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BroadCloud Adtran Total Access Quick Start Guide

Specification Document

Version 2.0

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1. Scope

This document will provide a quick start configuration guide for provisioning the Adtran Total Access line of Integration Access Devices for use with the BroadSoft BroadCloud VoIP Network. It is important to note that this document is not intended to provide an extensive view of all configuration options available on the Total Access IADs. Instead, it will focus on the most common configuration procedures necessary for proper interoperability with the BroadSoft BroadCloud VoIP network.

BroadSoft BroadCloud does not manage the customer Total Access IAD configurations or provide in depth support for customer configurations not included in this document. If configuration options not covered in this document are required, please consult the Adtran website at www.adtran.com or contact Adtran support by phone using the contact number listed on their website.

2. Overview

The Adtran Total Access Integrated Access Device or IAD currently ships in two families of hardware. The families differ from each other in the density of both the data and voice capacity supported. The first of these is the TA900 family, which has support for the following:

- 4, 8, 12, 16, or 24 FXS Analog Lines
- One T1 interface for PRI or CAS signaling
- One T1 interface for data connectivity
- One Ethernet interface for data connectivity

The second of these families is the TA900e, which has support for the following:

- 8, 16, or 24 FXS Analog Lines
- 1 FXO Analog Line
- Up to two T1 interfaces for PRI or CAS signaling
- Up to four T1 interfaces for data connectivity
- Two Ethernet interfaces for data connectivity

This document will describe the default state in which each IAD ships, mandatory tasks that must be completed for proper functionality in the BroadSoft BroadCloud VoIP Network, optional tasks that can be performed to support an individual customer's needs, and common administrative tasks that can be performed on the IAD.

3. Default Configurations

Each of the Total Access models covered in this document will initially boot up supporting a factory default configuration that offers little in the way of functionality. This makes initial turn-up of the IAD somewhat difficult and time consuming. In order to

ease the initial configuration of the IAD, BroadSoft BroadCloud loads a configuration on the IAD that allows for quicker turn-up of the IADs.

WARNING!!! *Restoring the IAD to the factory default will return it to the Adtran default state. This state requires serial connection to the box to complete the initial configuration.*

NOTE: If the IAD has been restored to the factory default or if it has been acquired from a source other than BroadSoft BroadCloud, it is recommended that the BroadSoft BroadCloud default configuration be loaded on the IAD before proceeding any further. In order to obtain a copy of the BroadSoft BroadCloud default configuration, one must visit the SIP Advantage Sales Management dashboard where a link to the default configurations for all models of the TA900 and TA900e is available.

NOTE: Once the BroadSoft BroadCloud default configuration has been obtain, follow the steps contained in Section 6.6 of this document to load it on the IAD.

The configuration established by BroadSoft BroadCloud adheres to the following requirements:

1. The IADs are configured as routers by default.
2. Each IAD has a single ppp T1 configured as the WAN. For both the TA900 and TA900e this is the T1 0/1 port.
3. The WAN T1 is configured to dynamically learn its IP Address from the remote peer to which it is connected.
4. Each IAD has a single Ethernet port configured as the LAN. For both the TA900 and TA900e this is the ETH 0/1 port.
5. The LAN is configured with a network of 10.10.10.0 and a subnet mask of 255.255.255.0.
6. The LAN is assigned a static address of 10.10.10.1.
7. The LAN is assigned a DHCP server that dynamically assigns addresses for the 10.10.10.0/24 network.
8. A Firewall is configured that NATs all traffic from clients on the LAN to the address on the WAN.
9. QoS Maps are assigned to the WAN and LAN to ensure that VoIP traffic has the highest priority of all traffic traversing the IAD.
10. Each IAD is configured to have one T1 port active and configured for NI2 PRI. For the TA900 this is the T1 0/2 port. For the TA900e this is the T1 0/3 port.
11. The PRI is configured with all 23 B-Channels active.

12. The PRI is configured to send calling name in the initial PRI Setup message it sends to the CPE to initiate a new call.
13. The PRI is configured to send the digits it receives from the BroadSoft BroadCloud VoIP Network as is to the CPE.
14. The PRI channel selection sequence is set to Linear Hunt Ascending.
15. All FXS ports on both the TA900 and TA900e are disabled by default.
16. All FXO ports on the TA900e are disabled by default.
17. The ETH 0/2, T1 0/2, and T1 0/4 ports on the TA900e are disabled by default.
18. The IAD's Primary Clock Source is configured as the active PRI T1. For the TA900 this is the T1 0/2 port. For the TA900e this is the T1 0/3 port.
19. The IAD's SNTP Time Server is configured as ntp.adpt-tech.com.
20. The IAD's Time Zone is configured as (GMT-06:00) Central Time (US & Canada).

4. Mandatory Configuration

The following sub-sections will detail procedures that must be performed on every Total Access IAD to finalize turn-up and place the IAD in an operable state in the BroadSoft BroadCloud VoIP Network. These procedures will be further subcategorized into those that must be performed on the data portion of the IAD and those on the voice portion of the IAD.

NOTE: All the procedures defined in the following sub-sections assume that the BroadSoft BroadCloud default configuration is used as the starting point.

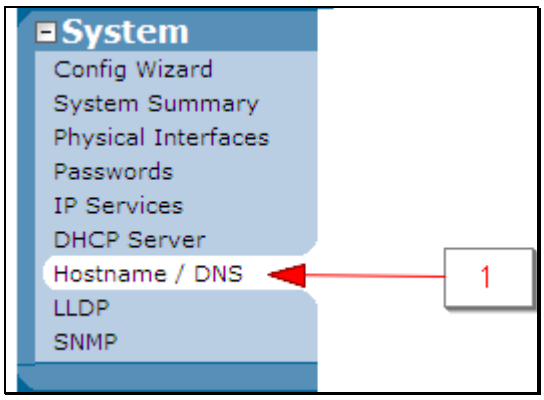
4.1 Data Configuration

The following sub-sections will detail procedures that must be performed on the Total Access IAD's data configuration in order for it to function properly in the BroadSoft BroadCloud VoIP Network. These procedures include configuring DNS Servers.

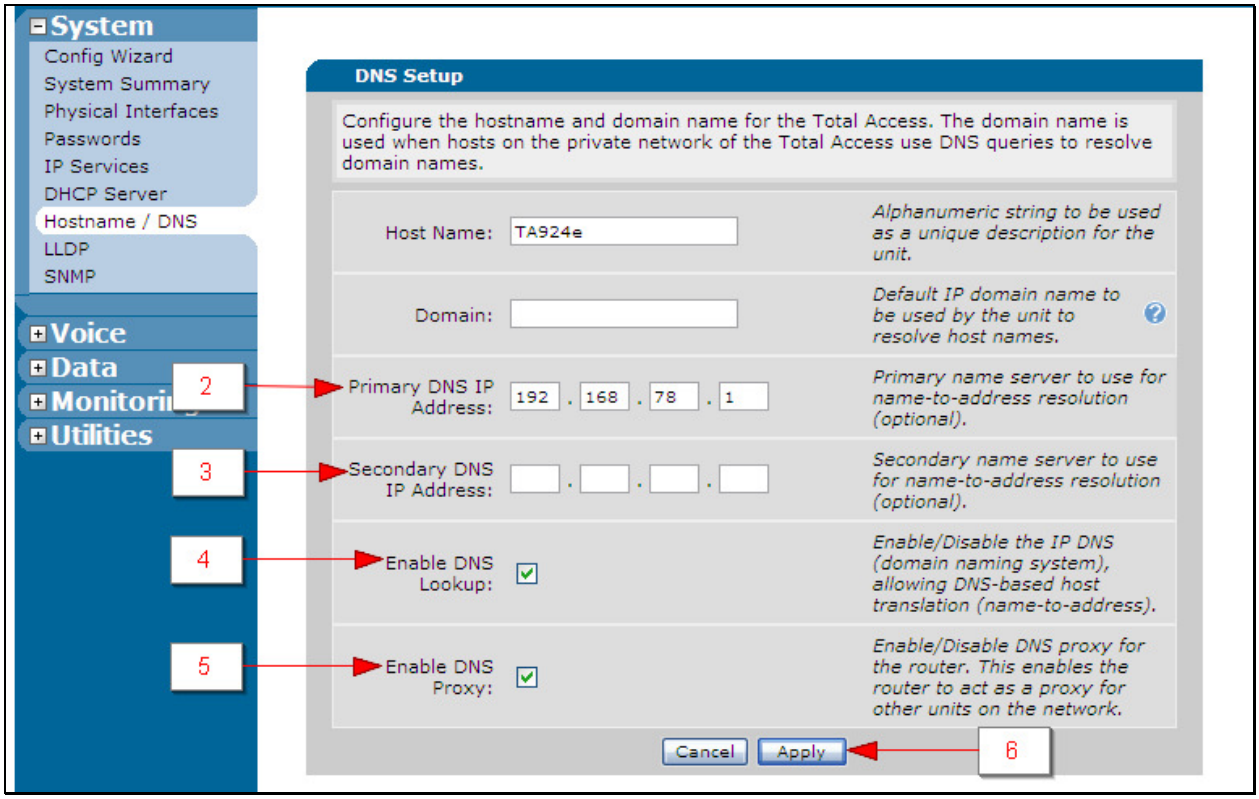
4.1.1 Configure DNS Servers

Complete the following steps to configure the DNS servers the IAD will use to resolve DNS addresses.

1. Select the **Hostname/DNS** link located under the **System** heading in the left hand margin.



2. Enter the IP Address of the first DNS Server in the **Primary DNS IP Address** textboxes.
3. If applicable, enter the IP Address of the second DNS Server in the **Secondary DNS IP Address** textboxes.
4. Check the **Enable DNS Lookup** checkbox.
5. Check the **Enable DNS Proxy** checkbox.
6. Click the **Apply** button.



4.2 Voice Configuration

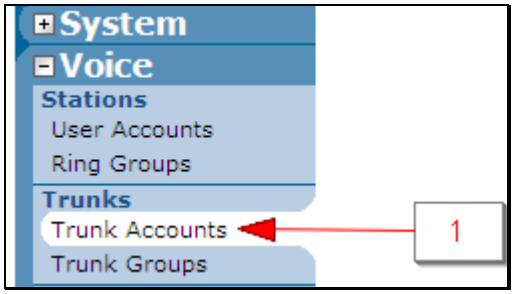
The following sub-sections will detail procedures that must be performed on the Total Access IAD's voice configuration in order for it to function properly in the BroadSoft BroadCloud VoIP Network. These procedures include configuring a registration phone number on the SIP Trunk and configuring a channel selection sequence on the TDM Trunk.

NOTE: The Total Access must provide an originating calling number that is valid in the BroadSoft BroadCloud VoIP Network for all outbound calls. Calls that do not contain a valid calling number will not complete.

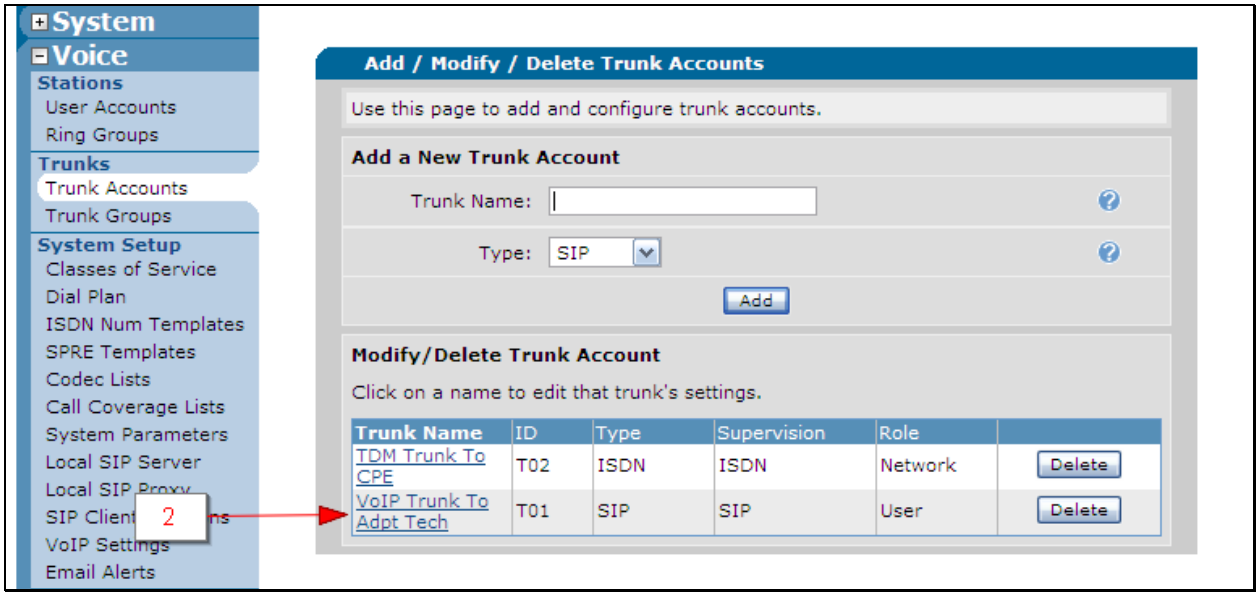
4.2.1 Configuring SIP Trunk Registration

Complete the following steps to configure the phone number the IAD will use to register itself with the BroadSoft BroadCloud VoIP Network.

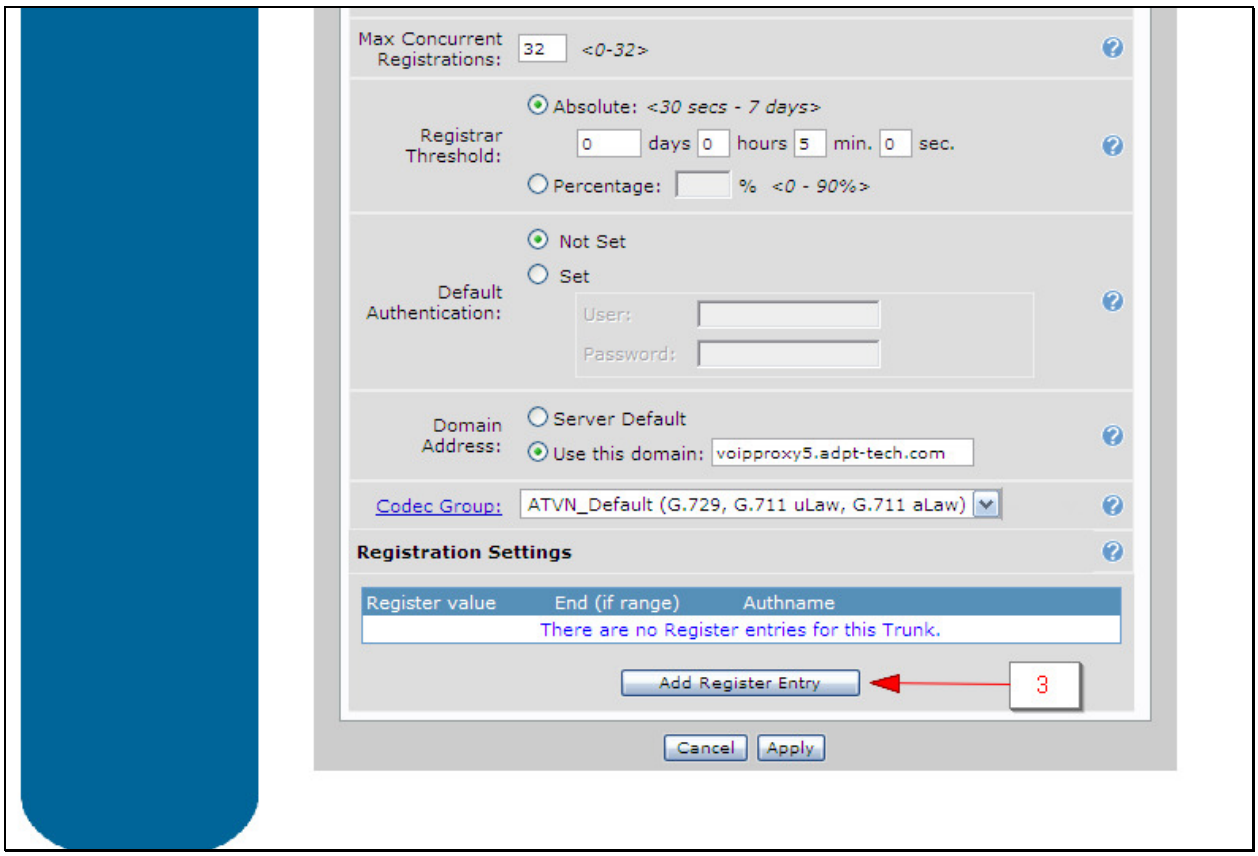
1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.



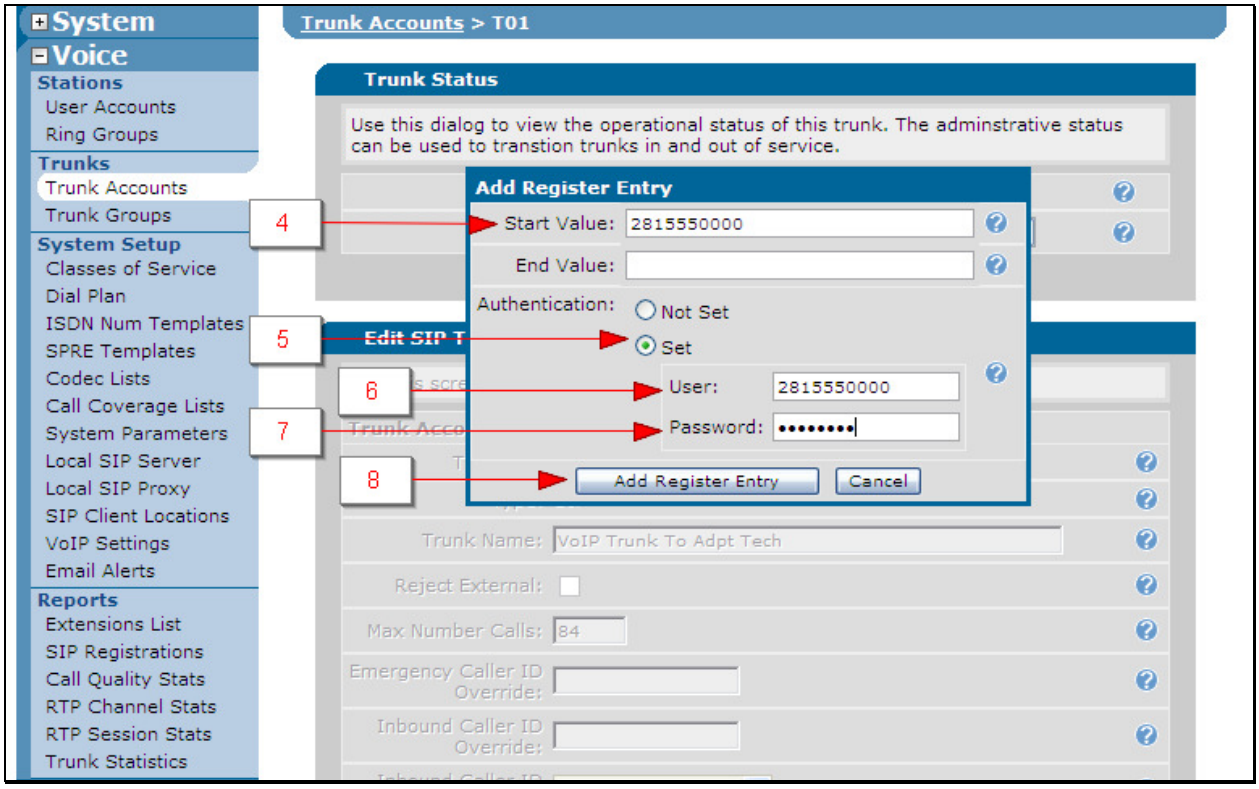
2. Click the **VoIP Trunk To Adpt Tech** link under the **Trunk Name** column header.



3. Scroll down and click the **Add Register Entry** button.



4. Enter the main trunk number in the **Start Value** textbox.
5. Select the **Set** radial button from the **Authentication** list.
6. Enter the main trunk number in the **User** textbox.
7. Enter the main trunk number's authentication password in the **Password** textbox.
8. Click the **Add Register Entry** button.

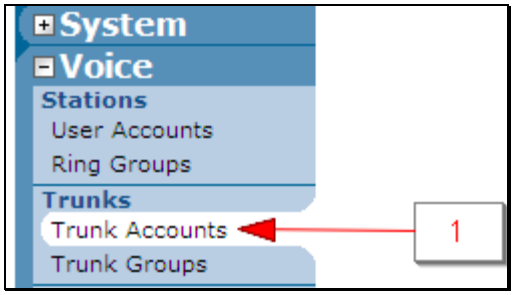


4.2.2 Configuring TDM Trunk Channel Selection Sequence

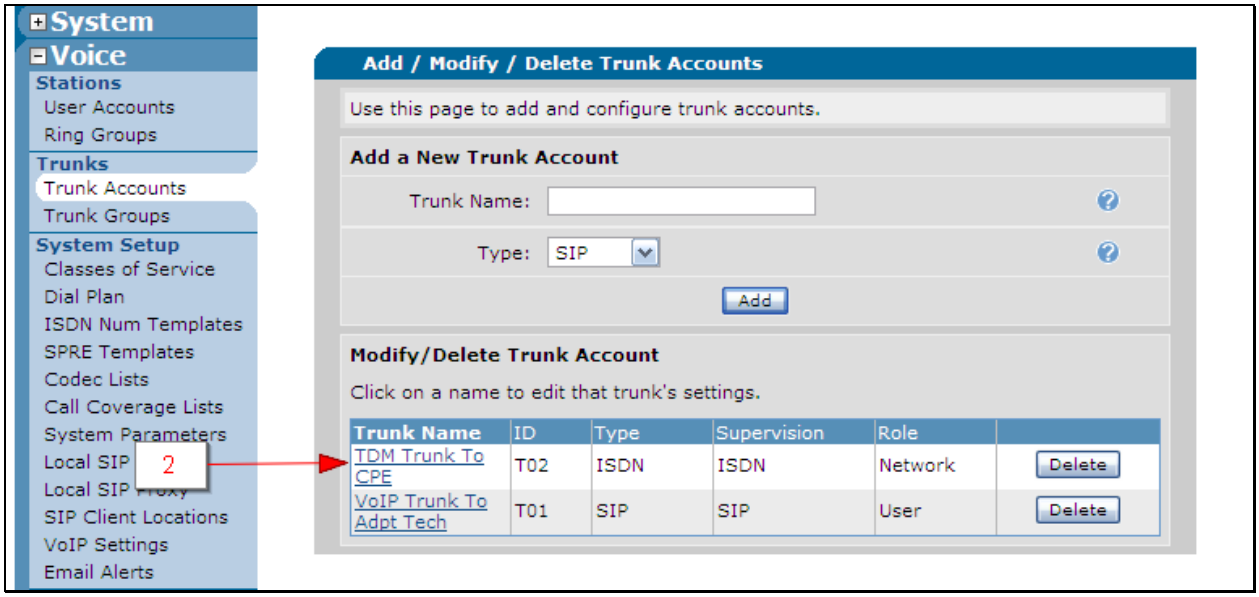
Complete the following steps to configure the selection sequence which the IAD will use when determining the channel on the TDM trunk to seize when terminating a call to the CPE.

NOTE: It is important to configure the IAD selection sequence so that it selects channels in a manner opposite from the CPE. For example, if the CPE is configured for Circular Hunt Descending then the IAD should be configured for Circular Hunt Ascending. This is important for minimizing the situation when the IAD and CPE select the same channel and cause a glare issue.

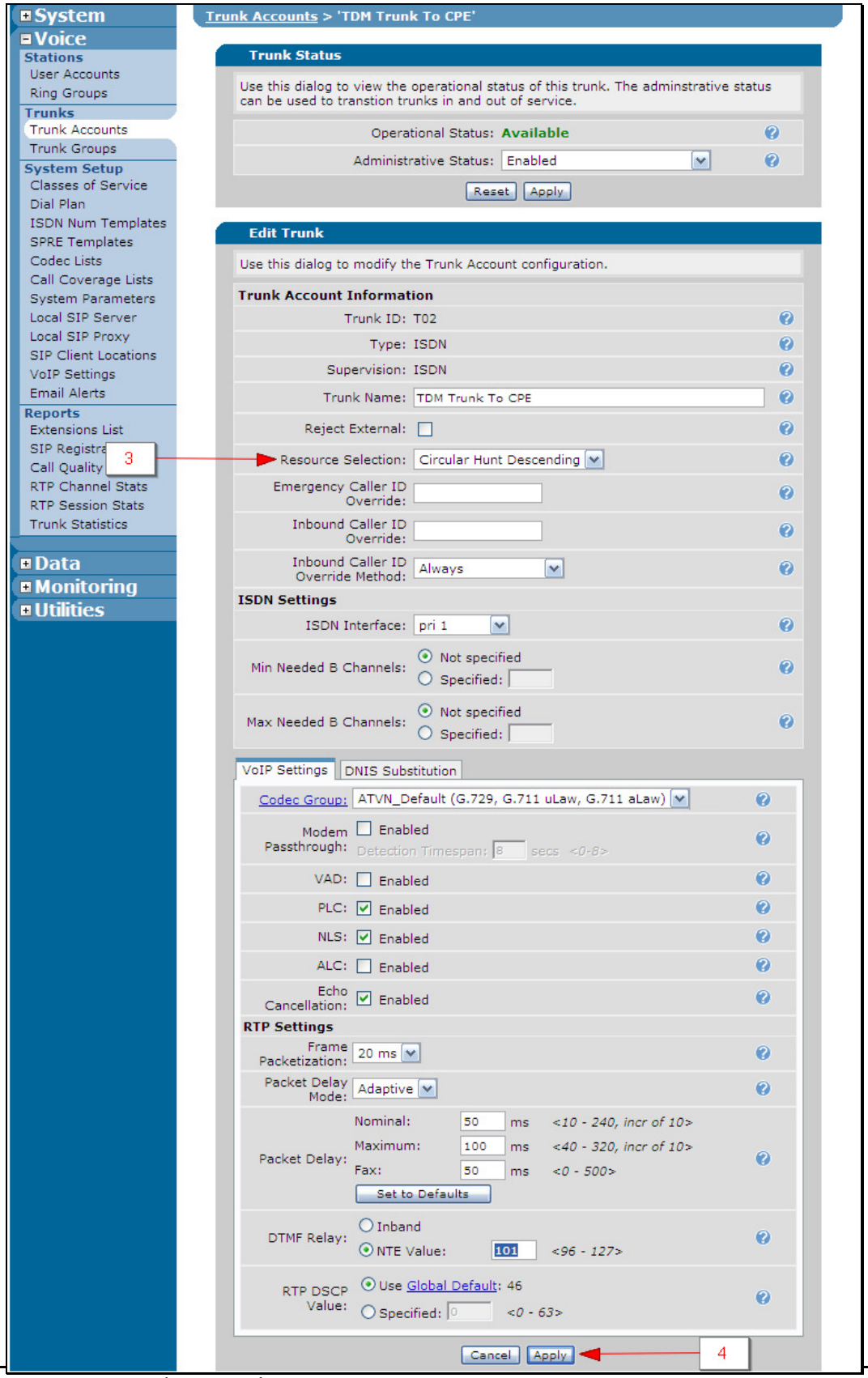
1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.



2. Click the **TDM Trunk To CPE** link under the **Trunk Name** column header.



3. Select the appropriate selection sequence from the **Resource Selection** dropdown box.
4. Click the **Apply** button.



5. Optional Configuration

The following sub-sections will detail procedures that may need to be performed depending on the particular needs of a given customer. These procedures will be further subcategorized into those that must be performed on the data portion of the IAD and those on the voice portion of the IAD.

NOTE: All the procedures defined in the following sub-sections assume that the BroadSoft BroadCloud default configuration is used as the starting point.

5.1 Data Configuration

The following sub-sections will detail procedures that can be used to customize the data network configuration of an IAD. These procedures include setting a static IP on the T1 PPP WAN, configuring the IAD with a T1 MLPPP WAN interface, configuring the IAD with an Ethernet WAN interface with DHCP, and configuring the IAD with an Ethernet WAN interface with Static IP Addressing.

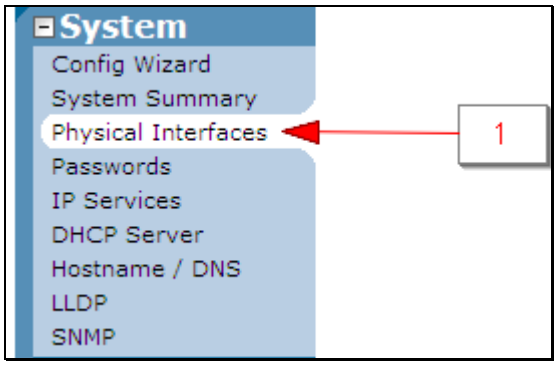
NOTE: For the purposes of this document, all T1 provisioning will focus on PPP encapsulation.

5.1.1 Configuring Static IP Addressing on T1 PPP WAN

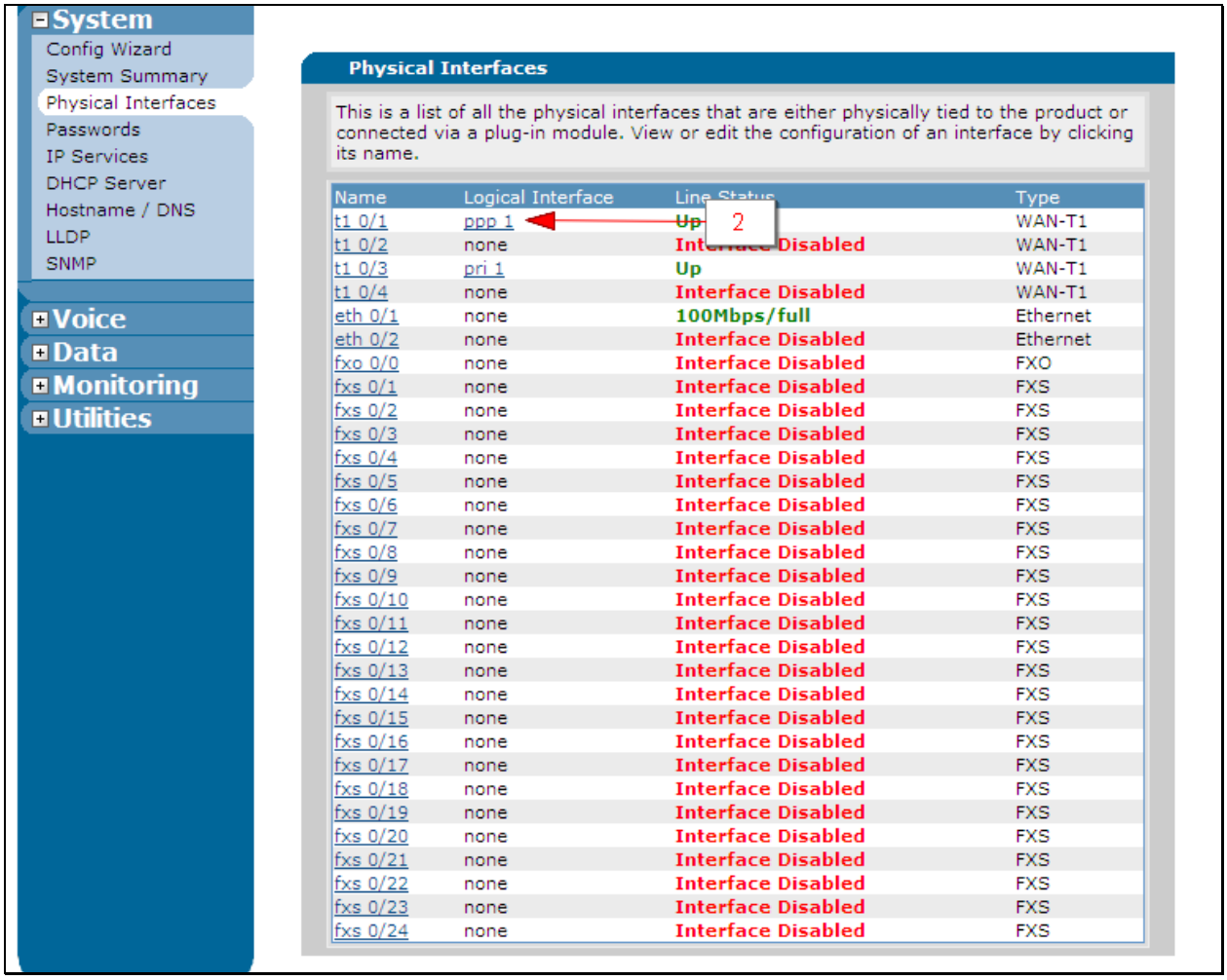
Complete the steps in the following sections to assign a static IP address to the T1 PPP WAN Interface.

