Introduction

Session Initiation Protocol (SIP) trunking is a packet-based voice service that routes calls over an IP network to an IP-compatible private branch exchange (PBX) or voice switch using SIP signaling to place and receive calls. ADTRAN's NetVanta 7000 Series IP PBXs support SIP trunks delivered from your Covad service provider. The following sections in this document explain application and configuration implementation of SIP trunking using the ADTRAN NetVanta 7000 Series IP PBXs with Covad's Integrated Access.
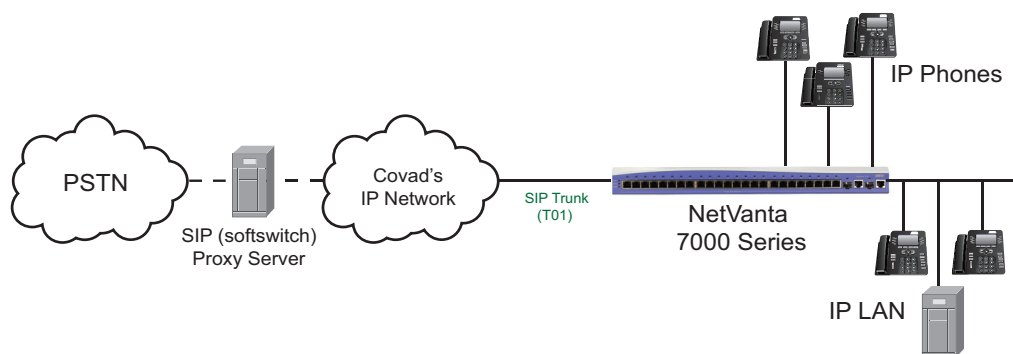
ADTRAN Operating System (AOS) firmware version A2.02.00 or later is required on your NetVanta 7000 Series product in order to support Covad's SIP trunking.

The following ADTRAN documents are prerequisites to configuring a new Covad SIP trunk on your system:

- *NetVanta 7000 Series Quick Start Guide*
- *NetVanta 7000 Series Web GUI Quick Configuration Guide*
- *NetVanta 7000 Administrator's Guide*
- *NetVanta 7000 Series SIP Trunking*

The following ADTRAN documentation is also available to assist with implementing configuration and application relating to SIP trunks and SIP networks:

- *Source and ANI Based Routing*
- *Switchboard and Dial Plan*
- *Transparent Proxy*
- *Voice Traffic over SIP Trunks*
- *Voice Quality Monitoring*
- *User Accounts (additional information available in the NetVanta 7000 Series Admin Guide)*
- *Voicemail (additional information available in the NetVanta 7000 Series Admin Guide)*

Configuration guides are located on the *AOS Documentation* CD shipped with your AOS unit or on the website at http://kb.adtran.com.

Follow the steps below to configure the incoming Covad SIP trunk:

- Create a SIP trunk account. Only one trunk account setup is allowed for the Covad service.
  - Set the SIP server address.
  - Set the SIP registrar address.
- Create trunk group(s).

Configuring the Covad SIP Trunk

1. Open a Web-based graphical user interface (GUI) session. If you need assistance, follow the steps in the *NetVanta 7000 Series Web GUI Quick Configuration Guide* available on the *AOS Documentation* CD shipped with your unit.

2. Navigate to the **Voice > System Setup > System Parameters** menu. Verify that the **Transfer Mode** and **Forward Mode** are set to **Local** (decisions are made internally by the NetVanta unit).
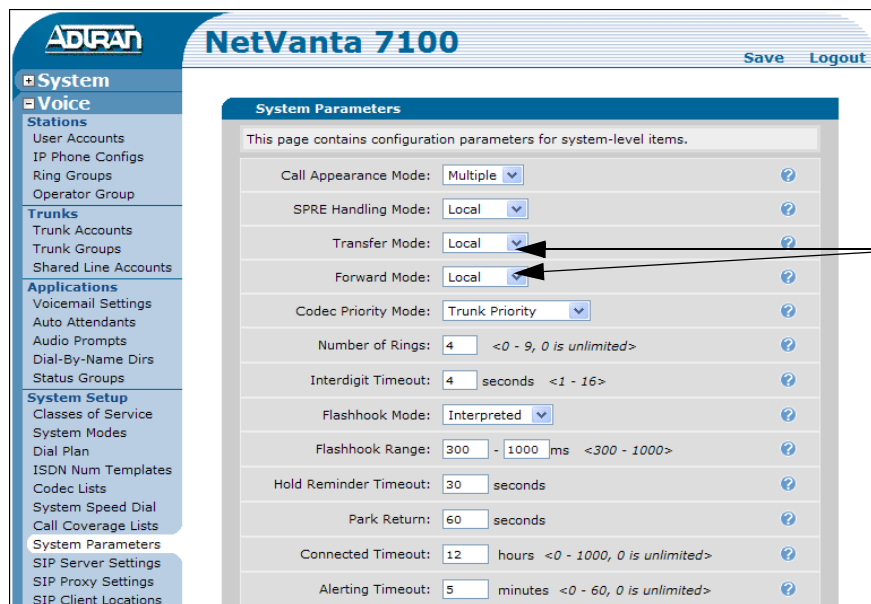
Verify that the **Transfer Mode** and **Forward Mode** are set to **Local**.

