ADTRAN

Configuration Guide

International Configuration Guide

This configuration guide provides international configuration support for ADTRAN Operating System (AOS) products. It describes how to configure the system country, the system clock time zone, the Simple Network Time Protocol (SNTP) server, analog voice trunk disconnect supervision, call progress tones for local blind transfers, the dial plan, accept and reject numbers, and E1 interfaces using both the AOS command line interface (CLI) and Web-based graphical user interface (GUI).

This guide consists of the following sections:

International Configuration Overview

By default, NetVanta voice products comply with United States standards; however, NetVanta 6310/6330 Series, NetVanta 6355, and NetVanta 7000 series voice products running AOS firmware versions A4.05 and later and the NetVanta 644 voice product running AOS firmware version A5.01 and later can readily be adapted to comply with other country standards. Multiple system settings can be configured simultaneously by changing the system country. These settings include the coder-decoder (CODEC) companding type, foreign exchange station (FXS) ringing frequency and cadence, default FXS/FXO impedance, and the default CODEC country. Changing the system country also affects other system settings, such as the default local emergency numbers and the default language for the voice prompts and the system email. Additionally, the system clock time zone, SNTP server, dial plan, and accept and reject numbers can be manually configured to match the conventions of the country in which the unit is operating. Analog voice trunks can also be adapted for auto attendant, modem, and fax applications in countries where a busy tone is used to indicate that a call has ended. In these countries, disconnect supervision for busy tone can be configured on analog voice trunks to monitor foreign exchange office (FXO) ports connected to the trunk. This ensures that calls are not connected indefinitely in auto attendant, modem, and fax applications.

Hardware and Software Requirements and Limitations

Disconnect supervision for busy tone is only supported on NetVanta 6310/6330 Series, NetVanta 6355, and NetVanta 7000 series voice products running AOS firmware versions A4.05 and later. The NetVanta 644 does not support disconnect supervision for busy tone because it does not have FXO interfaces. When using disconnect supervision for busy tone, the busy tone is detected within ±10 percent of the specified frequency and cadence. Disconnect supervision is only available for loop start and ground start analog trunks.

NetVanta 6310/6330 Series, NetVanta 6355, and NetVanta 7000 series voice products cannot be configured to generate tones of one country type and detect tones of a different country type.

International call progress tones for blind transfers is only supported on AOS units with voice features (except the NetVanta 644) running AOS firmware versions R10.1.0 and later. AOS units with voice features that have a digital signal processor (DSP) use the DSP by default to generate ringback tones based on the system country setting during blind transfers over a SIP trunk when operating in local transfer mode. The DSP is only able to provide ringback tones and does not generate a busy tone on SIP to SIP calls. By default, AOS units with voice features that lack a DSP provide North American ringback and busy tones for blind transfers.

International Configuration Using the CLI

All AOS features that apply to international configurations can be configured using the CLI. While many international features can be configured using the GUI, some features, including the startup configuration, the system country, disconnect supervision for busy tone, always-permitted dial plan patterns, and named digit timeouts, can only be configured using the CLI. For information on the features that can be configured using the GUI, refer to *International Configuration Using the GUI on page 29*.

Accessing the CLI

To access the CLI on your AOS unit, follow these steps:

1. Boot up the unit.

2. Telnet to the unit (**telnet** *<ip address>*). For example:

    telnet 10.10.10.1.

    > **NOTE** *If during the unit's setup process you have changed the default Internet Protocol (IP) address (**10.10.10.1**), use the configured IP address.*

3. Enter your user name and password at the prompt.

    > **NOTE** *The AOS default user name is **admin** and the default password is **password**. If your product no longer has the default user name and password, contact your system administrator for the appropriate user name and password.*

4. Enter the Enable mode by entering **enable** at the prompt as follows:

    >enable

5. Enter your Enable mode password at the prompt.

    > **NOTE** *The default Enable mode password is **password**. If your product no longer has the default Enable password, contact your system administrator for the appropriate password.*

6. Enter the unit's Global Configuration mode as follows:

    #configure terminal

    (config)#

Creating a Blank Startup Configuration Using the CLI

CAUTION	*ADTRAN strongly recommends that you connect to the unit using the console port when creating a blank startup configuration. Otherwise, you will lose access to the unit when rebooting.*

It is recommended that a blank startup configuration be created for the NetVanta 7060 and NetVanta 7100 before configuring the system because the system automatically generates default integrated services digital network (ISDN) number templates, dial plan entries, and accept and reject numbers that may not apply to your country. Creating a blank startup configuration removes any existing number templates so that they can be manually defined for the country in which the unit is operating. To create a blank startup configuration, follow these steps:

1. From the Enable mode prompt, enter the following:

    #copy console flash startup-config force-overwrite

NOTE	*This command does not overwrite existing users or phone configurations on the NetVanta 7100.*

2. The following text will be displayed:

    Enter text to be saved to "startup-config".

    Type CTRL+D to finish.

    On your keyboard, simultaneously press the **Ctrl** and **D** keys.

3. Reload the unit using the following command:

    #reload

4. The following prompt will appear:

    Save System Configuration?[y/n]

5. Enter **n** to reboot the system without saving the system configuration.

Configuring the System Country Using the CLI

To configure the NetVanta 644, NetVanta 6310/6330 Series, NetVanta 6355, and NetVanta 7000 Series voice products for operation in a specific country, changes are made to the system country setting. Once the system country is set, several default settings will automatically change to match the standards of the specified country. These settings include the CODEC companding type, FXS ringing frequency and cadence, default FXS/FXO impedance, and the default CODEC country. Changing the system country also affects other system settings, such as the default local emergency numbers and the default language for the voice prompts and the system email.

The system country setting is not stored as part of the running configuration or the startup configuration; therefore, erasing the startup configuration will not change the system country. Also, if a particular feature or configuration option is configured to something other than the default, changing the system country will have no effect on that feature or option.

> ✎ NOTE   *The system country can only be configured using the CLI.*

The following tables show some of the FXO and FXS parameters and other system parameters affected by the system country setting. *Table 1 below* includes a comprehensive list of features affected by the system country and CODEC country settings. Because changing the system country also changes the default CODEC country (if the CODEC country has not been previously changed), setting the system country affects all features in both the **System Country** and **CODEC Country** columns. *Table 2 on page 6* shows the default settings of several parameters affected by the system country setting. The defaults for other parameters affected by the system country setting are outlined in tables in subsequent sections. *Table 3 on page 7* lists general system parameters that are affected by the system country setting. *Table 4 on page 7* lists the emergency numbers that are affected by the system country setting.

Table 1. Features Affected by System Country and CODEC Country Settings

System Country	CODEC Country
NetVanta 644 and 6310 PRI Compatibility (T1 or E1)	Dial Tone
Default Voice Prompt Language	Busy Tone
Default System Email Language	Fast Busy Tone
Default CODEC Country	Ringing Parameters
Default CODEC Companding Type	SAS Tone
Default Caller ID Type	CAS Tone
Default FXO/FXS Impedance	Test Tone
Release Tone Detection	Stutter Dial Tone
Dial Tone Detection	Confirmation Tone
FXS Ring Frequency	Howler Tone
Default Country Code	Call Waiting Tone
Default International Dialing Prefix	Ring Cadence
Maximum Frequency-Shift Keying (FSK) Based Caller ID Name Length	
Emergency Numbers List	

Table 2. Default Parameters

System Country	CODEC Country	CODEC Companding	Country Code	International Dialing Prefix	Impedance	NetVanta 644 and 6310 PRI Compatibility
Australia	Australia	A-law	61	0011	Z1 (Rs 220 Ω, Rp 820 Ω, Cp 115 nF)	E1
Belgium	Belgium	A-law	32	00	600 Ω real	E1
Canada	Canada	µ-law	1	011	600 Ω complex	T1
ETSI	ETSI	A-law	N/A	N/A	Z2 (Rs 270 Ω, Rp 750 Ω, Cp 150 nF)	E1
Ireland	Ireland	A-law	353	00	Z2 (Rs 270 Ω, Rp 750 Ω, Cp 150 nF)	E1
Mexico	Mexico	A-law	52	00	Z1 (Rs 220 Ω, Rp 820 Ω, Cp 115 nF)	E1
Puerto_Rico	Puerto_Rico	µ-law	1	011	600 Ω complex	T1
United_Arab_Emirates	United_Arab_Emirates	A-law	971	00	600 Ω real	E1
United_Kingdom	United_Kingdom	A-law	44	00	Z4 (Rs 320 Ω, Rp 1050 Ω, Cp 230 nF)	E1
United_States	United_States	µ-law	1	011	600 Ω complex	T1

Table 3. General System Parameters

System Country	Default GUI Language	Default Voice Prompt Language*	Default Email Language
Australia	English	English	English
Belgium	English	English	English
Canada	English	English	English
ETSI	English	English	English
Ireland	English	Irish	English
Mexico	English	Spanish	Spanish
Puerto_Rico	English	Spanish	Spanish
United_Arab_Emirates	English	English	English
United_Kingdom	English	UKEnglish	English
United_States	English	English	English

* The default voice prompt language affects the voice prompts for voicemail, FindMe-FollowMe, auto attendants, and call queuing.

