

**Spectrum Enterprise SIP Trunking Service
FORTINET - Fortivoice FVE 200D-T
Software Verison: V5.0 B156
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

Document Purpose and Target Audience

This document will serve as a reference guide to configure the Fortivoice FVE 200D-T IP PBX to interoperate with Time Warner Cable (TWC) SIP Trunk Service.

This guide is not intended to be a replacement of the PBX manufacturer's user or configuration guide. It is intended to provide additional guidance on configuring the PBX in preparation to receive voice service from the SIP Trunk. It provides detailed instructions and best practices for a successful installation with TWC SIP Trunks.

There are many options for establishing and maintaining service using the Fortivoice FVE 200D-T IP PBX. This guide focuses on the minimum configurations essential for successful interoperability with Time Warner Cable Business Class SIP Trunks.

This configuration guide is based on:

Customer Premise Equipment:

Manufacturer	Variant	Software Version
FVE 200D-T		V5.0 B156
Fortifone	460i, 470i,etc	
TWC	Setup as of Dec 2015	

TWC Network Equipment:

ESG	InnoMedia ESBC 9378-4B
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Interop Status:

The Interop of TWC with Fortivoice Enterprise has been given a Compatible status.

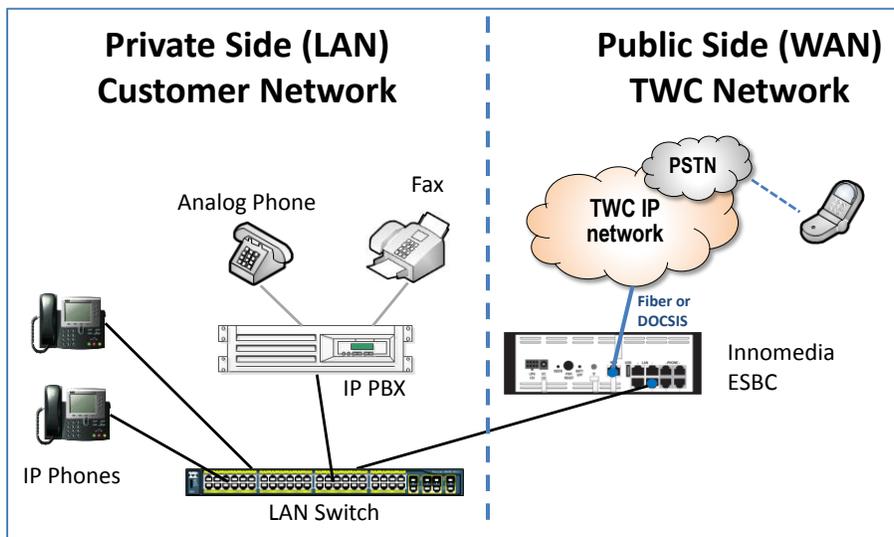
SIP Trunk Components

The Time Warner Cable Business Class (TWCBC) SIP Trunks product is an IP-based, voice only trunk that uses Session Initiation Protocol (SIP) to connect an IP PBX to the PSTN. The IP PBX uses SIP to exchange signaling information with the service provider and to deliver and receive voice in IP packets.

The IP PBX is connected to the TWC Enterprise SIP Gateway (ESG), which provides network access for voice traffic. The customer is responsible for the LAN infrastructure and configuration, including the physical connection to the LAN port 2 on the ESG.

The ESG is the demarcation point to the TWC network. The ESG is connected to a dedicated router for SIP Trunks delivered over a fiber connection or to a cable modem when delivered over a DOCSIS connection.

SIP Trunk components located on the customer premise, including connections to the TWC network, are illustrated below .



All TWC SIP Trunk calls are routed over Time Warner Cable’s IP network and are not routed over the public internet.

Getting Started

You will need to have the TWC “**SIP Trunk Questionnaire**” and “**Business Class (BC) SIP Trunks: Customer Cut Sheet**” in order to configure your IP PBX for TWC Business Class SIP Trunk service.

Confirm that your **IP PBX model number and software versions** recorded on the **Customer Cut Sheet** match those associated with your current equipment. If they do not, be sure to alert your TWC sales engineer or TWC project manager as this can impact how TWC designs your service configuration.

Example from Customer Cut Sheet for Cisco UC 560:

SERVICE INFORMATION	
PRODUCT	Business Class SIP TRUNK
IP-PBX MAKE	Cisco
IP-PBX MODEL	UC560
IP-PBX SOFTWARE VERSION	15.1(4)

While configuring your IP PBX for BC SIP Trunk service, you will need to know your Lead Telephone Number and the IP address of your IP PBX.

