Spectrum Enterprise SIP Trunking Service
ShoreTel Connect Onsite v1.1
Build [21.75.1908.0]
IP PBX Configuration Guide

About Spectrum Enterprise:

Spectrum Enterprise is a division of Charter Communications following a merger with Time Warner Cable and acquisition of Bright House Networks. Spectrum Enterprise is a national provider of scalable, fiber technology solutions. The Spectrum Enterprise portfolio includes networking and managed services solutions, including Internet access, Ethernet and Managed Network Services, Voice, TV and Cloud solutions. Our industry-leading team of experts works closely with clients to achieve greater business success.

About this document:

Spectrum Enterprise assures IP PBX compatibility by conducting interoperability testing to ensure any potential compatibility issues have been resolved prior to installation. Please review the IP PBX configuration instructions in this guide prior to your installation date.

Be advised that this document may contain references to Time Warner Cable Business Class. All references to Time Warner Cable Business Class, TWCBC or TWC should be read as Spectrum Enterprise.

Thank you,

Spectrum Enterprise

SHORETEL APPLICATION NOTE

for

Time Warner Cable Business Class SIP Trunking

Date:	January 12, 2016
App Note Number:	[XXXXX]
For use with:	Time Warner Cable Business Class SIP Trunking
Product:	ShoreTel Connect Onsite
System:	ShoreTel Connect Onsite Build [21.75.1908.0]

This document and its contents was prepared by:

Contents

Audience

This document is intended for the SIP Trunk Customer's technical staff and Value Added Reseller (VAR) having installation and operational responsibilities

Introduction

This Application Note describes configuration steps for configuring Time Warner Cable Business Class (TWCBC) SIP Trunking with ShoreTel Connect Onsite System

Time Warner Cable Business Class

Time Warner Cable Business Class (TWCBC) SIP Trunks offer an IP-based, voice-only trunk service using Session Initiation Protocol (SIP) to connect an IP PBX to the Public Switched Telephone Network. An Enterprise SIP Gateway (ESG) owned and managed by Time Warner Cable is then installed at a customer's site. The ESG serves as a gateway and demarcation point between a customer's IP PBX and the voice network. The ESG also enables Time Warner Cable Business Class to remotely monitor and manage the SIP Trunk service performance.

TWCBC SIP trunks are delivered over their own fiber-rich IP network. They provide a reliable and secure voice solution where voice traffic is not routed over the public Internet. TWCBC SIP Trunks deliver a highly scalable, cost-efficient alternative to traditional voice services.

For Sales and Support, please contact Time Warner Cable Business Class at
https://business.timewarnercable.com/support/contact-us.html

SIP Trunking Network Components

The network for the SIP Trunk reference configuration is illustrated below and is representative of a ShoreTel Connect Onsite System configuration.
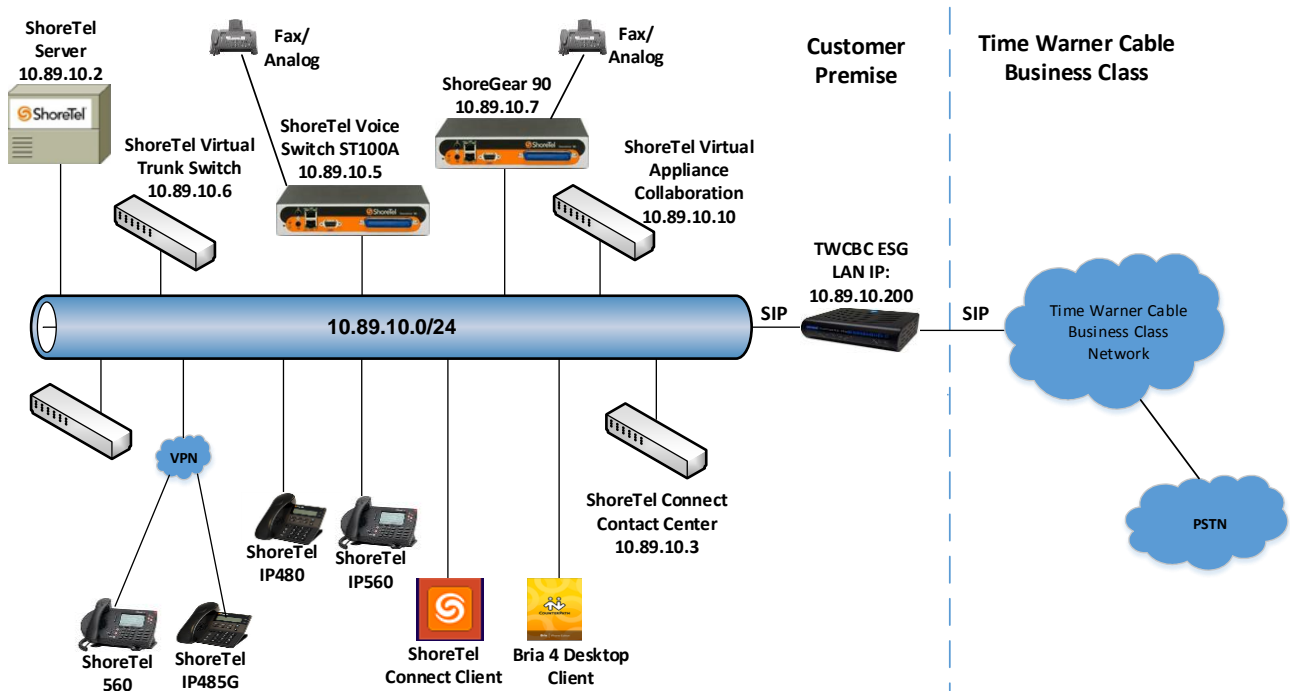