Table 4. Emergency Numbers Lists

System Country	Emergency Number(s)
Australia	000, 106, 112
Belgium	112
Canada	911
ETSI	112
Ireland	112, 999
Mexico	060, 065, 066, 068, 080
Puerto_Rico	911
United_Arab_Emirates	112, 997, 998, 999
United_Kingdom	112, 999
United_States	911

NOTE

*To minimize dialing errors in emergency situations, the emergency numbers lists for the NetVanta 7000 series voice products also contain a version of the emergency number with a 9 added at the beginning (for example, 9911 is also contained in the emergency numbers list for the **United_States**, **Canada**, and **Puerto_Rico** system countries). Consequently, users can dial the emergency number alone or precede the emergency number with a 9, and the call will be considered an emergency call.*

Use the **voice system-country** command from the Global Configuration mode to configure the system country for your unit. To configure your unit's system country, follow these steps:

1. From the Global Configuration mode prompt, enter the following:

   (config)#**voice system-country** *<country>*

   The *<country>* keyword specifies the default settings for several parameters. To view a full list of the countries supported, enter the command followed by a question mark. For example:

   (config)#**voice system-country ?**

2. After entering the **voice system-country** command, you will be prompted with the following:

   WARNING! Any unsaved configuration will be lost.
   Save system-country setting and continue with reboot? [y/n]

   Enter **y** to save the system country settings and continue with the system reboot. Enter **n** to abort the operation and return to the Global Configuration mode prompt.

The following example configures the default settings for Australian compliance:

   >**enable**
   #**configure terminal**
   (config)#**voice system-country Australia**

Configuring the System Clock Time Zone Using the CLI

The system clock time zone should be set to the geographic time zone in which the unit is operating. This setting is based on the difference in time (in hours) between Greenwich Mean Time (GMT) and the time zone for which you are setting up the unit. For instructions on how to set the time zone using the GUI, refer to *Configuring the System Clock Time Zone and SNTP Server Using the GUI on page 30*.

Use the **clock timezone** command from the Enable mode prompt to set the unit's internal clock to the time zone of your choice. The list below shows the valid commands used to configure the system clock time zone.

clock timezone +1-Amsterdam	clock timezone +4-Abu-Dhabi	clock timezone -10
clock timezone +1-Belgrade	clock timezone +4-Baku	clock timezone -11
clock timezone +1-Brussels	clock timezone +4:30	clock timezone -12
clock timezone +1-Sarajevo	clock timezone +5-Ekaterinburg	clock timezone -2
clock timezone +1-West-Africa	clock timezone +5-Islamabad	clock timezone -3-Brasilia
clock timezone +10-Brisbane	clock timezone +5:30	clock timezone -3-Buenos-Aires
clock timezone +10-Canberra	clock timezone +5:45	clock timezone -3-Greenland
clock timezone +10-Guam	clock timezone +6-Almaty	clock timezone -3:30
clock timezone +10-Hobart	clock timezone +6-Astana	clock timezone -4-Atlantic-Time
clock timezone +10-Vladivostok	clock timezone +6-Sri-Jay	clock timezone -4-Caracus
clock timezone +11	clock timezone +6:30	clock timezone -4-Santiago
clock timezone +12-Auckland	clock timezone +7-Bangkok	clock timezone -5
clock timezone +12-Fiji	clock timezone +7-Kranoyarsk	clock timezone -5-Bogota
clock timezone +13	clock timezone +8-Bejing	clock timezone -5-Eastern-Time
clock timezone +2-Athens	clock timezone +8-Irkutsk	clock timezone -6-Central-America
clock timezone +2-Bucharest	clock timezone +8-Kuala-Lumpur	clock timezone -6-Central-Time
clock timezone +2-Cairo	clock timezone +8-Perth	clock timezone -6-Mexico-City
clock timezone +2-Harare	clock timezone +8-Taipei	clock timezone -6-Saskatchewan
clock timezone +2-Helsinki	clock timezone +9-Osaka	clock timezone -7-Arizona
clock timezone +2-Jerusalem	clock timezone +9-Seoul	clock timezone -7-Mountain-Time
clock timezone +3-Baghdad	clock timezone +9-Yakutsk	clock timezone -8
clock timezone +3-Kuwait	clock timezone +9:30-Adelaide	clock timezone -9
clock timezone +3-Moscow	clock timezone +9:30-Darwin	clock timezone 0
clock timezone +3-Nairobi	clock timezone -1-Azores	clock timezone GMT-Casablanca
clock timezone +3:30	clock timezone -1-Cape-Verde	clock timezone GMT-Dublin

The following example sets the time zone for Auckland, New Zealand.

> **>enable**
> **#clock timezone +12-Auckland**

Use the **clock auto-correct-DST** command from the Global Configuration mode prompt to enable automatic correction for Daylight Savings Time (DST). Use the **no** form of this command to disable automatic correction for DST.

The following example enables automatic correction for DST:

> **>enable**
> **#configure terminal**
> (config)**#clock auto-correct-DST**

Configuring the Ring Frequency Using the CLI

In most circumstances, setting the system country will automatically configure the appropriate default FXS port ring frequency for the specified country. However, the FXS port ring frequency can be manually changed from the default system country setting if necessary. The table below shows the default ring frequencies for supported system countries:

Table 5. Default Ring Frequencies

System Country	Default Ring Frequency (Hz)
Australia	25
Belgium	25
Canada	20
ETSI	25
Ireland	25
Mexico	25
Puerto Rico	20
United_Arab_Emirates	25
United_Kingdom	25
United_States	20

Use the **ring-frequency** command to change the ring frequency of a single FXS port from the default system country value. From the FXS interface configuration mode, enter the command as follows:

(config-fxs slot/port)#**ring-frequency** *<value>*

The *<value>* variable specifies the FXS port ring frequency. Valid values are **20**, **25**, and **50** Hz

The following example configures the ring frequency for FXS port 2/1 as **25** Hz.

(config)#**interface fxs 2/1**
(config-fxs 2/1)#**ring-frequency 25**

Use the **ring-frequency** command to change the ring frequency of a range of FXS ports from the default system country value. From the FXS interface range configuration mode, enter the command as follows:

(config-fxs slot/port-port)#**ring-frequency** *<value>*

The *<value>* variable specifies the FXS port ring frequency. Valid values are **20**, **25**, and **50** Hz

The following example configures the ring frequency for FXS ports 2/1 through 2/4 as **25** Hz.

(config)#**interface range fxs 2/1-4**
(config-fxs 2/1-4)#**ring-frequency 25**

Configuring the Loop Disconnect Time Using the CLI

Loop disconnect time is the length of time a line must maintain a loop current feed open (LCFO) state to qualify as a valid disconnect. In most circumstances, setting the system country will automatically configure the defaults for the appropriate loop disconnect time for FXO trunks for the specified country. However, the loop disconnect time for loop-start and ground-start FXO trunks can be manually changed from the default system country setting if necessary. The table below shows the default loop disconnect time for supported countries:

Table 6. Default Loop Disconnect Times

System Country	Loop Disconnect Time (ms)
Australia	500
Belgium	200
Canada	500
ETSI	200
Ireland	200
Mexico	500
Puerto Rico	500
United_Arab_Emirates	200
United_Kingdom	200
United_States	500

Use the **loop-disconnect time** command to change the time period that qualifies as a valid loop disconnection on a specified FXO trunk. From the loop start or ground start analog Voice Trunk Configuration mode, enter the command as follows:

> (config-TRUNK)#**loop-disconnect time** *<value>*

The *<value>* variable specifies the loop disconnect time in milliseconds. Valid range is **50** to **1000** milliseconds.

The following example configures the loop disconnect time for loop-start FXO trunk T01 as **500** ms.

> (config)#**voice trunk t01 type analog supervision loop-start**
> (config-t01)#**loop-disconnect time 500**

Configuring Disconnect Supervision Using the CLI

Disconnect supervision is used in auto attendant, fax, and modem applications to ensure that a connection is not maintained indefinitely when a call has ended or could not be completed. Disconnect supervision monitors an FXO port for a specific condition to determine when the line should be released. The conditions typically monitored include: the lack of battery current (loop current feed open), the transition of battery current from a normal state to a reversed state and back again (reverse loop current feed), or the presence of a call progress tone that indicates that a call cannot be completed or should be disconnected.

> **NOTE** *Disconnect superivision is configured on a per-trunk basis. Disconnect supervision settings configured for the trunk apply to all connected FXO ports.*

Configuring Disconnect Supervision for Busy Tone on an Analog Voice Trunk

Disconnect supervision for busy tones can be configured on a per-trunk basis for loop start and ground start analog voice trunks using the **disconnect-supervision tone busy** command from the Voice Analog Trunk Configuration mode. Use the **no** form of this command to disable disconnect supervision for busy tone. Upon entering the command, the system will configure the voice trunk to monitor for busy tone. After a busy tone has been detected for **10** seconds, the call will be terminated. The table below shows the frequency and cadence of the busy release tones supported by NetVanta 6310/6330 Series, NetVanta 6355, and NetVanta 7000 Series voice products.