The **Lead Number** is confirmed on the **Customer Cut Sheet** as seen below:

Trunk Groups				
TWC TRUNK Group ID	DID Range	Lead Number	Inbound Call Blocking	Outbound Call Blocking

The **IP Address** of the IP PBX was recorded on the **SIP Trunk Questionnaire**, Section 5. Signaling and Media as shown below:

5- Signaling and Media		
IP Address for PBX or SBC	IP: xxx.xxx.xxx.xxx	
To setup LAN configuration for signaling of voice traffic to the ESG	Subnet: 255.255.xxx.xxx	
		TWC could provide IP address

This document is intended as an aid to help configure a customer’s IP PBX for interoperability with TWCBC SIP Trunk Service.

Software & Hardware Setup

This was the test setup to generate a basic SIP call between TWC SIP service provider and the FVE.

Manufacturer	Variant	Software Version
FVE 200D-T		V5.0 B156
Fortifone	460i, 470i,etc	
TWC	Setup as of Dec 2015	

Tested Features

This is an overview of the features tested during the Interop test cycle and not a detailed view of the test cases.

Feature	Feature Description	Issues
Basic Call	Making and receiving a call through the SIP Service provider, including basic and long distance inbound and outbound calls, call forward, hold, transfer, inbound call to Auto attendant etc.	<input checked="" type="checkbox"/>
DTMF	Making and receiving a call through the SIP Service provider, verifying RFC2833 DTMF generation and detection	<input checked="" type="checkbox"/>
Early Media	Verify if early media is supported	<input checked="" type="checkbox"/>
G711 Fax	Verify if G711 Fax can be sent or received via SIP service provider	<input checked="" type="checkbox"/>
T.38 Fax	Verify If T.38 Fax can be sent or received via SIP service provider	<input checked="" type="checkbox"/>

- No issues found - Issues found, cannot recommend to use - Issues found

Configuration Notes

This section is a description of how the SIP Interop was configured. These notes should give a guideline how the Fortivoice enterprise Platform can connect to TWC service provider

Fortivoice Enterprise Configuration Notes

The following steps show how to program a Fortivoice Enterprise to interconnect with TWC.

SIP Profile Configuration

SIP profile configures DTMF method, Transport and Codecs. For TWC sip profile, RFC 2833 DTMF was used. G711u Codec was selected as preferred codec. UDP was used as Transport method. SIP profile will be used by SIP trunk Configuration later. Check Figure 1 below for details.