Figure 2: SIP Trunk Lab Reference Network

Hardware Components

- ShoreTel Server running on Windows Server 2012
- ShoreTel Virtual Phone Switch
- ShoreTel Virtual Trunk Switch
- ShoreTel Voice Switch (ST100A)
- ShoreTel ShoreGear Switch (SG90)
- ShoreTel Contact Center running on Windows Server 2012
- ShoreTel Virtual Appliance Collaboration
- Analog Fax Machine
- ShoreTel 560 IP Phones
- ShoreTel 480/485G IP Phones
- ShoreTel Connect Client
- CounterPath Bria4 SIP Client
- TWCBC ESG (InnoMedia ESBC 9378)

Software Requirements

- ShoreTel Connect Onsite Build 21.75.1908.0
- ShoreTel Connect Contact Center Build 507.2.6311.0
- Windows Server 2012 R2 Standard
- Windows server 2012 R2 Data Center
- InnoMedia ESBC 9378 version 2.0.13.0
- ShoreTel 485G/480G version 803.1.3901.0
- ShoreTel 560 version S26.3.9.10
- ShoreTel 560G version S6G.3.9.10
- CounterPath Bria4 version 4.3.0 78749

Features

SIP Registration Method

This test used a Static Registration Method between the ShoreTel Connect Onsite IP-PBX and TWCBC. There is no registration requirement for the ShoreTel Connect Onsite PBX.

Features Supported

- Basic calls with G711Ulaw
- Call Hold and Resume
- Call Transfer
- Call Forwarding
- Three-Way Calling
- DTMF RFC 2833
- Calling Party Number Presentation
- Calling Party Number Restricted
- Hunt Group
- Group Pickup
- Call Park/un-park
- Simul Ring
- Call Forward – "FindMe"
- Operator Assisted
- Call Recording
- Auto-Attendant
- Bridge Call Appearances(BCA)
- Work Group
- Office Anywhere External
- Silent Monitor / Barge-In / Whisper Page
- Audio Conference Bridge
- Contact Center

Features Not Supported

- G729 Codec
- Fax Protocol T.38

Caveats and Limitations

- 911 calls were not executed in this test
- For test case 4.24 Silent Monitor / Barge-In / Whisper Page, if the Monitored phone is ShoreTel 485G, the Barge-in or Silence Monitor fails after testing Whisper Page on monitor phone

*NOTE: There may be other feature limitations when using SIP Trunks. Please refer to Chapter 18 of the **ShoreTel Administration Guide** for more information.*

Configuration

Configuration Steps

In this section an overview is presented of the steps that are required to configure the ShoreTel Connect Onsite IP-PBX for SIP Trunking to Time Warner cable Business Class.

NOTE: The InnoMedia ESBC is provided pre-configured to customers by TWCBC. Please contact a TWCBC representative for more information regarding this ESBC. The specifics of the InnoMedia ESBC configuration will not be covered in this Application Note.

Table 1 – PBX Configuration Steps

Step	Description
Step 1	Codec Lists and Sites
Step 2	SIP Trunk Configuration

IP Address Worksheet

The specific values listed in the table below and in subsequent sections are used in the lab configuration described in this document, and are for **illustrative purposes only**. The customer must obtain and use the values for your deployment.