Table 7. Frequency and Cadence for Busy Release Tones

Country	Frequency (Hz)	Cadence (ms)
Australia	425	375 on 375 off
Belgium	425	500 on 500 off
Canada	480 + 620	500 on 500 off
ETSI	425	500 on 500 off
Ireland	425	500 on 500 off
Mexico	425	250 on 250 off
Puerto Rico	480 + 620	500 on 500 off
United Arab Emirates	400	370 on 370 off
United Kingdom	400	375 on 375 off
United States of America	480 + 620	500 on 500 off

The following example enables disconnect supervision for busy tones on analog voice trunk **T01**:

```
>enable
#configure terminal
(config)#voice trunk t01 type analog supervision loop-start
(config-T01)#disconnect-supervision tone busy
```

Additionally, if users on the system experience phantom calls and dial-tone voicemails, you can use the **disconnect-supervision tone busy** *<seconds>* command to configure the delay in seconds the trunk will wait to terminate the call after release tones have been detected. The *<seconds>* variable specifies the time delay (in seconds) between the busy tone detection and the termination of the call. The valid range is **1** to **120** seconds.

The following example specifies the time delay for disconnect supervision for busy tones as **20** seconds on analog voice trunk **T01**:

> **>enable**
> **#configure terminal**
> (config)#**voice trunk t01 type analog supervision loop-start**
> (config-T01)#**disconnect-supervision tone busy 20**

Configuring the Release Delay for Terminated Inbound Calls

By default, after an inbound call has been terminated by a user on the AOS unit, the unit holds the FXO port in a clearing state for **12** seconds. During this time, calls can be accepted, but not placed, on the port. When this release delay expires, the AOS unit places the FXO port in an idle state, allowing calls to be placed on the port again. The duration of the FXO port release delay can be configured using the **disconnect-supervision release-delay** *<seconds>*. The *<seconds>* variable specifies the time delay (in seconds) between when the call is terminated and when the unit places the FXO port in an idle state. The valid range is **1** to **120** seconds.

The following example specifies the release delay as **20** seconds on analog voice trunk **T01**:

> **>enable**
> **#configure terminal**
> (config)#**voice trunk t01 type analog supervision loop-start**
> (config-T01)#**disconnect-supervision release-delay 20**

Configuring Dial Tone Detection Timeout Using the CLI

When an outbound call is placed from an FXO port on an AOS unit, the FXO seizes the line and waits for a dial tone. Once the unit detects a dial tone, the unit qualifies the tone for one second to determine the tone is indeed a dial tone. Depending on the network, it is possible for the time between when the FXO seizes the line and when the unit detects and qualifies the dial tone to exceed the detection timeout period (the total length of time the unit monitors the line for dial tone before moving to the next trunk or releasing the line). In this case, the dial tone detection timeout period must be lengthened in order for a call to be completed.

> **NOTE** *The dial tone detection timeout period is configured on a per-trunk basis. The dial tone detection timeout period configured for the trunk apply to all connected FXO ports.*

> **NOTE** *Dial tone detection timeout period can only be configured using the CLI.*

Use the **dialtone timeout** *<value>* command to set the dial tone detection timeout period (in milliseconds) for dial tone detection. Use the **no** form of this command to return to the default value. By default, the dialtone detection timeout period is **2000** milliseconds for the United States, Puerto Rico, and Canada and is **4000** milliseconds for all other supported countries. From the Voice Analog Trunk Configuration mode, enter the command as follows:

（config-TRUNK)#**dialtone timeout** *<value>*

The *<value>* variable specifies the dial tone detection timeout period in milliseconds. The valid range is **1500** to **60000** milliseconds.

The following example specifies that analog loop start trunk **T01** will use a **3000** milliseconds dial tone detection timeout period:

>**enable**
#**configure terminal**
(config)#**voice trunk t01 type analog supervision loop-start**
(config-T01)#**dialtone timeout 3000**

Configuring International Call Progress Tones for Local Blind Transfers

AOS units with voice features can be configured to provide international call progress tones during blind transfers over a SIP trunk operating in local transfer mode. For all international call progress tones, G.711 A-Law (PCMA), G.711 mu-Law (PCMU), and G.729 audio CODECs are supported. To configure international call progress tones, you must enable the AOS unit's File Transfer Protocol (FTP) server, upload the appropriate .wav files to the unit using an FTP client, and configure the unit to use the uploaded files. International call progress tones can be downloaded from the ADTRAN website at the following link: Download International Call Progress Tones.

> **NOTE**
> *AOS units with voice features that have a DSP use the DSP by default to generate ringback tones based on the system country setting during blind transfers over a SIP trunk operating in local transfer mode. The DSP is only able to provide ringback tones and does not generate a disconnect tone. However, these AOS units can be configured to provide both ringback and disconnect tones using the procedure described in this section.*

> **NOTE**
> *By default, AOS units with voice features that lack a DSP provide North American ringback and busy tones during blind transfers over a SIP trunk operating in local transfer mode. The required .wav files for North America are included with the AOS firmware and are automatically installed in the **Tones** directory on the unit.*

Enabling the Unit's FTP Server

In order to transfer files to the unit using FTP you must enable the unit's FTP server. Use the **ip ftp server** command to enable the unit's FTP server. Enter the command as follows at the Global Configuration Mode command prompt:

(config)#**ip ftp server**

Uploading International Tone Files Using FTP

After enabling the unit's FTP server, you can download the international call progress tones to your computer and then upload them to the **Tones** directory on the unit using an FTP client. You must upload a .wav file for each progress tone you want to support. Call progress tone files have the general form *<location prefix>_<tone type>_<codec>*.wav, where *<location prefix>* is the country or area prefix, *<tone type>* is the type of call progress tone (**ringback** or **busy**), and *<codec>* is the CODEC type used for the tone (**PCMA**, **PCMU**, or **G729**). For example, the United Kingdom G.711 A-Law ringback tone file is named **UK_ringback_PCMA.wav** and the United Kingdom G.729 busy tone file is named **UK_busy_G729.wav**.

> **NOTE**
> *Because the CODEC type used on a blind transfer can vary depending on the CODEC list used for the SIP trunk on which the blind transfer occurs, it is strongly recommended that you upload the .wav files for your country corresponding to each CODEC (**PCMA, PCMU, and G729**). Otherwise, the transferred caller will hear silence instead of call progress tones any time a CODEC is used for which there are no .wav files on the unit.*

To upload international call progress tone files to the unit, follow these steps:

1. Open Windows Explorer on the computer that has the downloaded call progress tone files.

2. In the Address Bar at the top of Windows Explorer, enter the FTP address of the AOS unit (for example, **ftp://10.22.148.64**) and press **Enter**. The **Log On As** window will appear.
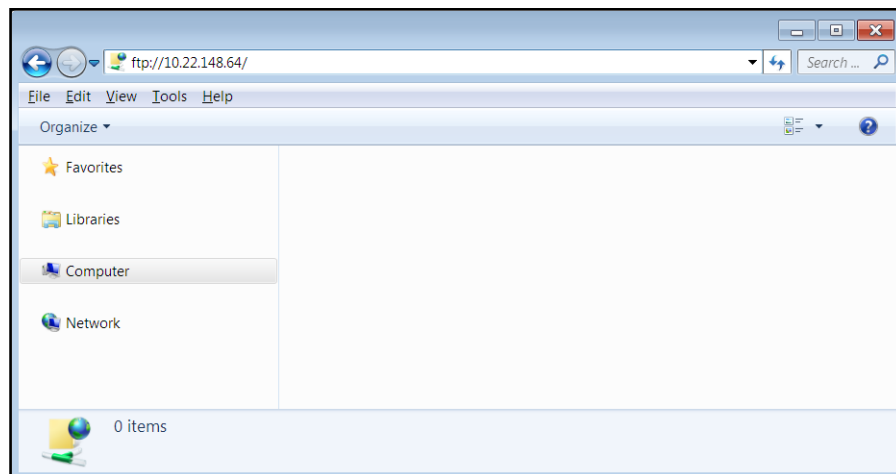
3. In the **Log On As** window, enter the **User name** and **Password** used to log in to the unit. Select **Log On** to log in to the unit.
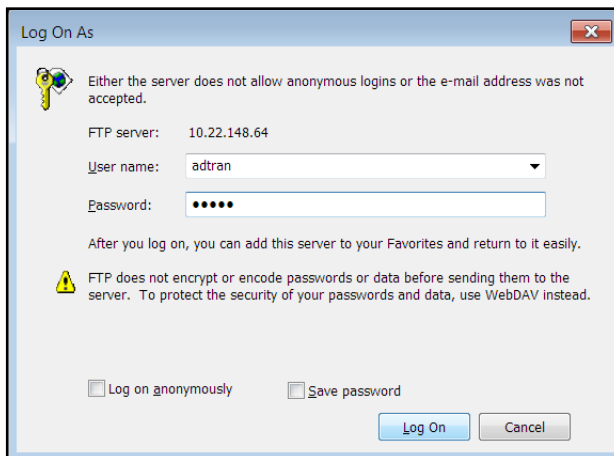
NOTE *The default user name is **admin** and the default password is **password**.*