3. Navigate to the **Voice > Trunks > Trunk Accounts** menu. Enter the desired name for the SIP trunk in the **Trunk Name** field and select **SIP** as the trunk **Type**. Select **Add** to create the new trunk account.

Enter a name for the Covad **SIP** trunk.

Select **SIP** as the **Type** of trunk.

4. Optional. Set the number of active calls to be allowed simultaneously on the SIP trunk and the caller ID override parameters.

Reject External must be unchecked to allow incoming calls on the SIP trunk to the PBX to be routed out in case of a call forwarding or transfer action.

Max Number Calls sets the maximum number of calls that can be active at the same time on this trunk.

5. Continue the SIP trunk configuration on the **SIP Settings** tab. Set the SIP server and SIP proxy addresses to the host name of **trial-covad-vsos.ia.covad.com** or the specific host name provided by Covad.

Configure the **SIP Server Address** and **SIP Proxy Address** to be **Host Name** using the FQDN on which the trunks will terminate.

Set the **SIP Server Port** to **5060** (default SIP port) for both addresses.

| SIP Settings | ANI Substitution | DNIS Substitution | DNIS:ANI Replacement |

SIP Server Address:
- ○ Not Set
- ○ IP Address: [ ].[ ].[ ].[ ]
- ◉ Host Name: trial-covad-vsos.ia.covad.com

SIP Server Port: 5060

SIP Proxy Address:
- ○ Not Set
- ○ IP Address: [ ].[ ].[ ].[ ]
- ◉ Host Name: trial-covad-vsos.ia.covad.com

SIP Proxy Port: 5060

SIP Conferencing URI: [ ]

Force Host Resolve: ☐ Override ☐ Enable

FROM Header User Formatting: ☐ Override [Domestic ▾]

FROM Header Host Type: ☐ Override [SIP Server ▾]

TO Header Host Type: ☐ Override [SIP Server ▾]

P-Asserted Identity Host Type: ☐ Override [SIP Server ▾]

Request URI Header Host Type: ☐ Override [SIP Server ▾]

Alert Info URL:
- ☐ Override
- ◉ Default
- ○ Custom: [ ]

Supports 100rel: ☐ Override ☑ Enable

Require 100rel: ☐ Override ☐ Enable

Dial String Source: [Request URI ▾]

Trust Domain: ☐ Enable

Require P-Assert Identity: ☐ Require

Verify Remote Supports Replaces: ☐ Enable

SIP Keepalive Type / Timeout: [None ▾] [30] seconds <30-3600>

6. Still on the SIP Settings tab, scroll down and configure the **SIP Registrar Settings** using the information obtained from Covad. Enter the **SIP Registrar Address** (host name of **trial-covad-vsos.ia.covad.com**). The SIP trunk will be used to register all Covad SIP identities for the configured user accounts (up to 32 registrations). Also, configure the **Domain Address** by selecting **Use this domain** and set the domain to **ia.covad.com**.

Configure the **Host Name** for the **SIP Registrar Address**.

Verify that the **Requires Expires** is enabled, and the **Registration Expire Time** is set to **3600** seconds.

Select **Use this domain** and set the domain to **ia.covad.com**.

Select **Apply** to append the settings to create the new SIP identity number(s) registration.

7. Optional. Select the **ANI Substitution** tab (on the **Trunk Accounts/Edit SIP Trunk** menu) to configure outgoing caller ID to match the main Covad assigned number on the SIP trunk.

Set the **Match Template** to **$** (matches any number).