Table 2 – IP Address Worksheet

Component	MSO Lab Value	Customer Value
ShoreTel Connect Onsite IP-PBX		
ShoreTel Server	10.89.10.2	Unique to every deployment
ShoreTel Voice Switch ST100A	10.89.10.5	Unique to every deployment
ShoreTel Virtual Trunk Switch	10.89.10.6	Unique to every deployment
ShoreTel ShoreGear 90	10.89.10.7	Unique to every deployment
ShoreTel Virtual Phone Switch	10.89.10.4	Unique to every deployment
ShoreTel Virtual Appliance Collaboration	10.89.10.10	Unique to every deployment
ShoreTel Connect Contact Center	10.89.10.3	Unique to every deployment
InnoMedia ESBC		
LAN IP Address	10.89.10.200	Unique to every deployment

Create Custom Codec Lists and Sites

Create Codec Lists

1. Navigate to **Features > Call Control > Codec Lists**

2. Click **NEW**

3. Set **Description**: TWCBC is used for this example

4. **Codec List Members**: PCMU/8000 was chosen and added for this test
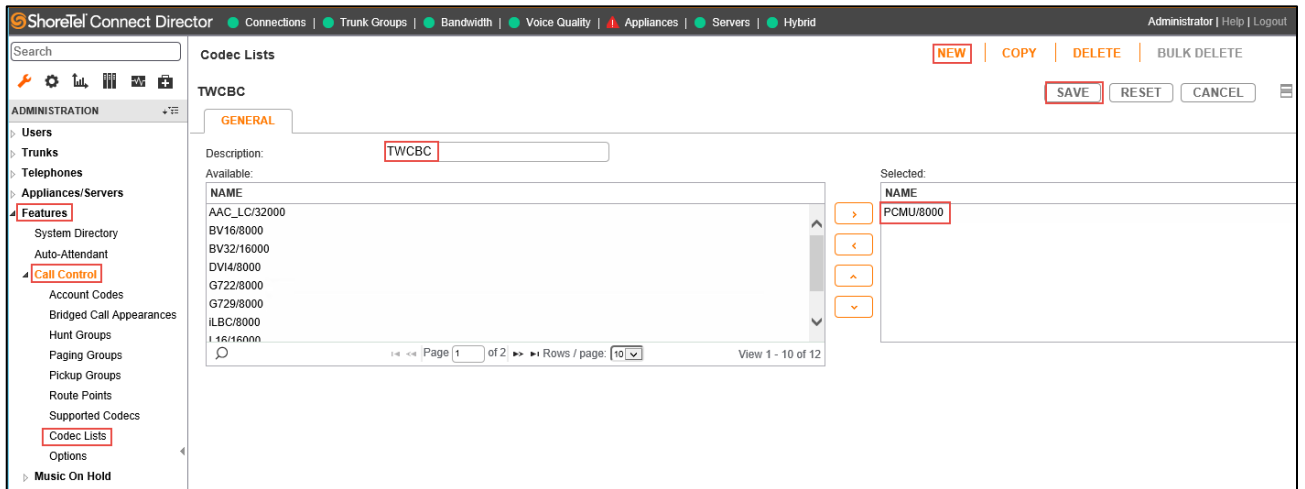
5. Click **SAVE**

Figure 3: Codec Lists

Create Sites

1. Navigate to **System** > **Sites**
2. Set **Name**: Headquarters
3. Set **Local Area Code**: *469* is used in this test
4. Set **Intra-Site Calls**: Newly created Codec List **TWCBC** is selected. This setting contains only G711 codecs.
5. Set **Inter-Site Calls**: Codec List **TWCBC** is selected from drop down menu
6. Set **FAX and Modem Calls**: Default Codec List *Fax Codecs –* **Low Bandwidth Passthrough** is selected from drop down menu
7. Leave all other fields as default
8. Click **SAVE**

Figure 4: Sites

SIP Trunk Configuration

This section describes the ShoreTel configuration necessary to support connectivity to Time Warner Cable Business Class (TWCBC) SIP Trunking service.

Create SIP Trunk Profiles
SIP Profiles are critical for SIP Trunking deployment. The **Default ITSP** SIP Profile is copied to create the SIP Profile for this test.