4. Once you have logged in to the unit, open the **Tones** directory.
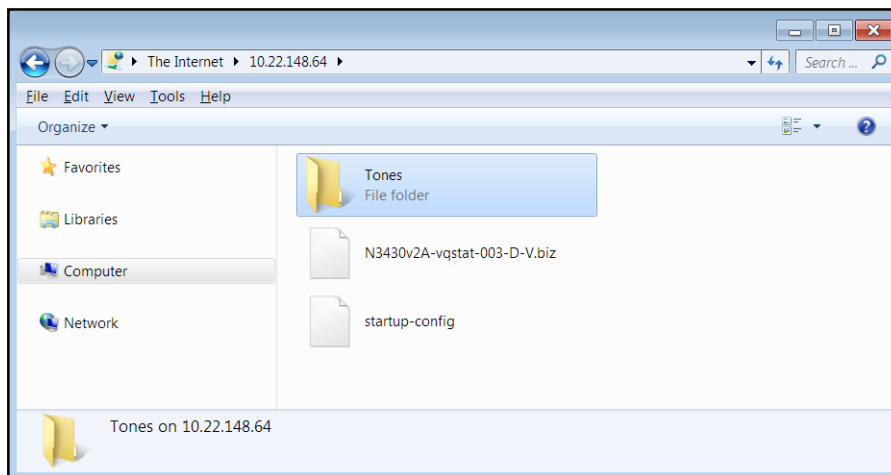
5. Copy the international call progress tone .wav files into the **Tones** directory.
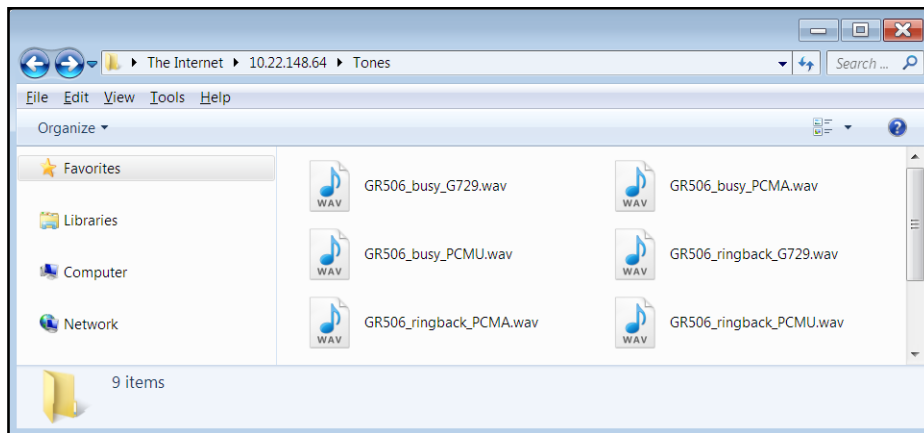
6. Close Windows Explorer to end the FTP session. You can now specify the tone files used for blind transfers over SIP trunks on the AOS unit.

Specifying the Tone Files to Use for SIP Blind Transfers

After transferring the desired international call progress tone .wav files to the unit using FTP, you must use the CLI to specify the tone files that the unit should use for blind transfers over SIP trunks. Use the **ip sip tone-file-prefix** <**flash | cflash**> <*location prefix*> command to specify which tone files to use. Use the **no** form of the command to return to the default setting.

> *By default, AOS units with a DSP use the DSP to generate ringback tones based on the*
> **NOTE** *system country setting during blind transfers over SIP trunks. By default, AOS units without a DSP use the North American call progress tone .wav files to provide ringback and disconnect tones during blind transfers over SIP trunks.*

Enter the command as follows at the Global Configuration Mode command prompt:

> (config)#**ip sip tone-file-prefix <flash | cflash>** *<location prefix>*

The **flash** keyword specifies that the tone file is located in the unit's internal flash memory.

The **cflash** keyword specifies that the tone file is located in the CompactFlash memory.

The *<location prefix>* variable specifies the location prefix of the tone files to be used. The table below lists the available locations and the corresponding location prefixes used for the tone files.

Table 8. Location Prefixes

Location	Location Prefix
Australia	AU
Belgium	BE
Canada	GR506
ETSI	ETSI
Ireland	IE

Table 8. Location Prefixes *(Continued)*

Location	Location Prefix
Mexico	MX
Puerto Rico	GR506
United Arab Emirates	AE
United Kingdom	UK
United States	GR506

The following example configures the unit to use tone files stored in flash memory that have the **UK** location prefix:

(config)#**ip sip tone-file-prefix flash UK**

> **NOTE**
>
> *You cannot designate the exact tone files that the unit will use during blind transfer. The tone file that is played is determined by the unit based on the user-configured location prefix, the progress of the call, and the CODEC type used in the call.*

Configuring the Dial Plan Using the CLI

The dial plan notifies the AOS unit when to stop collecting the digits being dialed and begin forwarding a phone call. Programmed number patterns and types also govern the telephone numbers allowed by AOS voice products for inbound and outbound calls. Number-complete templates can be created and stored in the dial plan. The AOS unit listens for digits and looks for a match against the number-complete templates in the dial plan. As soon as the digits dialed by the user match a pattern in the dial plan, the call is routed by the switchboard. If the digits dialed do not match any of the number-complete templates, the call is routed by the switchboard after a timeout period expires. In addition to number patterns, call types are defined in the dial plan, allowing the system to recognize dialed numbers as a particular type of call (local, long distance, toll free, etc.) for class of service purposes.

It is possible to successfully route calls through the unit without configuring any dial plan entries. However, your country may have a unique emergency numbering option or telephone numbering plan that will require configuration changes to the dial plan for proper execution of inbound and outbound calls. In AOS version R10.3.0 and later, emergency service numbers are configured automatically when the system country is specified using the **voice system-country** *<country>* command. Consequently, **always-permitted** entries need not be added to the dial plan for emergency service numbers if the appropriate system country setting is configured for your system. However, if your unit is running a previous version of AOS, an appropriate system country cannot be configured on your unit, or the emergency service numbers have been disabled using the **no voice emergency-services** command, you must configure **always-permitted** entries in the dial plan for your country's emergency service numbers in

order for emergency calls to be routed properly.

> **NOTE**
>
> *The following conditions apply to AOS units that have a blank startup configuration like that created using the procedure in Creating a Blank Startup Configuration Using the CLI on page 4:*
>
> - *AOS units running AOS version R10.3.0 or later have no entries in the **always-permitted** group.*
> - *AOS units running an AOS version prior to R10.3.0 have only the **911** entry in the **always-permitted** group.*
> - *NetVanta 7000 Series units running an AOS version prior to R10.3.0 have both the **911** and the **9-911** entries in the **always-permitted** group.*

Table 9 below lists the emergency service numbers for supported countries. This table is only a partial list of emergency numbers for each country to aide in manually configuring the **always-permitted** dial plan group. For a comprehensive list of all emergency numbers added to the emergency services list when the system country is configured, refer to *Table 4 on page 7* in *Configuring the System Country Using the CLI on page 4*

Table 9. Emergency Service Numbers

Country	Police	Medical	Fire
Australia	000	000	000
Belgium	112	112	112
Canada	911	911	911
ETSI	112 (European Union)	112 (European Union)	112 (European Union)
Ireland	112 or 999	112 or 999	112 or 999
Mexico	066	065	068
Puerto Rico	911	911	911
United Arab Emirates	112 or 999	998 or 999	997
United Kingdom	112 or 999	112 or 999	112 or 999
United States	911	911	911

For instructions on configuring dial plans using the GUI, refer to *Configuring the Dial Plan Using the GUI on page 34*.

Use the **voice dial-plan** command to create a dial plan entry. From the Global Configuration mode, enter the command as follows:

(config)#**voice dial-plan** *<pattern ID>* *<group>* *<pattern>* [**default** | **none** | *<NDT name>*]

The *<pattern ID>* variable specifies the identification number to assign to this dial plan. The valid range is **0** to **255**.

The *<group>* variable specifies the type of call the dial plan entry will represent. The available choices are: **900-number**, **always-permitted**, **extensions**, **internal-operator**, **international**, **local**, **long-distance**, **operator-assisted**, **specify-carrier**, **toll-free**, **user1**, **user2**, and **user3**.

> **NOTE**
> *All **always-permitted** calls are considered emergency calls and are handled accordingly. **Always-permitted** dial plan patterns can be defined in the CLI (but not in the GUI) and will be handled exactly like an emergency call by emergency call routing.*

The *<pattern>* variable specifies a dialing pattern. You can enter a complete phone number, or wildcards can be used to define the dialing pattern. The available wildcards for this command are:

0 - 9   Match the exact digit(s) only
X   Match any single digit 0 through 9
N   Match any single digit 2 through 9
M   Match any single digit 1 through 8
$ Match any number string dialed
[]   Match any digit in the list within the brackets (for example, [1,4,6])
,()   Formatting characters that are ignored but allowed
-   Use within brackets to specify a range, otherwise ignored

The following are example template entries using wildcards:

1) NXX-XXXX	Match any 7-digit number beginning with 2 through 9
2) 1-NXX-NXX-XXXX	Match any number with a leading 1, then 2 through 9, then any 2 digits, then 2 through 9, then any 6 digits
3) 555-XXXX	Match any 7-digit number beginning with 555
4) XXXX$	Match any number with at least 5 digits
5) [7,8]$	Match any number beginning with 7 or 8
6) 1234	Match exactly 1234

Some template number rules:

1) All brackets must be closed with no nesting of brackets and no wildcards within the brackets.
2) All brackets can hold digits and commas, for example: [1239]; [1,2,3,9]. Commas are implied between numbers within brackets and are ignored.
3) Brackets can contain a range of numbers using a hyphen, for example: [1-39]; [1-3,9].
4) The $ wildcard is only allowed at the end of the template, for example: 91256$; XXXX$.

The optional **default** parameter sets the named-digit-timeout (NDT) to the default value. The default value is set with the **voice timeouts interdigit** *<seconds>* command.