Set the **Substitution** to the Covad assigned SIP trunk number registered with the softswitch.

Configuring the Trunk Group

Trunk groups combine one or more trunk accounts and assign outbound call characteristics. The trunk group is assigned outbound call capabilities (local calls, long distance calls, etc.). Additionally, a cost is assigned to each attribute in the outbound call template. Use this section to create the trunk group, add the trunk account members to the group, and define the outbound call templates and costs.

1. Navigate to the **Voice > Trunks > Trunk Groups** menu and enter a new **Group Name** and select **Add**. To edit an existing trunk, select the link for the desired trunk from the list under **Modify/Delete Trunk Group**.

Enter a **Group Name**.
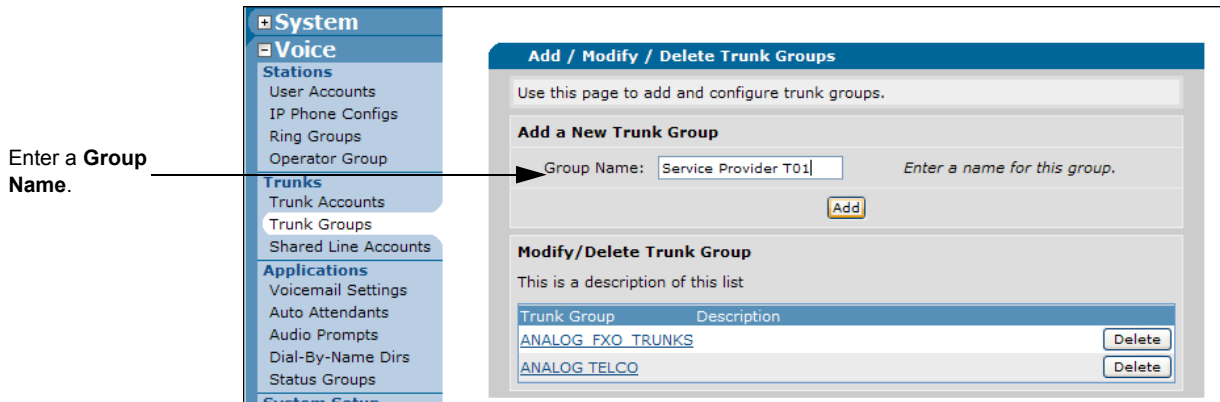
2. To add members to the trunk group, select the **Add Members** button. The **Add Members to Trunk Group** menu will appear.

Select **Add Members** to add trunk accounts to the trunk group.

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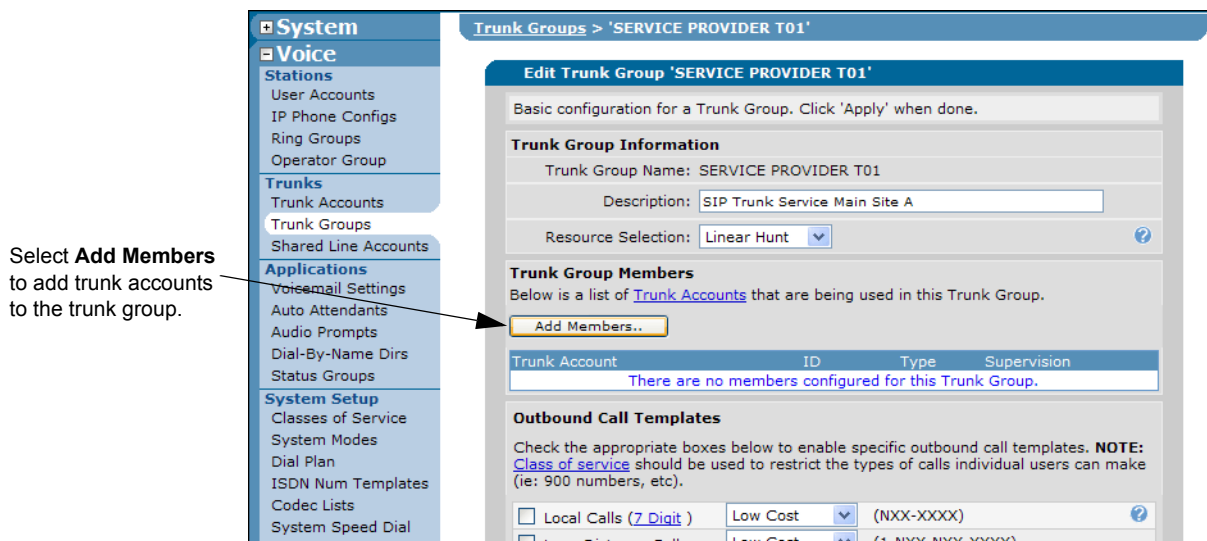
3. Add members by selecting the name you entered for the Covad SIP trunk.