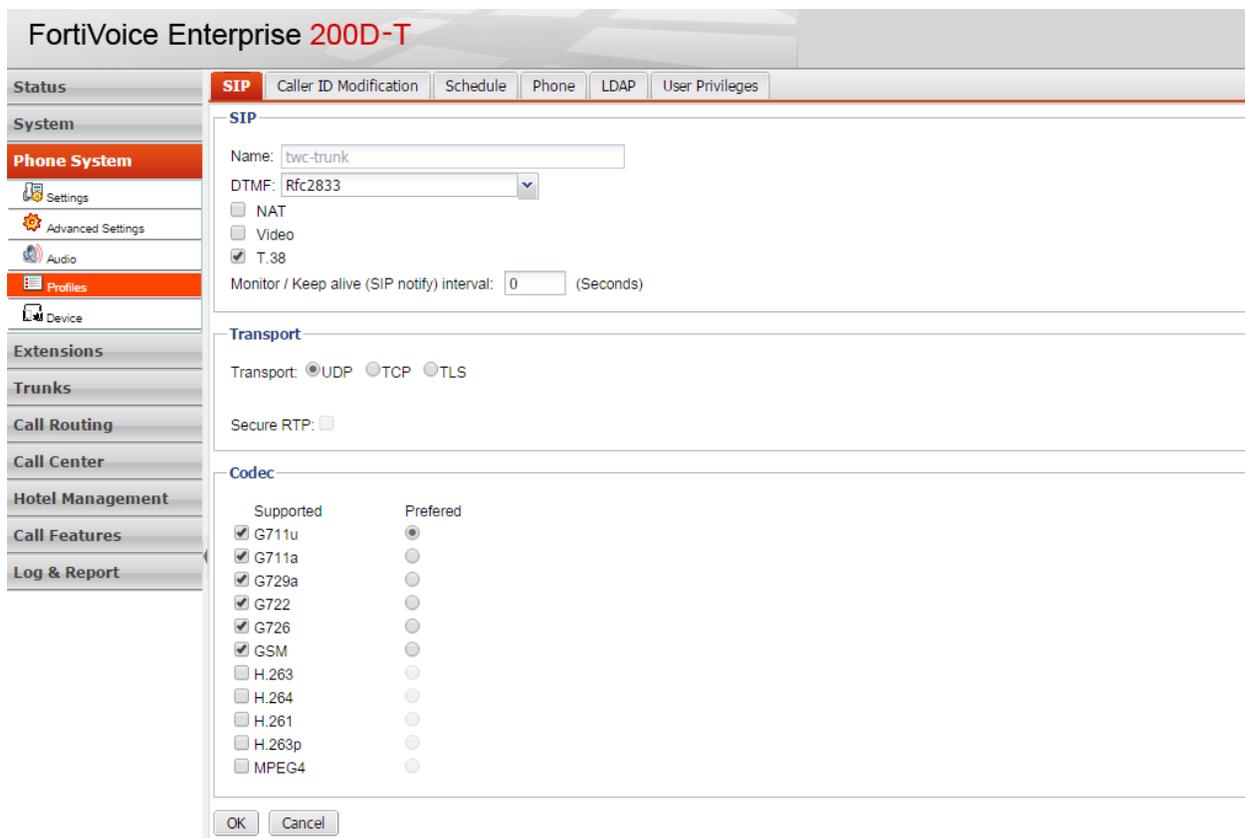


Figure 1 SIP profile

SIP Trunk Configuration

Figure 2 shows how TWC SIP trunk was configured. Below are some key parameters and description.

SIP server: TWC's SIP server IP address

SIP port: 5060 by default

User name: It's a DID number from TWC, un-check "Caller ID modification", PBX use "user name" as user part of SIP From header which is required by TWC

Auth. User name / Password: it's used for SIP trunk registration which was provided by TWC.

SIP setting: SIP profile "twc-trunk" was selected

The screenshot displays the FortiVoice Enterprise 200D-T configuration interface. On the left is a navigation menu with categories: Status, System, Phone System, Extensions, Trunks (highlighted), VoIP, PRI, Analog, Office Peers, Call Routing, Call Center, Hotel Management, Call Features, and Log & Report. The main content area is titled 'SIP' and contains several sections:

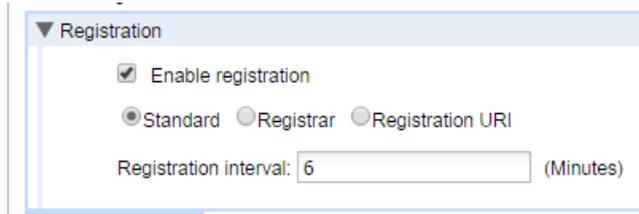
- SIP**: Fields for Name (TWC), Enabled (checked), Display name (FTNTTest), and Main number (19802651176).
- SIP Setting**: Fields for SIP server (107.14.112.6), SIP port (5060), Using SRV record (unchecked), User name (19193789301), Password (masked), Auth. user name (19193789301), and Realm/domain. A dropdown menu for SIP setting is set to 'twc-trunk', with 'New...' and 'Edit...' buttons. Below are checkboxes for Max channel (5), Max outgoing channel (0), User=Phone in SIP URI, Caller ID modification, and Inband ringtone. There are also expandable sections for 'Registration' and 'Outbound Proxy'.
- Fax**: A section for 'Phone Number' with a table containing one entry: '9193789301'. Above the table are 'New...', 'Edit...', and 'Delete' icons.

At the bottom of the configuration window are 'OK' and 'Cancel' buttons.

Figure 2 SIP trunk

SIP Trunk registration

TWC requires SIP registration, in Figure 2, the “Registration” should be configured as below.



The image shows a configuration window titled "Registration". It contains the following elements:

- A checked checkbox labeled "Enable registration".
- Three radio buttons: "Standard" (selected), "Registrar", and "Registration URI".
- A text input field labeled "Registration interval:" containing the number "6", followed by the text "(Minutes)".

Figure 3 SIP Trunk registration

In bound Call Routing

This is used when a call hit PBX, how PBX route the call to appropriate party. Figure 4 shows when a call from TWC sip trunk reaches PBX, it will be answered by auto attendant. You can use different “Action” and “Target” to reach different parties.