The optional **none** parameter indicates that no NDT is associated with this dial plan entry.

The optional *<NDT name>* variable specifies the NDT to associate with this dial plan entry. The named-digit-timeout is assigned a timeout value with the **voice timeouts named-digit-timeout** *<NDT name>* [*<value>*] command (refer to *Creating a Named Digit Timeout Using the CLI on page 21*).

The following example adds **9-112** to the **always-permitted** dial plan. After entering this command, the unit will route any calls matching the pattern as an emergency call.

```
>enable
#configure terminal
(config)#voice dial-plan 1 always-permitted 9-112
```

The following example adds the pattern **9-NXX-XXXX** to the **local** dial plan. This pattern will match phone numbers **9-200-0000** to **9-999-9999**.

> **>enable**
> **#configure terminal**
> (config)#**voice dial-plan 2 local 9-NXX-XXXX**

Brackets are used to define a range of numbers. The following example defines the range **2000** to **6999**.

> **>enable**
> **#configure terminal**
> (config)#**voice dial-plan 3 extensions [2-6]XXX**

Disabling the Local Emergency Service Numbers Using the CLI

In AOS version R10.3.0 and later, local emergency service numbers are configured automatically when the system country is specified using the **voice system-country** *<country>* command. If necessary, the local emergency service numbers can be manually disabled using the CLI.

CAUTION	*Disabling the local emergency service numbers on a unit will remove all local emergency service numbers from the emergency services list. If local emergency service numbers are disabled, for emergency calls to be routed properly, you must manually add the local emergency service numbers to the **always-permitted** group using the CLI. For more information on configuring **always-permitted** dial plan entries, refer to Configuring the Dial Plan Using the CLI on page 18.*

Use the **no voice emergency-services** command to disable the local emergency service numbers. From the Global Configuration mode, enter the command as follows:

> (config)#**no voice emergency-services**

Creating a Named Digit Timeout Using the CLI

An NDT can be created and associated with a number-complete template to indicate the amount of time to wait for additional digits to be dialed before routing the call. Setting the NDT to **default**, uses the system interdigit timeout. Setting the NDT to **none** will immediately route the call after a template match. If no NDT value is specified, the system will assign a value of 0.

Use the **voice timeouts named-digit-timeout** command to create a named-digit-timeout and assign it a value. From the Global Configuration mode, enter the command as follows:

> (config)#**voice timeouts named-digit-timeout** *<NDT name>* [*<value>*]

The *<NDT name>* variable specifies a name for the NDT.

The *<value>* variable indicates the value in seconds for the NDT.

Creating an NDT does not require a value. If a value is not specified, the system assigns the value of 0 seconds.

> **NOTE** *When removing an NDT and its value, if the NDT is assigned to a dial plan entry, then the deletion is not allowed. The dial plan entry must be removed first and added back into the system without the NDT association.*

The following example creates a named-digit-timeout named **short1** and sets the timeout value to **2** seconds:

> **>enable**
> **#configure terminal**
> (config)**#voice timeouts named-digit-timeout short1 2**

Configuring Accept Numbers for Trunk Groups Using the CLI

Accept numbers are used to configure numbers users can dial out on a group of trunks. For instructions on how to configure accept numbers using the GUI, refer to *Configuring Accept Numbers for Trunk Groups Using the GUI on page 38*.

Use the **accept** command from the Voice Trunk Group Configuration mode to specify numbers users can dial on a trunk group:

> (config-TRUNKGROUP)**#accept** *<pattern>* [**cost** *<value>*]

The *<pattern>* variable specifies a dialing pattern. You can enter a complete phone number, or wildcards can be used to define the dialing pattern. The available wildcards for this command are:

0 - 9	Match the exact digit(s) only
X	Match any single digit 0 through 9
N	Match any single digit 2 through 9
M	Match any single digit 1 through 8
$	Match any number string dialed
[]	Match any digit in the list within the brackets (for example, [1,4,6])
,()	Formatting characters that are ignored but allowed
-	Use within brackets to specify a range, otherwise ignored

The following are example template entries using wildcards:

1) NXX-XXXX	Match any 7-digit number beginning with 2 through 9
2) 1-NXX-NXX-XXXX	Match any number with a leading 1, then 2 through 9, then any 2 digits, then 2 through 9, then any 6 digits
3) 555-XXXX	Match any 7-digit number beginning with 555
4) XXXX$	Match any number with at least 5 digits
5) [7,8]$	Match any number beginning with 7 or 8
6) 1234	Match exactly 1234

Some template number rules:

1) All brackets must be closed with no nesting of brackets and no wildcards within the brackets.
2) All brackets can hold digits and commas, for example: [1239]; [1,2,3,9]. Commas are implied between numbers within brackets and are ignored.

3) Brackets can contain a range of numbers using a hyphen, for example: [1-39]; [1-3,9].
4) The $ wildcard is only allowed at the end of the template, for example: 91256$; XXXX$.

The optional **cost** *<value>* parameter specifies the cost value for the trunk. This option is used if a call is accepted by several trunks. The call will be routed to the trunk with the lowest cost value in the case of identical matching accept statements. The valid range is **0** to **499**.

The following example allows the trunk group **TRUNKGROUP** to accept 7-digit numbers from **200-0000** to **999-9999**:

> **>enable**
> **#configure terminal**
> (config)#**voice grouped-trunk TRUNKGROUP**
> (config-TRUNKGROUP)#**accept NXXXXXX**

Configuring Reject Numbers for Trunk Groups Using the CLI

Although reject numbers are not required for proper switchboard function, they can be used to restrict callers from making unwanted outbound calls, such as international and 900 number calls. For instructions on how to configure reject numbers using the GUI, refer to *Configuring Reject Numbers for Trunk Groups Using the GUI on page 40*.

Use the **reject** *<pattern>* command from the Voice Trunk Group Configuration mode to specify numbers users cannot dial on a trunk group:

> (config-TRUNKGROUP)#**reject** *<pattern>*

The *<pattern>* variable specifies a dialing pattern. You can enter a complete phone number, or wildcards can be used to define the dialing pattern. The available wildcards for this command are:

0 - 9   Match the exact digit(s) only
X   Match any single digit 0 through 9
N   Match any single digit 2 through 9
M   Match any single digit 1 through 8
$ Match any number string dialed
[]   Match any digit in the list within the brackets (for example, [1,4,6])
,()   Formatting characters that are ignored but allowed
-   Use within brackets to specify a range, otherwise ignored

The following are example template entries using wildcards:

1) NXX-XXXX   Match any 7-digit number beginning with 2 through 9
2) 1-NXX-NXX-XXXX   Match any number with a leading 1, then 2 through 9, then any 2 digits, then 2 through 9, then any 6 digits
3) 555-XXXX   Match any 7-digit number beginning with 555
4) XXXX$ Match any number with at least 5 digits
5) [7,8]$ Match any number beginning with 7 or 8
6) 1234   Match exactly 1234

Some template number rules:

1) All brackets must be closed with no nesting of brackets and no wildcards within the brackets.
2) All brackets can hold digits and commas, for example: [1239]; [1,2,3,9]. Commas are implied between numbers within brackets and are ignored.

3) Brackets can contain a range of numbers using a hyphen, for example: [1-39]; [1-3,9].
4) The $ wildcard is only allowed at the end of the template, for example: 91256$; XXXX$.

The following example blocks calls to any 900 number on the trunk group **TRUNKGROUP**:

>**enable**
#**configure terminal**
(config)#**voice grouped-trunk TRUNKGROUP**
(config-TRUNKGROUP)#**reject 900-NXX-XXXX**

Configuring E1 Interfaces Using the CLI

There are four main settings to consider when configuring E1 network interfaces. The source timing (clocking), framing format, line coding, and active channels must all be configured to match the circuit supplied by your network provider. By default, all NetVanta E1 interfaces are configured for standard multiframe without the optional configure cyclic redundancy check 4 (CRC4) error correction. Generally, the framing format and line coding default values will be correct for your application and do not need to be changed. For instructions on how to configure the E1 interface using the GUI, refer to *Configuring E1 Interfaces Using the GUI on page 42*.

Enabling the Interface

E1 interfaces are disabled by default. Before the E1 interface can pass data, the interface must be enabled using the **no shutdown** command from the E1 Interface Configuration mode.

The following example enables the **E1 2/1** interface:

>**enable**
#**configure terminal**
(config)#**interface e1 2/1**
(config-e1 2/1)#**no shutdown**

                                       6AOSCG0014-29D

Configuring the Source Timing

Use the **clock source** <**internal** | **line** | **system** | **through**> command from the E1 Interface Configuration mode to configure the source timing used for the E1 interface on the E1 voice interface module (VIM). The default clock source varies by platform.

> **NOTE**
> *For instructions on configuring timing for the NetVanta 644, please refer to the Independent T1 Timing on the NV 640 and NV 6240 available online at* https://supportforums.adtran.com.

The table below lists variations of the command.

Table 10. Clock Source Command Variations

Command	Function
clock source internal	Configures the unit to provide clocking using the internal oscillator.
clock source line	Configures the unit to recover clocking from the E1 circuit.
clock source system	Configures the unit to provide clocking from the chassis selection. This command is only supported on the E1 VIM installed in the NetVanta 7000 series and NetVanta 6355. It is not supported by the integrated PRI T1/E1 interface on the NetVanta 644 and NetVanta 6310.
clock source through	Configures the unit to recover clocking from the circuit connected to the G.703 interface. This command is only supported on the E1 VIM installed in the NetVanta 6355 and NetVanta 7000 series. It is not supported by the integrated PRI T1/E1 interface on the NetVanta 644 and NetVanta 6310.