4. Select **Add Selected Trunks** to append the new member selection(s) and return to the **Edit Trunk Group** menu.

5. Select the appropriate check boxes under **Outbound Call Templates** to enable specific outbound call templates. Outbound call templates are the types of calls to allow from this trunk.

Select the boxes to enable specific outbound call templates for this trunk group. Select the cost for each template.

6. Select **Apply** at the bottom of the menu to append the new settings and return to the **Add/Modify/Delete Trunk Groups** menu.

7. Verify the addition of the new Covad trunk group.

Verify the newly added trunk group. Look for the name you entered for the Covad SIP trunk in this area.

Special Configuration Notes

This section contains Covad-specific SIP trunk configuration limitations when interfacing with the ADTRAN's NetVanta 7000 Series products. There are two limitations with the Covad SIP Trunk, forwarding calls to an auto attendant and accessing a network operator. However, there is a solution for accessing a network operator through the NetVanta 7000 Series. Refer to *Accessing a Network Operator* on page 9 for a step-by-step guide through this configuration modification.

Contact Covad or ADTRAN (or both) for the current status on the Covad-specific SIP trunk configuration limitations.

Forwarding Calls to an Auto Attendant

When using Covad's Integrated Access Service, call coverage for voice users cannot be configured to forward calls to an auto attendant. An alternative call coverage option is forwarding calls to an operator group (or an internal operator). Also, forwarding calls to voicemail and cell phones works properly.

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Accessing a Network Operator

By default, all operator calls (9-0 or 0) terminated by the NetVanta 7000 Series are routed to the internal operator group. Therefore, dialing "0" or "9-0" will not reach an outside operator. To reach an external operator on the network or SIP trunk, the dial plan configuration must be modified. When the new configuration is applied, the NetVanta 7000 Series phone users will be required to dial an alternate number for an external operator.

The configuration to resolve this issue first requires making 9-00 a valid number, and then a Dialed Number Identification Service (DNIS) substitution must be applied on the trunk account. The DNIS substitution will substitute a 0 for the 00, and then parse the INVITE to the Covad service.

1. Navigate to **Voice > System Setup > Dial Plan** to add the new dial plan configuration. Enter **9-00** as the **Template** and select **Local** as the **Number Type**. Select **Add** to create the new dial plan template.

Enter **9-00** for the **Template** and select **Local** as the **Number Type**.

Select **Add** to create the new dial plan template.

2. Verify the newly added **Dial Plan Template** in the table under the **View/Delete Dial Plan Templates** section.

The new **Dial Plan Template** will appear in this table.

3. Navigate to the **Voice > Trunks > Trunk Groups** to edit the trunk group to make sure the dialed digits 00 are not rejected. Select the **Trunk Group** created for the SIP trunk.

Select the name for Covad SIP trunk group.

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4. Select the **Detailed View - Permit/Restriction Call Templates** hyperlink to expand the menu. Then, select the **Configure Advanced Templates** button to access the advanced menu settings.

Select the hyperlink to view the expanded menu.

Select the **Configure Advanced Templates** button to access the advanced menu.
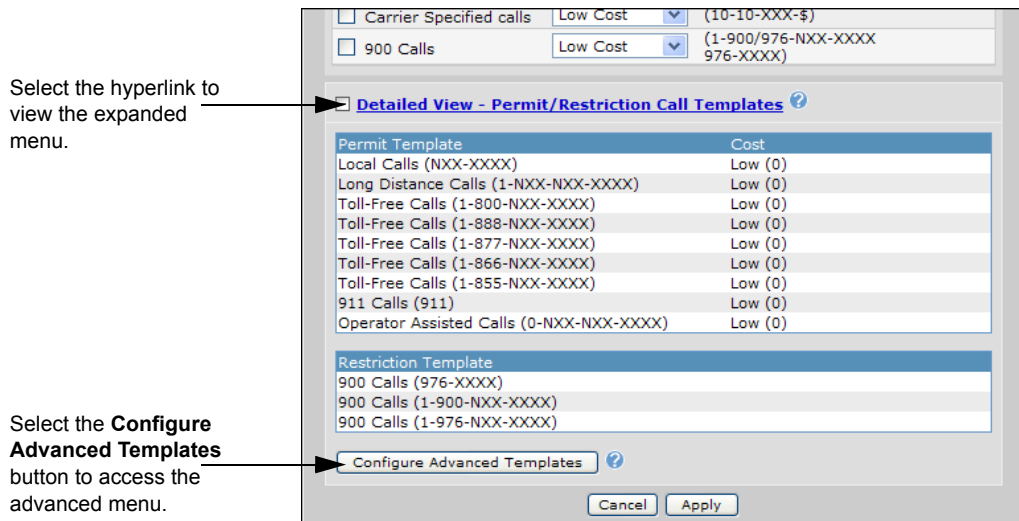
5. On the **Advanced Permit/Restriction Templates** menu, enter **00** for the **Template** and **0** for the **Cost**. Select **Add** to create the new outbound permit template.