5.1.1.1 Configure the PPP Interface

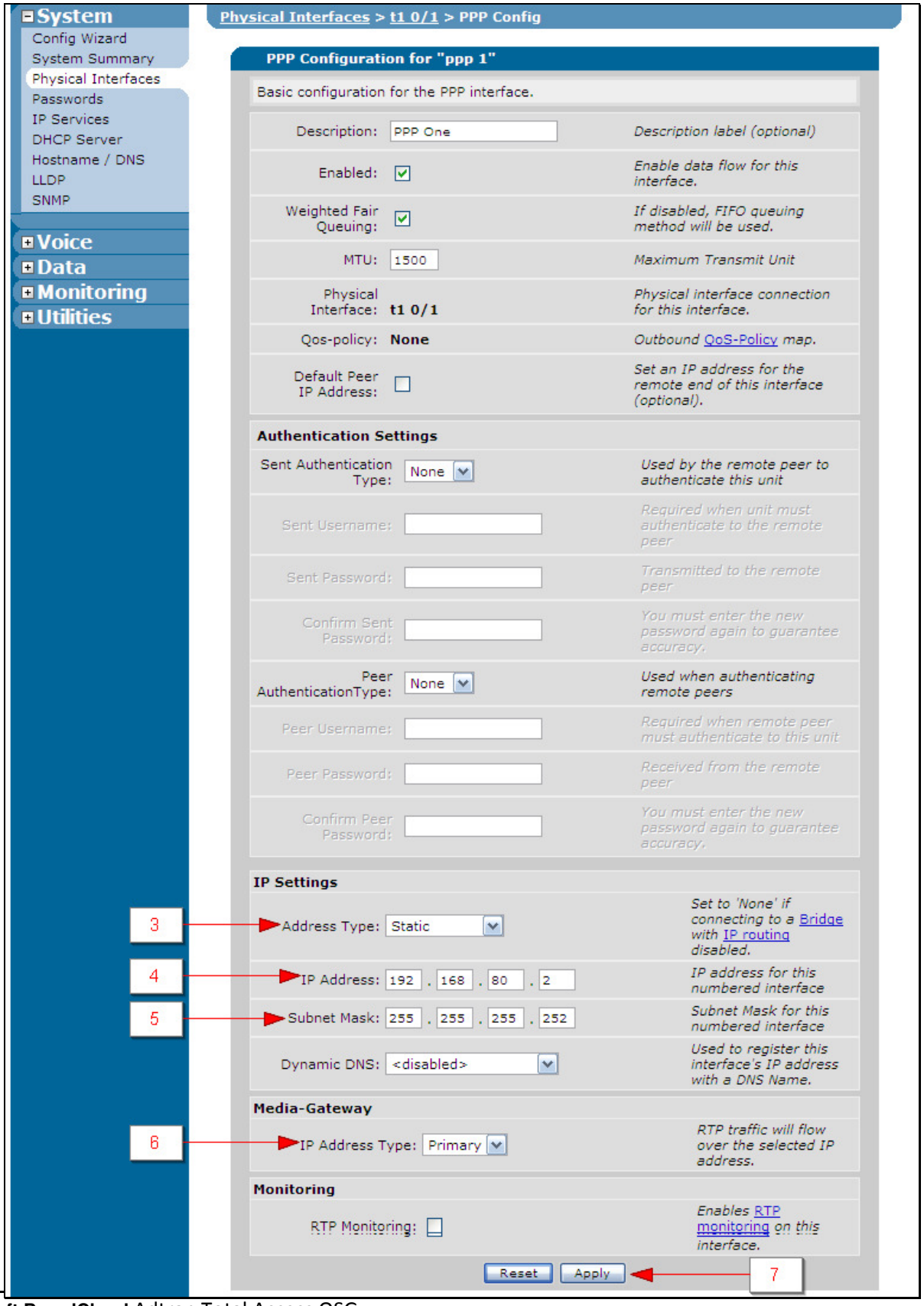
1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



2. Select the **ppp 1** link under the **Logical Interface** column header.

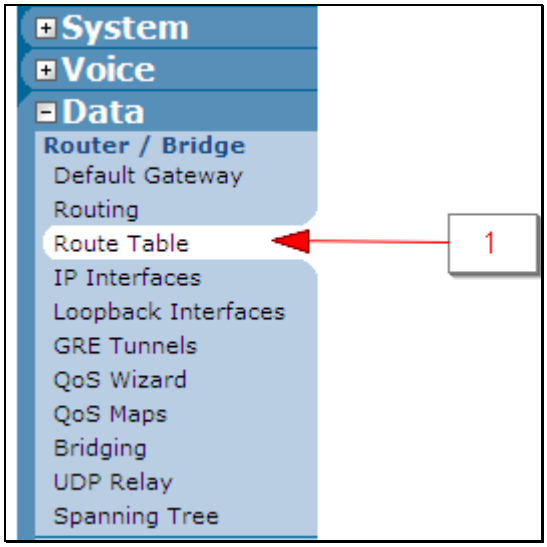


3. Select the **Static** option in the **Address Type** dropdown box.
4. Enter the IP address assigned to the T1 interface in the **IP Address** textboxes.
5. Enter the Subnet Mask assigned to the T1 interface in the **Subnet Mask** textboxes.
6. Select the **Primary** option in the **IP Address Type** dropdown box.
7. Click the **Apply** button.

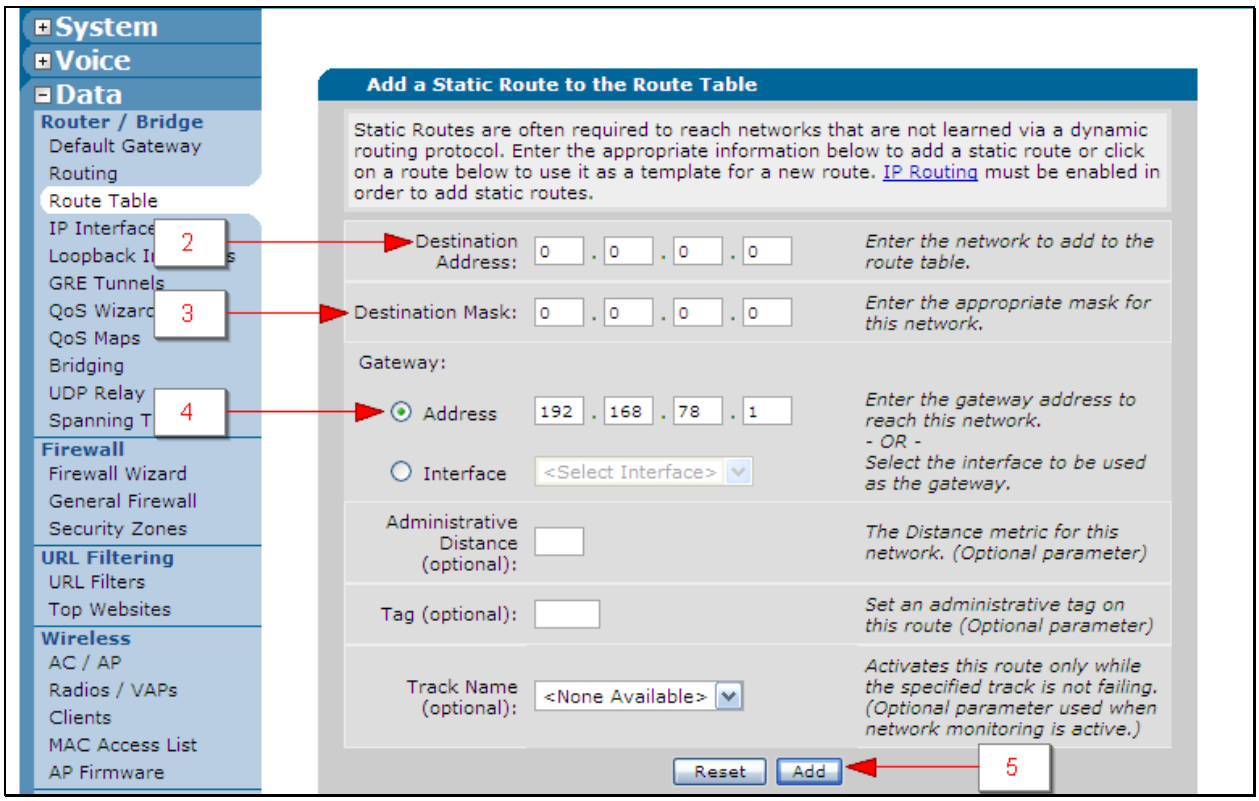


5.1.1.2 Default Route Configuration

1. Select the **Route Table** link located under the **Data** heading in the left hand margin.

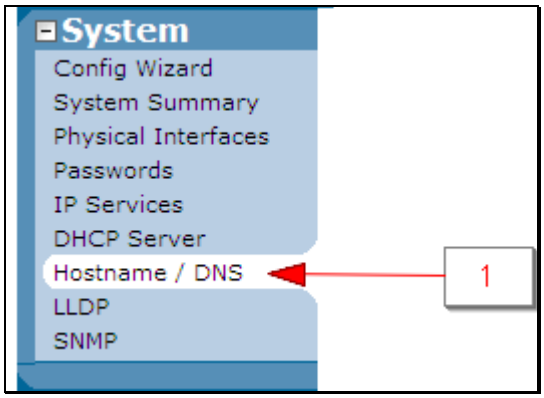


2. Enter an address of 0.0.0.0 in the **Destination Address** textboxes.
3. Enter a subnet mask of 0.0.0.0 in the **Destination Mask** textboxes.
4. Select the **Address** radial button in the **Gateway** list and enter the default gateway address.
5. Click the **Add** button.



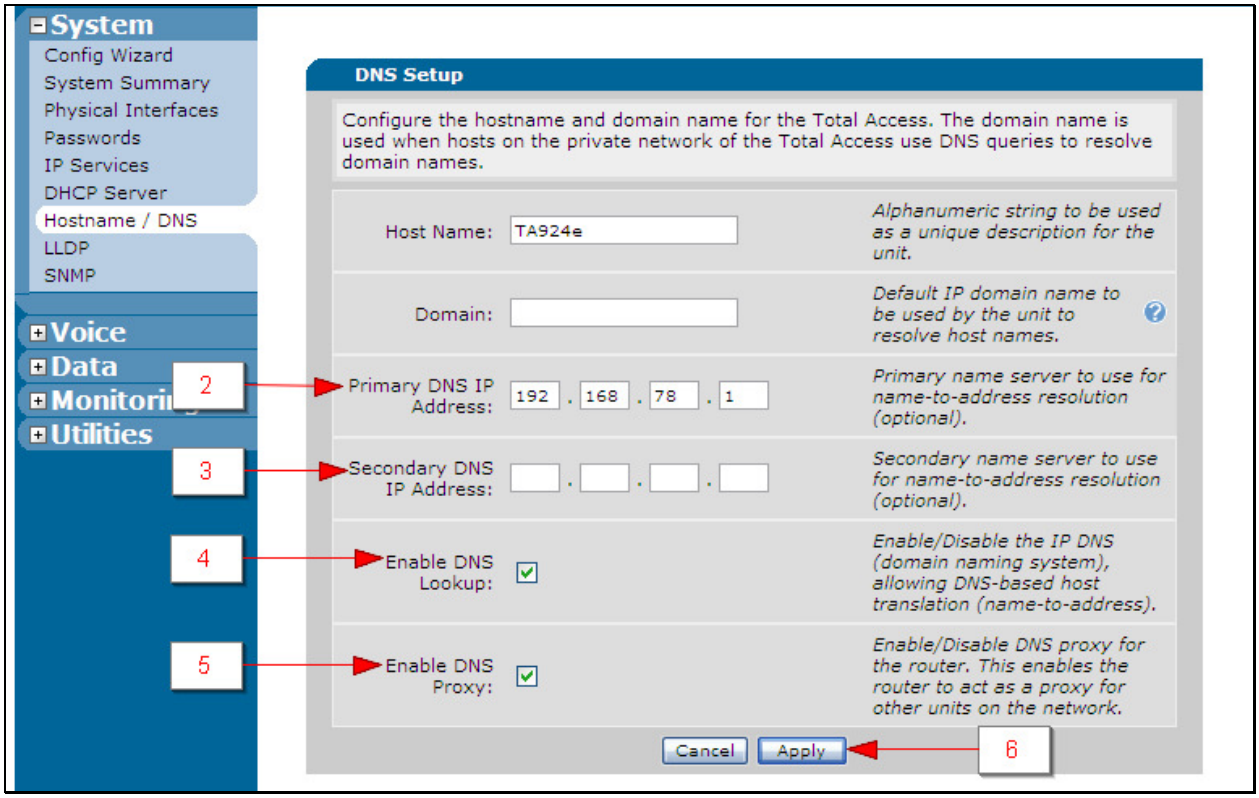
5.1.1.3 Assign DNS Servers

1. Select the **Hostname/DNS** link located under the **System** heading in the left hand margin.



2. Enter the IP Address of the first DNS Server in the **Primary DNS IP Address** textboxes.
3. If applicable, enter the IP Address of the second DNS Server in the **Secondary DNS IP Address** textboxes.
4. Check the **Enable DNS Lookup** checkbox.
5. Check the **Enable DNS Proxy** checkbox.

6. Click the **Apply** button.



5.1.2 Configuring T1 MLPPP WAN Access

Complete the steps in the following sections to provision a T1 MLPPP interface on the IAD for WAN Access.

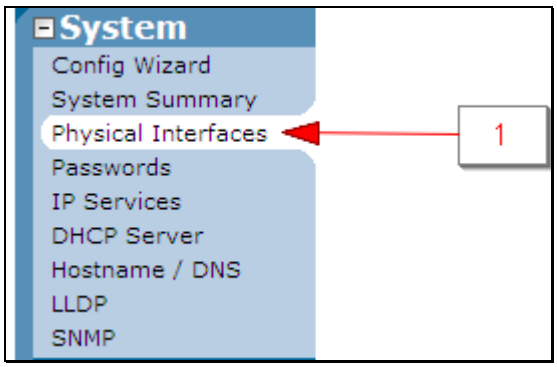
NOTE: The procedure detailed below applies only to the TA908e, TA916e, and TA924e models.

NOTE: The procedure detailed below assumes that Static IP Addressing will be used. If one of the other methods is required, substitute for that method where appropriate.

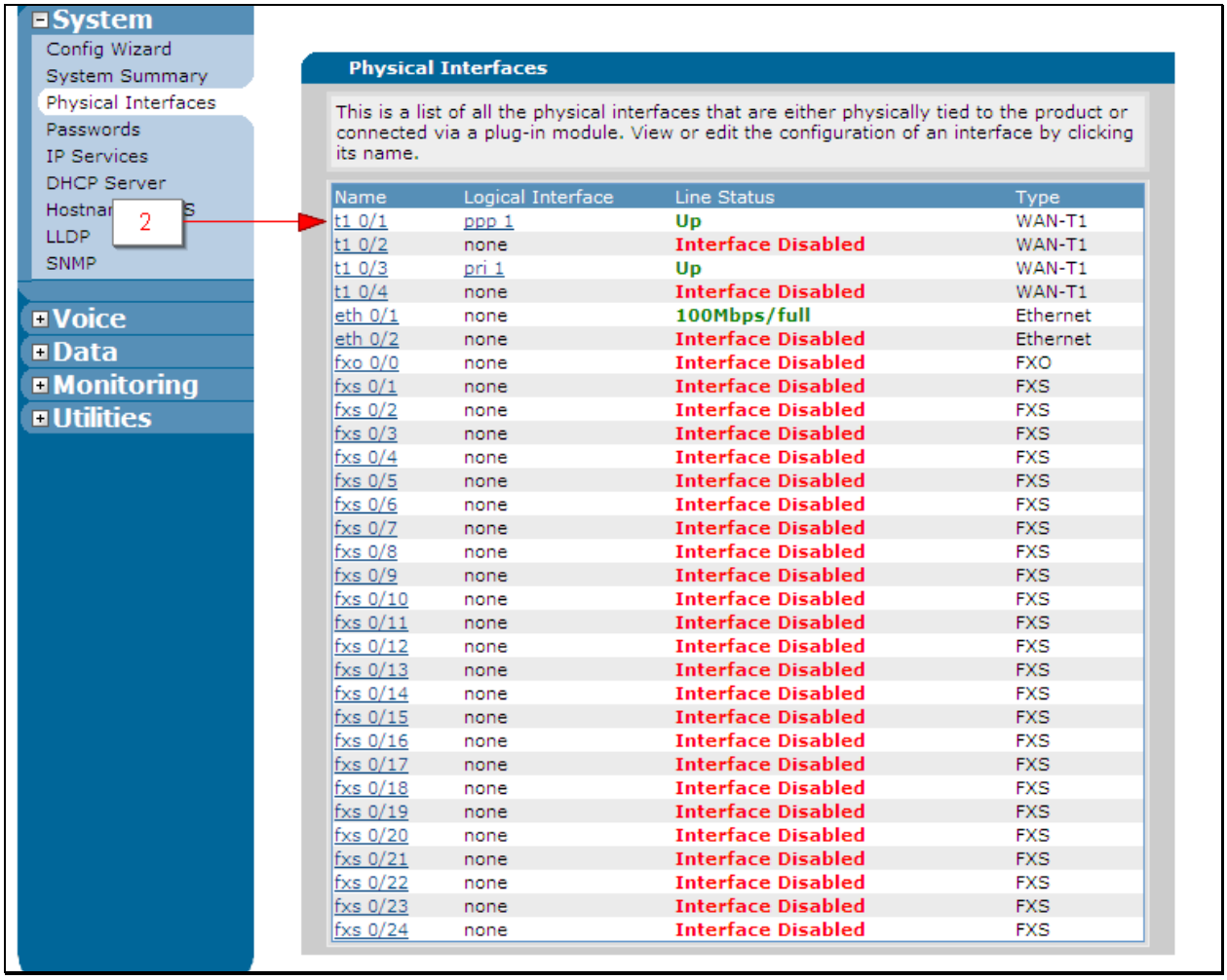
NOTE: For deployments that require more than two T1s, repeat the steps defined in section 5.1.2.3 to add a third and fourth T1 to the MLPPP interface.

5.1.2.1 Configure T1 PPP Multilink Interface

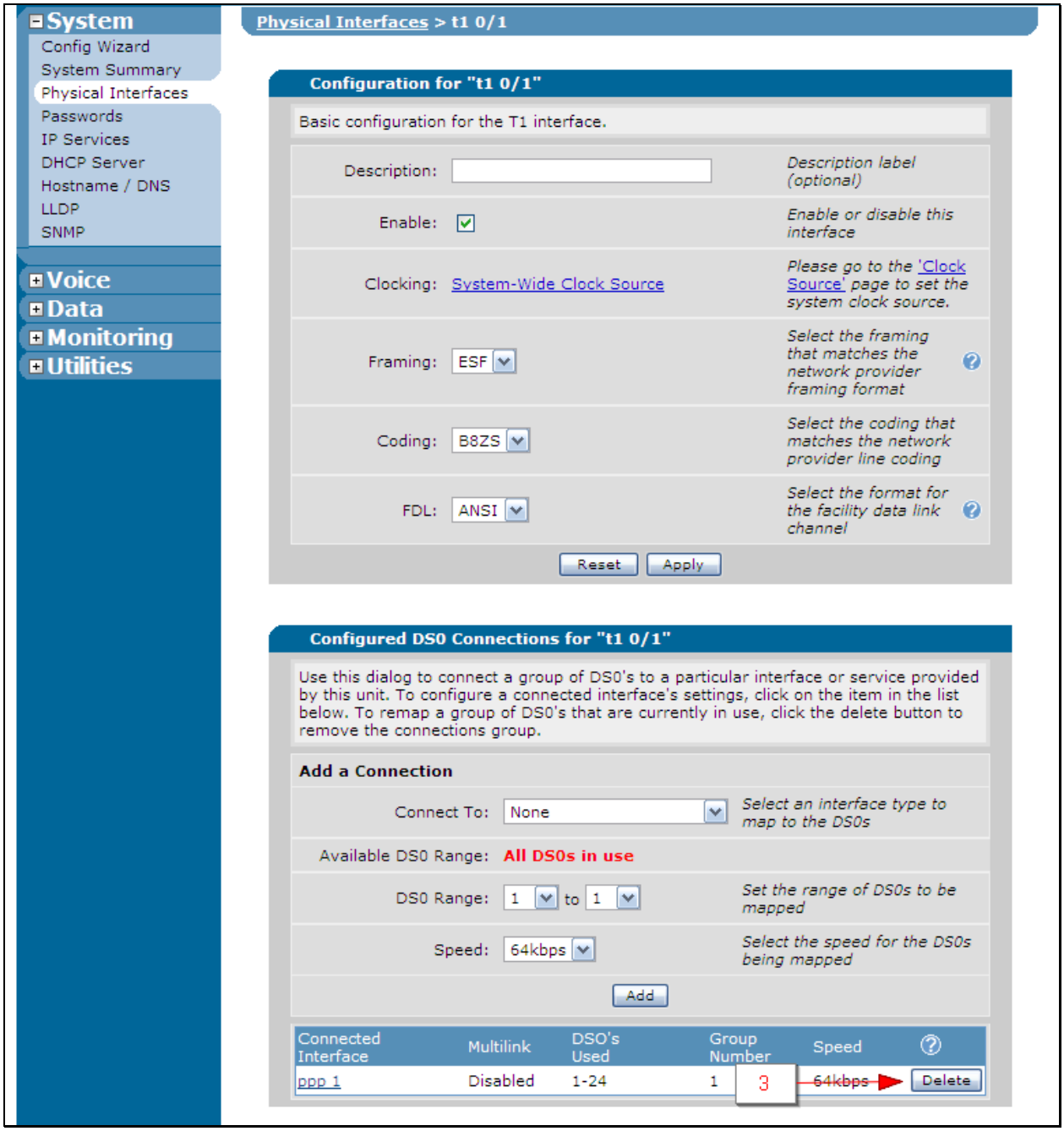
1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



2. Select the **t1 0/1** link under the **Name** column header.

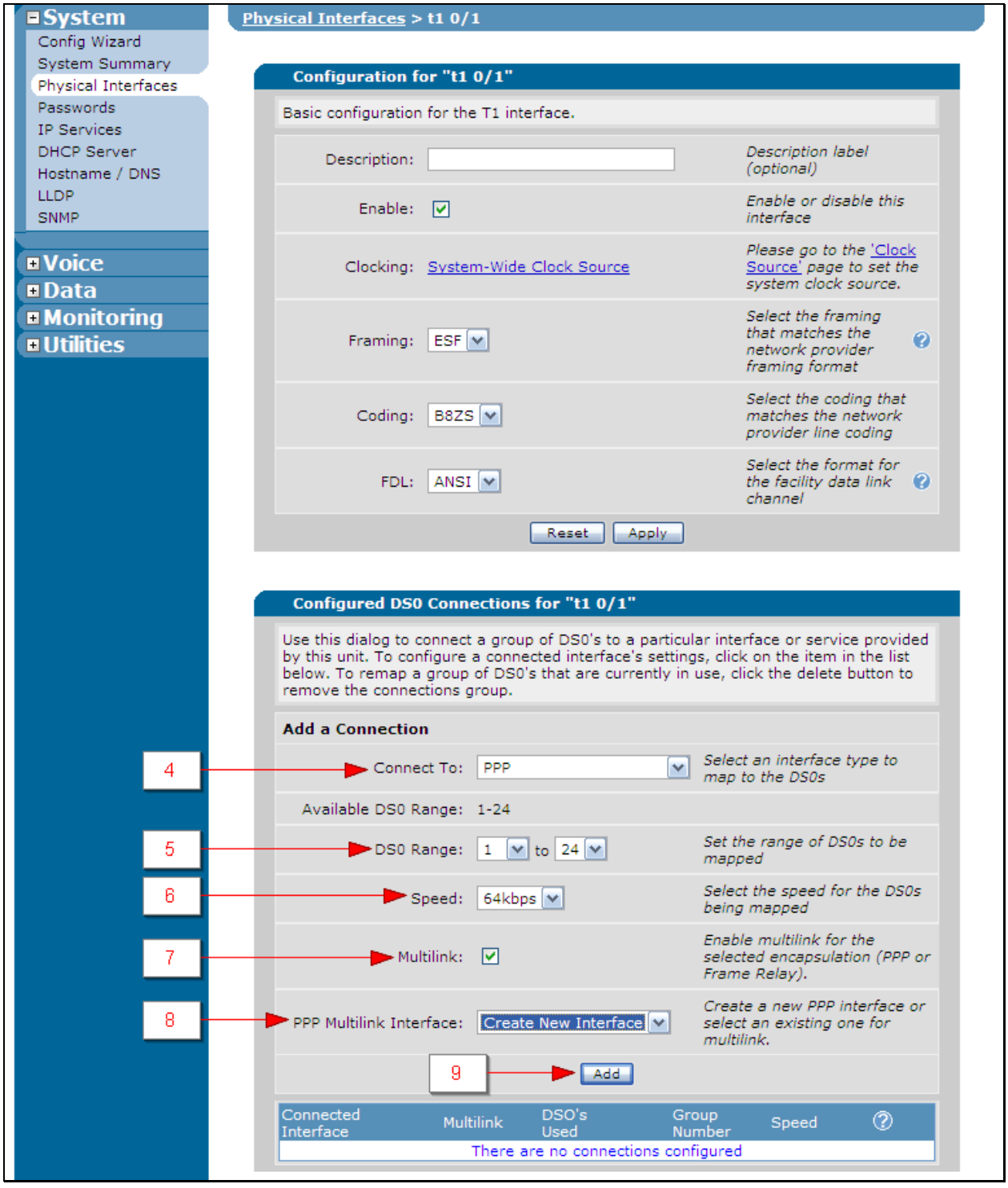


3. Click the **Delete** button located in the **ppp 1** row.



4. Select the **PPP** option in the **Connect To** dropdown box.
5. Select the range of DS0s that will be assigned to the T1 from the **DS0 Range** dropdown boxes.
6. Select the appropriate DS0 speed from the **Speed** dropdown box.
7. Check the **Multilink** checkbox.
8. Select the **Create New Interface** option in the **PPP Multilink Interface** dropdown box.

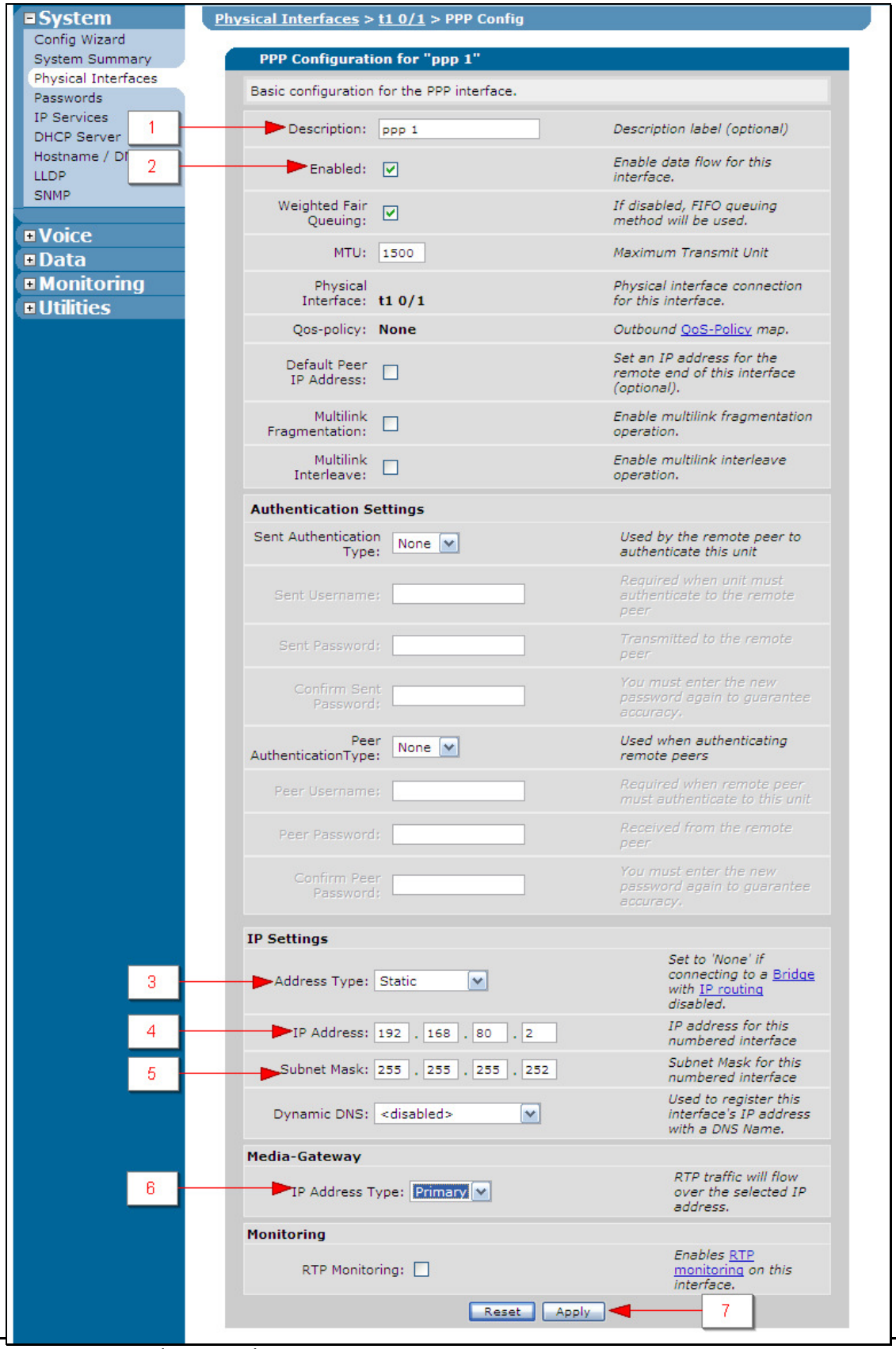
9. Click the **Add** button to commit the changes and advance the screen to the PPP configuration page.



5.1.2.2 Configure PPP Multilink Interface for First T1

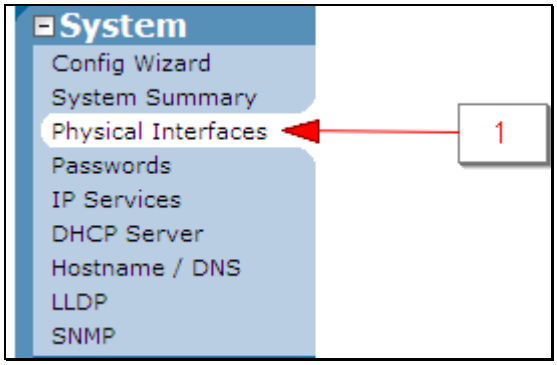
1. Enter a label for the PPP interface in the **Description** textbox.

2. Check the **Enable** checkbox.
3. Select the **Static** option in the **Address Type** dropdown box.
4. Enter the IP address assigned to the T1 in the **IP Address** textboxes.
5. Enter the Subnet Mask assigned to the T1 interface in the **Subnet Mask** textboxes.
6. Select the **Primary** option in the **IP Address Type** dropdown box.
7. Click the **Apply** button.