The following example configures the unit to provide clocking for the **E1 2/1** interface using the internal oscillator:

```
>enable
#configure terminal
(config)#interface e1 2/1
(config-e1 2/1)#clock source internal
```

On the NetVanta 6355, NetVanta 7060, and NetVanta 7100, if you are using the **internal**, **line**, or **through** options, you will also need to configure the system timing to use the E1 interface as the clock source. Use the system-timing <**primary** | **secondary**> command from the E1 Interface Configuration mode to configure the system timing to use the E1 interface as the clock source. The table below lists variations of the command.

Table 11. System-timing Command Variations

Command	Function
system-timing primary	Configures the unit to use the E1 interface as the source of the primary system clock.
system-timing secondary	Configures the unit to use the E1 interface as the source of the secondary system clock.

The following example configures the unit to use the E1 interface as the primary system timing source:

>**enable**
#**configure terminal**
(config)#**interface e1 1/1**
(config-e1 1/1)#**system-timing primary**

Configuring the Framing Format

Use the **framing crc4** command from the E1 Interface Configuration mode to configure CRC4 framing for the E1 interface. This command enables CRC4 bits to be transmitted in the outgoing data stream. The received signal is also checked for CRC4 errors. This parameter should match the framing format provided by the service provider or external device, as a mismatch will result in a loss of frame alarm. By default, CRC4 framing is disabled on E1 interfaces.

The following example configures the **E1 2/1** interface for CRC4 framing:

>**enable**
#**configure terminal**
(config)#**interface e1 2/1**
(config-e1 2/1)#**framing crc4**

Configuring the Line Coding

Use the **coding** <**ami** | **hdb3**> command from the E1 Interface Configuration mode to configure the line coding for the E1 interface. This setting must match the line coding supplied on the circuit by the service provider, as a mismatch will result in line errors. The table below lists variations of the command.

Table 12. Coding Command Variations

Command	Function
coding ami	Configures the line coding for alternate mark inversion (AMI).
coding hdb3	Configures the line coding for high-density bipolar 3 (HDB3).

The following example configures the **E1 2/1** interface for HDB3 line coding:

>**enable**
#**configure terminal**
(config)#**interface e1 2/1**
(config-e1 2/1)#**coding hdb3**

Configuring the Tx Value of the Sa4 Bit

Use the **sa4tx-bit** <**0** | **1**> command from the E1 Interface Configuration mode to assign a value (either **0** or **1**) to the Tx spare bit in position 4. By default, the value of the Sa4 bit is **1**. The table below lists variations of the command.

Table 13. Sa4tx-bit Command Variations

Command	Function
sa4tx-bit 0	Specifies a **0** for the transmit value of the Sa4 bit on the E1.
sa4tx-bit 1	Specifies a **1** for the transmit value of the Sa4 bit on the E1.

The following example sets the Tx value of Sa4 to **0**:

>**enable**
#**configure terminal**
(config)#**interface e1 2/1**
(config-e1 2/1)#**sa4tx-bit 0**

Configuring the TDM Group

Time division multiplexing (TDM) groups must be created to identify which E1 channels to use for data transport. There are no default TDM groups configured on the system. Contact your service provider to determine which channels to use. To create a TDM group, use the following command from the E1 Interface Configuration mode:

(config-e1 2/1)#**tdm-group** <*number*> **timeslots** <*value*> [**speed 64**]

The <*number*> variable identifies the TDM group. The valid range for this variable is **1** to **255**.

The **timeslots** <*value*> parameter specifies the channels to be used in the TDM group. The valid range for this parameter is **1** to **31**. The timeslot value can be entered as a single number or as a contiguous group of channels. For example, **1-10** specifies the first 10 channels of the E1 interface.

The optional **speed 64** parameter specifies the individual channel rate on the E1 interface to be 64 kbps. The default speed is 64 kbps.

The following example creates a TDM group (labeled **5**) of 31 channels on the E1 2/1 interface:

>**enable**
#**configure terminal**
(config)#i**nterface e1 2/1**
(config-e1 2/1)#**tdm-group 5 timeslots 1-31**

Configuration Example

The following example specifies the minimum configuration parameters required for a standard E1 interface:

>**enable**
#**config terminal**
(config)#**interface e1 2/1**
(config-e1 2/1)#**tdm-group 1 timeslots 1-31**

(config-e1 2/1)#**clock source line**
(config-e1 2/1)#**no shutdown**
(config-e1 2/1)#**exit**

International Configuration Using the GUI

Many international features can be configured using the GUI. However, creating blank startup configurations, setting the system country, configuring disconnect supervision for busy tones, adding always-permitted dial plan patterns, and specifying named digit timeouts can only be accomplished using the CLI. Refer to *International Configuration Using the CLI on page 3* for more information on configuring these features.

Accessing the GUI

To access the GUI, follow these steps:

1. Open a new Web page in your Internet browser.

2. Enter your AOS product's IP address in the Internet browser's address field in the following form: **http://***<ip address>*/**admin**. For example:

    http://10.10.10.1/admin

3. At the prompt, enter your user name and password and select **OK**.
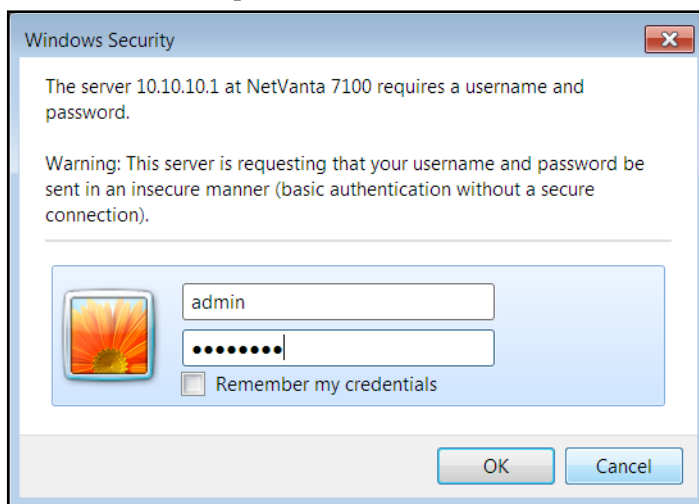
> **NOTE**   *The default user name is **admin** and the default password is **password**.*

Configuring the System Clock Time Zone and SNTP Server Using the GUI

The system clock time zone should be set to the geographic time zone in which the unit is operating. For instructions on how to set the time zone using the CLI, refer to *Configuring the System Clock Time Zone Using the CLI on page 9*. For instructions on how to set the SNTP server using the CLI, refer to *Configuring the SNTP Server Using the CLI on page 11*. To configure the time zone and SNTP server for the unit using the GUI, follow these steps:

1. Navigate to the **System > System Summary** menu (the system's main menu).
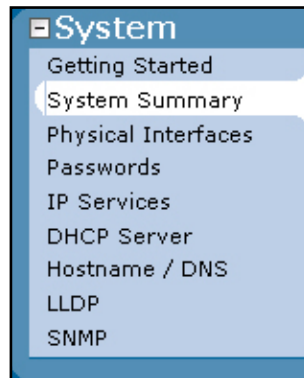
2. Select the **System Time, System Date**, or **SNTP Time Server** link to access the **Time Server Configuration** menu.

3. Select **SNTP** from the Time Server drop-down menu.

4. If you would like the time server to automatically correct for Daylight Savings Time (DST), ensure that the **Auto-Correct DST** check box is checked. If you would not like the time server to correct for DST, ensure that the check box is not checked.

5. Select the desired time zone from the **Time Zone** drop-down menu

6. Enter the host name of the desired SNTP server in the **SNTP Server Hostname** field.

7. Using the **SNTP Server Version** drop-down menu, choose the SNTP version of the SNTP server entered in Step 4.

8. Optional. In the **SNTP Wait Time** field, enter the desired number of seconds between updates from the SNTP server. The valid range for this field is **10** to **2000000** seconds.

9. Optional. In the **SNTP Retry Timeout** field, enter the desired number of seconds to wait for a response from the SNTP server before allowing a new request. The valid range for this field is **3** to **2000000** seconds.

10. Select **Apply** to apply the time server configurations to the system.

11. Select **Save** at the top right corner of the screen to save the configuration. A dialog box appears if the save is successful. Select **OK** to close the dialog box and return to the previous menu.

Configuring Disconnect Supervision Using the GUI

Disconnect supervision is used in auto attendant, fax, and modem applications to ensure that a connection is not maintained indefinitely when a call has ended or could not be completed. Disconnect supervision monitors an FXO port for a specific condition to determine when the line should be released. The conditions typically monitored include: the lack of battery current (loop current feed open), the transition of battery current from a normal state to a reversed state and back again (reverse loop current feed), or the presence of a call progress tone that indicates that a call cannot be completed or should be disconnected. For instructions on how to configure disconnect supervision using the CLI, refer to *Configuring Disconnect Supervision Using the CLI on page 12*.