1. Navigate to **Trunks > Trunk Groups > SIP Profiles**

2. Check **Default ITSP** under **NAME**
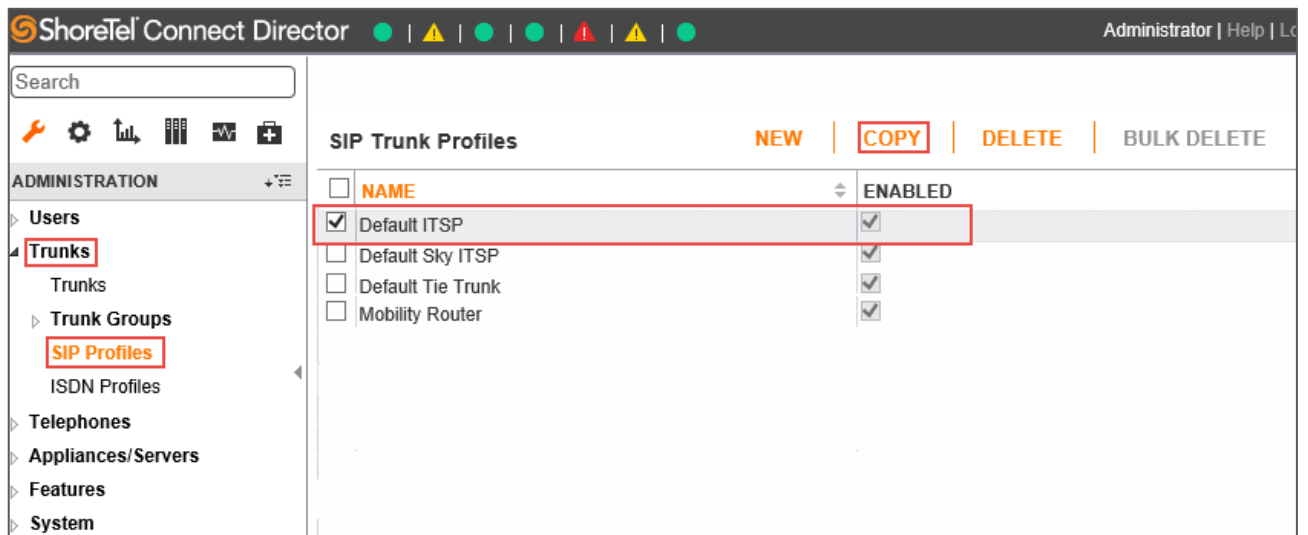
3. Click **COPY**

Figure 5: SIP Trunk Profiles

4. Set **Name**: Change name from *Default ITSP* to *TWCBC*
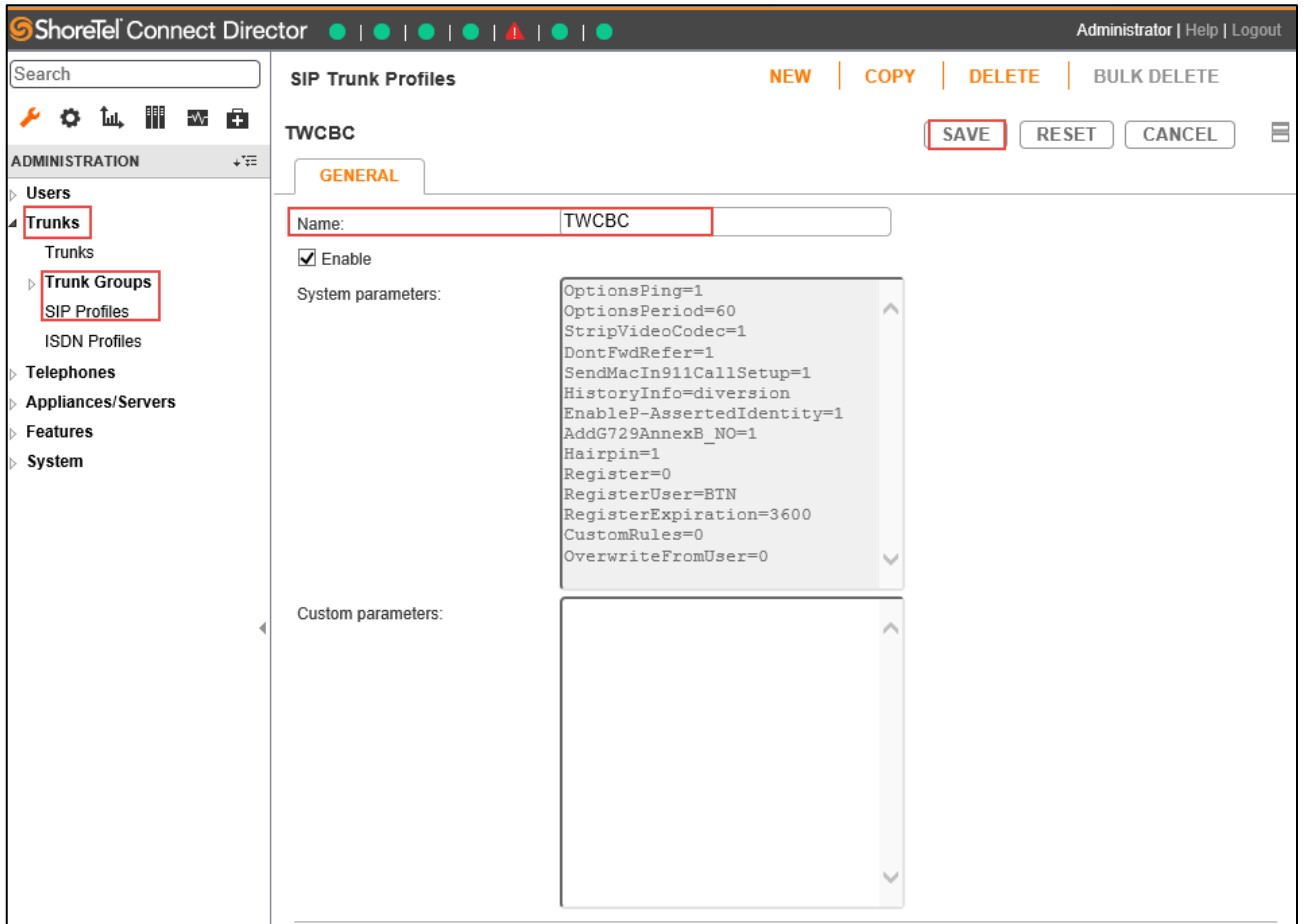
5. Click **SAVE**

Figure 6: SIP Profile - Cont.

Add Trunk Group

1. Navigate to **Trunks >Trunk Groups > Trunk Groups**

