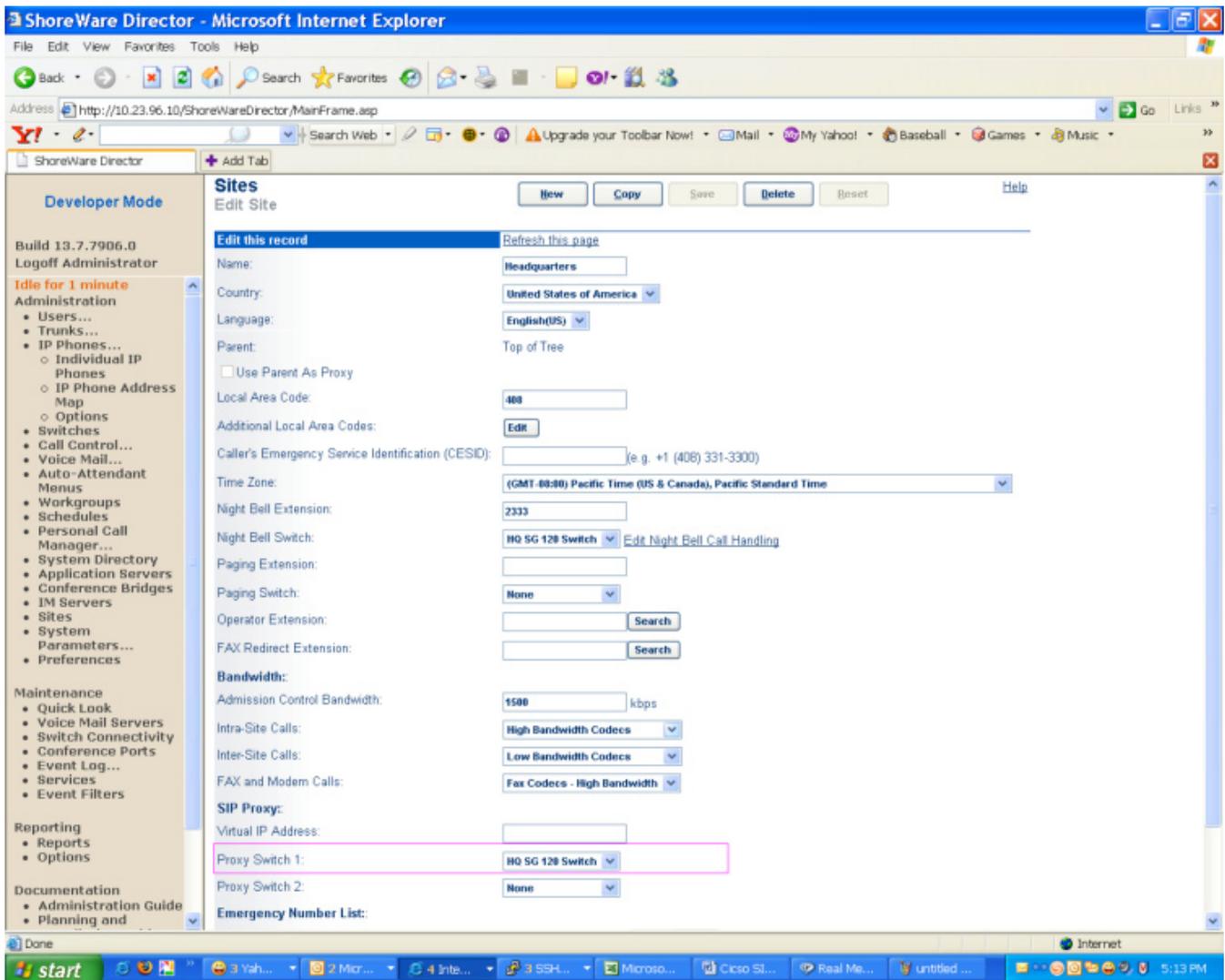


Figure 2

Step 5: Create SIP Profile

a. To access the SIP Profile list panel, select Administration -> Call Control -> SIP Profiles from the ShoreWare Director menu.