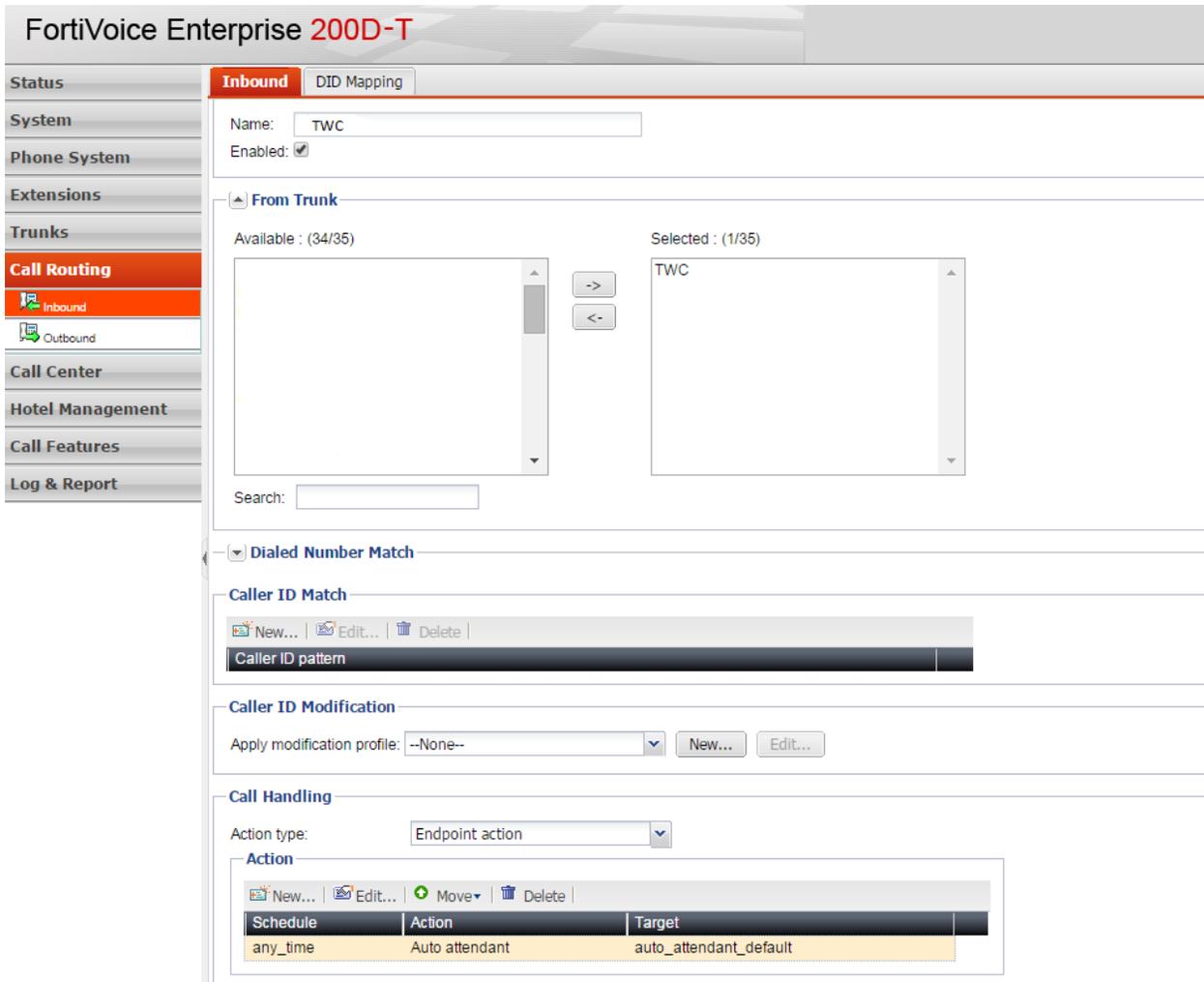


Figure 4. Inbound call routing

Outbound call routing

This describes how SIP trunk was selected for outbound calls. In Figure 5 below, when you dial prefix 987 followed by any digits, the call will go out using TWC SIP trunk. “Strip” means how many preceding digits will be absorbed before the dialed digits outpulsed.