2. Select the **GENERAL** tab

3. Set **Name**: *TWCBC*

4. Set **Trunk Type**: *SIP*

5. Set **Profile**: SIP Profile *TWCBC* created in the previous step is selected from drop down

Figure 7: Trunk Groups

6. Select the **INBOUND** tab

7. Set **Number of Digits from CO**: 10 is used in this setup

8. **DNIS**: Checked

9. **DID**: Checked
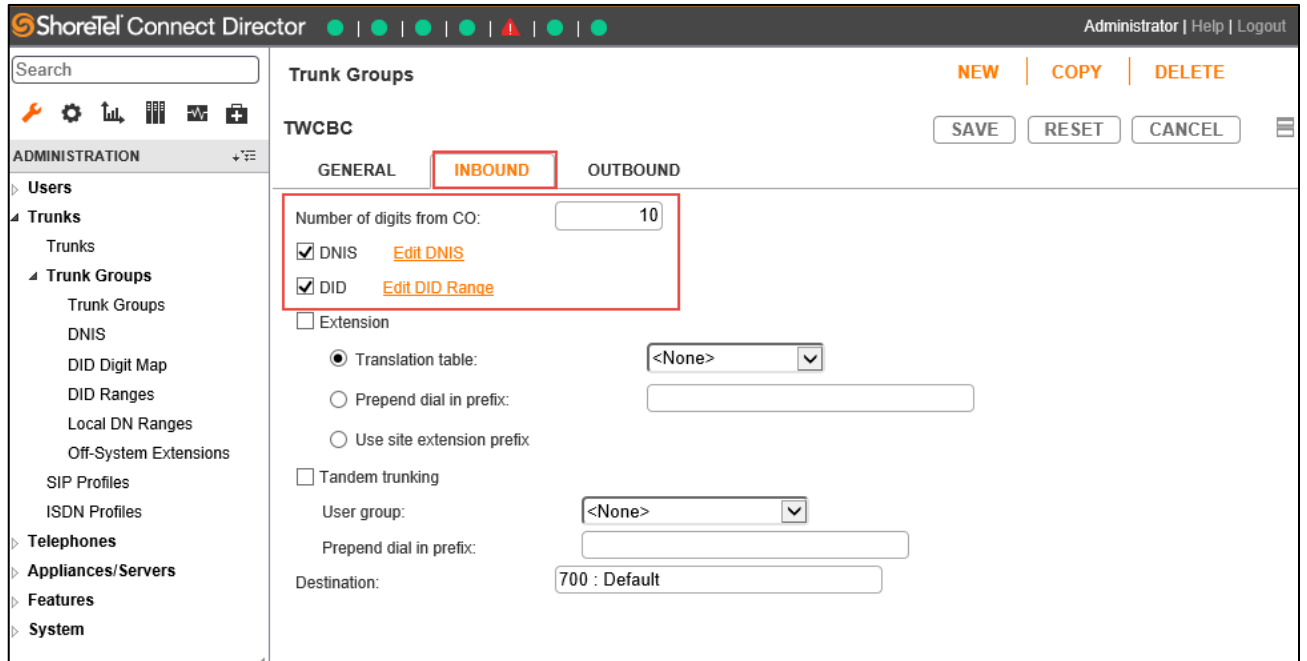
Figure 8: Trunk Groups - Cont.