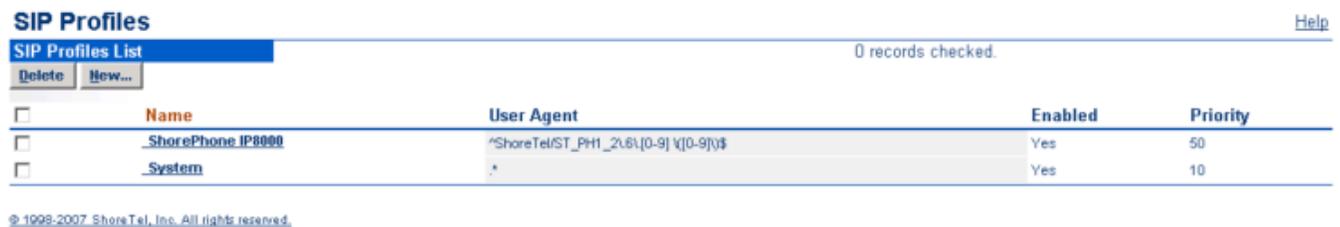


Figure 3

- b. To add a profile, press the New button in the top left corner of the panel. Fill in the values as follows:

Name: <Any relevant name>

User Agent : ^Cisco-CP79[46]0G/7\5\$

Priority: 100

Enable: Toggle on

Custom parameters: OptionsPing=0

SendEarlyMedia=1

MWI=notify

AddGracePeriod=300

XferFailureNotSupported=1

1CodecAnswer=1

The screenshot shows a web interface for editing a SIP profile. At the top, there are buttons for 'New', 'Copy', 'Save', 'Delete', and 'Reset'. Below these is a header 'SIP Profile' and 'Edit SIP Profile'. A blue bar contains 'Edit this record' and a 'Refresh this page' link. The main form has several sections: 'Name' with a text box containing 'Cisco 7960'; 'User Agent' with a text box containing '^Cisco-CP79[46]0G/7\5\$'; 'Priority' with a text box containing '100'; an 'Enable' checkbox which is checked; 'System Parameters' with a text area containing 'OptionsPing=1', 'SendEarlyMedia=0', 'MWI=none', '1CodecAnswer=0', and 'StripVideoCodec=0'; and 'Custom Parameters' with a text area containing 'OptionsPing=0', 'SendEarlyMedia=1', 'MWI=notify', 'AddGracePeriod=300', 'XferFailureNotSupported=1', and '1CodecAnswer=1'.

Figure 4

Step 6: Ensure that the SIP Password for the User is the same as the SIP Phone Administration-> Users-> Individual Users

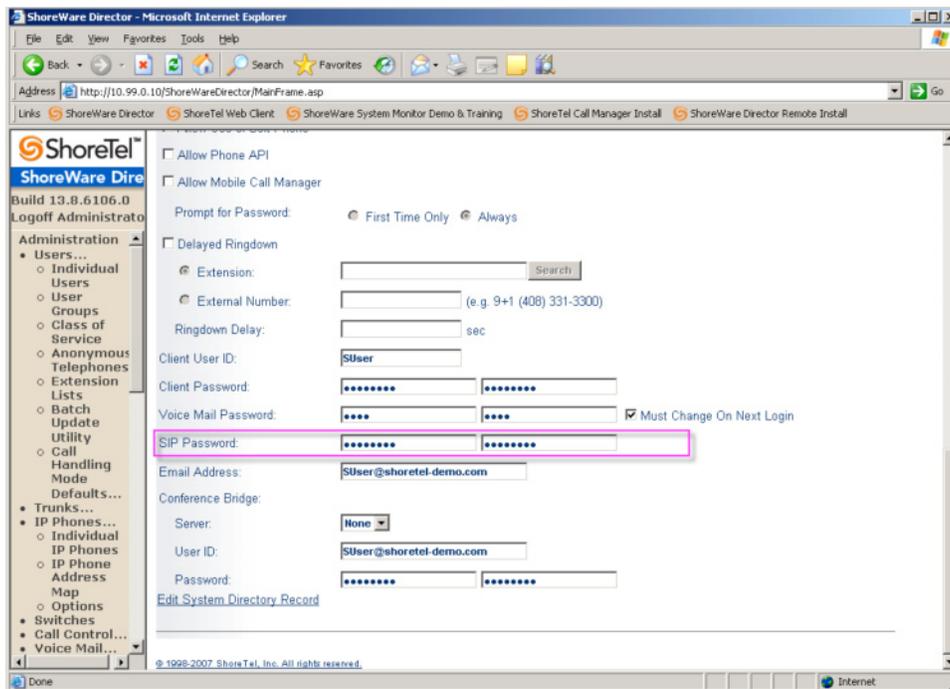


Figure 5

Step 7: Configure the phone

You can do this in the config file (.CNF) or through the configuration menu of the phone

To do this via the config file (.CNF) modify the bolded values with the correct proxy value and user extension number on your system.

Note: That the password corresponds to the SIP Password of this user.

- a. Update the proxy and Line 1 settings in the config file (.CNF) of the Cisco phone as shown below:

```
# Proxy Server
proxy1_address: "11.25.98.67" ; Can be dotted IP or FQDN

# Line 1 Settings
line1_name: "2368" ; Line 1 Extension\User ID
line1_shortcode: "2368" ; This is what is displayed next to the phone icon
line1_displayname: "2368" ; Line 1 Display Name
line1_authname: "2368" ; Line 1 Registration Authentication
line1_password: "123456" ;Line 1 Registration Password
```

Modify the bolded values with the correct proxy value and user extension number on your system.