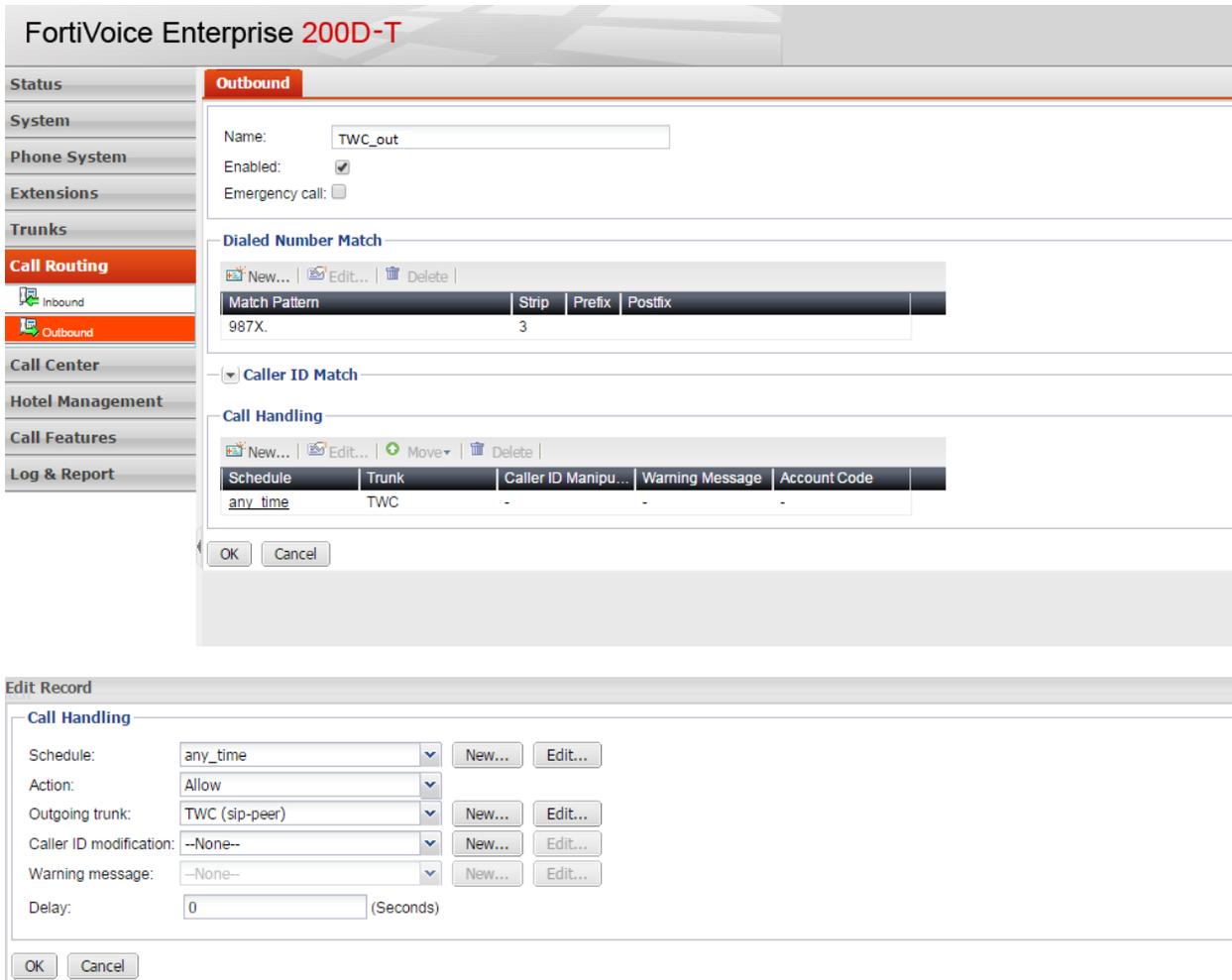


Figure 5. Outbound call routing

Fortigate Firewall Setup

This test bed use Fortigate as firewall, Fortigate should be configured to allow PBX to send call to TWC and map the inbound call to PBX. Configuration of Fortigate is beyond the scope of this configuration document, refer to your specific Firewall user guide to configure your Firewall accordingly.

Appendix

TWC Turn-up Testing Procedure

To ensure proper service between the IP PBX and the TWC network, test calls from the IP PBX will be made. Typically, the following call types will be used (call testing varies depending on service configuration)

1. Outbound/Inbound call to a local number
2. Outbound/Inbound call to a long distance number
3. Calls to 411 and 611
4. Outbound calls to a blocked number to verify call blocking settings
5. Other calls based on customer request , e.g. FAX testing using T.38 or calls to an auto-attendant to verify DTMF

Questions

If you have questions, please contact your Time Warner Cable Business Class Account Executive.