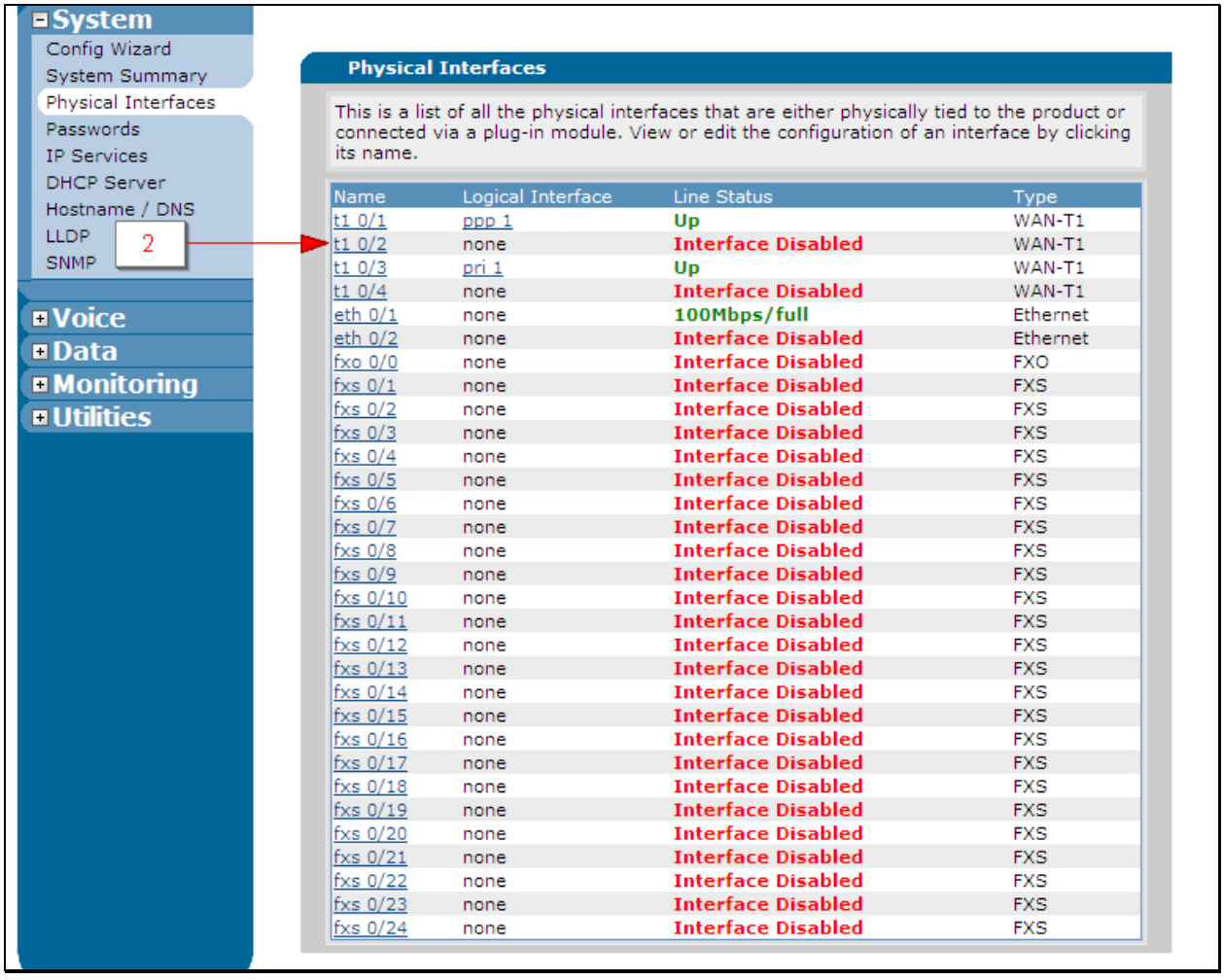


5.1.2.3 Configuring the Second T1 Interface

1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.

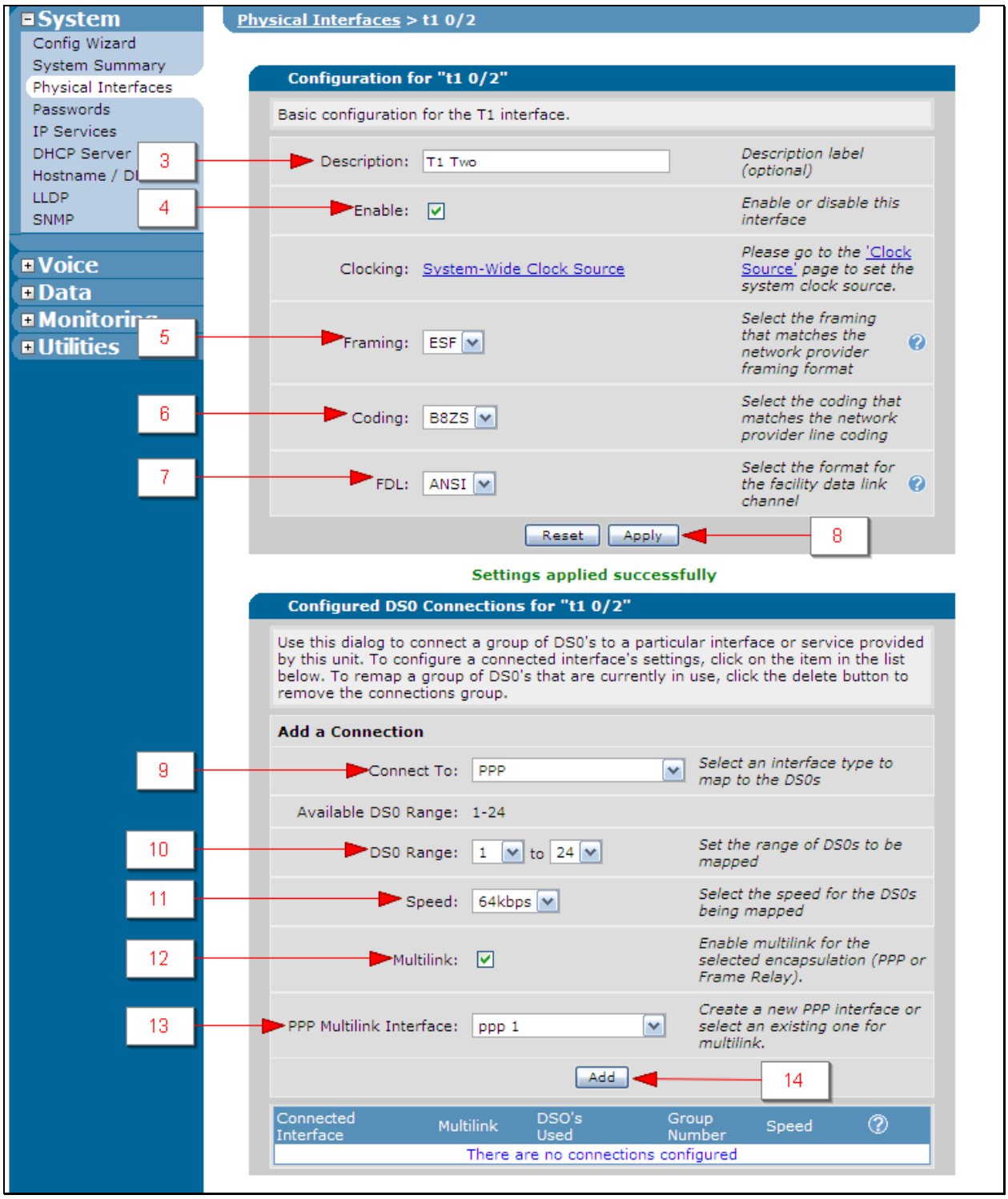


2. Select the **t1 0/2** link under the **Name** column header.



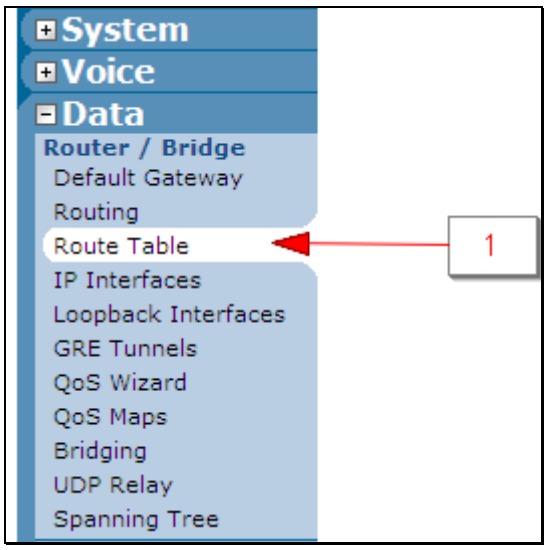
3. Enter a label for the T1 in the **Description** textbox.
4. Select the **Enable** checkbox.

5. Select the appropriate framing from the **Framing** dropdown box.
6. Select the appropriate coding from the **Coding** dropdown box.
7. Select the appropriate facility data link formatting from the **FDL** dropdown box.
8. Click the **Apply** button.
9. Select the **PPP** option from the **Connect To** dropdown box.
10. Select the range of DS0s that will be assigned to the T1 from the **DS0 Range** dropdown boxes.
11. Select the appropriate DS0 speed from the **DS0 Speed** dropdown box.
12. Check the **Multilink** checkbox.
13. Select the **ppp 1** option from the **PPP Multilink Interface** dropdown box.
14. Click the **Add** button.

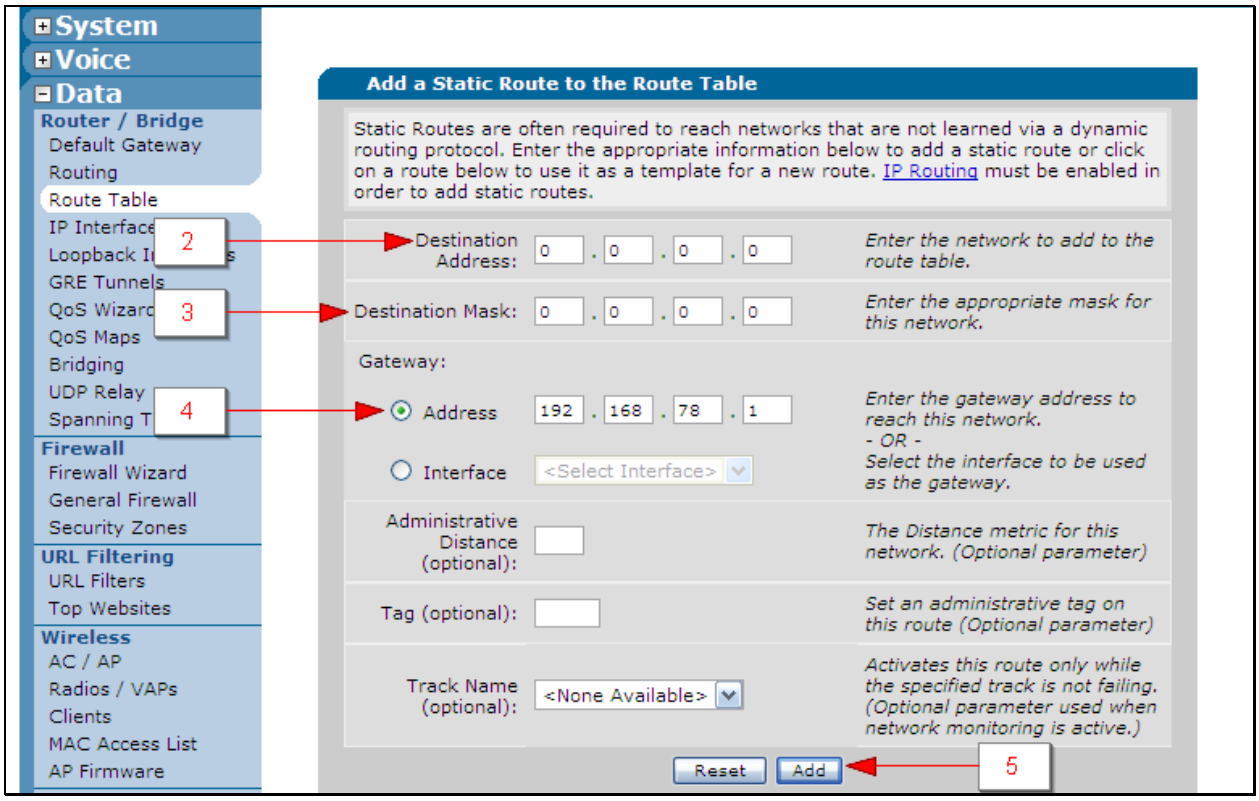


5.1.2.4 Default Route Configuration

1. Select the **Route Table** link located under the **Data** heading in the left hand margin.

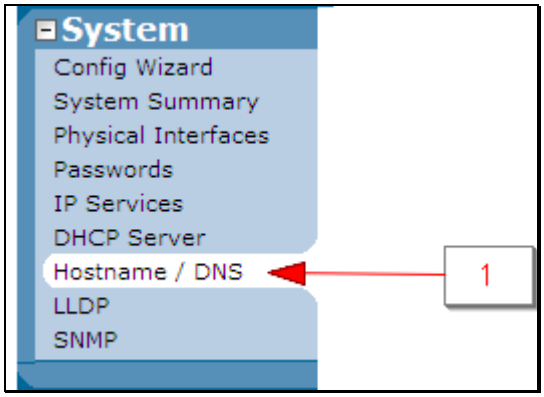


2. Enter an address of 0.0.0.0 in the **Destination Address** textboxes.
3. Enter a subnet mask of 0.0.0.0 in the **Destination Mask** textboxes.
4. Select the **Address** radial button in the **Gateway** list and enter the default gateway address.
5. Click the **Add** button.

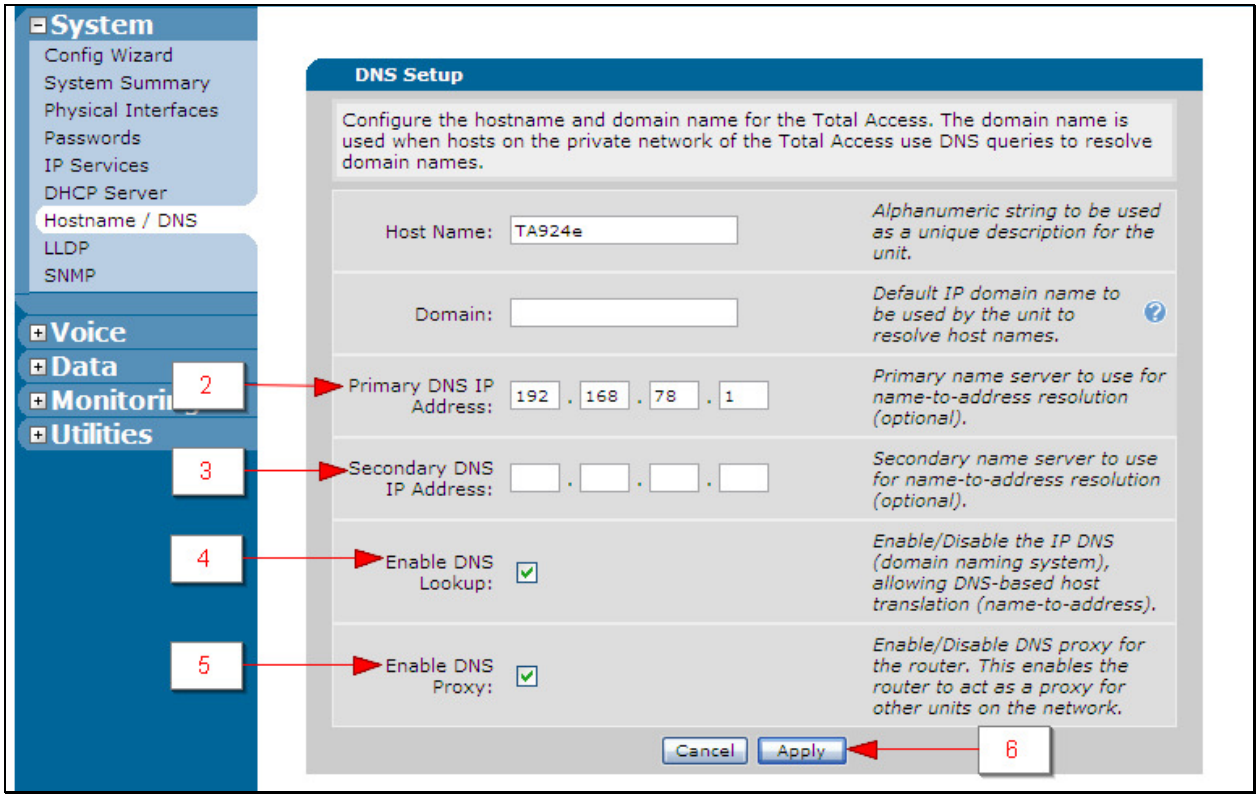


5.1.2.5 Assign DNS Servers

1. Select the **Hostname/DNS** link located under the **System** heading in the left hand margin.



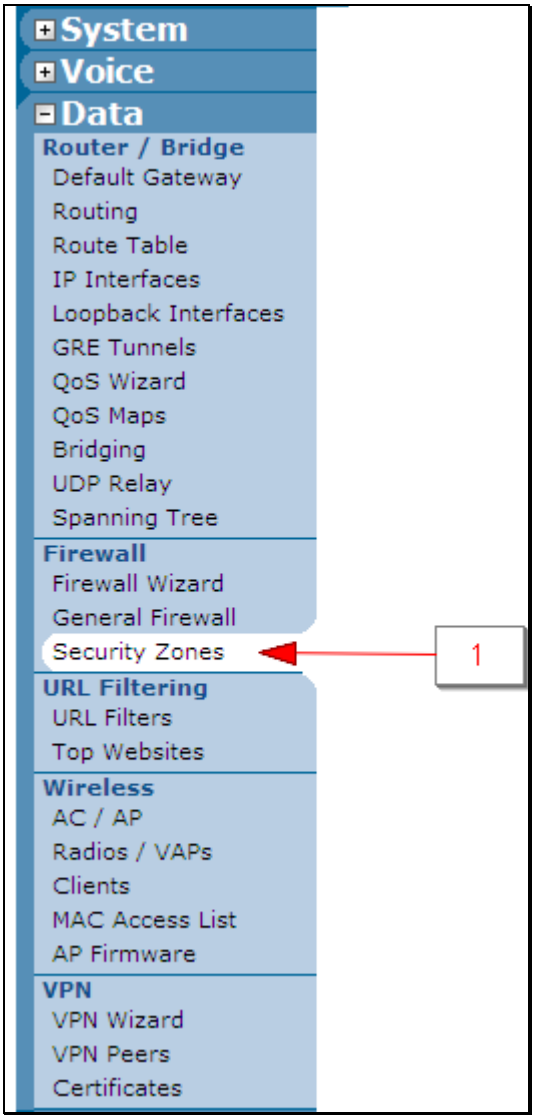
2. Enter the IP Address of the first DNS Server in the **Primary DNS IP Address** textboxes.
3. If applicable, enter the IP Address of the second DNS Server in the **Secondary DNS IP Address** textboxes.
4. Check the **Enable DNS Lookup** checkbox.
5. Check the **Enable DNS Proxy** checkbox.
6. Click the **Apply** button.



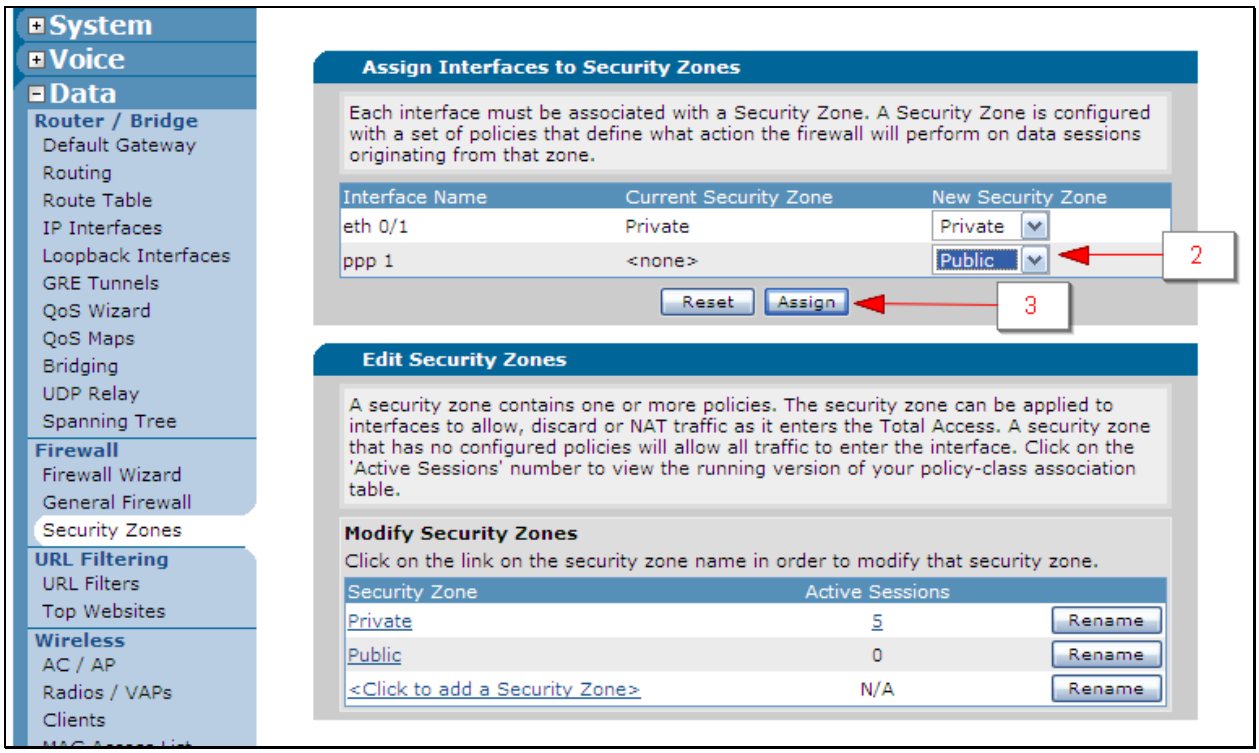
5.1.2.6 Re-Configure the Firewall

NOTE: In the process of deleting and re-adding the ppp interface on the T1, the firewall policy assigned to the WAN interface by the default configuration is removed by the system and must be re-configured.

1. Select the **Security Zones** link located under the **Data** heading in the left hand margin.



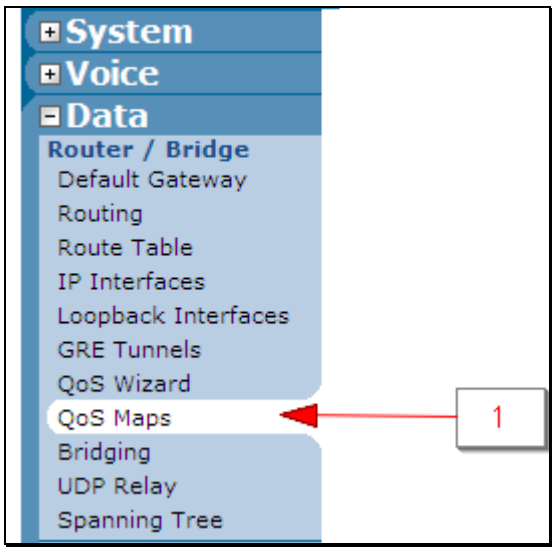
2. Select the **Public** zone in the **New Security Zone** dropdown box for the **ppp 1** interface.
3. Click the **Assign** button.



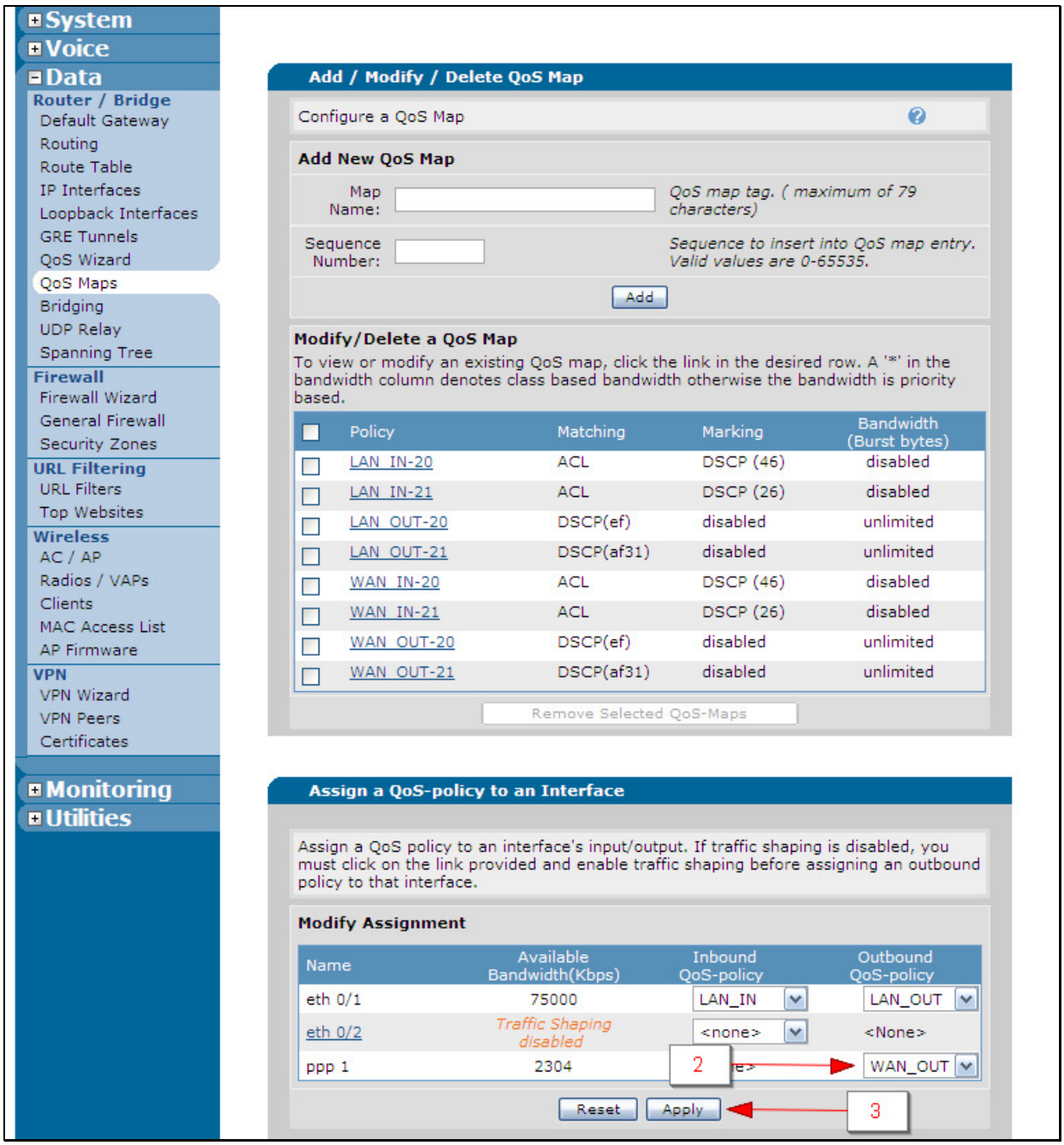
5.1.2.7 Re-configure the QoS Map

NOTE: In the process of deleting and re-adding the ppp interface on the T1, the QoS Map assigned to the WAN interface by the default configuration is removed by the system and must be re-configured.

1. Select the **QoS Maps** link located under the **Data** heading in the left hand margin.



2. Select the **WAN_OUT** option in the **Outbound QoS-Policy** dropdown box in the **ppp 1** row.
3. Click the **Apply** button.



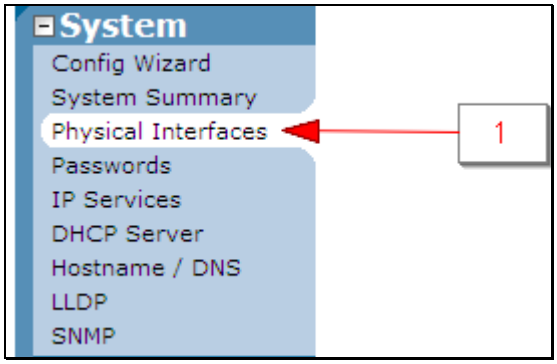
5.1.3 Configuring Ethernet WAN Access with DHCP

Complete the steps in the following sections to provision an Ethernet interface on the IAD for WAN Access with DHCP.

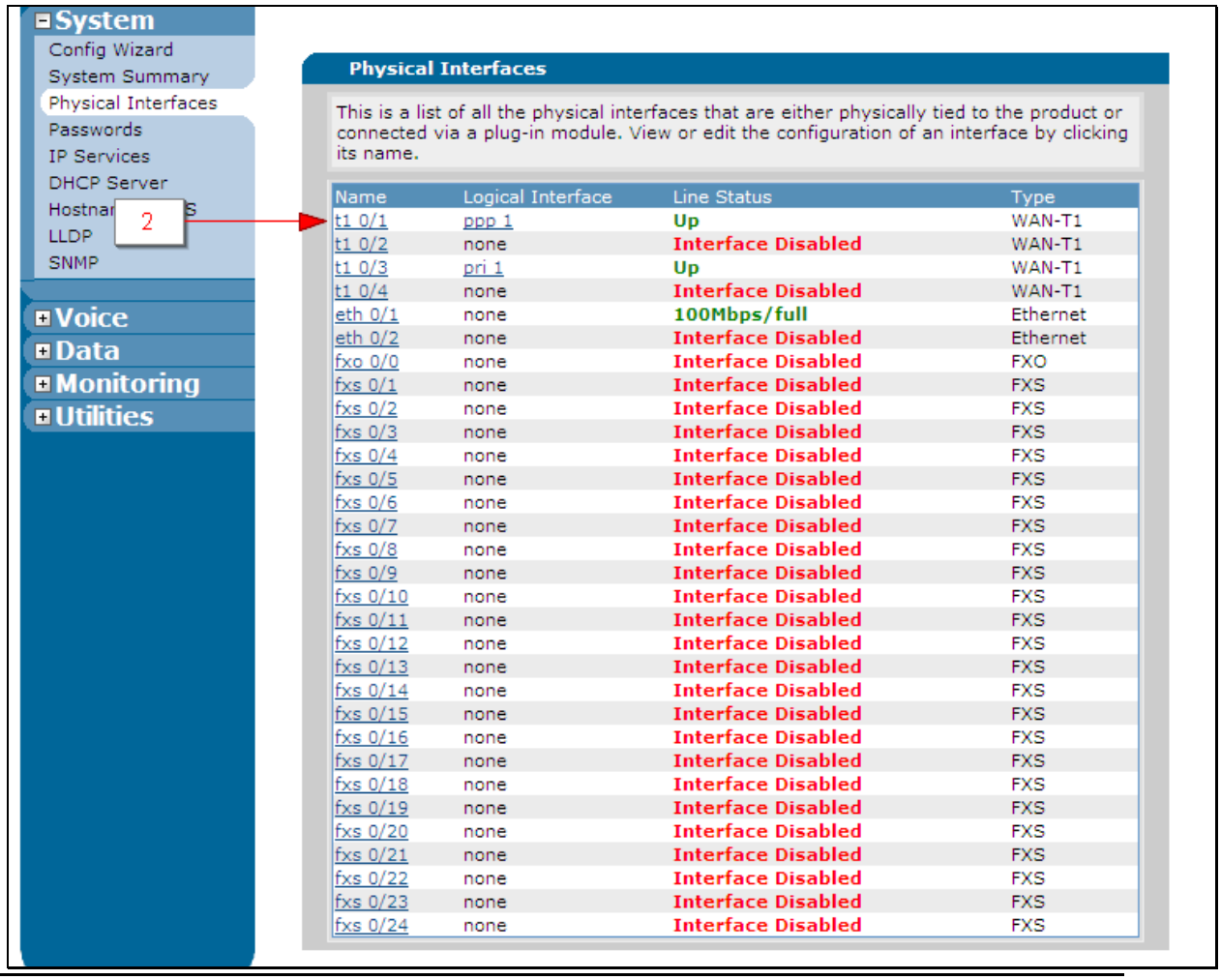
NOTE: The steps outlined in this section apply only to the TA908e, TA916e, and TA924e models.