> **NOTE**
> *Disconnect superivision is configured on a per-trunk basis. Disconnect supervision settings configured for the trunk apply to all connected FXO ports.*

Configuring Disconnect Supervision for Busy Tone on an Analog Voice Trunk

Disconnect supervision for busy tones can be configured on a per-trunk basis for loop start and ground start analog voice trunks using the GUI. When this feature is enabled, the system will configure the voice trunk to monitor for busy tone. After a busy tone has been detected for **10** seconds, the call will be terminated. Additionally, if users on the system experience phantom calls and dial-tone voicemails, the time (in seconds) the trunk will wait to terminate the call after release tones have been detected can be specified. The table below shows the frequency and cadence of the busy release tones supported by NetVanta 6310/6330 Series, NetVanta 6355, and NetVanta 7000 series voice products.

Table 14. Frequency and Cadence of Busy Release Tones

Country	Frequency (Hz)	Cadence (ms)
Australia	425	375 on 375 off
Belgium	425	500 on 500 off
Canada	480 + 620	500 on 500 off
ETSI	425	500 on 500 off
Ireland	425	500 on 500 off
Mexico	425	250 on 250 off
Puerto Rico	480 + 620	500 on 500 off
United Arab Emirates	400	370 on 370 off
United Kingdom	400	375 on 375 off
United States of America	480 + 620	500 on 500 off

To configure disconnect supervision for busy tones using the GUI, follow these steps:

1. Navigate to **Voice > Trunks > Trunk Accounts**. The **Add/Modify/Delete Trunk Accounts** menu will appear.

2. In the **Add/Modify/Delete Trunk Accounts** menu, select an analog trunk account on which you want to configure disconnect supervision for busy tones. The **Edit Trunk** menu will appear.

3. To enable disconnect supervision for busy tones, select the **Disconnect Tone Busy** check box.

4. In the **Delay** field, enter a value (in seconds) for the amount of time the trunk should wait to terminate a call after release tones have been detected. Changing this value can help eliminate the occurrence of phantom calls and dial-tone voicemails for users on the system.The default value for this field is **10** seconds, and the valid range for this field is **1** to **120** seconds.

5. In the **Disconnect Release Delay** field, enter a value (in seconds) for the amount of time the unit should hold the FXO port in a clearing state after an inbound call has been terminated. During this time, calls can be accepted, but not placed, on the port. When this release delay expires, the AOS unit places the FXO port in an idle state, allowing calls to be placed on the port again. The default value for this field is **12** seconds, and the valid range for this field is **1** to **120** seconds.

Configuring the Dial Plan Using the GUI

The dial plan notifies the AOS unit when to stop collecting the digits being dialed and begin forwarding a phone call. Programmed number patterns and types also govern the telephone numbers allowed by AOS voice products for inbound and outbound calls. Number-complete templates can be created and stored in the dial plan. The AOS unit listens for digits and looks for a match against the number-complete templates in the dial plan. As soon as the digits dialed by the user match a pattern in the dial plan, the call is routed by the switchboard. If the digits dialed do not match any of the number-complete templates, the call is routed by the switchboard after a timeout period expires. In addition to number patterns, call types are defined in the dial plan, allowing the system to recognize dialed numbers as a particular type of call (local, long distance, toll free, etc.) for class of services purposes.

It is possible to successfully route calls through the unit without configuring any dial plan entries. However, your country may have a unique emergency numbering option or telephone numbering plan that will require configuration changes to the dial plan for proper execution of inbound and outbound calls. In AOS version R10.3.0 and later, emergency service numbers are configured automatically when the system country is specified using the **voice system-country** *<country>* command. Consequently, **always-permitted** entries need not be added to the dial plan for emergency service numbers if the appropriate system country setting is configured for your system. However, if your unit is running a previous version of AOS, an appropriate system country cannot be configured on your unit, or the emergency service numbers have been disabled, you must configure **always-permitted** entries in the dial plan for your country's emergency service numbers in order for emergency calls to be routed properly. Always-permitted entries can only be added to the dial plan using the CLI. For instructions on how to configure the dial plan using the CLI, refer to *Configuring the Dial Plan Using the CLI on page 18*.

> **NOTE**
>
> *The following conditions apply to AOS units that have a blank startup configuration like that created using the procedure in* Creating a Blank Startup Configuration Using the CLI on page 4*:*
>
> - *AOS units running AOS version R10.3.0 or later have no entries in the **always-permitted** group.*
> - *AOS units running an AOS version prior to R10.3.0 have only the **911** entry in the **always-permitted** group.*
> - *NetVanta 7000 Series units running an AOS versions prior to R10.3.0 have both the **911** and the **9-911** entries in the **always-permitted** group.*

Table 15 on page 35 lists the emergency service numbers for supported countries. This table is only a partial list of emergency numbers for each country to aide in manually configuring the **always-permitted** dial plan group. For a comprehensive list of all emergency numbers added to the emergency services list when the system country is configured, refer to *Table 4 on page 7* in *Configuring the System Country Using the CLI on page 4*.

Table 15. Emergency Service Numbers

Country	Police	Medical	Fire
Australia	000	000	000
Belgium	112	112	112
Canada	911	911	911
ETSI	112 (European Union)	112 (European Union)	112 (European Union)
Ireland	112 or 999	112 or 999	112 or 999
Mexico	066	065	068
Puerto Rico	911	911	911
United Arab Emirates	112 or 999	998 or 999	997
United Kingdom	112 or 999	112 or 999	112 or 999
United States	911	911	911

Dial plan entries can be created using the GUI. However, it is recommended that a blank startup configuration be created for the NetVanta 7060 and NetVanta 7100 before configuring the system because the system automatically generates default dial plan entries that may not apply to your country. Blank startup configurations can only be created using the CLI. Refer to *Creating a Blank Startup Configuration Using the CLI on page 4* for more information on creating a blank startup configuration. For instructions on how to configure the dial plan using the CLI, refer to *Configuring the Dial Plan Using the CLI on page 18*.

To configure dial plan entries using the GUI, follow these steps:

1. Navigate to **Voice > System Setup > Dial Plan** to open the **Dial Plan** configuration menu.
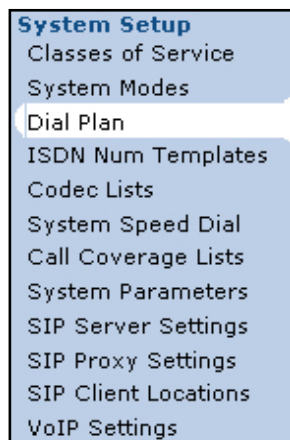
2. In the **Template field**, enter the desired dial plan pattern. Dashes and parentheses are ignored. You can enter the pattern using the exact digits or using wildcards.

The available wildcards for this field are:

0 - 9 Match the exact digit(s) only
X Match any single digit 0 through 9
N Match any single digit 2 through 9
M Match any single digit 1 through 8
$ Match any number string dialed
[] Match any digit in the list within the brackets (for example, [1,4,6])
,() Formatting characters that are ignored but allowed
- Use within brackets to specify a range, otherwise ignored

The following are example template entries using wildcards:

1) NXX-XXXX	Match any 7-digit number beginning with 2 through 9
2) 1-NXX-NXX-XXXX	Match any number with a leading 1, then 2 through 9, then any 2 digits, then 2 through 9, then any 6 digits
3) 555-XXXX	Match any 7-digit number beginning with 555
4) XXXX$	Match any number with at least 5 digits
5) [7,8]$	Match any number beginning with 7 or 8
6) 1234	Match exactly 1234

Some template number rules:

1) All brackets must be closed with no nesting of brackets and no wildcards within the brackets.
2) All brackets can hold digits and commas, for example: [1239]; [1,2,3,9]. Commas are implied between numbers within brackets and are ignored.
3) Brackets can contain a range of numbers using a hyphen, for example: [1-39]; [1-3,9].
4) The $ wildcard is only allowed at the end of the template, for example: 91256$; XXXX$.

3. Select the number type for the dial plan entry using the **Number Type** drop-down menu. The number type is used when defining what call types are permitted in the user class of service (CoS).

4. Once the dial plan template has been entered and the number type has been selected, select **Add** to add the dial plan template to the system.

5. Repeat Steps 2 through 4 for each additional dial plan entry.

6. Remove dial plan entries by selecting the **Delete** button next to the dial plan template in the **View/Delete Dial Plan Templates** section.

7. Select **Save** at the top right corner of the screen to save the configuration. A dialog box appears if the save is successful. Select **OK** to close the dialog box and return to the previous menu.

Disabling the Local Emergency Service Numbers Using the GUI

In AOS version R10.3.0 and later, local emergency service numbers are configured automatically when the system country is specified using the **voice system-country** *<country>* command. If necessary, the local emergency service numbers can be manually disabled using the GUI.