Enter **00** for the **Template**.

Enter **0** for the **Cost**.

The new **00** template will appear at the bottom of this table.
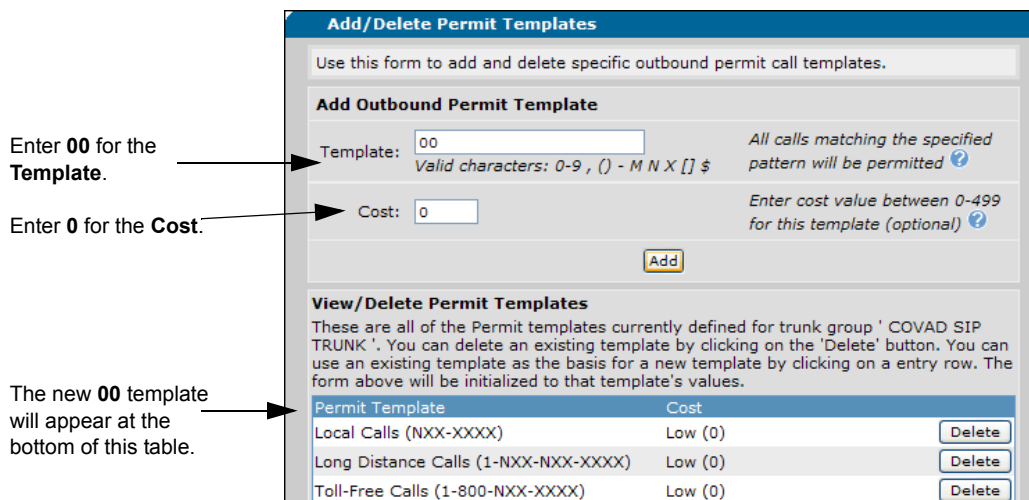
NetVanta 7000 Series CLI Trunk Account Configuration

After the GUI dial plan configuration has been completed. Access the NetVanta 7000 Series command line interface (CLI) to enter the configuration below. Refer to the *NetVanta 7000 Series Quick Start Guide* located on the *AOS Documentation* CD shipped with your AOS unit or on the website at http://kb.adtran.com for instructions on accessing the CLI.

1. Enter **show run** at the configuration prompt (#). Identify the trunk account section that looks like the configuration snippet below:

   ```
   <snip>
   !
   voice trunk T03 type sip
     description Covad Trunks
     no reject-external
     match dnis 00 substitute 0 name Local Operator Workaround
     match ani $ substitute 2135551234
     sip-server primary trial-covad-vsos.vsos.ia.covad.com
     registrar primary trial-covad-vsos.vsos.ia.covad.com
     outbound-proxy primary trial-covad-vsos.vsos.ia.covad.com
     domain ia.covad.com
     default-ring-cadence external
   !
   <end snip>
   ```

2. Enter **configure terminal** at the prompt (#), then enter the **voice trunk** *<Txx>,* where *<Txx>* represents the two-digit trunk identifier, in this case T03, to access the Covad trunk account configuration.

3. Enter the following command to replace **00** with **0** before forwarding the INVITE to the Covad service:

   match dnis 00 substitute 0 name Local Operator Workaround

4. Enter **do write** to save the running configuration to the unit's nonvolatile memory (NVRAM). Once the save is complete, the changes are retained even if the unit is shut down or suffers a power outage.

After completing the GUI and CLI configuration, the dial string of 9-00 will terminate to a local operator external to the NetVanta 7000 Series.