5.1.3.1 Remove the T1 Interface

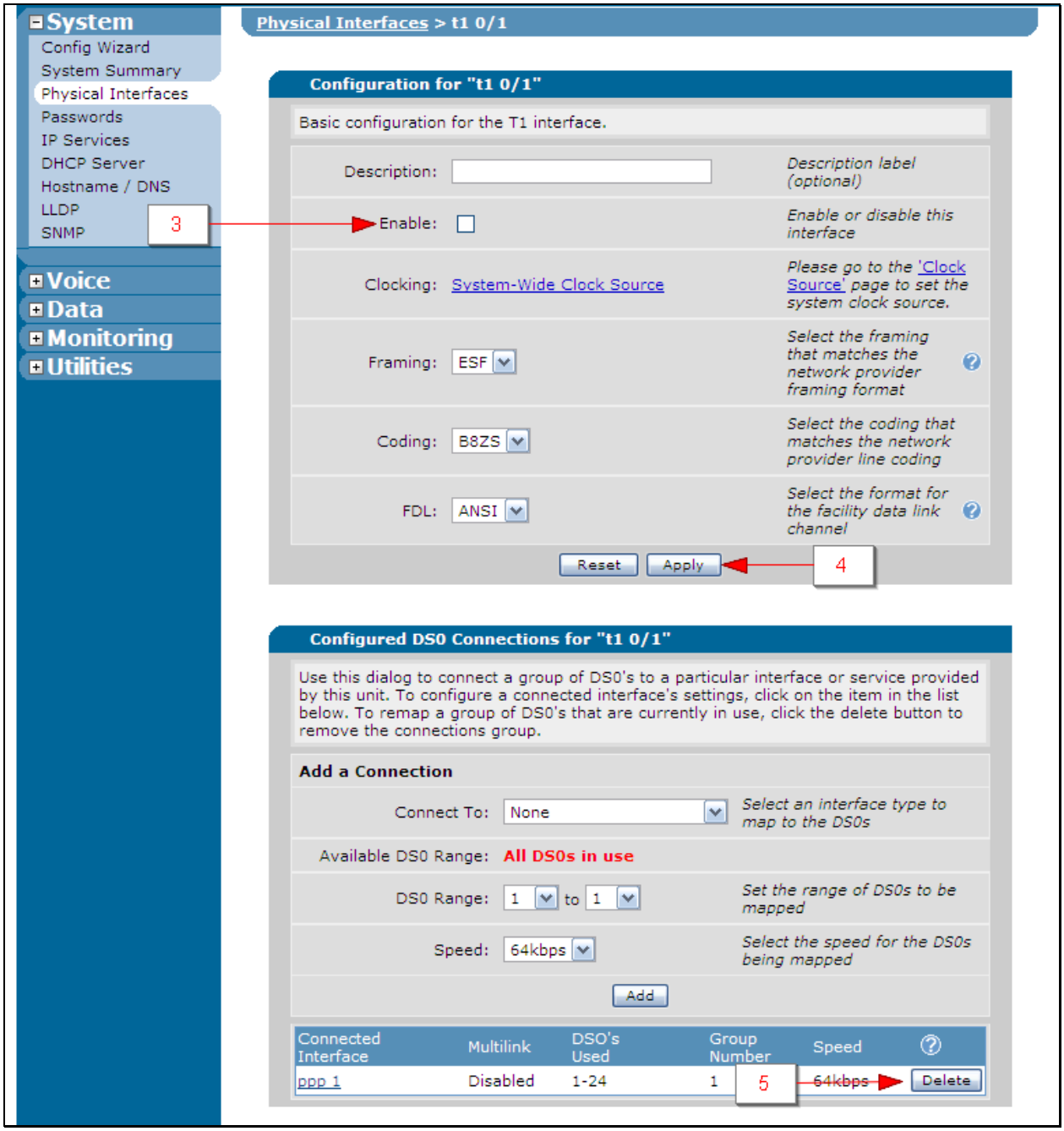
1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



2. Select the **t1 0/1** link under the **Name** column header.

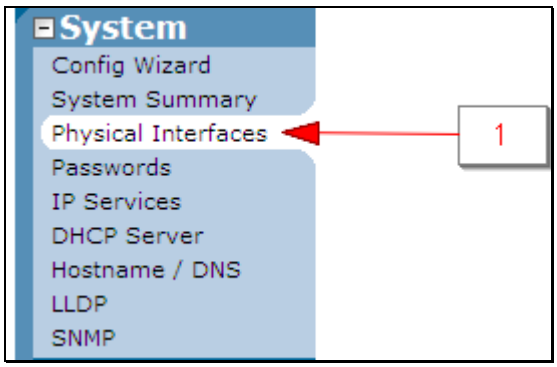


3. Uncheck the **Enable** checkbox.
4. Click the **Apply** button.
5. Click the **Delete** button located in the **ppp 1** row.

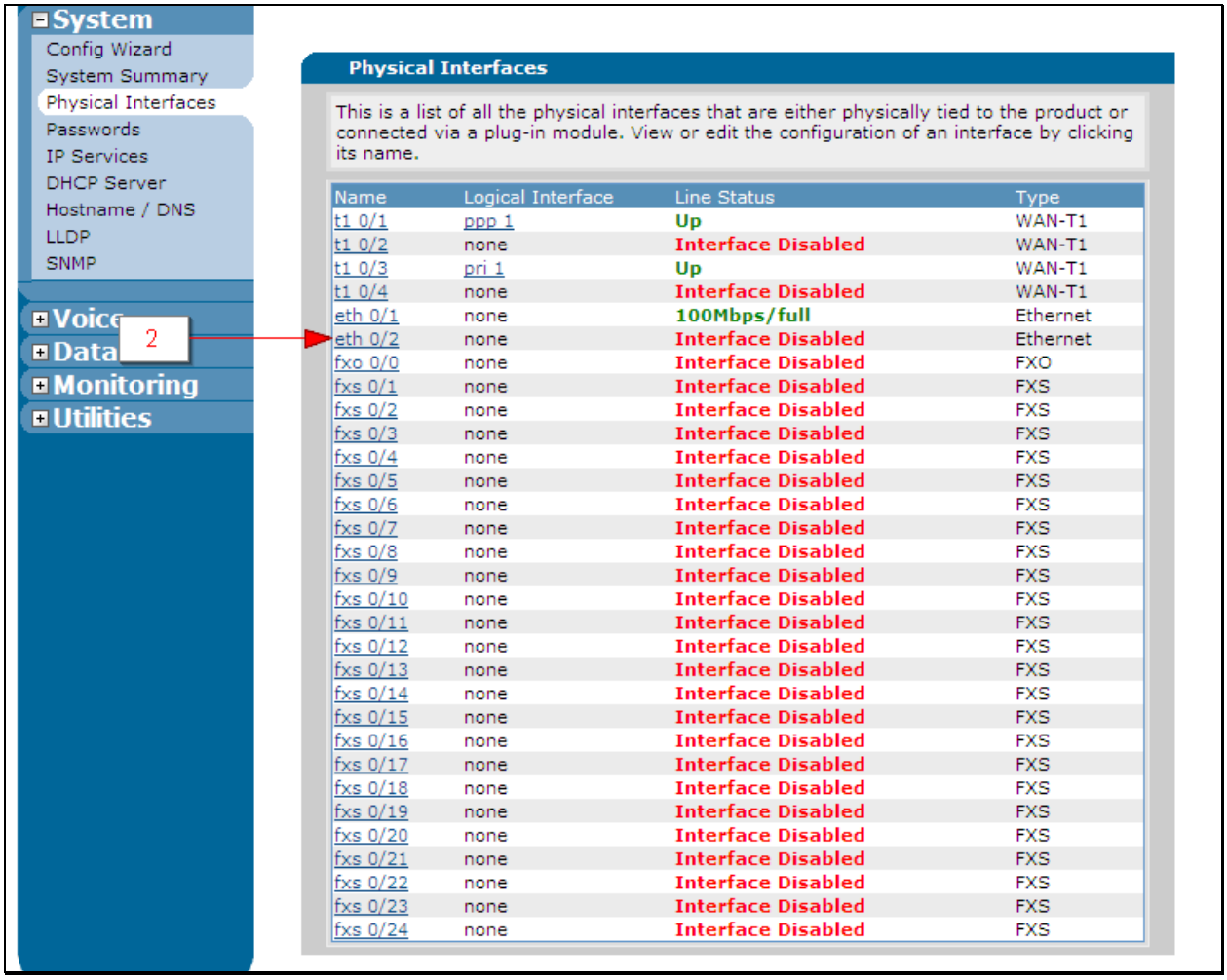


5.1.3.2 Configure the Ethernet Interface

1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.

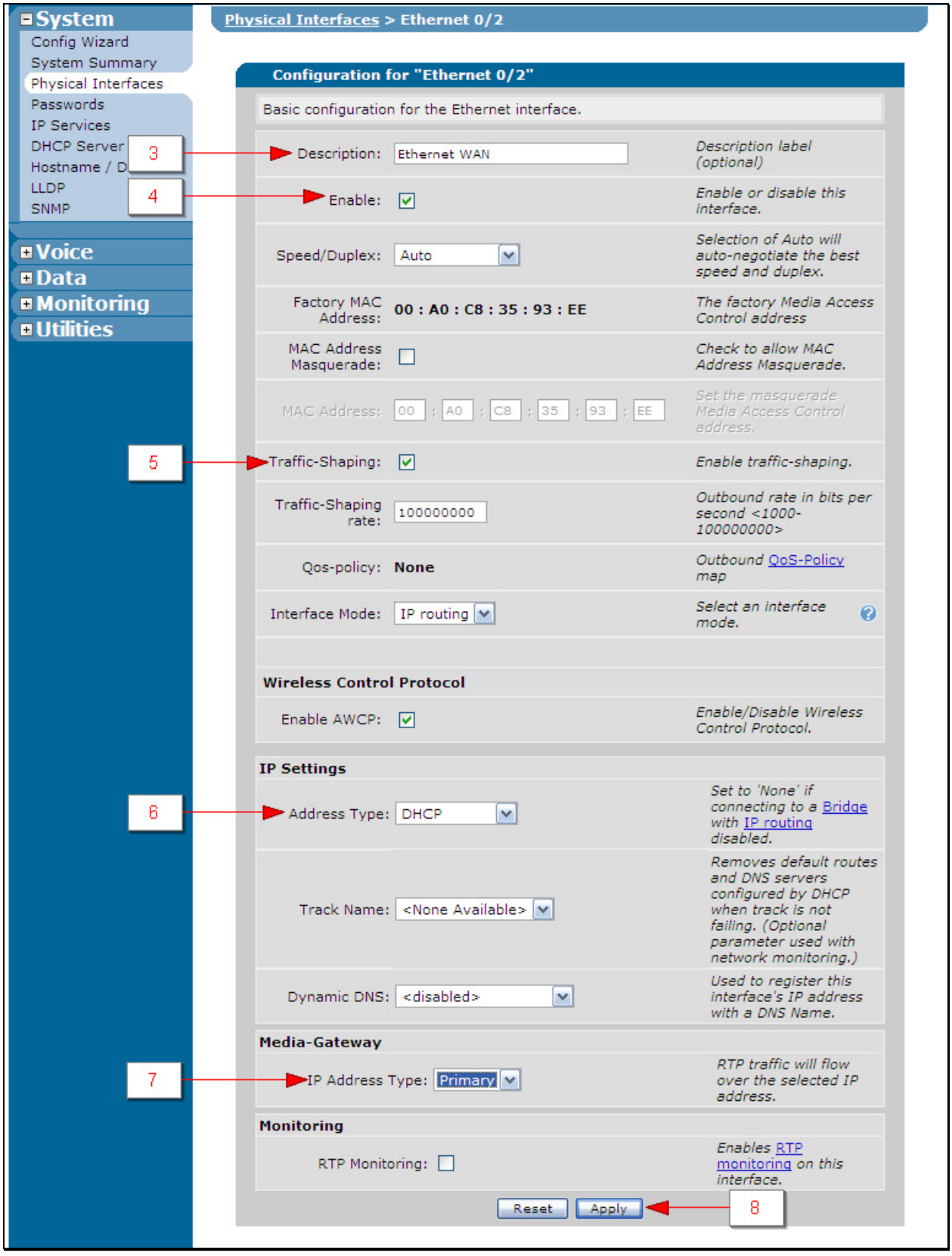


2. Click the **eth 0/2** link under the **Name** column header.



3. Enter a label for the interface in the **Description** textbox.
4. Check the **Enable** checkbox.
5. Check the **Traffic Shaping** checkbox.
6. Select the **DHCP** option from the **Address Type** dropdown box.

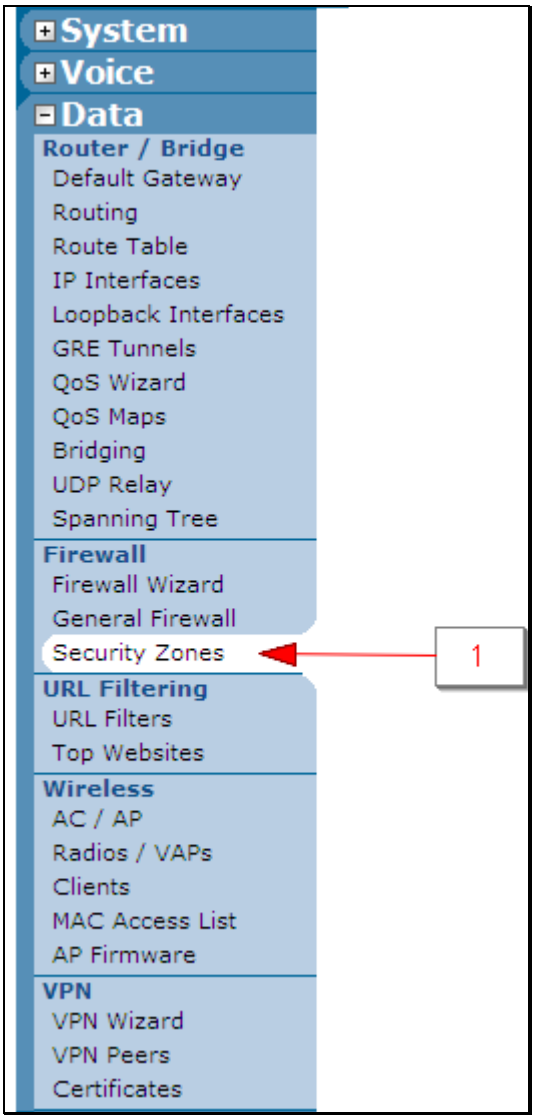
7. Select the **Primary** option in the **IP Address Type** dropdown box.
8. Click the **Apply** button.



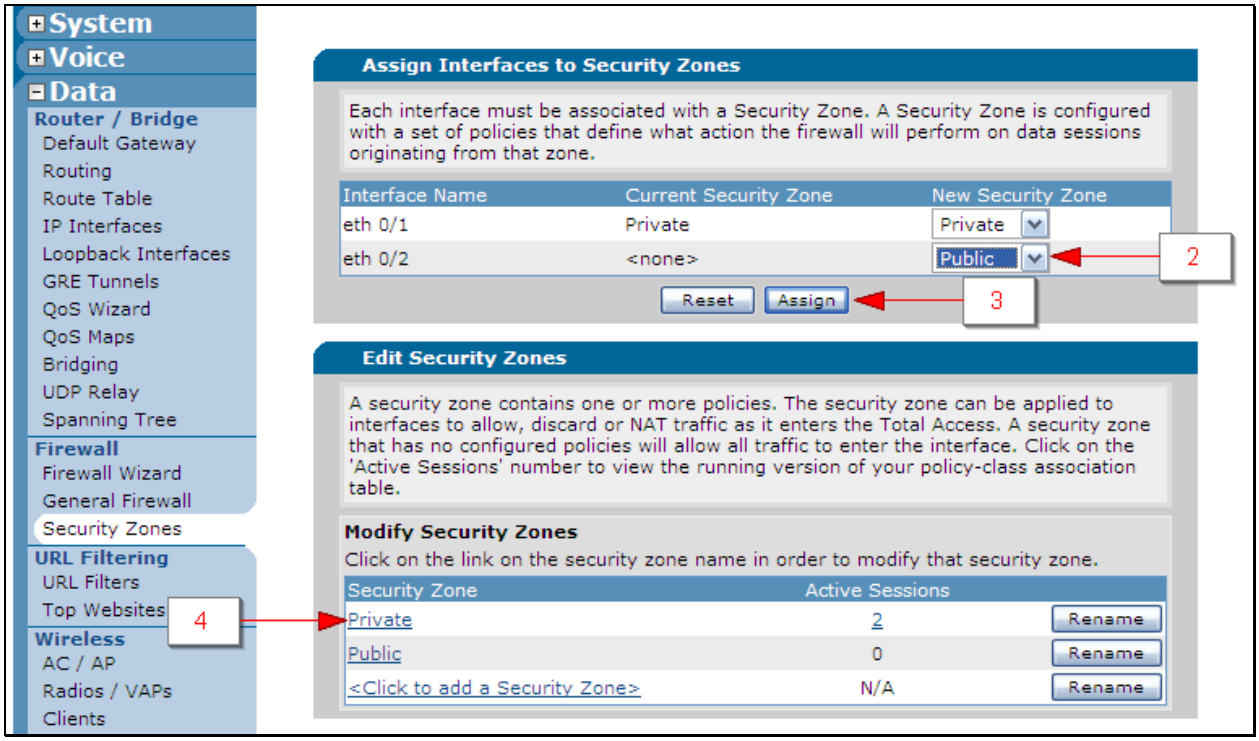
5.1.3.3 Re-configure the Firewall

NOTE: In the process of replacing the T1 PPP interface with the Ethernet interface, the firewall policy assigned to the WAN interface by the default configuration is removed by the system and must be re-configured.

1. Select the **Security Zones** link located under the **Data** heading in the left hand margin.

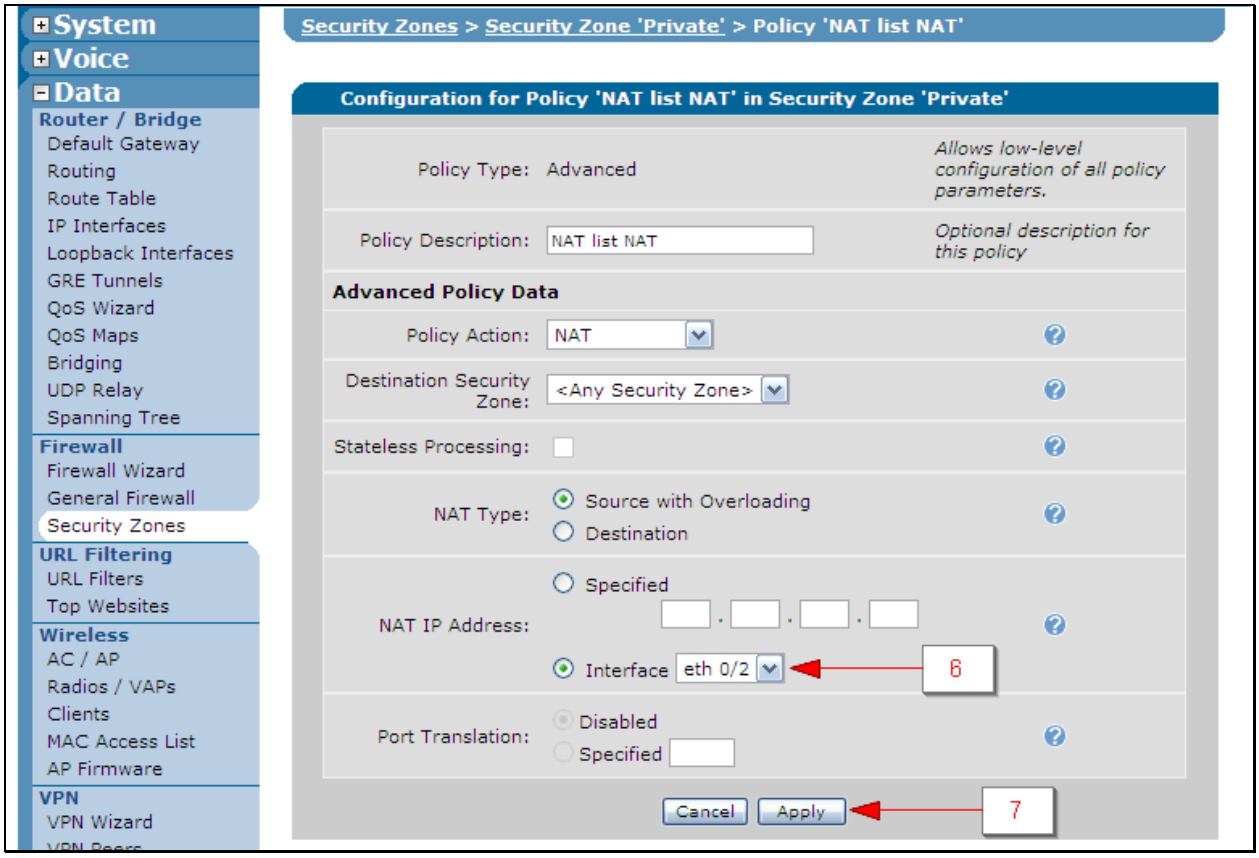


2. Select the **Public** zone in the **New Security Zone** dropdown box for the **eth 0/2** interface.
3. Click the **Assign** button.
4. Click the **Private** link under the **Security Zone** column header.



5. Click the **NAT list** link under the **Description** column header.

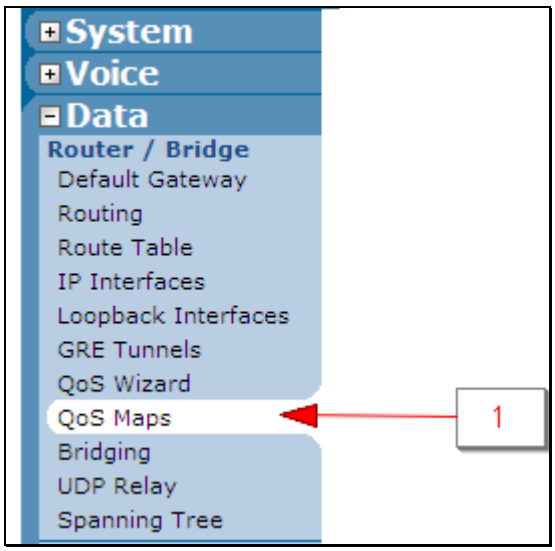
6. Select the **Interface** radial button in the **NAT IP Address** list and select **eth 0/2** from the **Interface** dropdown box.
7. Click the **Apply** button.



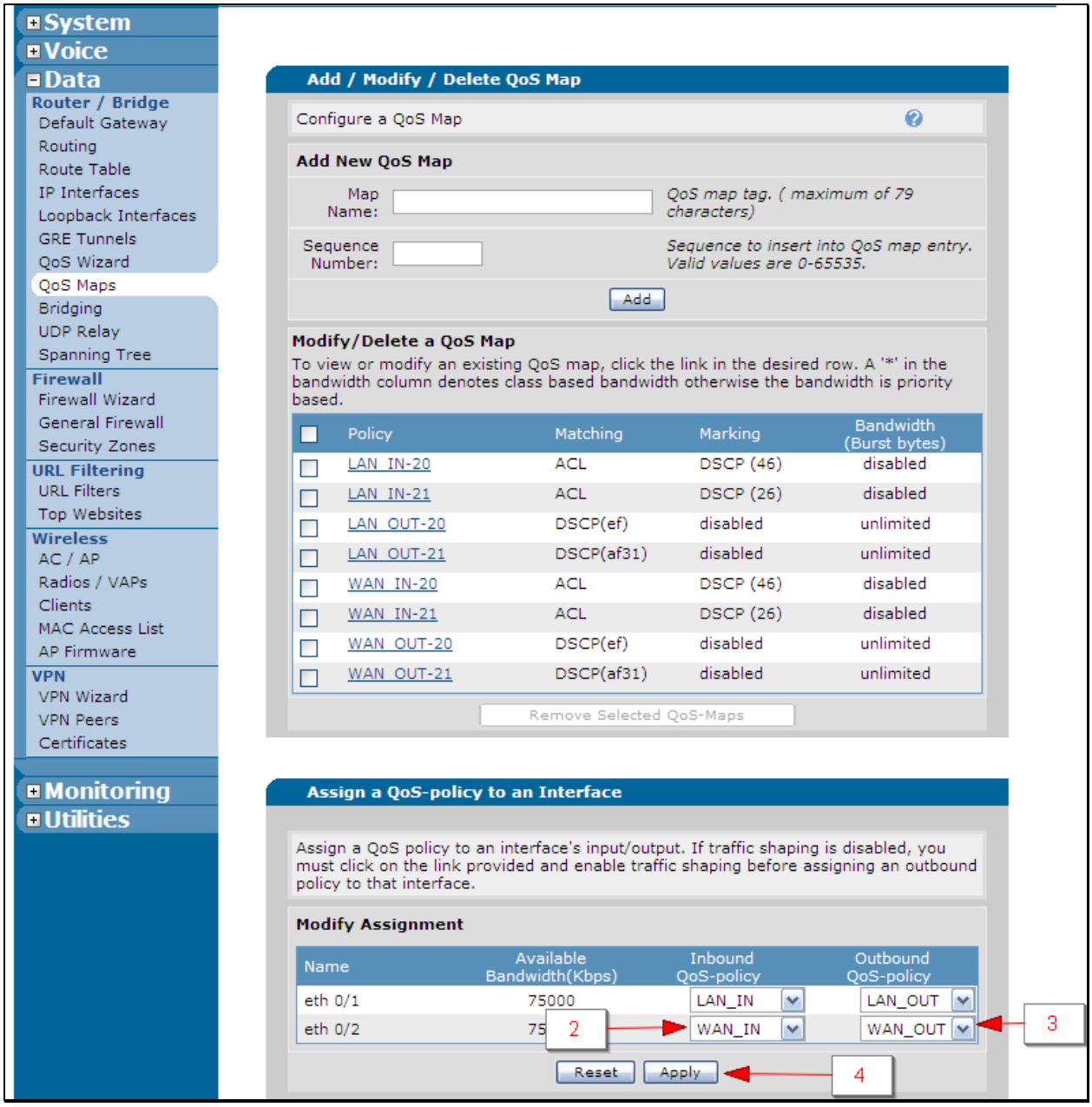
5.1.3.4 Re-configure the QoS Map

NOTE: In the process of replacing the T1 PPP interface with the Ethernet interface, the QoS Map assigned to the WAN interface by the default configuration is removed by the system and must be re-configured.

1. Select the **QoS Maps** link located under the **Data** heading in the left hand margin.



2. Select the **WAN_IN** option in the **Inbound QoS-Policy** dropdown box in the **eth 0/2** row.
3. Select the **WAN_OUT** option in the **Outbound QoS-Policy** dropdown box in the **eth 0/2** row.
4. Click the **Apply** button.



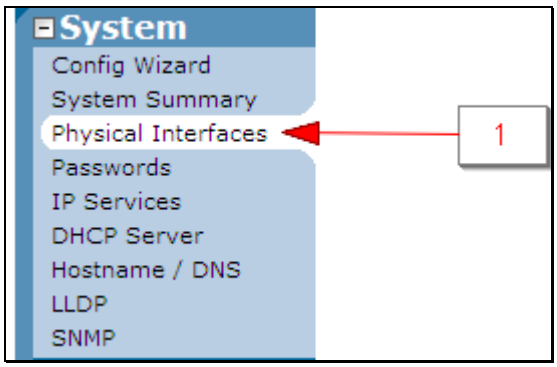
5.1.4 Configuring Ethernet WAN Access with Static IP Addressing

Complete the steps in the following sections to provision an Ethernet interface on the IAD for WAN Access with Static IP Addressing.

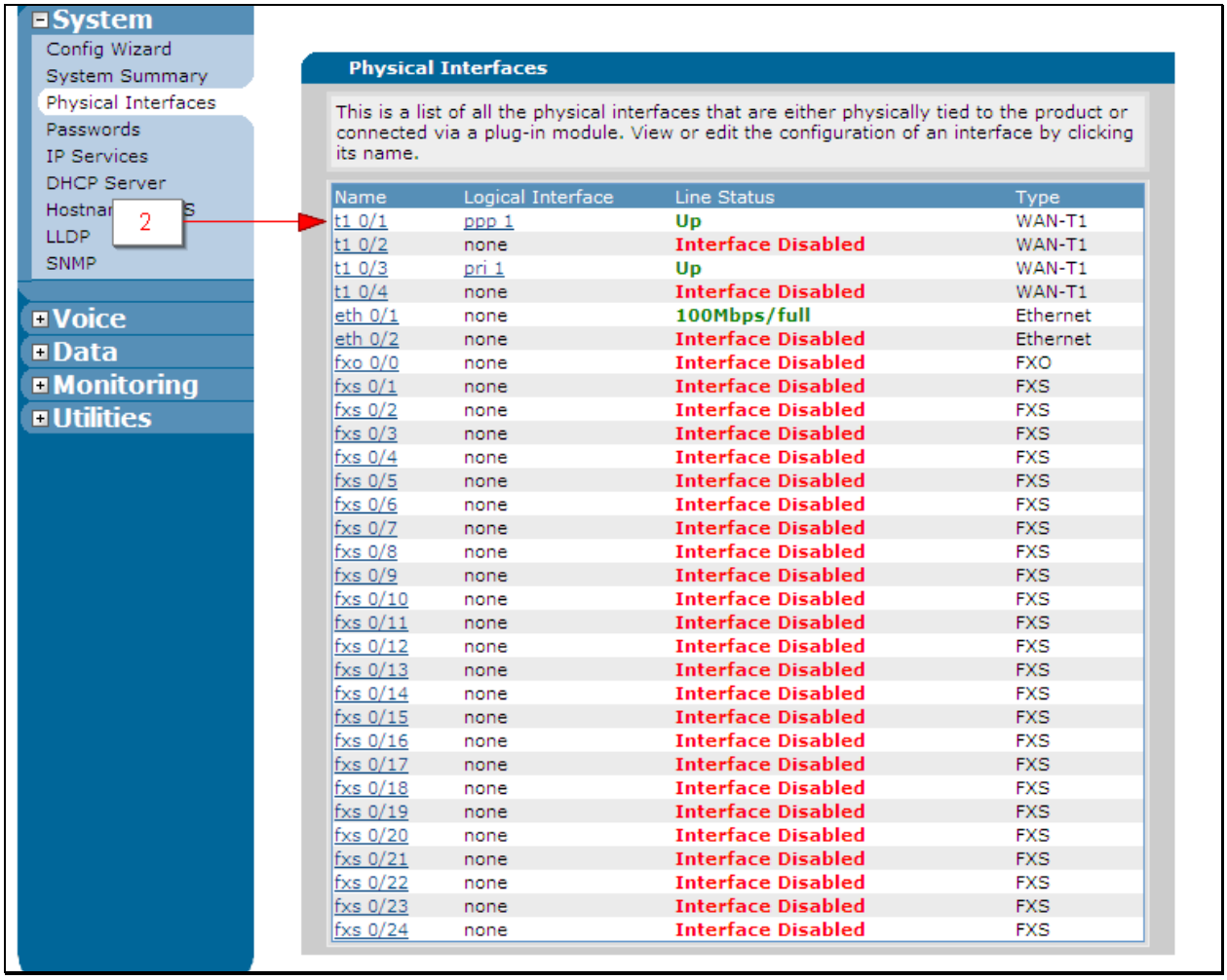
NOTE: The steps outlined in this section apply only to the TA908e, TA916e, and TA924e models.