> **CAUTION**
>
> *Disabling the local emergency service numbers on a unit will remove all local emergency service numbers from the emergency services list. If local emergency service numbers are disabled, for emergency calls to be routed properly, you must manually add the local emergency service numbers to the **always-permitted** group using the CLI. For more information on configuring **always-permitted** dial plan entries, refer to Configuring the Dial Plan Using the CLI on page 18.*

To disable the local emergency service numbers using the GUI, follow these steps:

1. Navigate to **Voice > System Setup > Dial Plan** to open the **Dial Plan** configuration menu.
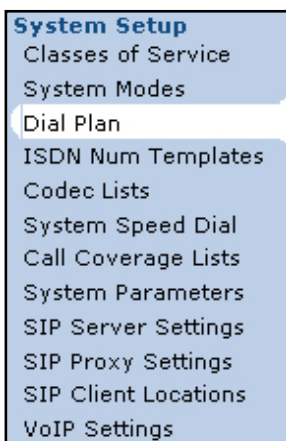
2. In the **Local Emergency Services** section uncheck the **Local Emergency Services** check box to disable the local emergency service numbers.
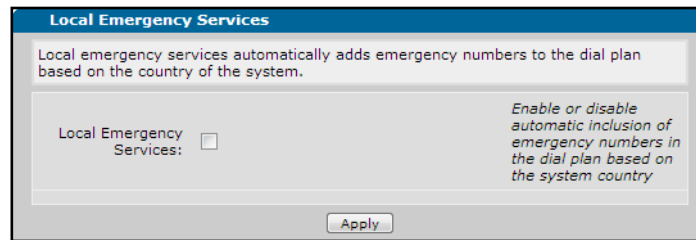

3. Select the **Apply** button to apply the change.

Configuring Accept Numbers for Trunk Groups Using the GUI

Accept numbers are used to configure numbers users can dial on a trunk. Accept numbers for trunk groups can be configured using the GUI. However, it is recommended that a blank startup configuration be created for the NetVanta 7060 and NetVanta 7100 before configuring the system because AOS automatically generates default accept numbers that may not apply to your country. Blank startup configurations can only be created using the CLI. Refer to *Creating a Blank Startup Configuration Using the CLI on page 4* for more information on creating a blank startup configuration. For instructions on how to configure accept numbers using the CLI, refer to *Configuring Accept Numbers for Trunk Groups Using the CLI on page 22*.

To configure accept numbers using the GUI, follow these steps:

1. Navigate to **Voice > Trunks > Trunk Groups** to access the **Add/Modify/Delete Trunk Groups** menu.
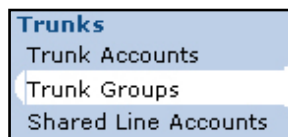
2. To create a new trunk group and add accept numbers to it, enter a name for the new group in the **Group Name** field of the **Add a New Trunk Group** section and select add. The **Edit Trunk Group** menu will appear.

    To add accept numbers to an existing trunk group, select the name of the group to which you would like to add an accept number in the **Modify/Delete Trunk Group** section. The **Edit Trunk Group** menu will appear.

3. In the **Detailed View - Permit/Restriction Call Templates** section, select **Configure Advanced Templates**. The **Advanced Permit/Restriction Templates** menu will appear.

4. In the **Add/Delete Permit Templates** section, enter the accept number template into the **Template** field. Dashes and parentheses are ignored. You may enter the pattern using the exact digits or using wildcards. The available wildcards for this field are:

    0 - 9   Match the exact digit(s) only
    X   Match any single digit 0 through 9
    N   Match any single digit 2 through 9
    M   Match any single digit 1 through 8
    $ Match any number string dialed
    []   Match any digit in the list within the brackets (for example, [1,4,6])
    ,()   Formatting characters that are ignored but allowed
    -   Use within brackets to specify a range, otherwise ignored

    The following are example template entries using wildcards:

    1) NXX-XXXX   Match any 7-digit number beginning with 2 through 9
    2) 1-NXX-NXX-XXXX   Match any number with a leading 1, then 2 through 9, then any 2 digits, then 2 through 9, then any 6 digits
    3) 555-XXXX   Match any 7-digit number beginning with 555
    4) XXXX$ Match any number with at least 5 digits
    5) [7,8]$ Match any number beginning with 7 or 8
    6) 1234   Match exactly 1234

Some template number rules:

1) All brackets must be closed with no nesting of brackets and no wildcards within the brackets.
2) All brackets can hold digits and commas, for example: [1239]; [1,2,3,9]. Commas are implied between numbers within brackets and are ignored.
3) Brackets can contain a range of numbers using a hyphen, for example: [1-39]; [1-3,9].
4) The $ wildcard is only allowed at the end of the template, for example: 91256$; XXXX$.

.

5. Optional. Enter the cost value for the accept template in the **Cost** field. This option is used if a call is accepted by several trunks. The call will be routed to the trunk with the lowest cost value in the case of identical matching accept statements. If no value is enter, the default cost value of **0** will be assigned to the template. The valid range is **0** to **499**. Select **Add** to add the accept template.

6. Select **Save** at the top right corner of the screen to save the configuration. A dialog box appears if the save is successful. Select **OK** to close the dialog box and return to the previous menu.

Configuring Reject Numbers for Trunk Groups Using the GUI

Although reject numbers are not required for proper switchboard function, they can be used to restrict callers from making unwanted outbound calls, such as international and 900 number calls. Reject numbers for trunk groups can also be configured using the GUI. However, it is recommended that a blank startup configuration be created for the NetVanta 7060 and NetVanta 7100 before configuring the system because the system automatically generates default accept numbers that may not apply to your country. Blank startup configurations can only be created using the CLI. Refer to *Creating a Blank Startup Configuration Using the CLI on page 4* for more information on creating a blank startup configuration. For instructions on how to configure reject numbers using the CLI, refer to *Configuring Reject Numbers for Trunk Groups Using the CLI on page 23*.

To configure reject numbers using the GUI, follow these steps:

1. Navigate to **Voice > Trunks > Trunk Groups** to access the **Add/Modify/Delete Trunk Groups** menu.

2. To add reject numbers to an existing trunk group, select the name of the group to which you would like to add a reject number in the **Modify/Delete Trunk Group** section. The **Edit Trunk Group** menu will appear.

3. In the **Detailed View - Permit/Restriction Call Templates** section, select **Configure Advanced Templates**. The **Advanced Permit/Restriction Templates** menu will appear.

4. In the **Add/Delete Restriction Templates** section, enter the reject number template into the **Template** field, and select **Add**. Dashes and parentheses are ignored. You may enter the pattern using the exact characters or using wildcards. The available wildcards for this field are:

0 - 9   Match the exact digit(s) only
X   Match any single digit 0 through 9
N   Match any single digit 2 through 9
M   Match any single digit 1 through 8
$ Match any number string dialed
[]   Match any digit in the list within the brackets (for example, [1,4,6])
,()   Formatting characters that are ignored but allowed
-   Use within brackets to specify a range, otherwise ignored

The following are example template entries using wildcards:

1) NXX-XXXX	Match any 7-digit number beginning with 2 through 9
2) 1-NXX-NXX-XXXX	Match any number with a leading 1, then 2 through 9, then any 2 digits, then 2 through 9, then any 6 digits
3) 555-XXXX	Match any 7-digit number beginning with 555
4) XXXX$	Match any number with at least 5 digits
5) [7,8]$	Match any number beginning with 7 or 8
6) 1234	Match exactly 1234

Some template number rules:

1) All brackets must be closed with no nesting of brackets and no wildcards within the brackets.
2) All brackets can hold digits and commas, for example: [1239]; [1,2,3,9]. Commas are implied between numbers within brackets and are ignored.
3) Brackets can contain a range of numbers using a hyphen, for example: [1-39]; [1-3,9].
4) The $ wildcard is only allowed at the end of the template, for example: 91256$; XXXX$.

5. Select **Save** at the top right corner of the screen to save the configuration. A dialog box appears if the save is successful. Select **OK** to close the dialog box and return to the previous menu.

Configuring E1 Interfaces Using the GUI

There are four main settings to consider when configuring E1 network interfaces. The source timing (clocking), framing format, line coding, and active channels must all be configured to match the circuit supplied by your network provider. By default, all NetVanta E1 interfaces are configured for standard multiframe without the optional configure CRC4 error correction. Generally, the framing format and line coding default values will be correct for your application and do not need to be changed. For instructions on how to configure the E1 interface using the CLI, refer to *Configuring E1 Interfaces Using the CLI on page 24*.

To configure the E1 interface, follow these steps:

1. Navigate to **System > Physical Interfaces** to access the **Physical Interfaces** menu.
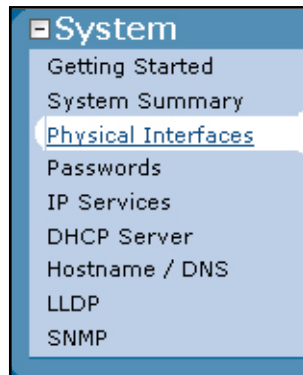
2. From the list of physical interfaces, select the name of the E1 interface you would like to configure. The interface should be labeled **e1** *<slot/port>*. For example, **e1 2/1**. The **Interface Configuration** menu will appear.

3. Optionally, enter a description of the interface in the **Description** field.

4. Select the check box next to **Enable** to allow the interface to pass data.

5. Use the **Clocking** drop-down menu to select the source timing used for the E1 interface.

6. Use the **Framing** drop-down menu to select the framing that matches the network provider framing format. Selecting **CRC4** configures CRC4 framing for the E1 interface. This enables CRC4 bits to be transmitted in the outgoing data stream. The received signal is also checked for CRC4 errors.

7. Use the **Coding** drop-down menu to select the coding that matches the network provider line coding.

8. Use the **Sa4Tx-Bit** drop-down menu to select a **0** or **1** for the Tx value of Sa4 on the E1 interface.

9. Select **Apply** to apply the settings to the interface.

10. Select **Save** at the top right corner of the screen to save the configuration. A dialog box appears if the save is successful. Select **OK** to close the dialog box and return to the previous menu.