10. Select the **OUTBOUND** tab

11. **Outgoing**: Checked

12. Set **Access Code**: 9 is used in this example

13. Set **Local Area Code**: 469 is used in this example

14. Set **Billing Telephone Number**: Pilot number will be provided by your TWCBC Account Representative and must be kept confidential

15. **Enable original caller information**: Checked

16. **Dial 7 Digits for local area code**: Unchecked

17. Leave all other fields as default

18. Click **SAVE**

Figure 9: Trunk Groups - Cont.

Create Individual Trunks

1. Navigate to **Trunks > Trunks**

2. Click **NEW**

3. Set **Trunk Group**: *TWCBC (SIP)* is selected from drop down menu

4. Set **Name**: *TWCBC* is used in this setup

5. Set **Switch**: *Lab110-vTS1* is selected from drop down menu

6. Set **IP Address or FQDN**: Enter the LAN IP Address of the TWCBC ESG. Please contact TWCBC for more information regarding your deployment.

7. Set **Number of Trunks**: 4 is given in this setup

8. Click **SAVE**

Figure 11: Individual Trunks

Summary of Tests and Results

N/S = Not Supported   N/T= Not Tested   N/A= Not Applicable

Primary Switch Test Plan

ID	Result	Name	Description	Notes
1.1	PASS	Setup and Initialization	Verify successful setup and initialization of the SUT	
1.2	PASS	Outbound Call (Domestic)	Verify calls outbound placed through the SUT reach the external destination	
1.3	PASS	Inbound Call (Domestic)	Verify calls received by the SUT are routed to the default trunk group destination	
1.4	PASS	All Trunks Busy– Inbound Caller	Verify an inbound caller hears busy tone when all channels/trunks are in use	
1.5	PASS	All Trunks Busy– Outbound Caller	Verify an outbound caller hears busy tone when all channels/trunks are in use	
1.6	PASS	Incomplete Inbound Calls	Verify proper call progress tones are provided and proper call teardown for incomplete inbound calls	

ID	Result	Name	Description	Notes
2.1	G729 N/S	Codec Negotiation	Verify codec negotiation between the SUT and the calling device with each side configured for a different codec	TWCBC does not support G729
2.2	G711 PASS G729 N/S	DTMF Transmission – Out of Band / Inband	Verify transmission of inband and out-of-band digits per RFC 2833 for various devices connected to the SUT	TWCBC does not support G729

ID	Result	Name	Description	Notes
2.3	PASS	Auto Attendant Menu	Verify that inbound calls are properly terminated on the ShoreTel Auto Attendant menu and that you can transfer to the desired extension	
2.4	PASS	Auto Attendant Menu checking Voicemail mailbox	Verify that inbound calls are properly terminated on the ShoreTel Auto Attendant menu and that you can transfer to the Voicemail Login Extension	

ID	Result	Name	Description	Notes
3.1	PASS	Post Dial Delay	Verify that post dial delay is within acceptable limits	

ID	Result	Name	Description	Notes
4.1	PASS	Caller ID Name and Number - Inbound	Verify that Caller ID name and number is received from SIP endpoint device	
4.2	PASS	Caller ID Name and Number - Outbound	Verify that Caller ID name and number is sent from SIP endpoint device	
4.3	PASS	Hold from SUT to SIP Reference	Verify successful hold and resume of connected call	
4.4	PASS	Call Forward - SUT	Verify outbound calls that are being forwarded by the SUT are redirected and connected to the appropriate destination	
4.5	PASS	Call Forward – External PSTN Number	Verify outbound calls that are being forwarded by the SUT are redirected and connected to the appropriate destination	
4.6	PASS	Call Transfer – Blind	Verify a call connected from the SUT to the ShoreTel phone can be transferred to an alternate destination	
4.7	PASS	Call Transfer – Consultative	Verify a call connected from the SUT to the ShoreTel phone can be transferred to an alternate destination	
4.8	N/T	Outbound 911	Verify that outbound calls to 911 are routed to the correct PSAP for the calling location and that caller ID information is delivered	TWCBC opted not to make test call to 911
4.9	PASS	Operator Assisted	Verify that 0+ calls are routed to an operator for calling assistance	
4.10	PASS	Inbound / Outbound call with Blocked Caller ID	Verify that calls with Blocked Caller ID route properly and the answering phone does not display any Caller ID information	