5.1.4.1 Remove the T1 Interface

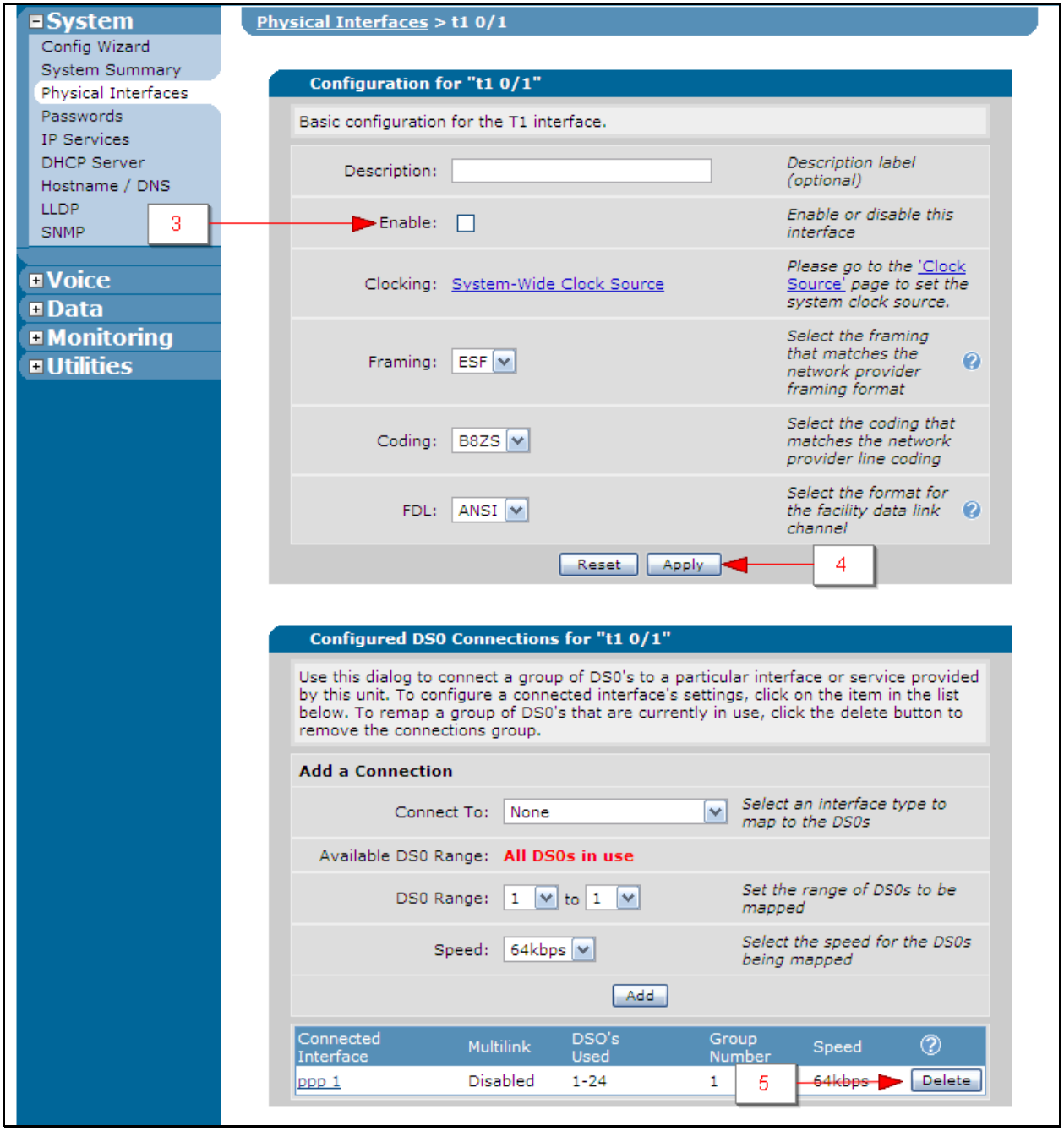
1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



2. Select the **t1 0/1** link under the **Name** column header.

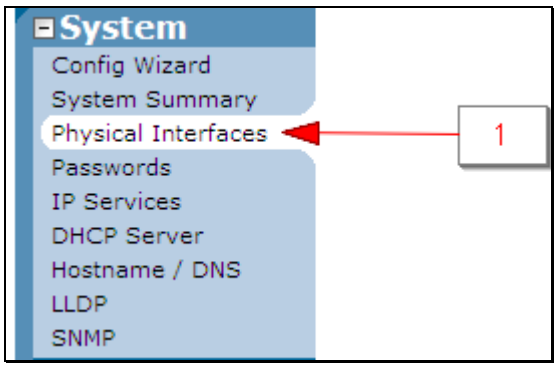


3. Uncheck the **Enable** checkbox.
4. Click the **Apply** button.
5. Click the **Delete** button located in the **ppp 1** row.

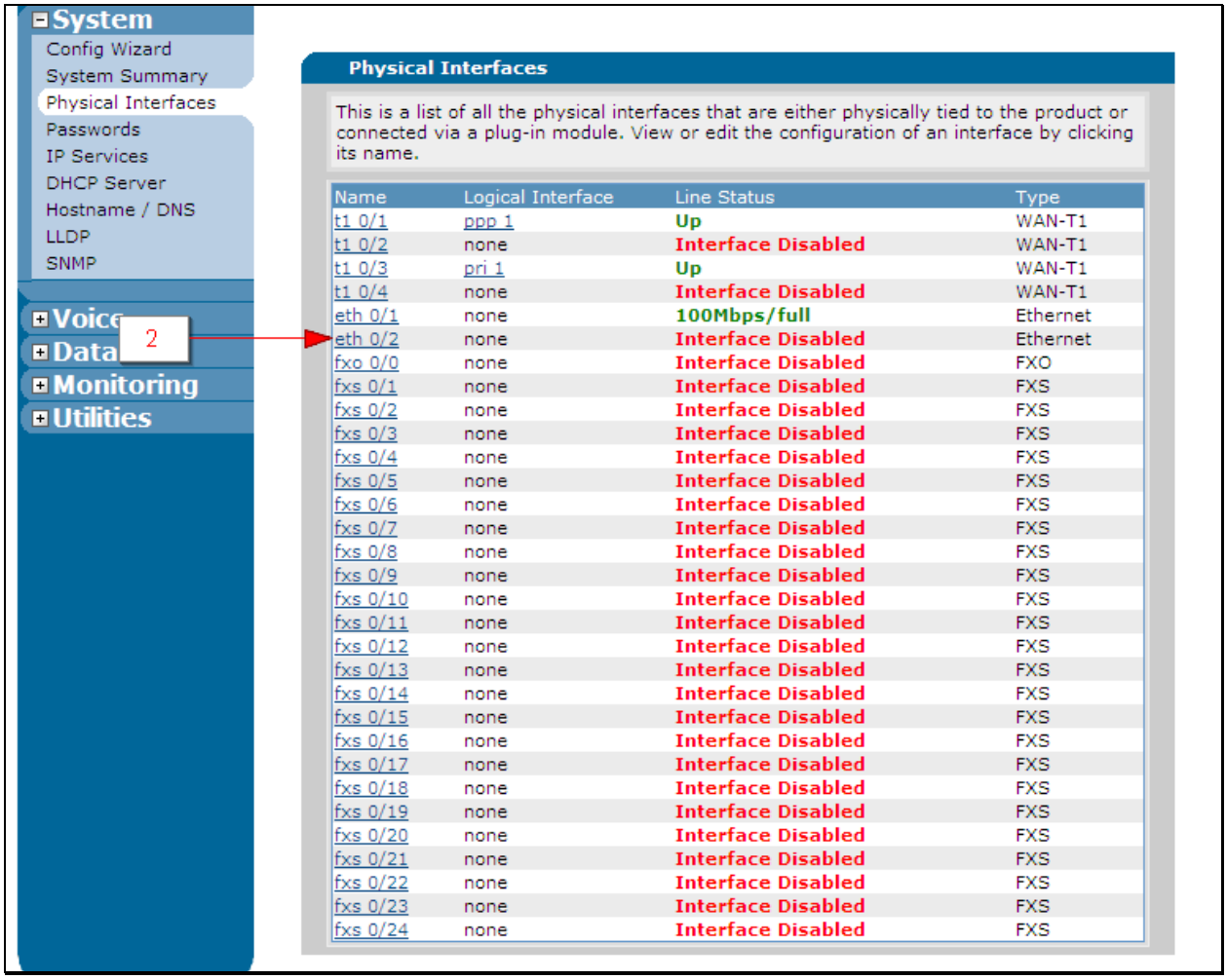


5.1.4.2 Configure the Ethernet Interface

1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.

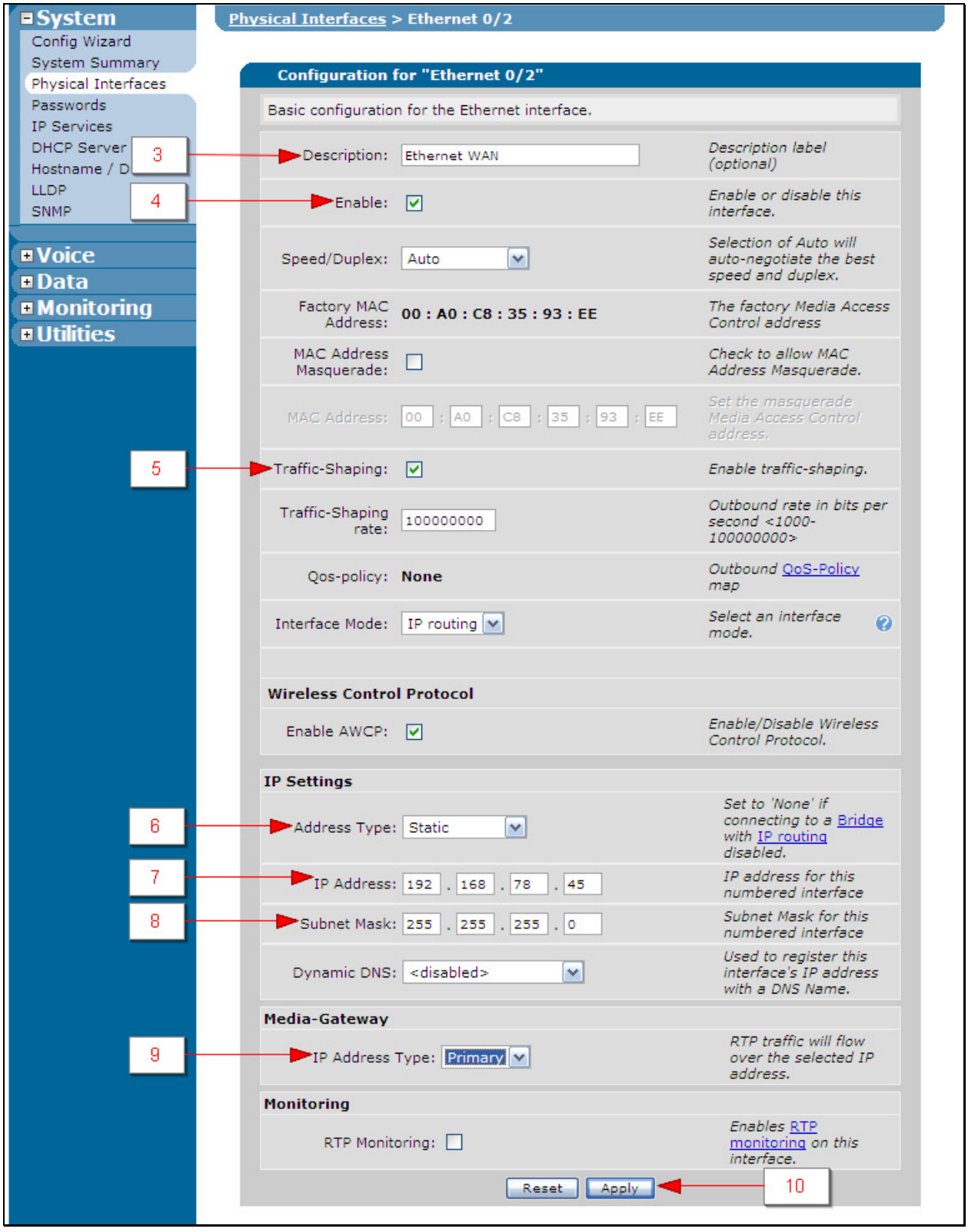


2. Click the **eth 0/2** link under the **Name** column header.



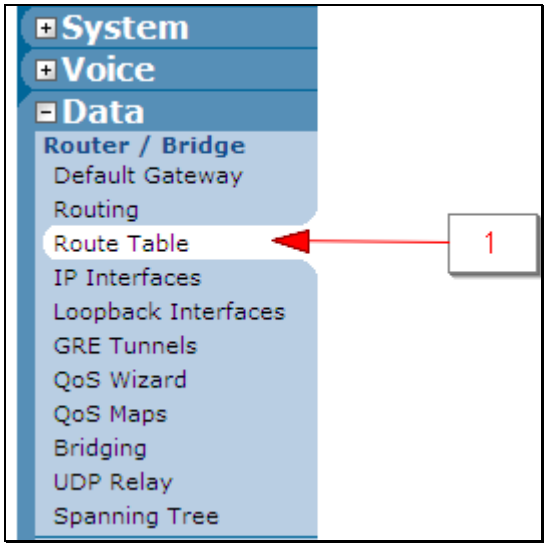
3. Enter a label for the interface in the **Description** textbox.
4. Check the **Enable** checkbox.
5. Check the **Traffic Shaping** checkbox.
6. Select the **Static** option from the **Address Type** dropdown box.

7. Enter the IP Address assigned to the WAN interface in the **IP Address** textboxes.
8. Enter the Subnet Mask assigned to the WAN interface in the **Subnet Mask** textboxes.
9. Select the **Primary** option in the **IP Address Type** dropdown box.
10. Click the **Apply** button.

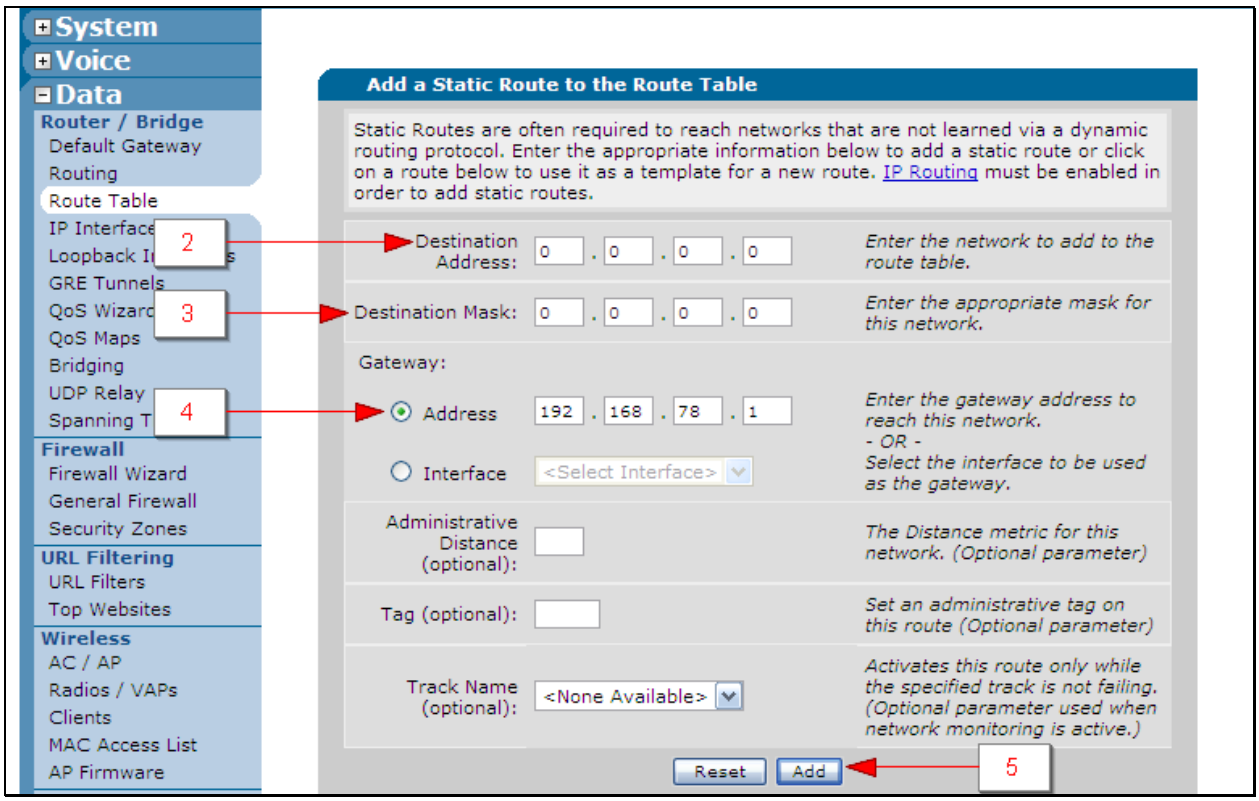


5.1.4.3 Default Route Configuration

1. Select the **Route Table** link located under the **Data** heading in the left hand margin.

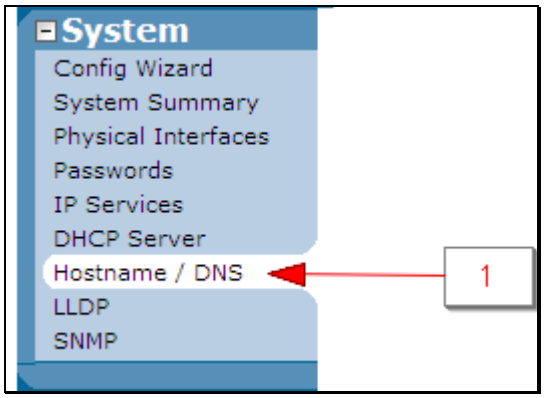


2. Enter an address of 0.0.0.0 in the **Destination Address** textboxes.
3. Enter a subnet mask of 0.0.0.0 in the **Destination Mask** textboxes.
4. Select the **Address** radial button in the **Gateway** list and enter the default gateway address.
5. Click the **Add** button.



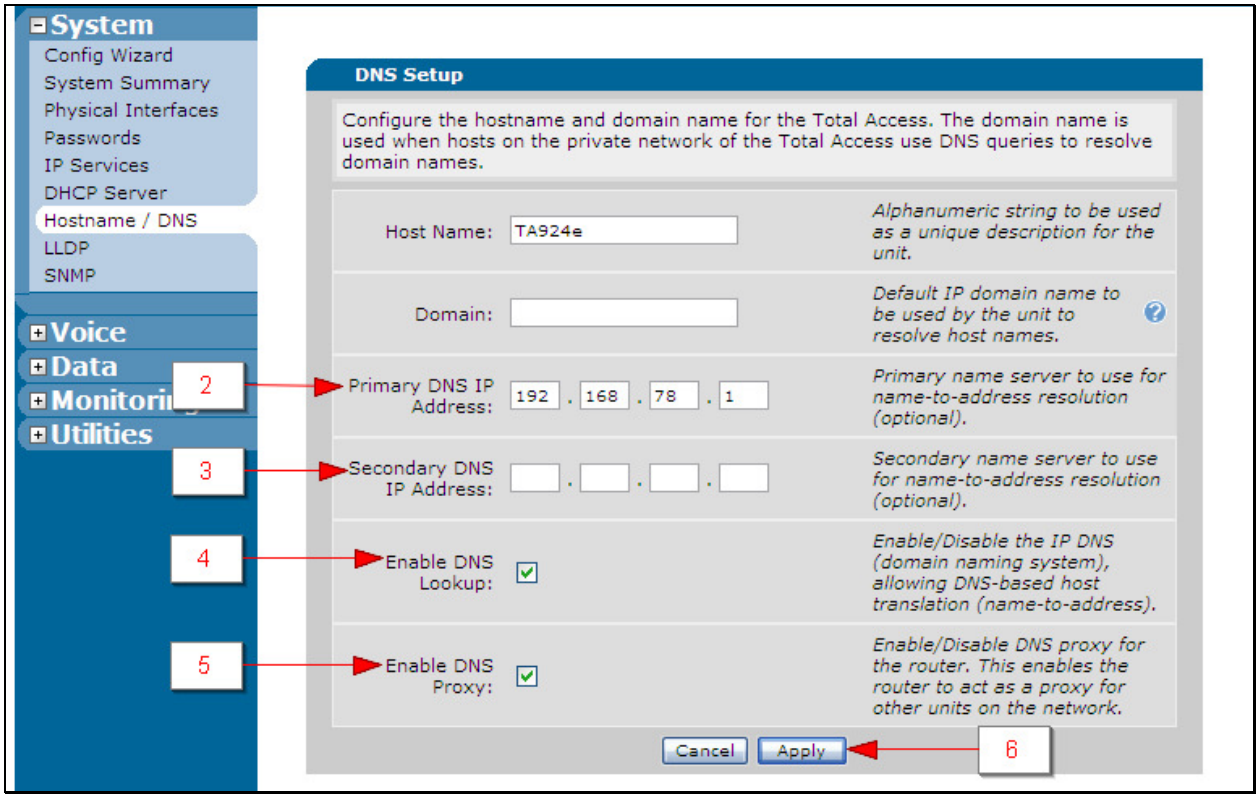
5.1.4.4 Assign DNS Servers

1. Select the **Hostname/DNS** link located under the **System** heading in the left hand margin.



2. Enter the IP Address of the first DNS Server in the **Primary DNS IP Address** textboxes.
3. If applicable, enter the IP Address of the second DNS Server in the **Secondary DNS IP Address** textboxes.
4. Check the **Enable DNS Lookup** checkbox.
5. Check the **Enable DNS Proxy** checkbox.

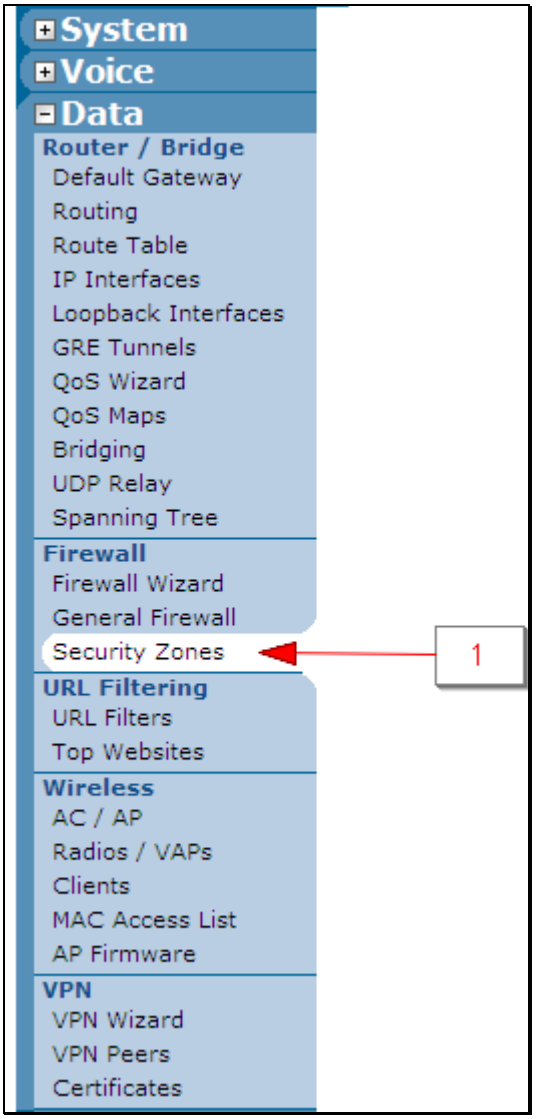
6. Click the **Apply** button.



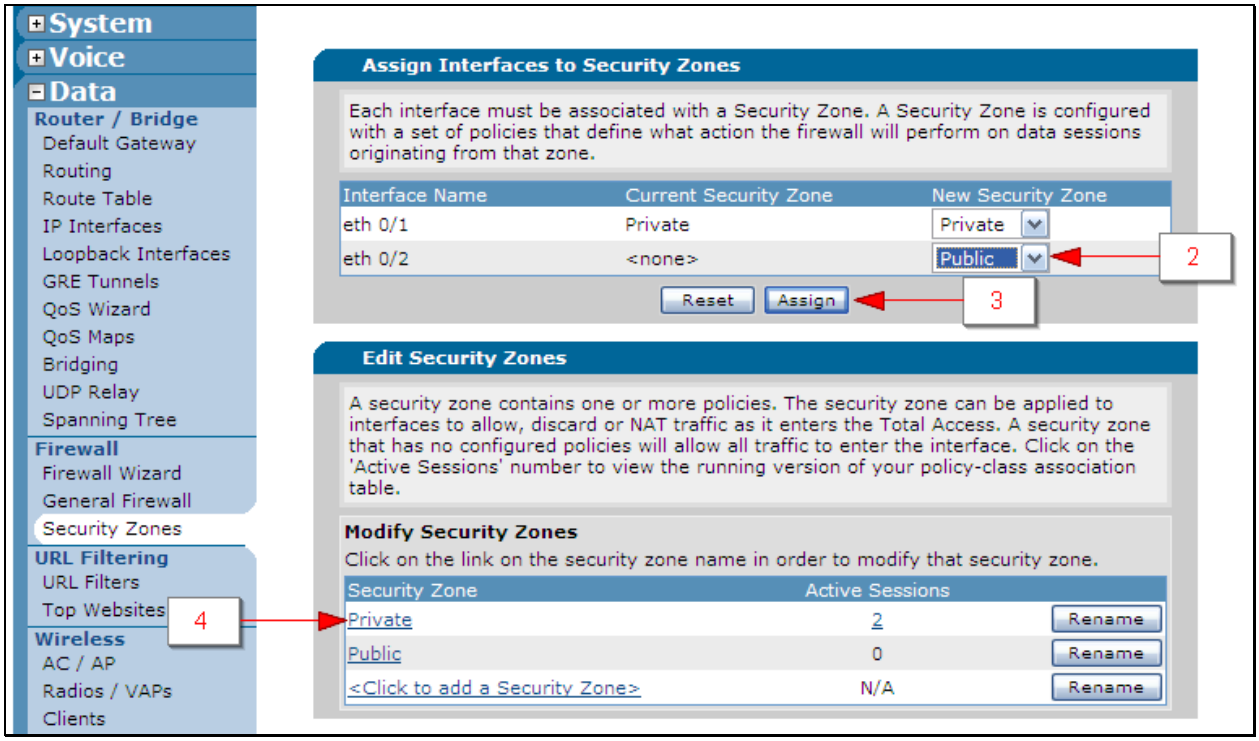
5.1.4.5 Re-configure the Firewall

NOTE: In the process of replacing the T1 PPP interface with the Ethernet interface, the firewall policy assigned to the WAN interface by the default configuration is removed by the system and must be re-configured.

1. Select the **Security Zones** link located under the **Data** heading in the left hand margin.

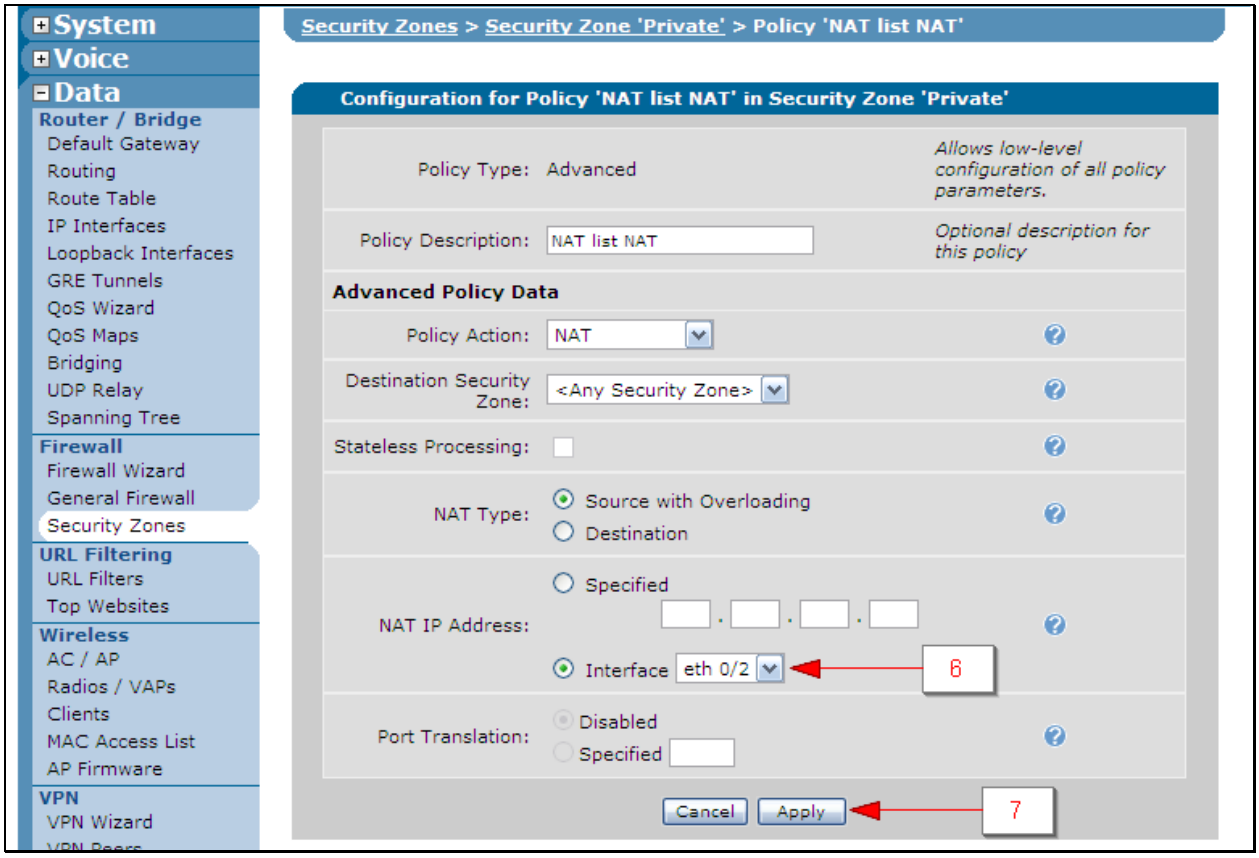


2. Select the **Public** zone in the **New Security Zone** dropdown box for the **eth 0/2** interface.
3. Click the **Assign** button.
4. Click the **Private** link under the **Security Zone** column header.



5. Click the **NAT list** link under the **Description** column header.

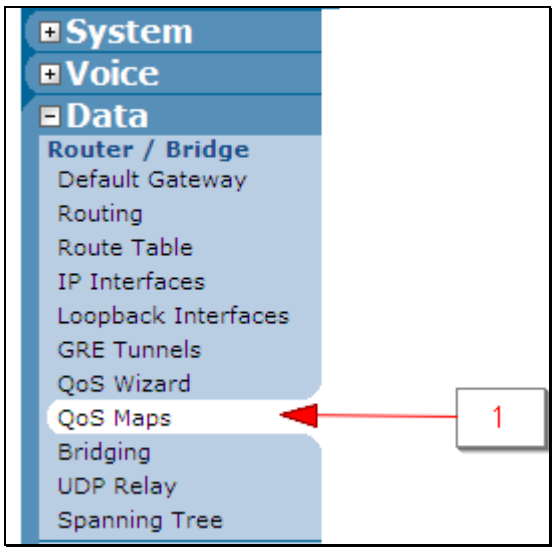
6. Select the **Interface** radial button in the **NAT IP Address** list and select **eth 0/2** from the **Interface** dropdown box.
7. Click the **Apply** button.



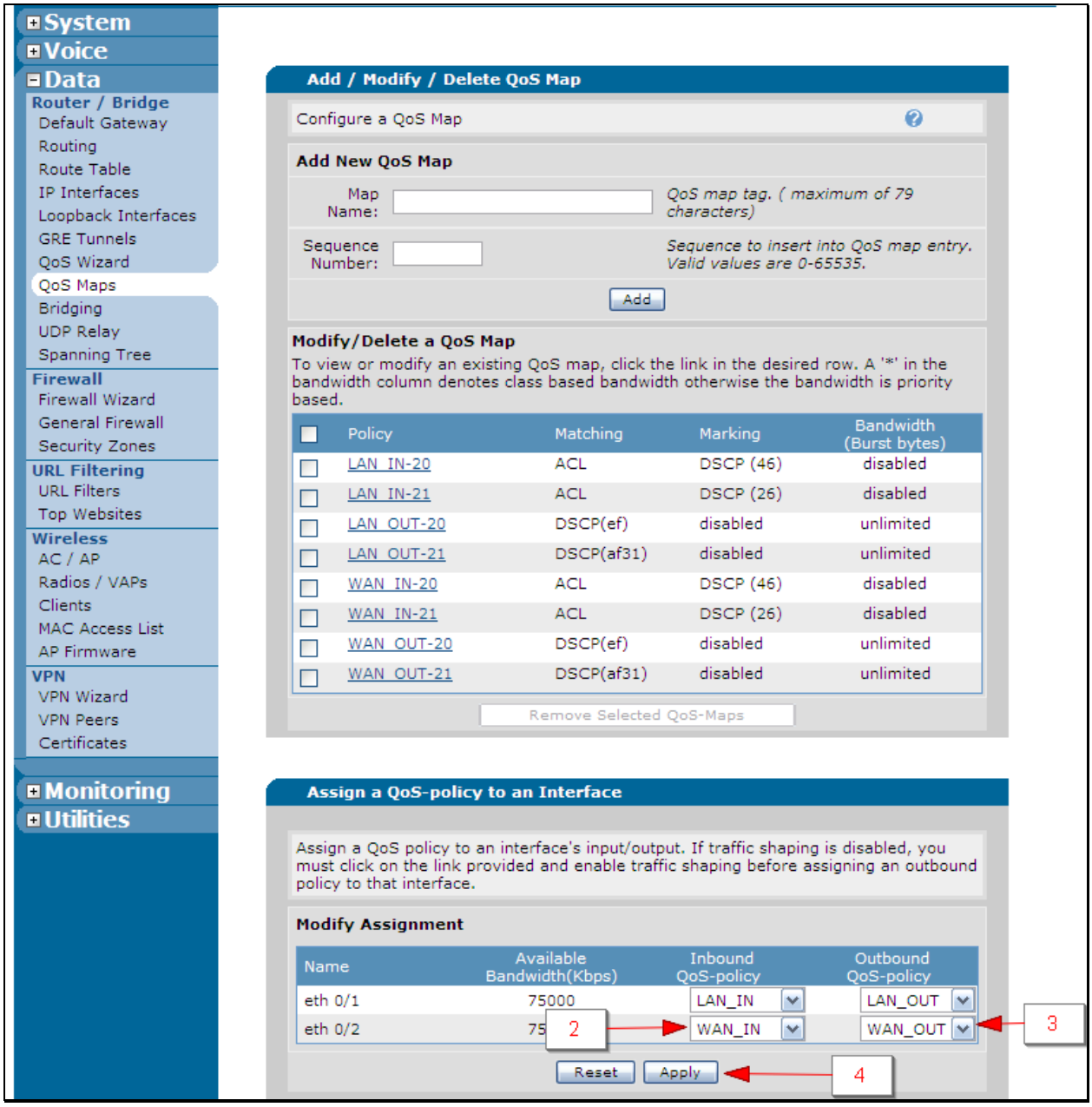
5.1.4.6 Re-configure the QoS Map

NOTE: In the process of replacing the T1 PPP interface with the Ethernet interface, the QoS Map assigned to the WAN interface by the default configuration is removed by the system and must be re-configured.