Note: That the password corresponds to the SIP Password of this user.

Step 8: Verify that your phone has registered with ShoreWare Director

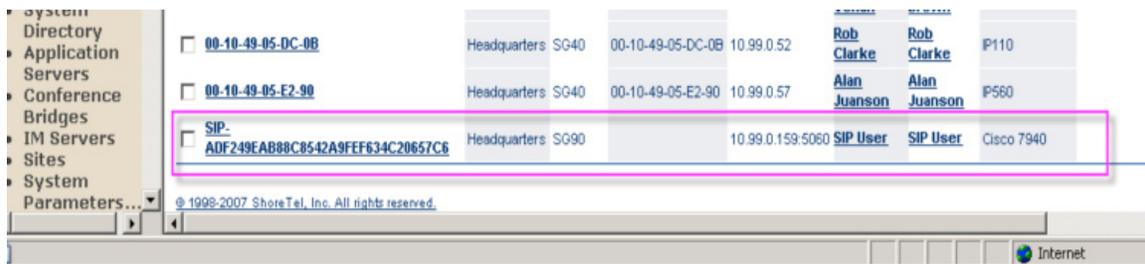


Figure 6

Known Issues:

The following Cisco 7940/7960 phone specific issues (running the SIP firmware revision 7.5) are known to ShoreTel:

- The Cisco 7940/7960 phone fails to recover the original established call if blind transferred to a busy destination (i.e. if a transfer operation fails with response code 486 'Busy'). The call is lost.
- The Cisco 7940/7960 phone starts failing calls with response code 486 'Busy' after performing quick multiple blind transfers (i.e. call the Cisco phone and immediately send a REFER). The phone will no longer be able to receive or make calls until a reset is performed.

Device SIP Feature Support

The following table documents the ShoreTel test cases that were exercised:

Test	Result	Comments
Register – Create a profile and register the phone. Verify that the phone is in the database with the correct profile.	Pass	
Options – Verify that the device supports options ping. Adjust OptionsPing if needed.	Fail	Cisco 7940/7960 phones do not support Options ping
BAA – Dial an incorrect number and see if it receives BAA prompt. Adjust SendEarlyMedia if needed.	Pass	BAA prompts can be streamed as early media
MWI – Set MWI=notify and leave a message. If subscribe is evident, test subscribe.	Pass	
Basic Outgoing inter-site – If device support PCMU,G729, in that order, make call intersite to MGCP or analog. Verify G729 negotiated and audio. Adjust 1CodecAnswer if needed. Test Hold/Unhold from both sides.	Pass	
Re-Register – Allow the phone to re-register after the initial period. Should re-register with appropriate timing. AddGracePeriod if needed.	Not supported	Cannot divert calls from Cisco 7940/7960 TUI
Dynamic Payload Types – If device supports dynamic payload codecs in common with MGCP or ShoreGear ports, test these. Verify that correct codec is negotiated. Adjust AllowedCodecs if needed.	Not supported	Cisco 7940/7960 phones only support codecs with standard payload type
Un-register – If the device supports un-register, verify that the device is properly removed from the system.	Pass	
Retrieve and Send Voicemail – Use local method to configure voicemail extension '#', and retrieve a voicemail and send to other.	Pass	Can configure messages uri to 'sip:#@ipaddr of proxy'
Cancel Outgoing – Make a call and abort.	Pass	
Cancel Incoming – Make a call to the device and abort.	Pass	
ToVM Outgoing – Make a call to an MGCP phone and press the ToVM softkey.	Pass	
Decline Outgoing (ShoreWare Call Manager) – Make a call and decline using ShoreWare Call Manager	Pass	
Basic Incoming intra-site – Test hold/unhold both sides.		
Basic Incoming inter-site – Test hold/unhold both sides.	Pass	
Basic Outgoing intra-site – Test hold/unhold both sides.	Pass	
OAE Outgoing - Test hold/unhold both sides.	Pass	
OAE Incoming - Test hold/unhold both sides.	Pass	
Place second call to device – Verify that user is notified, and call can be answered.	Pass	
Blind Transfer (Transferor)	Pass	
Consult Transfer (Transferor)	Pass	
Consult Transfer (Transfer Target)	Pass	
Conference (Conferencee)	Pass	
Blind Transfer (Transferee)	Pass	
Consult Transfer (Transferee)	Pass	
Conference (Conferencee)	Pass	

Record of Change

This application note is subject to change. Updates and corrections are always welcome. Please submit any updates or corrections to info@shoretel.com.

Issue	Author	Reason for Change	Date
1.0	D. Rencken	New Release	April 16, 2008