ID	Result	Name	Description	Notes
4.11	G711 PASS G729 N/S	Inbound call to a Hunt Group	Verify that calls route to the proper Hunt Group and are answered by an available hunt group member with audio in both directions using G.729 and G.711 codecs	TWCBC does not support G729
4.12	G711 PASS G729 N/S	Inbound call to a Workgroup	Verify that calls route to the proper Workgroup and are answered successfully by an available workgroup agent with audio in both directions using G.729 and G.711 codecs	TWCBC does not support G729
4.13	PASS	Inbound call to DNIS/DID and leave a voice mail message	Verify that inbound calls to a user, via DID / DNIS, routes to the proper user mailbox and a message can be left with proper audio	
4.14	PASS	Call Forward – "FindMe"	Verify that inbound calls are forwarded to a user's "FindMe" destination	
4.15	N/A	Inbound / Outbound Fax Calls	Verify that inbound / outbound fax calls complete successfully	FAX test cases are not applicable for Virtual trunk Switch
4.17	PASS	Inbound call to Bridged Call Appearance (BCA) Extension	Verify that inbound calls properly presented to all of the phones that have BCA configured and that the call can be answered, placed on-hold and then transferred	
4.18	PASS	Inbound call to a Group Pickup Extension	Verify that inbound calls properly presented to all of the phones that have Group Pickup configured and that the call can be answered, placed on-hold and then transferred	
4.19	PASS	Office Anywhere External	Verify that inbound calls are properly presented to the Office Anywhere External PSTN destination	

ID	Result	Name	Description	Notes
4.20	PASS	Simul Ring	Verify that inbound calls are properly presented to the desired extension and the "Additional Phones" destinations	
4.21	PASS	MakeMe Conference	Verify that an inbound call can be conferenced with three (or more) additional parties	
4.22	PASS	Park / Unpark	Verify that an inbound call can be parked and unparked	
4.23	G711 PASS G729 N/S	Call Recording	Verify that external calls can be recorded via the SIP Trunk using ShoreTel Communicator	TWCBC does not support G729
4.24	FAIL	Silent Monitor / Barge-In / Whisper Page	Verify that external calls can be silently monitored, barged-in and whisper paged via the SUT	If the monitored phone is ShoreTel 485G, the Barge-in or Silence Monitor fails after Whisper Page to monitor phone. ShoreTel BUG ID ENG-379430.
4.25	PASS	Long Duration – Inbound	Verify that an inbound call is established for a minimum of 30 minutes	
4.26	PASS	Long Duration – Outbound	Verify that an outbound call is established for a minimum of 30 minutes	

ID	Result	Name	Description	Notes
5.1	PASS	Registration or Digest Authentication	Verify the SUT supports the use of registration or digest authentication for service access for inbound and outbound calls	

Secondary Switch Sanity Test Results

ID	Result	Name	Description	Notes
1.2	PASS	Outbound Call (Domestic)	Verify calls outbound placed through the SUT reach the external destination	
1.3	PASS	Inbound Call (Domestic)	Verify calls received by the SUT are routed to the default trunk group destination	
2.2	G711 PASS G729 N/S	DTMF Transmission – Out of Band / In Band	Verify transmission of in-band and out-of-band digits per RFC 2833 for various devices connected to the SUT	TWCBC does not support G729
4.5	PASS	Call Forward – External PSTN Number	Verify outbound calls that are being forwarded by the SUT are redirected and connected to the appropriate destination	
4.6	PASS	Call Transfer – Blind	Verify a call connected from the SUT to the ShoreTel phone can be transferred to an alternate destination	
4.7	PASS	Call Transfer – Consultative	Verify a call connected from the SUT to the ShoreTel phone can be transferred to an alternate destination	
4.12	G711 PASS G729 N/S	Inbound call to a Workgroup	Verify that calls route to the proper Workgroup and are answered successfully by an available workgroup agent with audio in both directions using G.729 and G.711 codecs	TWCBC does not support G729