1. Select the **QoS Maps** link located under the **Data** heading in the left hand margin.



2. Select the **WAN_IN** option in the **Inbound QoS-Policy** dropdown box in the **eth 0/2** row.
3. Select the **WAN_OUT** option in the **Outbound QoS-Policy** dropdown box in the **eth 0/2** row.
4. Click the **Apply** button.



5.2 Voice Configuration

The following sub-sections will detail procedures that can be used to customize the voice configuration of the IAD. These procedures include configuring the PRI name delivery method, reducing the number of B Channels on the PRI, configuring an additional PRI, configuring a CAS trunk, and configuring an analog FXS user.

5.2.1 Configuring PRI Name Delivery

The default configuration of the Total Access has the PRI configured to send calling name to the CPE via the PRI Setup message sent to initiate calls. Some CPE require that the calling name be sent at different points in the call setup. This section will define the

steps that must be completed in order to change the method used by the Total Access to deliver calling name to the CPE.

NOTE: The Total Access supports four methods of delivering Calling Name over a PRI to the CPE. These methods are:

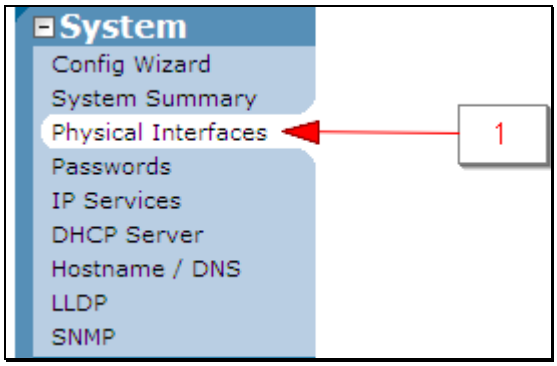
1. None -> Calling Name is not delivered.

2. Setup -> Calling Name is delivered via a Facility IE within the Setup message.

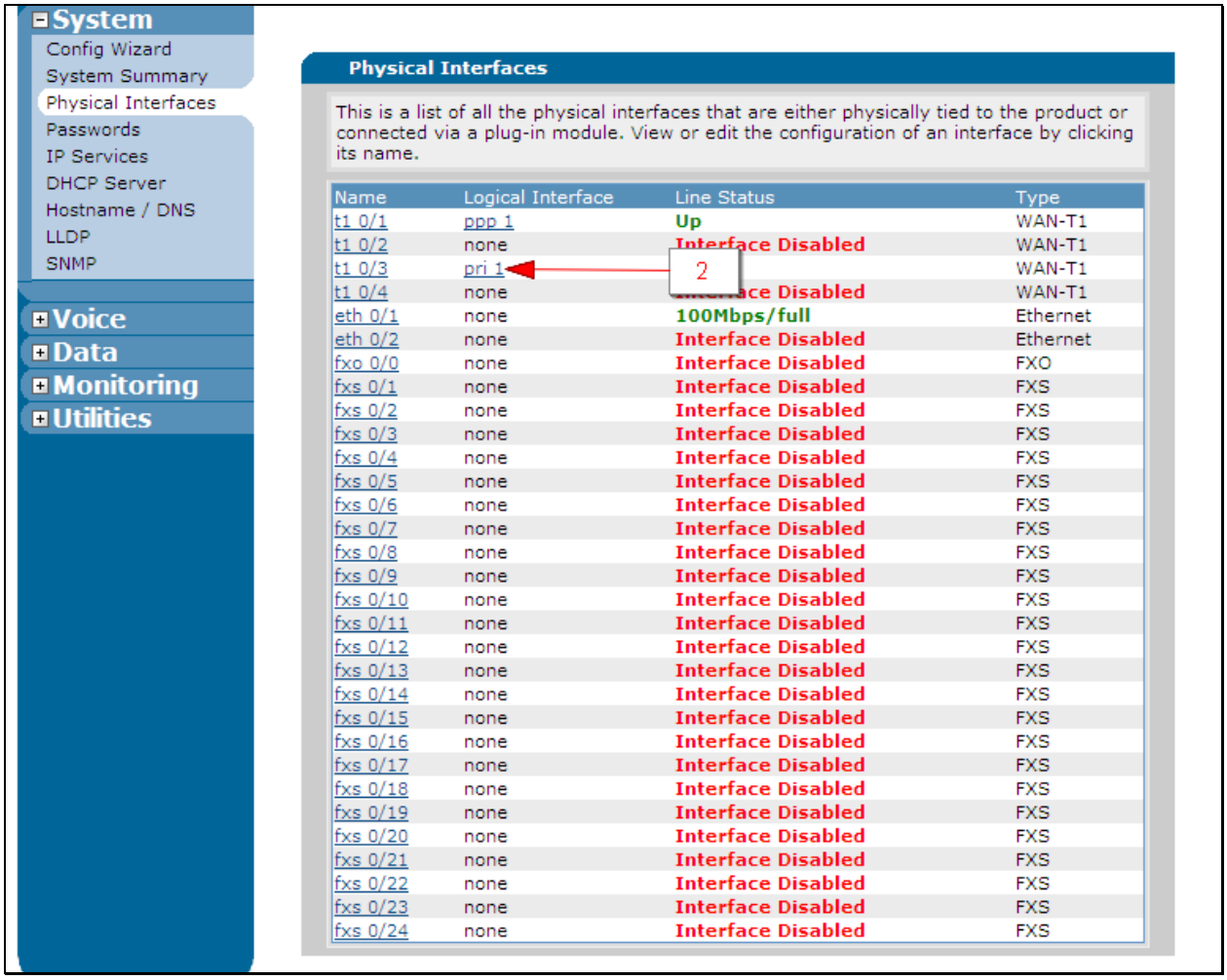
3. Proceeding -> Calling Name is delivered in a Facility message after the CPE has sent the Call Proceeding Message.

4. Display -> Calling Name is delivered via a Display IE within the Setup message.

1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



2. Select the **pri 1** link under the **Logical Interface** column header.



3. Select the appropriate name delivery method from the **Name Delivery** dropdown box.

4. Click the **Apply** button.

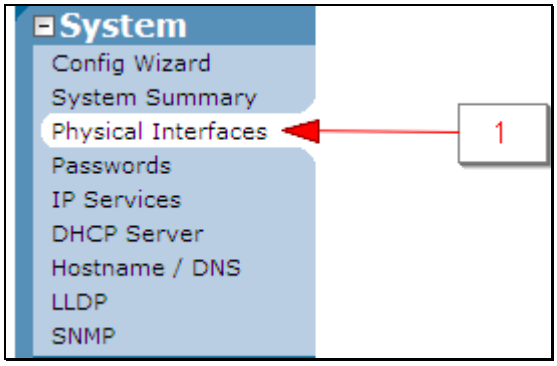
5.2.2 Reducing the Number of Active PRI B-Channels

The default configuration of the Total Access has all 23 B-Channels on the PRI set to active. Some implementations require a smaller number of B-Channels in order to implement the PRI. This section will cover the steps that must be performed to reduce the number of active B-Channels on the PRI.

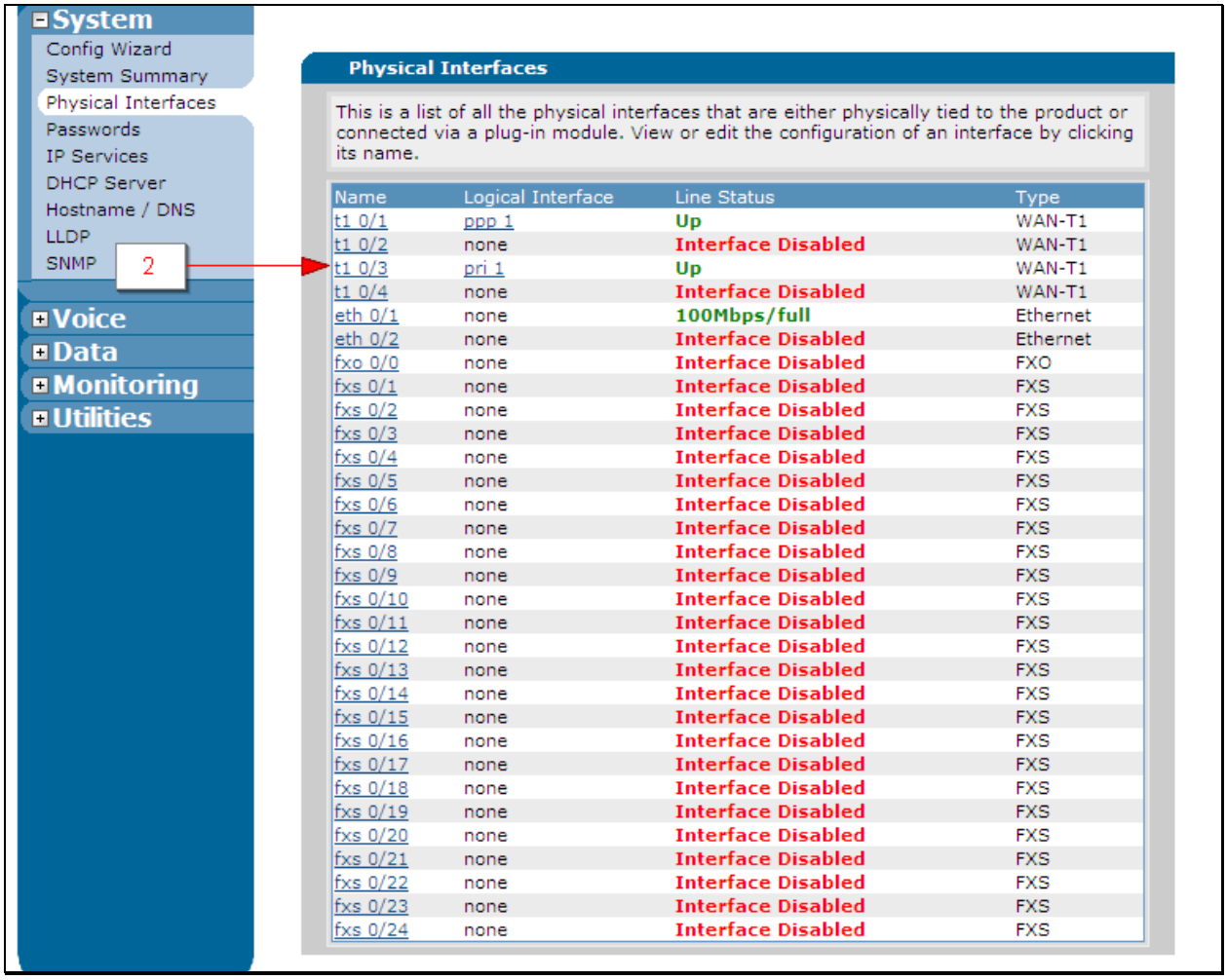
NOTE: If the number of active B-Channels is less that the number of SIP Trunks provisioned through the SIP Advantage service, the total number of simultaneous calls will be determined by the total number of active B-Channels. Because of this, it is recommended that all PRI B-Channels be provisioned in the active state and the total number of simultaneous calls be controlled through the SIP Advantage service. Doing so will eliminate the need to activate or deactivate B-Channels if more or less simultaneous calls are needed in the future.

5.2.2.1 T1 Interface Configuration

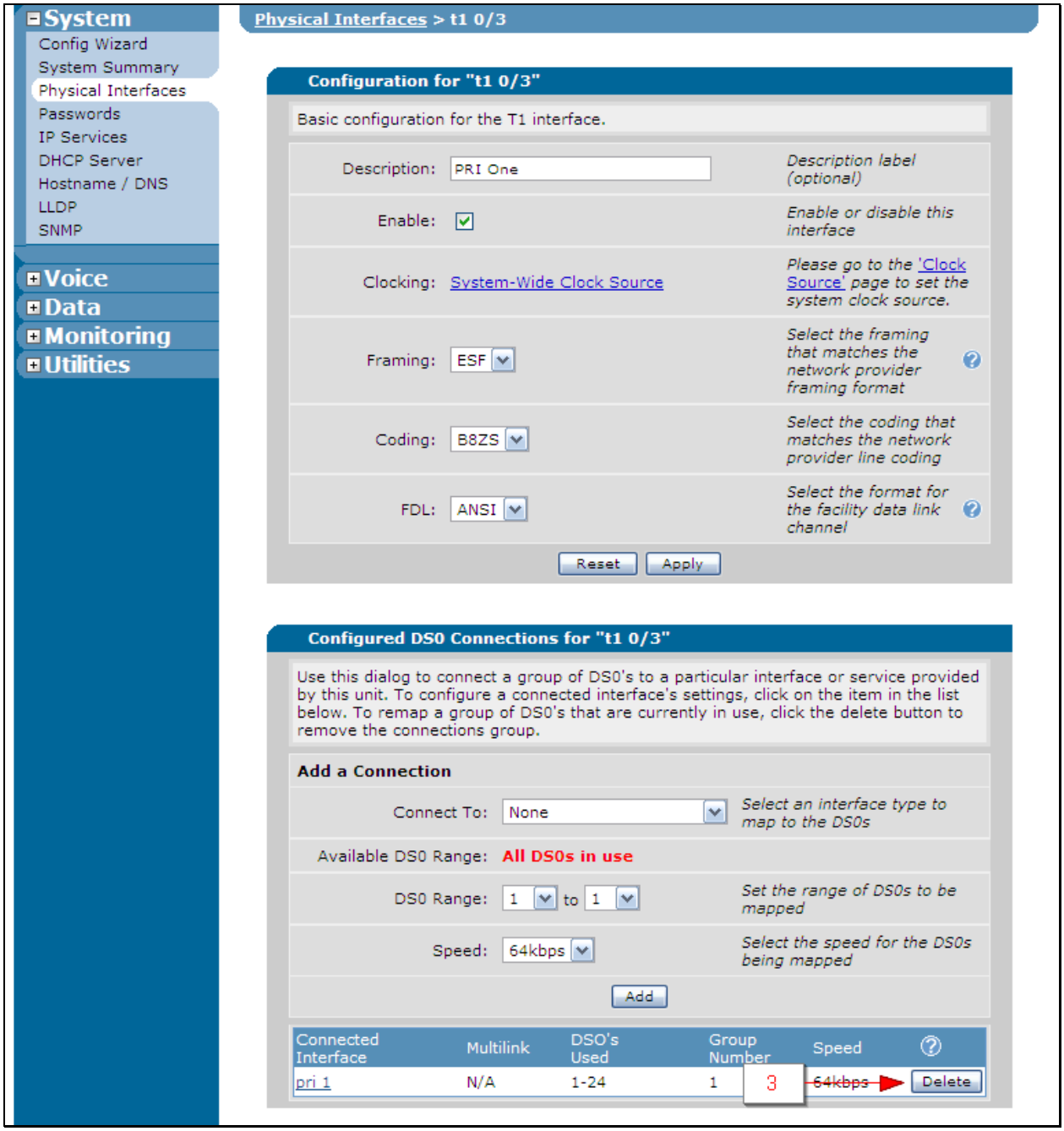
1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



2. Select the **t1 0/3** link under the **Name** column header.



3. Click the **Delete** button located in the **pri 1** row.

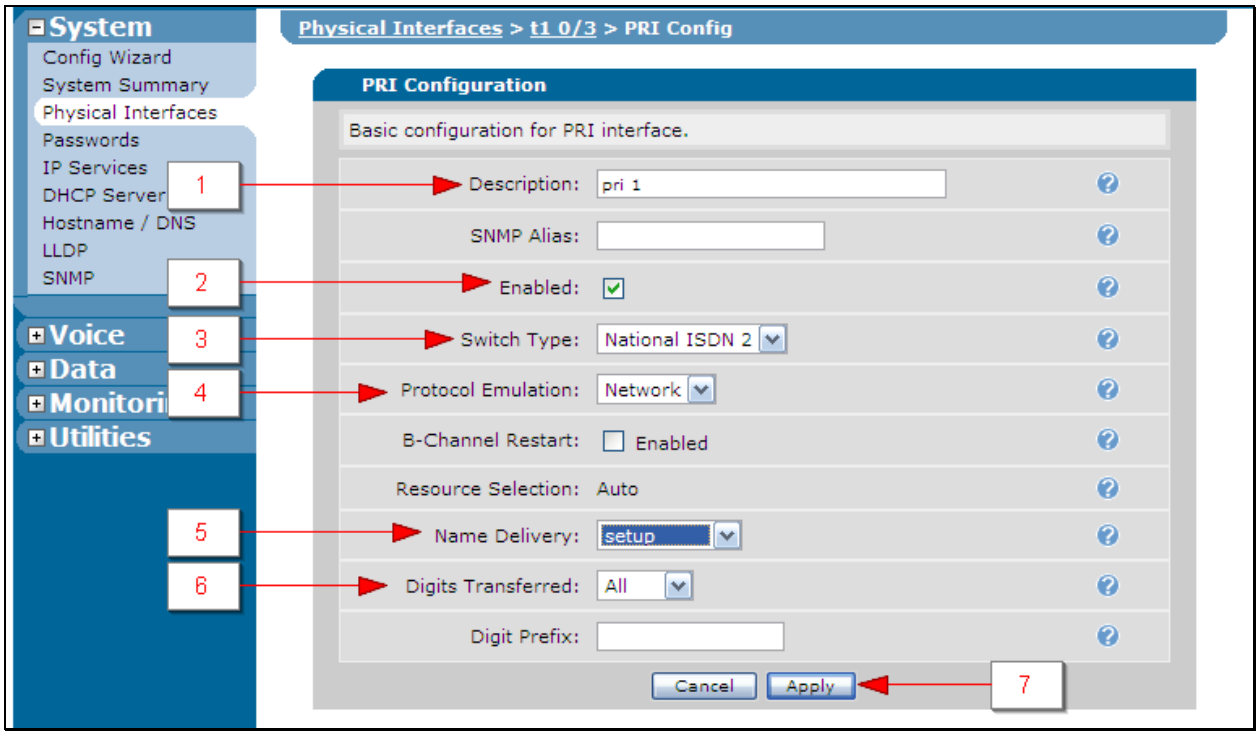


4. Select the **PRI** option in the **Connect To** dropdown box.
5. Select the range of DS0s that will be assigned to the T1 from the **DS0 Range** dropdown boxes.
6. Click the **Add** button to commit the changes and advance the screen to the PRI configuration page.

5.2.2.2 PRI Interface Configuration

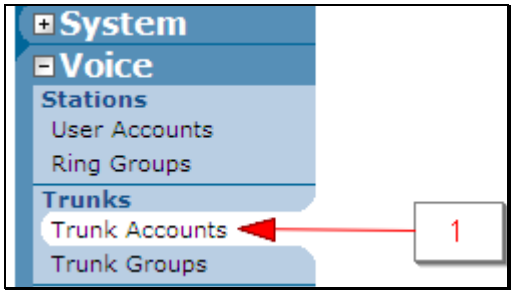
1. Enter a label for the PRI interface in the **Description** textbox.
2. Check the **Enable** checkbox.
3. Select the appropriate type from the **Switch Type** dropdown box.
4. Select the appropriate emulation from the **Protocol Emulation** dropdown box.
5. Select the appropriate delivery method from the **Name Delivery** dropdown box.

6. Select the appropriate number of digits to transfer from the **Digits Transferred** dropdown box.
7. Click the **Apply** button.

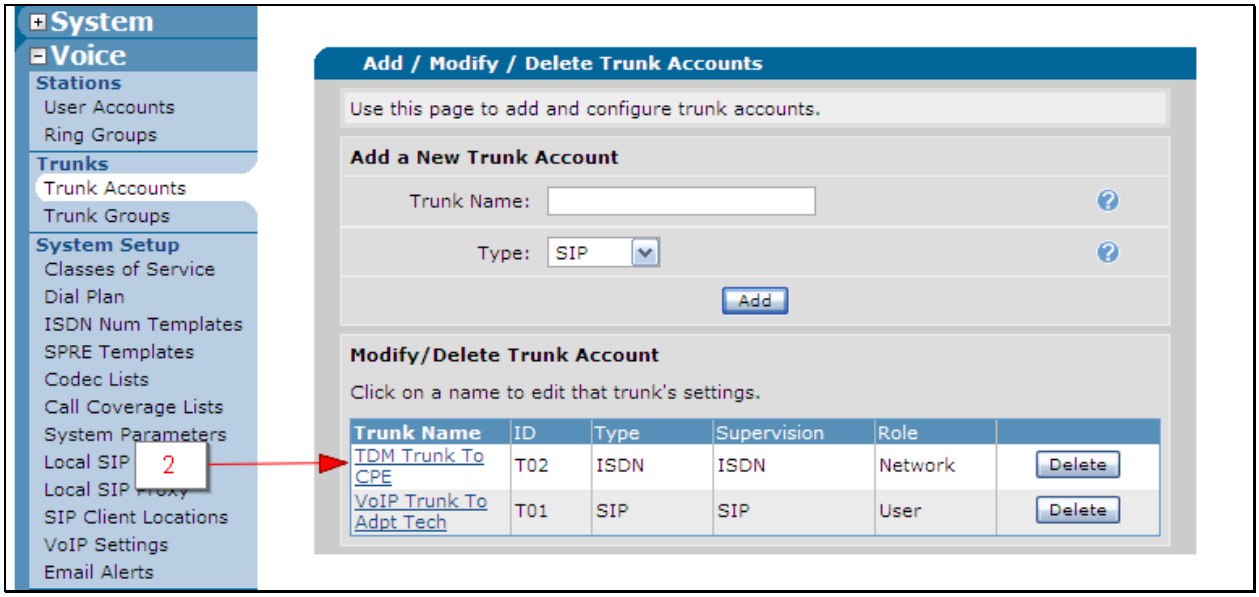


5.2.2.3 Re-configure the Trunk Account

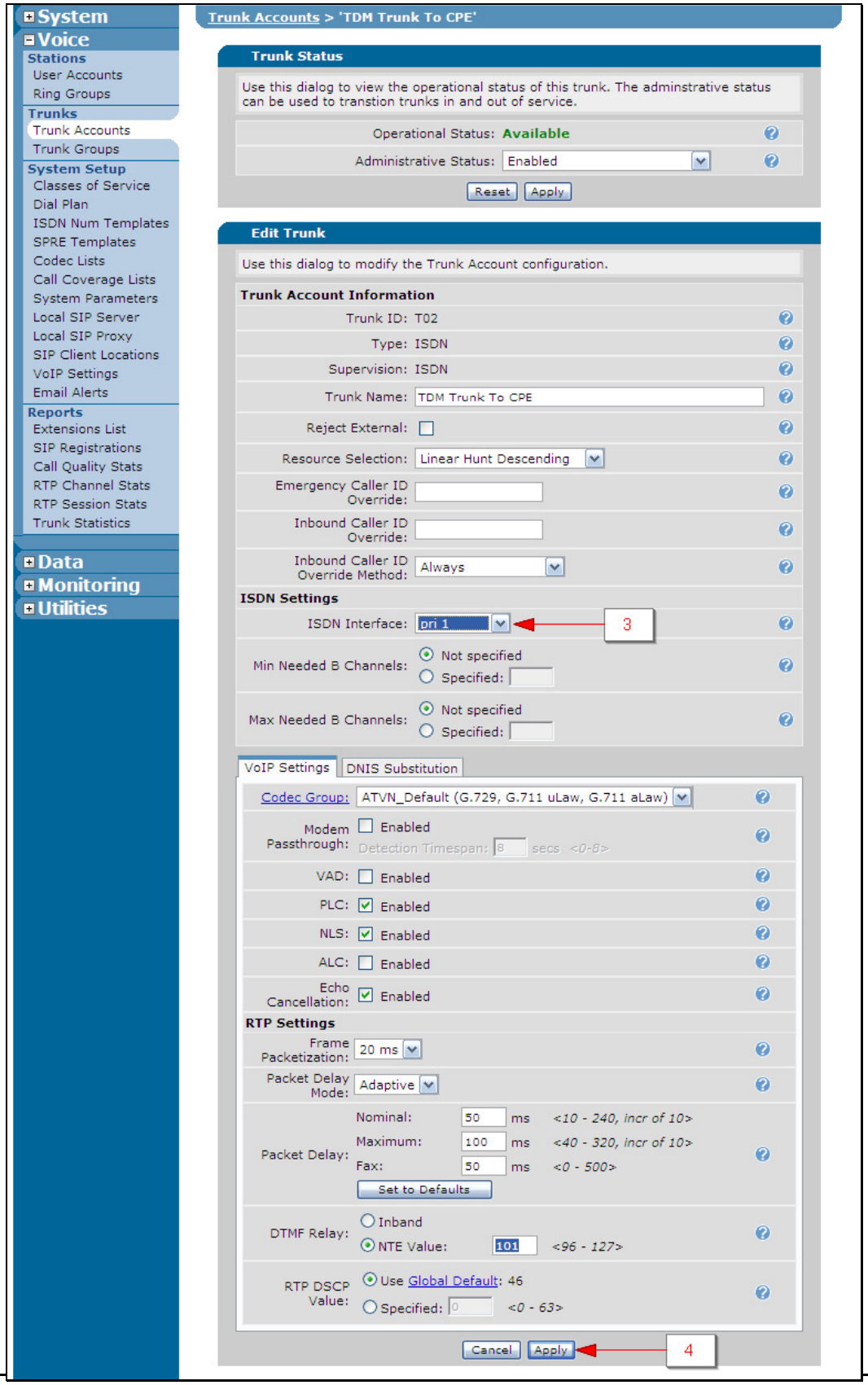
1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.



2. Click the **TDM Trunk To CPE** link under the **Trunk Name** column header.



3. Select the **pri 1** option from the **ISDN Interface** dropdown box.
4. Click the **Apply** button.



5.2.3 Configuring Multiple PRI

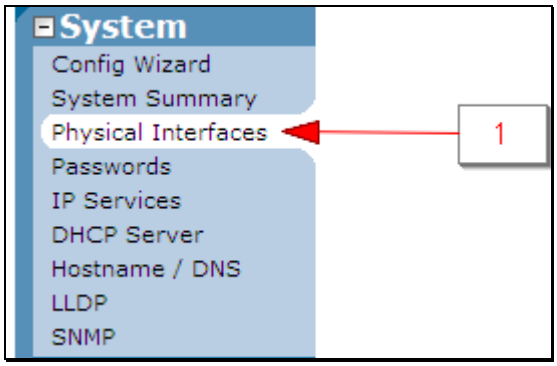
Complete the steps in the following sections to provision multiple PRI interfaces on the IAD.

NOTE: Non-Facility Associated Signaling (NFAS) is a feature that allows a PRI configuration where multiple PRIs can share a D channel. The IADs do not make use of this feature in their support of multiple PRI. Instead, they create two unique PRI each with its own D-channel and then group them together under a common trunk group.

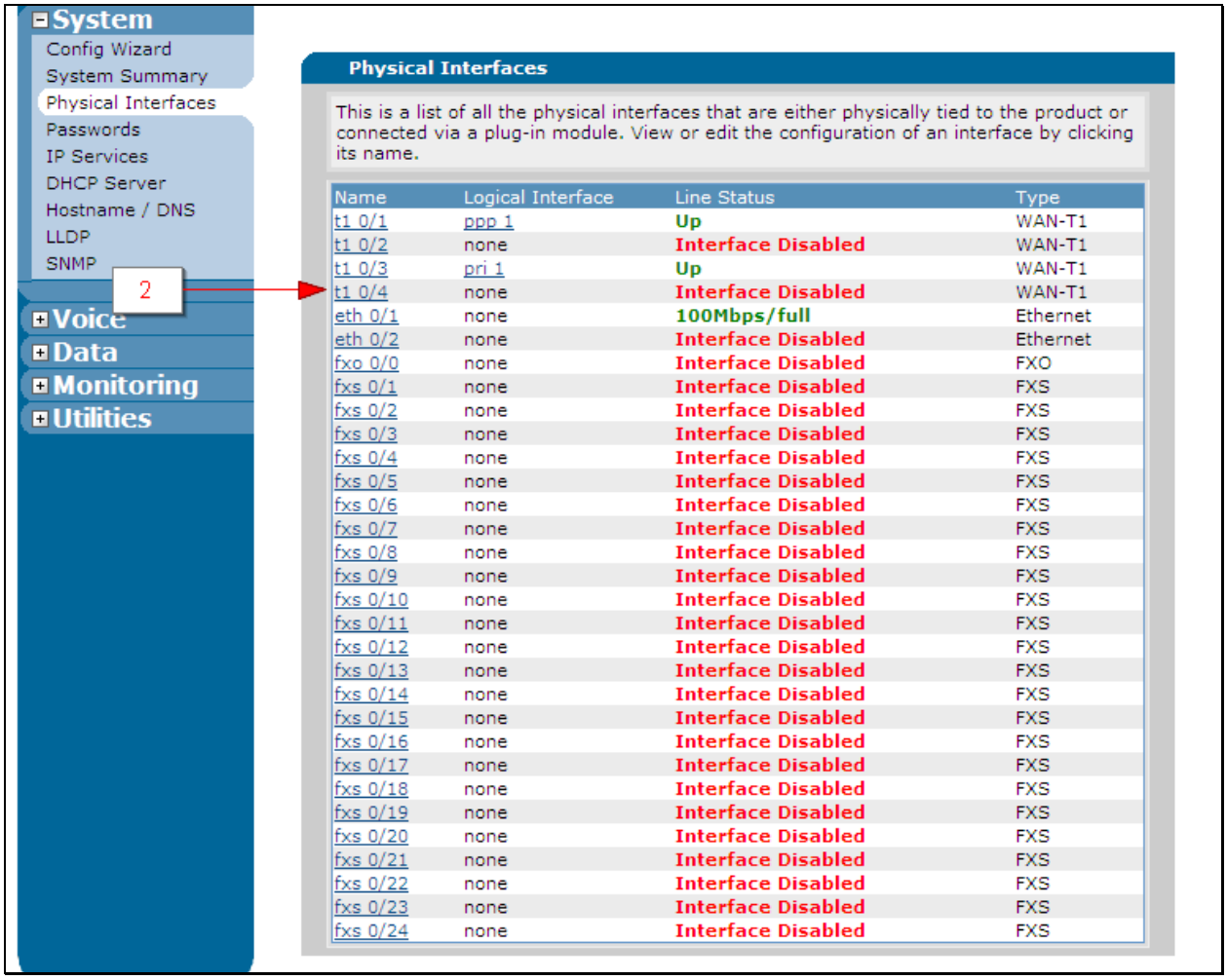
NOTE: The steps outlined in this section apply only to the TA908e, TA916e, and TA924e models.