4.15	G711 PASS T38 N/S	Inbound / Outbound Fax Calls	Verify that inbound / outbound fax calls complete successfully	TWCBC does not support T38 Fax Protocol
4.16	PASS	ShoreTel Service Appliance Unified Communication System	Verify that inbound calls are properly forwarded to the ShoreTel Service Appliance and it properly accepts the access code and you're able to participate in the conference bridge	
4.21	PASS	MakeMe Conference	Verify that an inbound call can be conferenced with three (or more) additional parties	
4.23	G711 PASS G729 N/S	Call Recording	Verify that external calls can be recorded via the SIP Trunk using ShoreTel Communicator	TWCBC does not support G729
4.24	FAIL	Silent Monitor / Barge-In / Whisper Page	Verify that external calls can be silently monitored, barged-in and whisper paged via the SUT	If the monitored phone is ShoreTel 485G, the Barge-in or Silence Monitor fails after monitor phone did Whisper Page. Reported ShoreTel and got the BUG ID ENG-379430 for the same.
4.27	PASS	Contact Center	Verify that an inbound call can be established directly to the ShoreTel Contact Center, that all prompts are heard and the agent can answer the call	

Tertiary Switch Sanity Test Results

ID	Result	Name	Description	Notes
1.2	PASS	Outbound Call (Domestic)	Verify calls outbound placed through the SUT reach the external destination	
1.3	PASS	Inbound Call (Domestic)	Verify calls received by the SUT are routed to the default trunk group destination	
2.2	G711 PASS G729 N/S	DTMF Transmission – Out of Band / In Band	Verify transmission of in-band and out-of-band digits per RFC 2833 for various devices connected to the SUT	TWCBC does not support G729
4.5	PASS	Call Forward – External PSTN Number	Verify outbound calls that are being forwarded by the SUT are redirected and connected to the appropriate destination	
4.6	PASS	Call Transfer – Blind	Verify a call connected from the SUT to the ShoreTel phone can be transferred to an alternate destination	
4.7	PASS	Call Transfer – Consultative	Verify a call connected from the SUT to the ShoreTel phone can be transferred to an alternate destination	
4.12	G711 PASS G729 N/S	Inbound call to a Workgroup	Verify that calls route to the proper Workgroup and are answered successfully by an available workgroup agent with audio in both directions using G.729 and G.711 codecs	TWCBC does not support G729

4.15	G711 PASS T38 N/S	Inbound / Outbound Fax Calls	Verify that inbound / outbound fax calls complete successfully	TWCBC does not support T38 Fax Protocol
4.21	PASS	MakeMe Conference	Verify that an inbound call can be conferenced with three (or more) additional parties	
4.23	G711 PASS G729 N/S	Call Recording	Verify that external calls can be recorded via the SIP Trunk using ShoreTel Communicator	TWCBC does not support G729
4.24	*FAIL*	Silent Monitor / Barge-In / Whisper Page	Verify that external calls can be silently monitored, barged-in and whisper paged via the SUT	If the monitored phone is 485G, the Barge-in or Silence Monitor fails after Whisper Page to monitor phone. ShoreTel BUG ID ENG-379430
4.27	PASS	Contact Center	Verify that an inbound call can be established directly to the ShoreTel Contact Center, that all prompts are heard and the agent can answer the call	

Conclusion

Time Warner Cable Business Class (TWCBC) SIP Trunking has been successfully tested with ShoreTel Connect Onsite Build 21.75.1908.0

Additional Resources

- ShoreTel Administration Guide

- InnoMedia ESBC Administration Guide

Version	Date	Contributor	Content
1.0	Dec 15, 2015	R. Jerome	Original Release
1.1	Jan 7, 2016	R. Jerome	Incorporated TWCBC changes

ShoreTel. Brilliantly simple business communications.

ShoreTel, Inc. (NASDAQ: SHOR) is a leading provider of brilliantly simple IP phone systems and unified communications solutions powering today's always-on workforce. Its flexible communications solutions for on-premises, cloud and hybrid environments eliminate complexity, reduce costs and improve productivity.

World Headquarters	+1 (800) 425-9385 Toll Free	**EMEA**	**APAC**
960 Stewart Drive	+1 (408) 331-3300 Tel	Inspired	8 Temasek Boulevard#41-03
Sunnyvale, CA 94085	+1 (408) 331-3333 Fax	Easthampstead Road	Suntec Tower 3
USA		Bracknell, RG12 1YQ	Singapore 038988
shoretel.com		+44 (0) 1344 208800 Tel	+65 6517 0800 Tel