5.2.3.1 T1 Interface Configuration

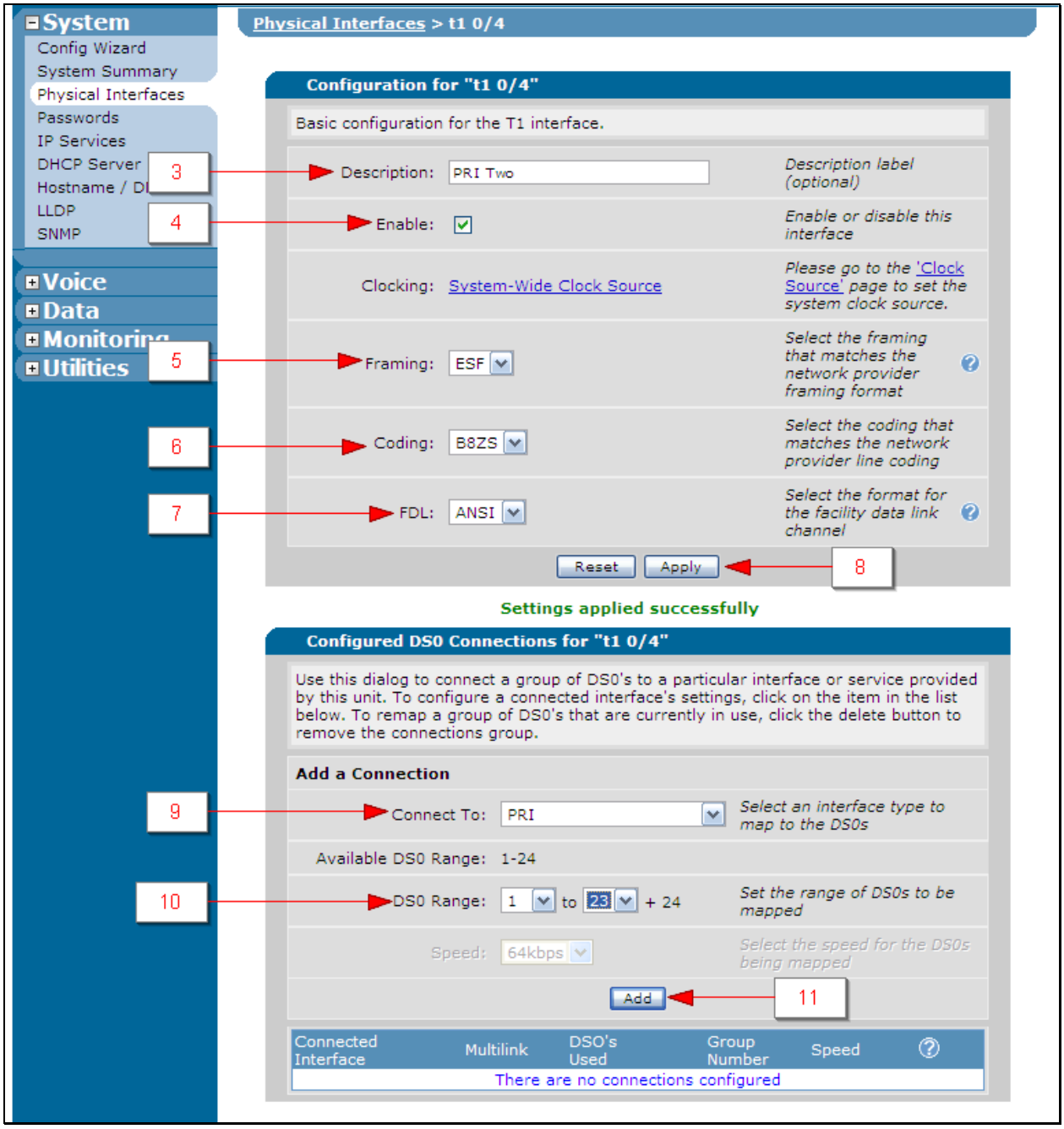
1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



2. Select the **t1 0/4** link under the **Name** column header.



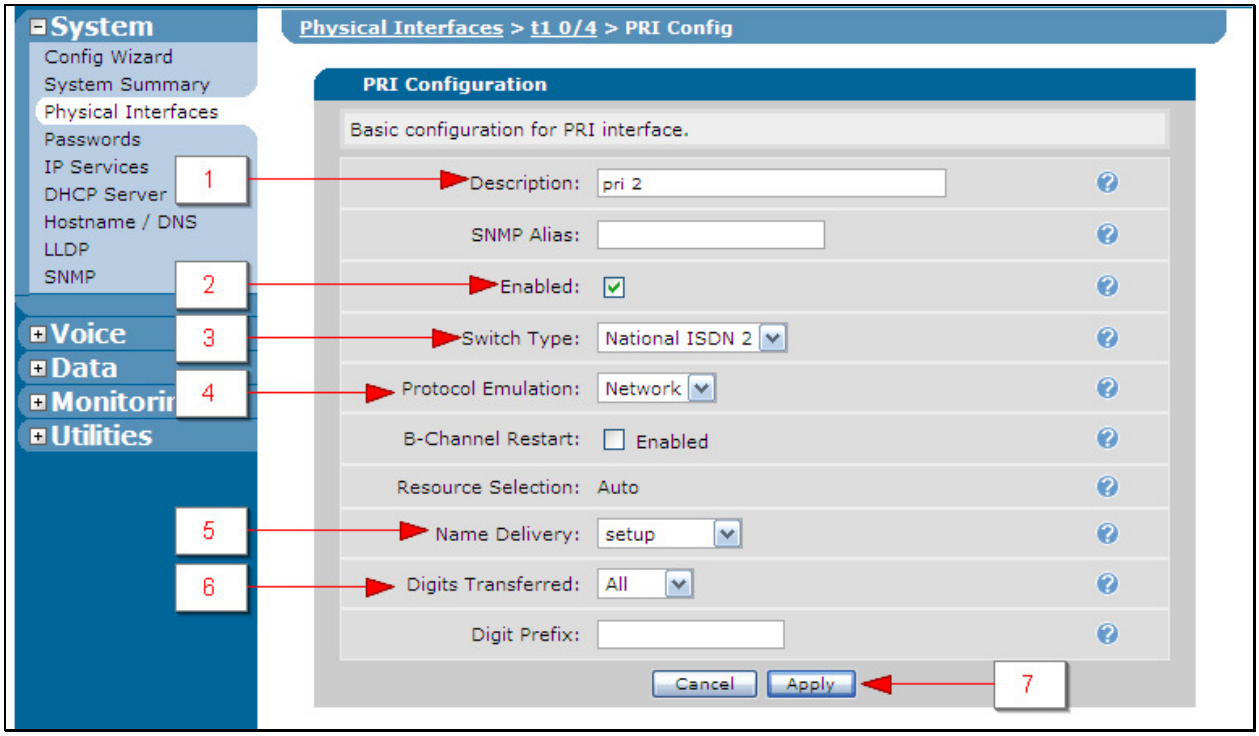
3. Enter a label for the T1 in the **Description** textbox.
4. Select the **Enable** checkbox.
5. Select the appropriate framing from the **Framing** dropdown box.
6. Select the appropriate coding from the **Coding** dropdown box.
7. Select the appropriate facility data link formatting from the **FDL** dropdown box.
8. Click the **Apply** button.
9. Select the **PRI** option from the **Connect To** dropdown box.
10. Select the range of DS0s that will be assigned to the T1 from the **DS0 Range** dropdown boxes.
11. Click the **Add** button to commit the changes and advance the screen to the PRI configuration page.



5.2.3.2 PRI Interface Configuration

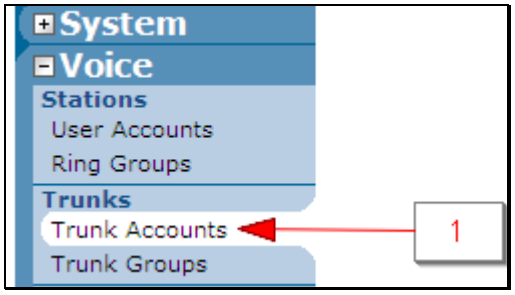
1. Enter a label for the PRI interface in the **Description** textbox.
2. Check the **Enable** checkbox.
3. Select the appropriate type from the **Switch Type** dropdown box.
4. Select the appropriate emulation from the **Protocol Emulation** dropdown box.
5. Select the appropriate delivery method from the **Name Delivery** dropdown box.

6. Select the appropriate number of digits to transfer from the **Digits Transferred** dropdown box.
7. Click the **Apply** button.

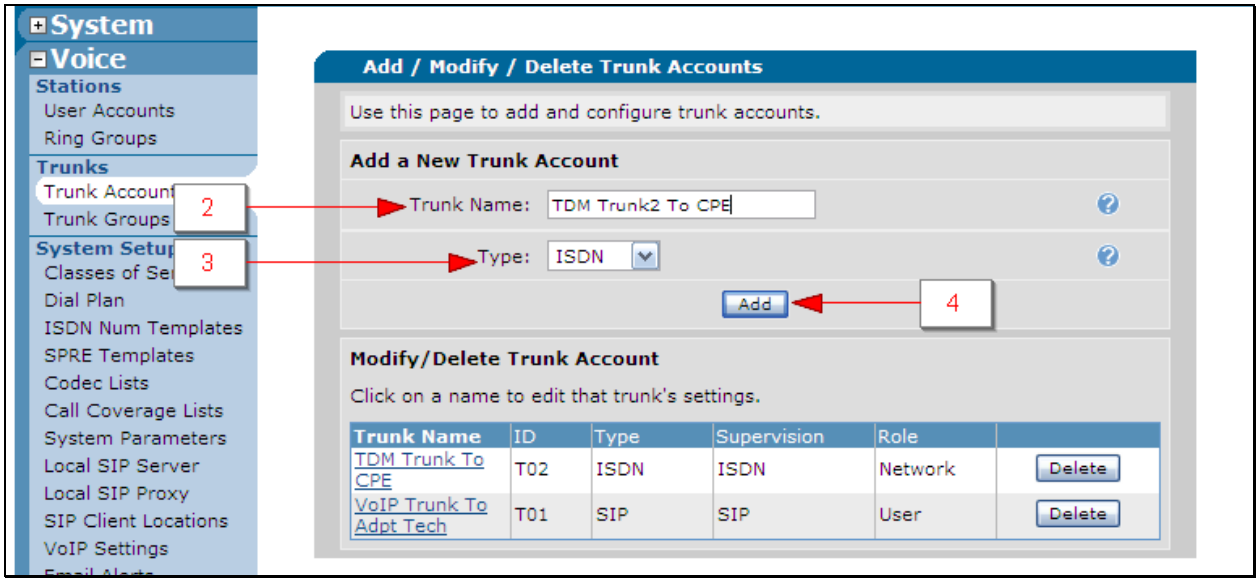


5.2.3.3 Add New Trunk Account

1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.

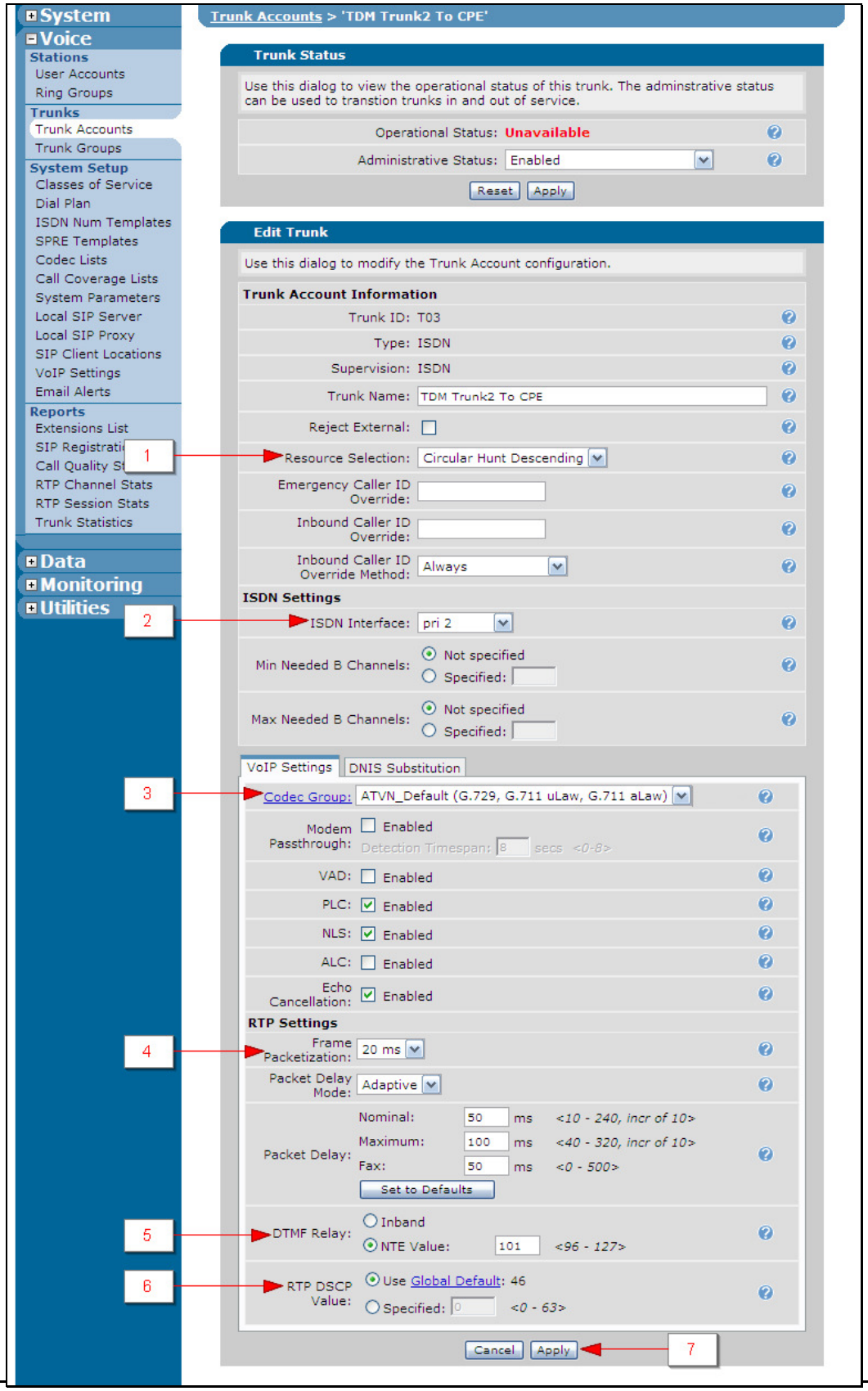


2. Enter a name for the trunk in the **Trunk Name** textbox.
3. Select the **ISDN** option from the **Type** dropdown box.
4. Click the **Add** button to commit the changes and advance the screen to the Trunk Account configuration page.



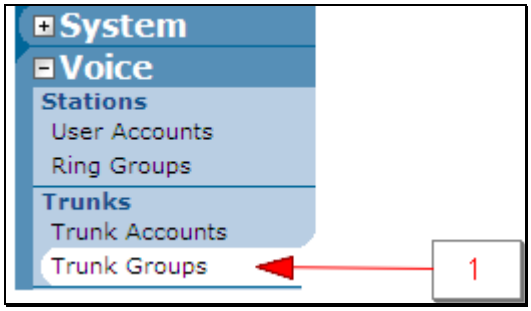
5.2.3.4 New Trunk Account Configuration

1. Select the appropriate selection sequence from the **Resource Selection** dropdown box.
2. Select the **pri 2** option from the **ISDN Interface** dropdown box.
3. Select the **ATVN_Default** option from the **Codec Group** dropdown box.
4. Select the **20 ms** option from the **Frame Packetization** dropdown box.
5. Select the **NTE Value** radial button in the **DTMF Relay** list and enter a value of **101**.
6. Select the **Use Default Value: 46** radial button in the **RTP DSCP Value** list.
7. Click the **Apply** button.

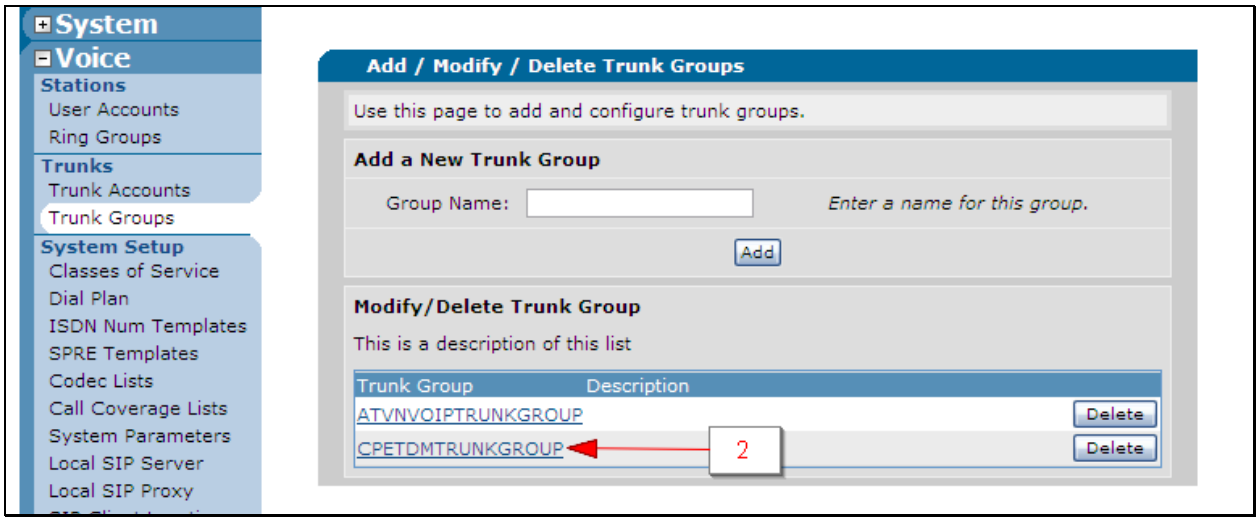


5.2.3.5 Add Second PRI to Trunk Group

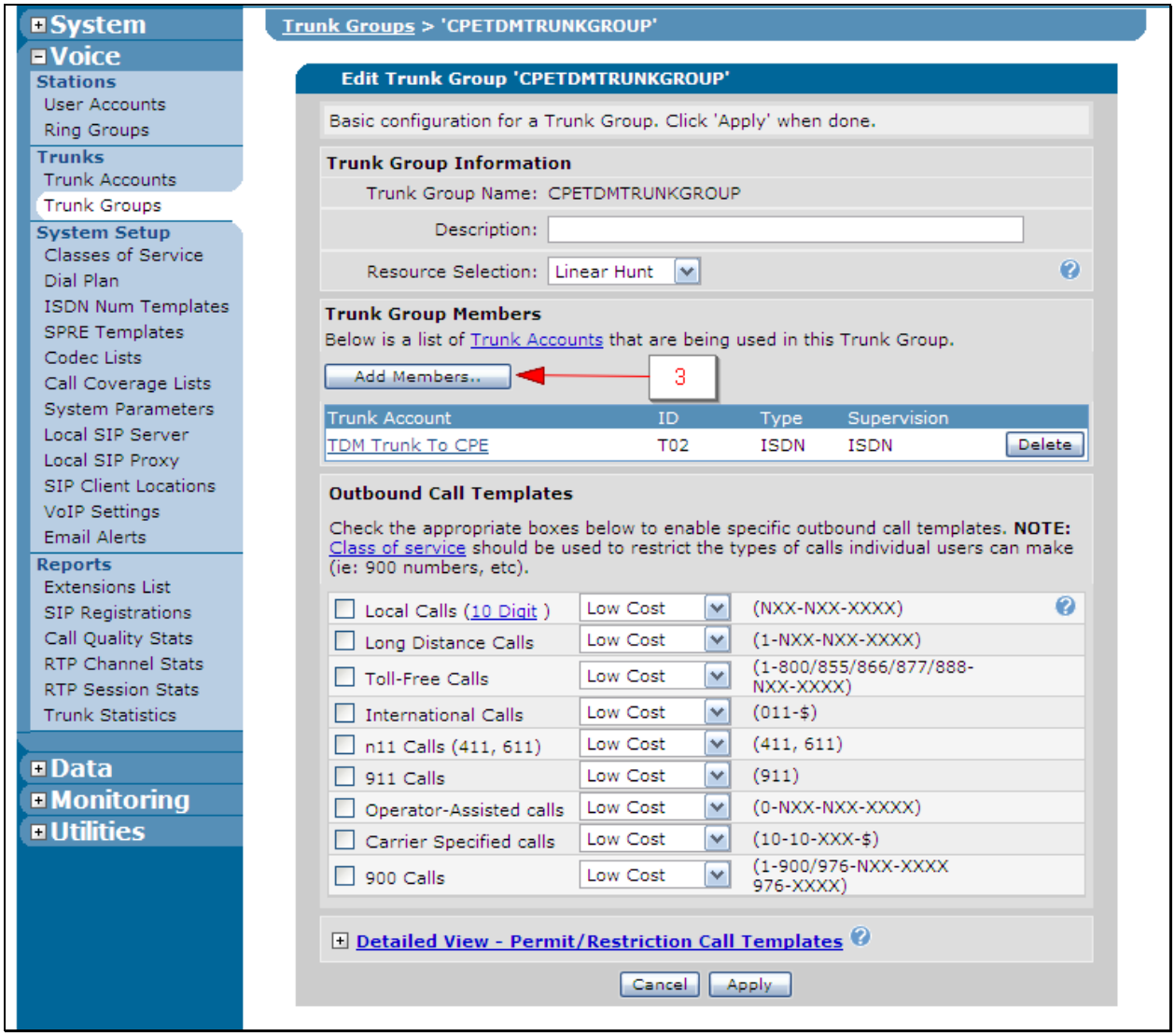
1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.



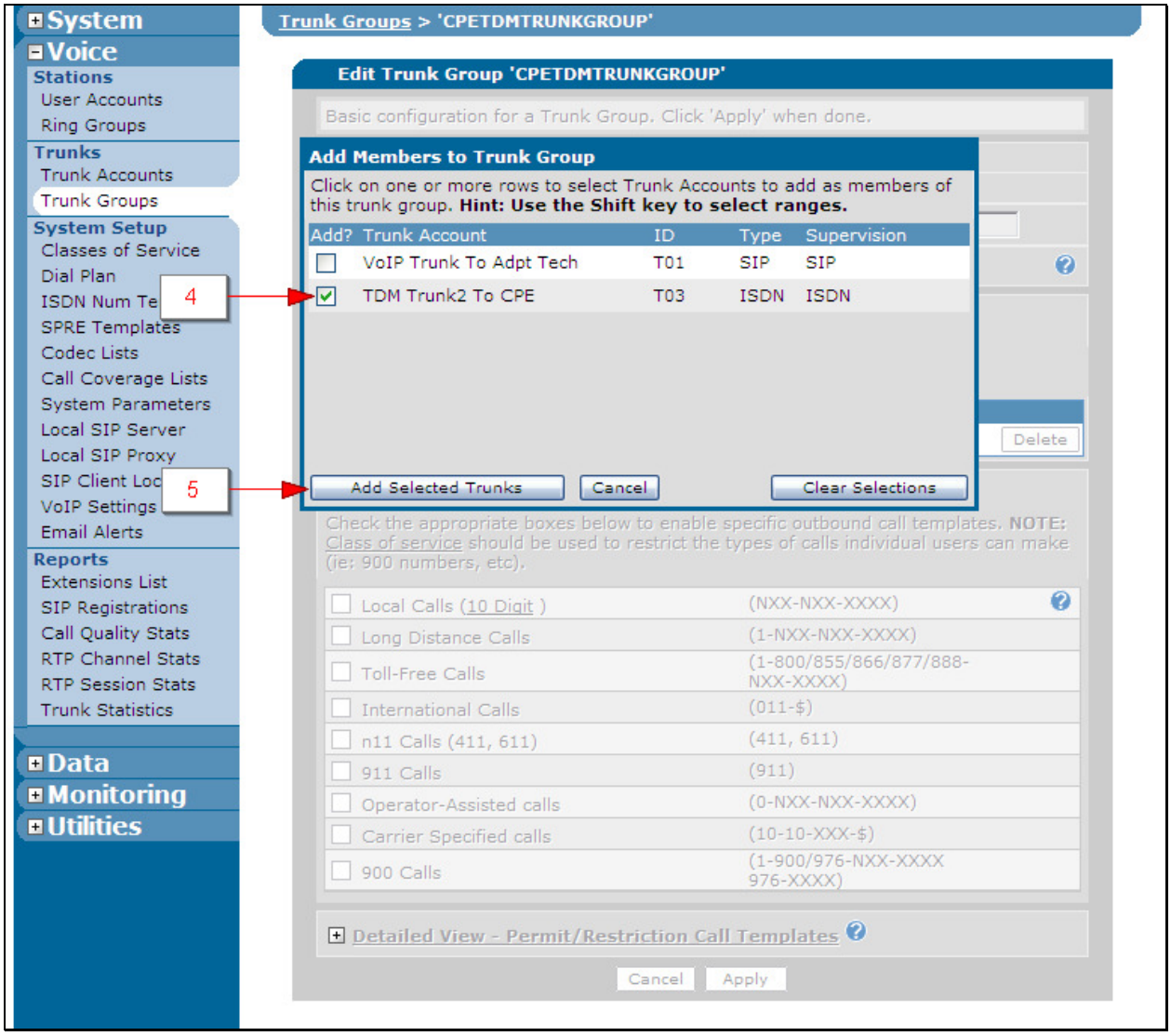
2. Select the **CPETDMTRUNKGROUP** link under the **Trunk Group** column header.



3. Click the **Add Members** button.



4. Check the checkbox associated with the ISDN Trunk Account added in the previous section.
5. Click the **Add Selected Trunks** button.

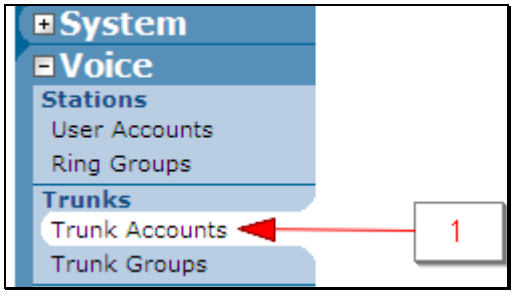


5.2.4 Configuring CAS Trunk Group

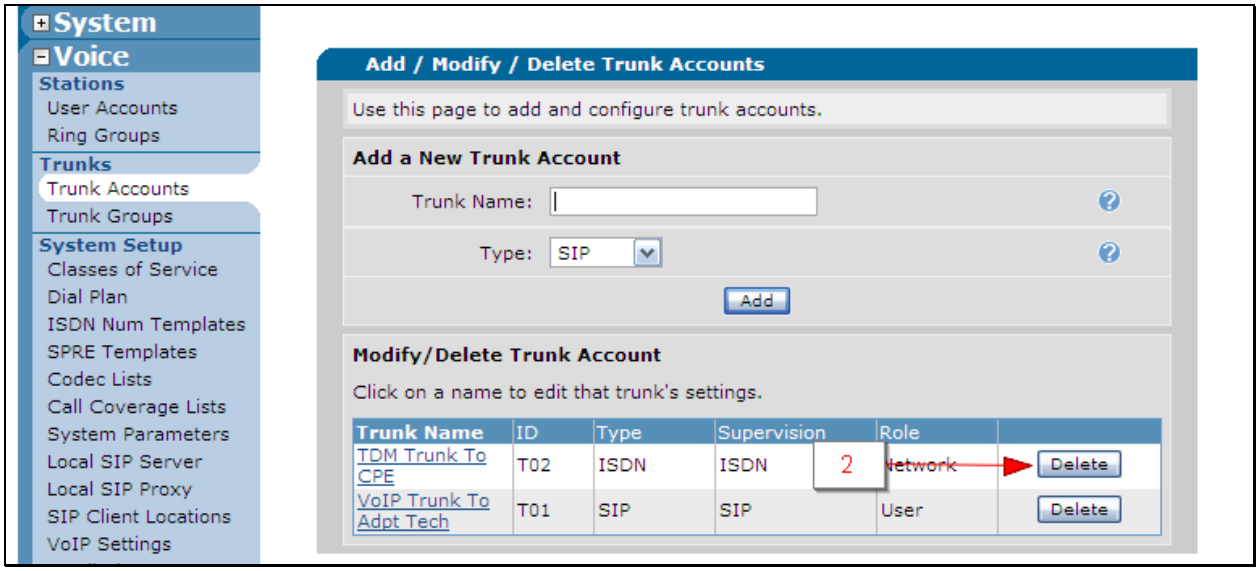
Complete the steps in the following sections to provision a CAS Trunk on the IAD.

5.2.4.1 Remove PRI Configuration

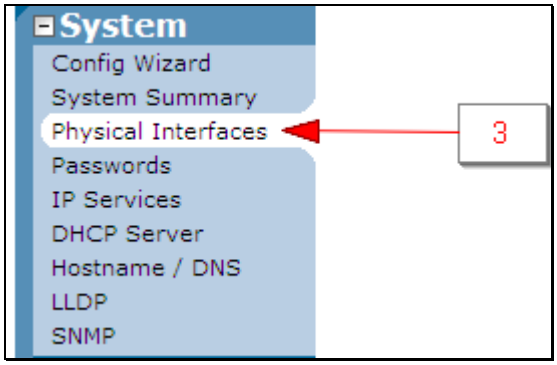
1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.



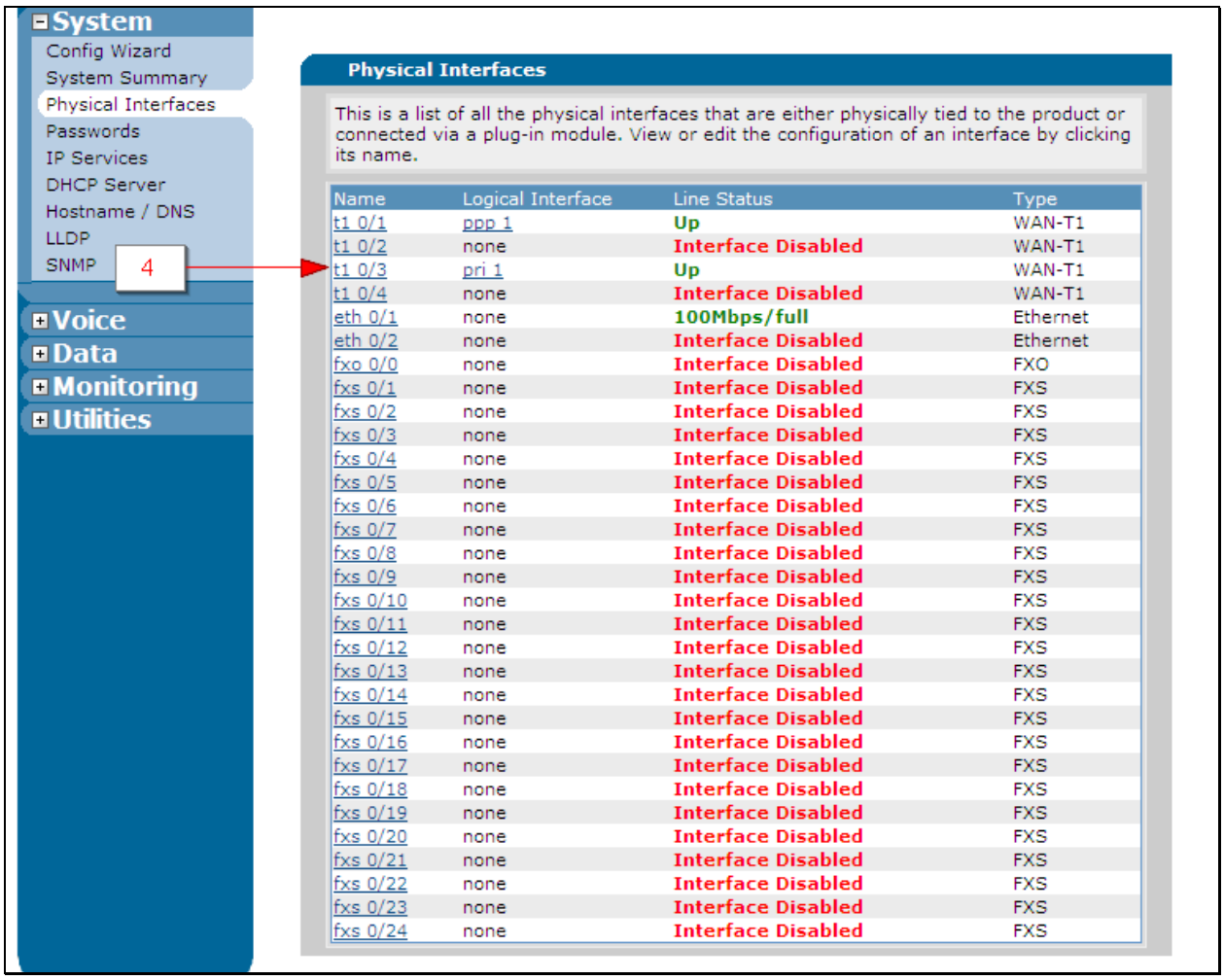
2. Click the **Delete** button in the **TDM Trunk To CPE** row.



3. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.



4. Select the **t1 0/3** link under the **Name** column header.

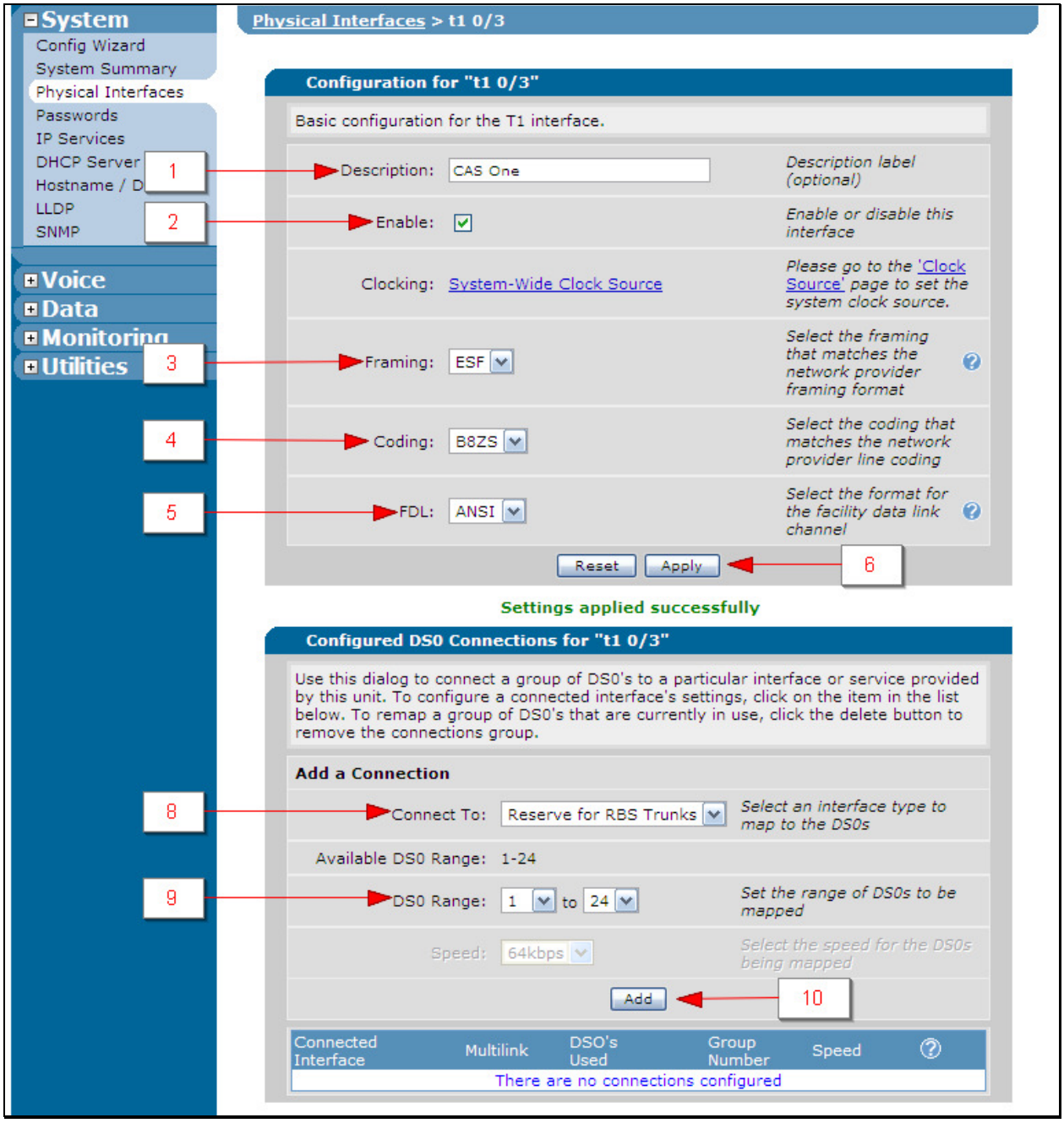


5. Click the **Delete** button located in the **pri 1** row.

5.2.4.2 T1 Interface Configuration

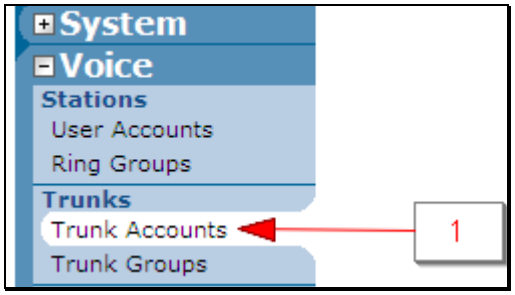
1. Enter a label for the T1 in the **Description** textbox.
2. Select the **Enable** checkbox.
3. Select the appropriate framing from the **Framing** dropdown box.
4. Select the appropriate coding from the **Coding** dropdown box.
5. Select the appropriate facility data link formatting from the **FDL** dropdown box.

6. Click the **Apply** button.
7. Select the **Reserve for RBS Trunks** option from the **Connect To** dropdown box.
8. Select the range of DS0s that will be assigned to the T1 from the **DS0 Range** dropdown boxes.
9. Click the **Add** button.

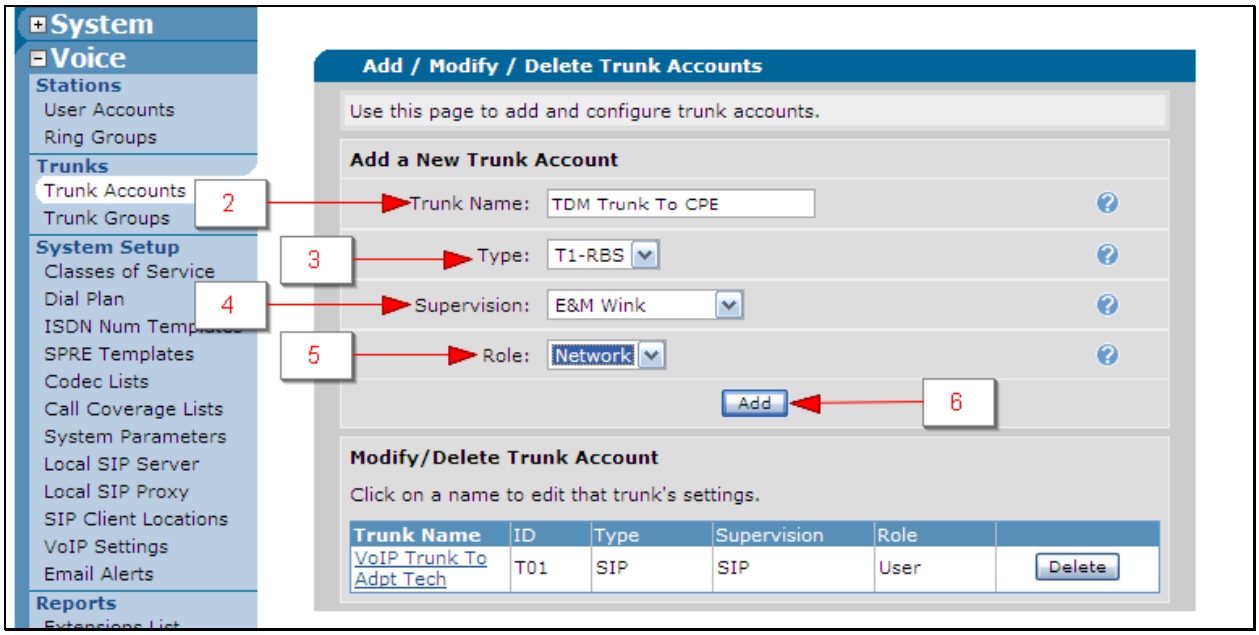


5.2.4.3 Add New Trunk Account

1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.



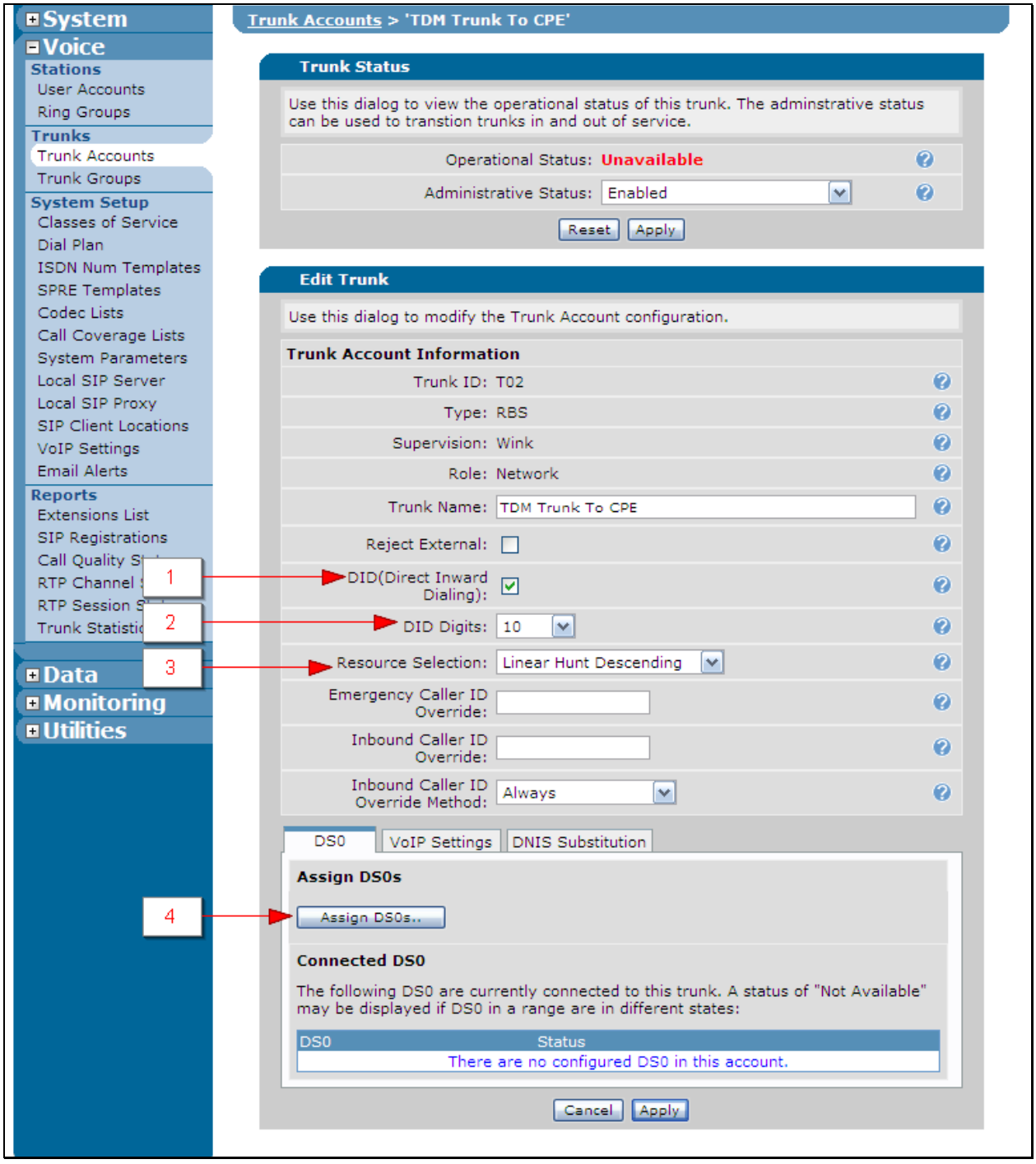
2. Enter a name for the trunk in the **Trunk Name** textbox.
3. Select the **T1-RBS** option from the **Type** dropdown box.
4. Select the appropriate supervision setting from the **Supervision** dropdown box.
5. Select the **Network** option from the **Role** dropdown box.
6. Click the **Add** button to commit the changes and advance the screen to the Trunk Account configuration page.



5.2.4.4 New Trunk Account Configuration

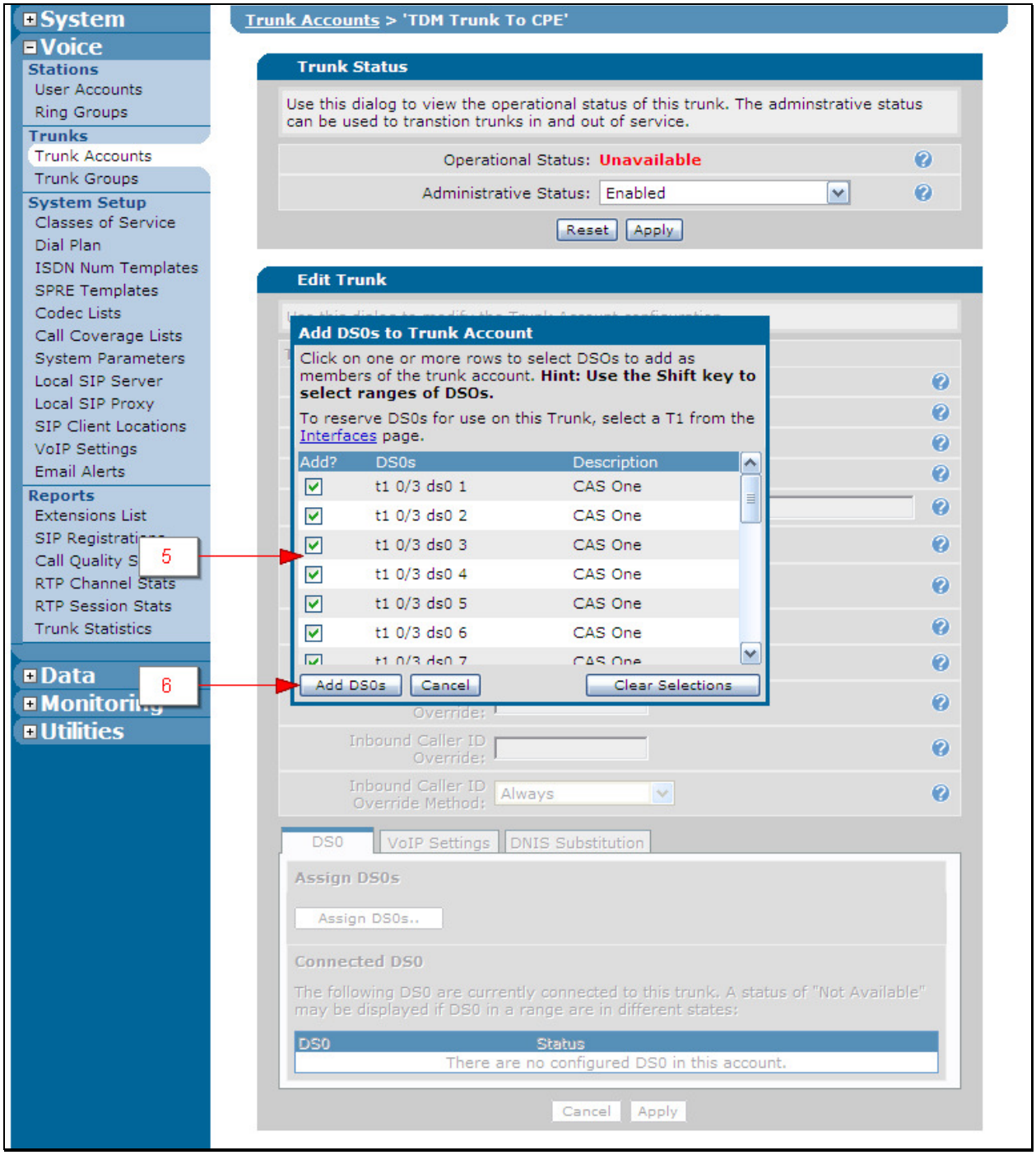
1. If applicable, check the **DID(Direct Inward Dial)** checkbox.
2. If the above checkbox is selected, select the appropriate number of digits for the IAD to send to the CPE from the **DID digits** dropdown box.
3. Select the appropriate selection sequence from the **Resource Selection** dropdown box.

4. Click the **Assign DS0s** button to bring up the **Add DS0s to Trunk Account** pop up.



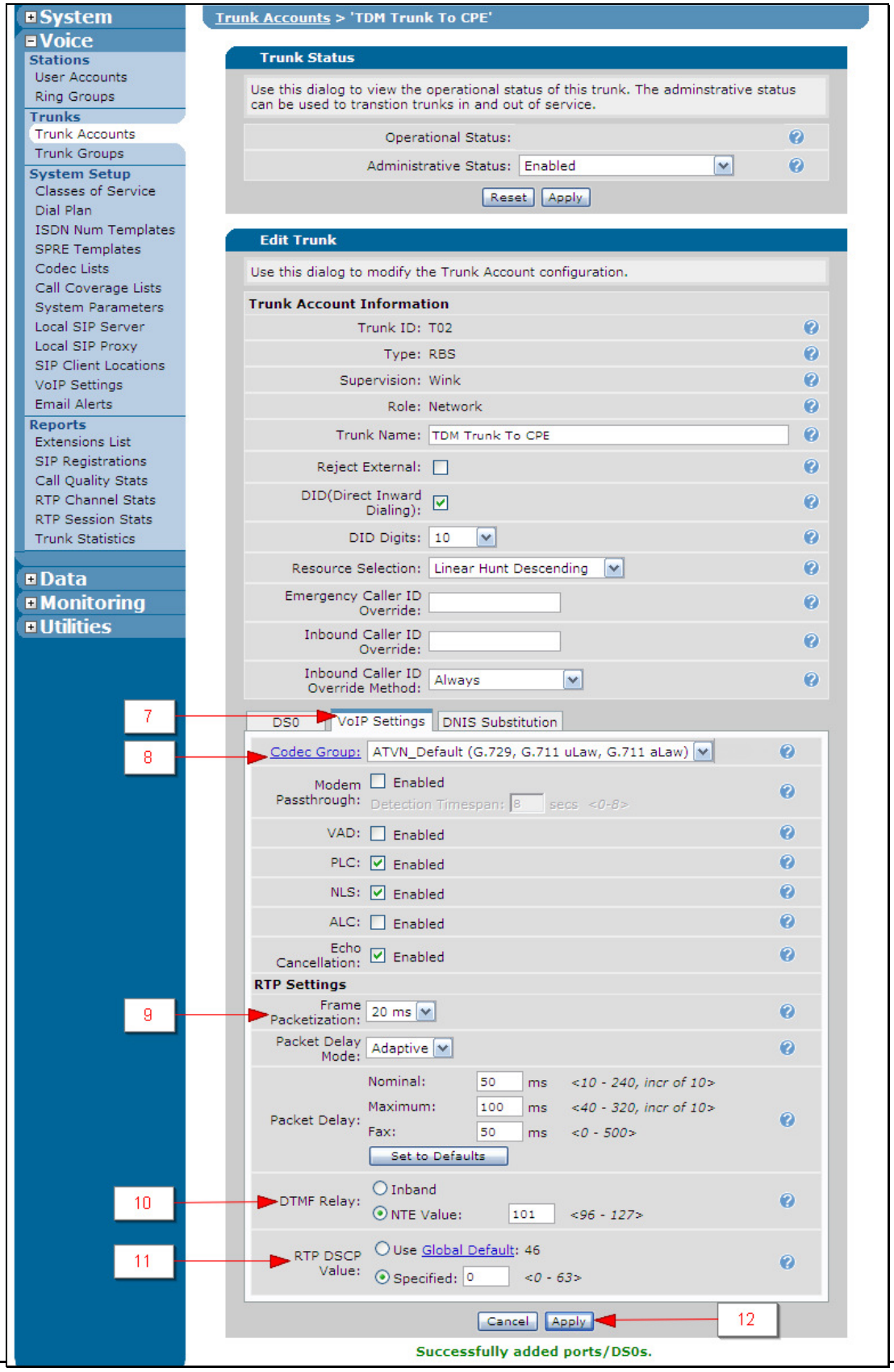
5. Check the checkbox under the **Add?** column header for each DS0 that needs to be added to the trunk account.

6. Click the **Add DS0s** button to apply the selections and close the **DS0s to Trunk Account** pop up.



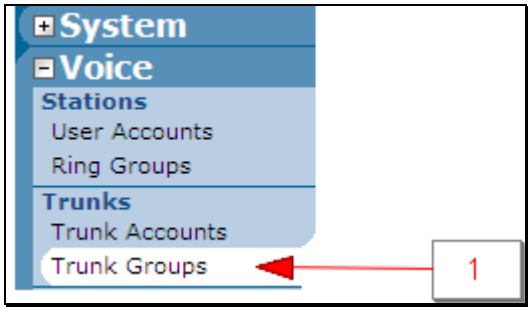
7. Click the **VoIP Settings** tab.
8. Select the **ATVN_Default** option from the **Codec Group** dropdown box.
9. Select the **20 ms** option from the **Frame Packetization** dropdown box.
10. Select the **NTE Value** radial button in the **DTMF Relay** list and enter a value of **101**.

11. Select the **Use Default Value: 46** radial button in the **RTP DSCP Value** list.
12. Click the **Apply** button.

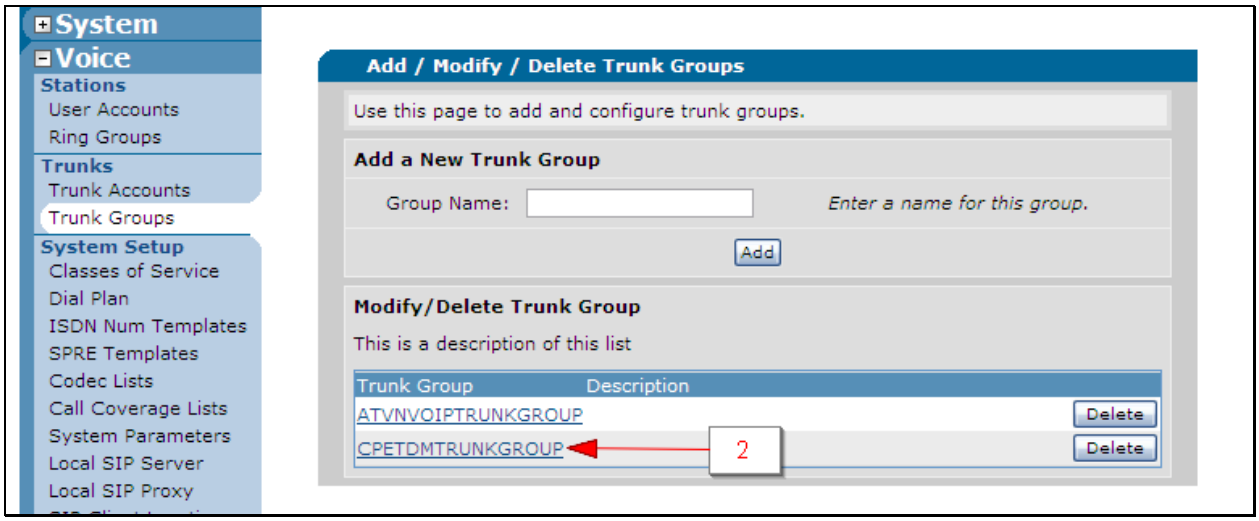


5.2.4.5 Trunk Group Configuration

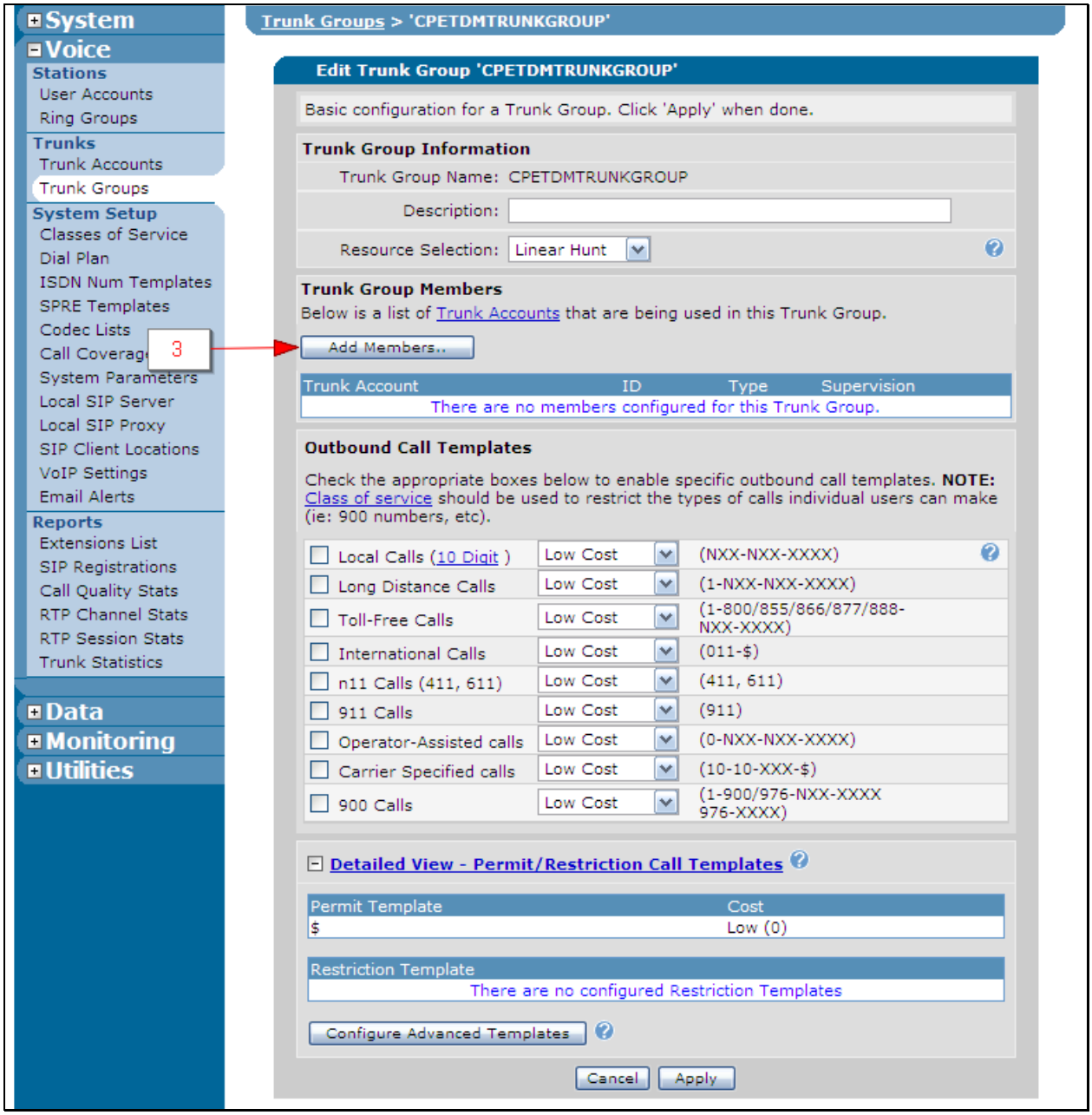
1. Select the **Trunk Accounts** link located under the **Voice** heading in the left hand margin.



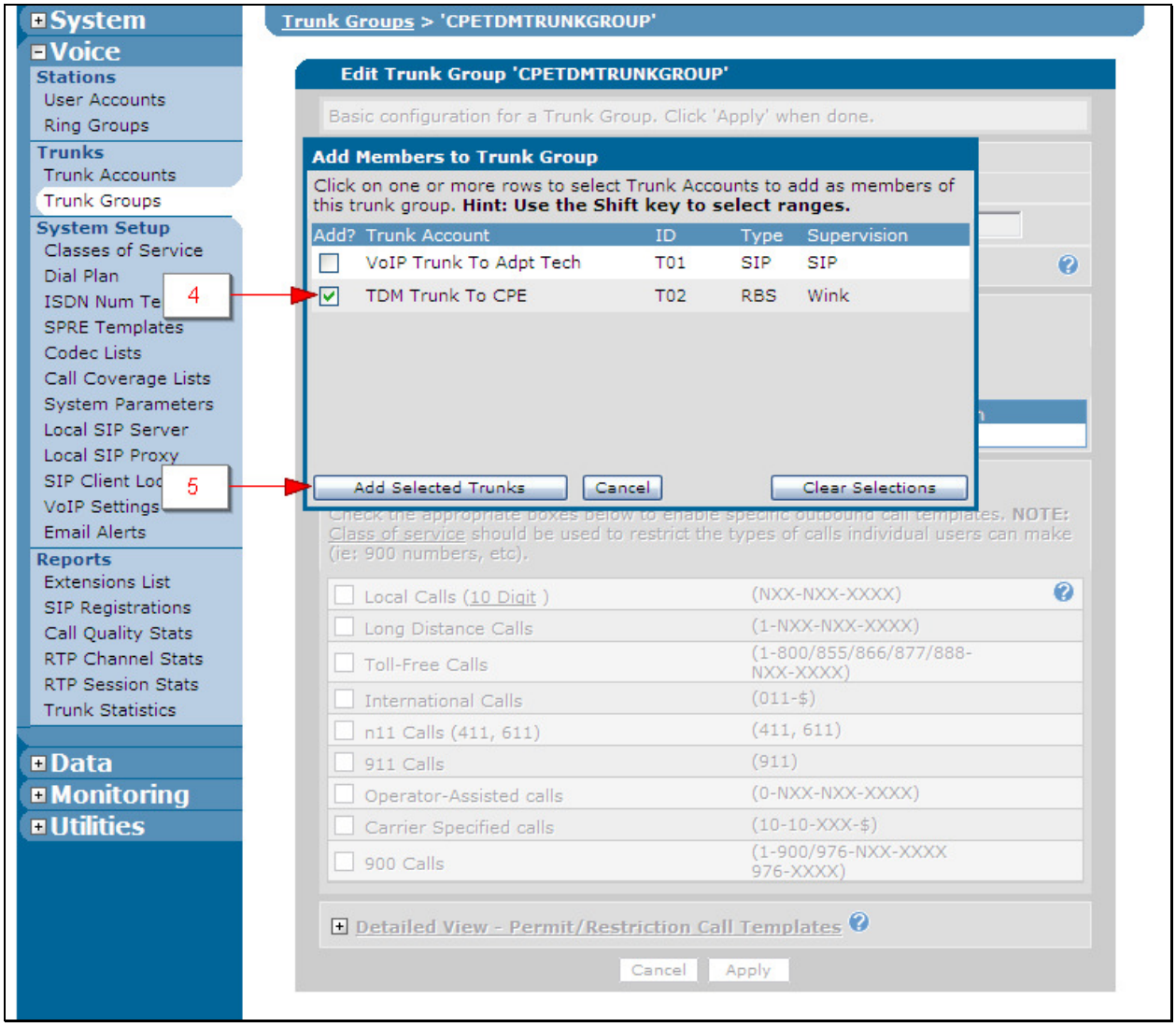
2. Select the **CPETDMTRUNKGROUP** link under the **Trunk Group** column header.



3. Click the **Add Members** button.



4. Check the checkbox associated with the CAS Trunk Account added in the previous section.
5. Click the **Add Selected Trunks** button.



5.2.4.6 Adding a Second CAS Trunk Account to a CAS Trunk Group

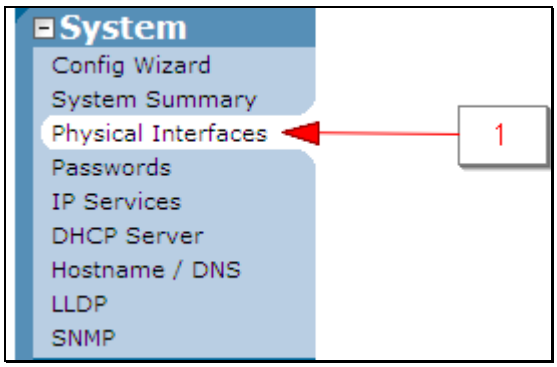
For the TA908e, TA916e, and TA924e models of the Total Access IAD, it is possible to add a second CAS Trunk Interface to an existing CAS Trunk Group. In order to do this, repeat the steps defined in sections 5.2.4.2-5.2.4.5 using t1 0/4 as the interface to provision.

5.2.5 Configuring an FXS User

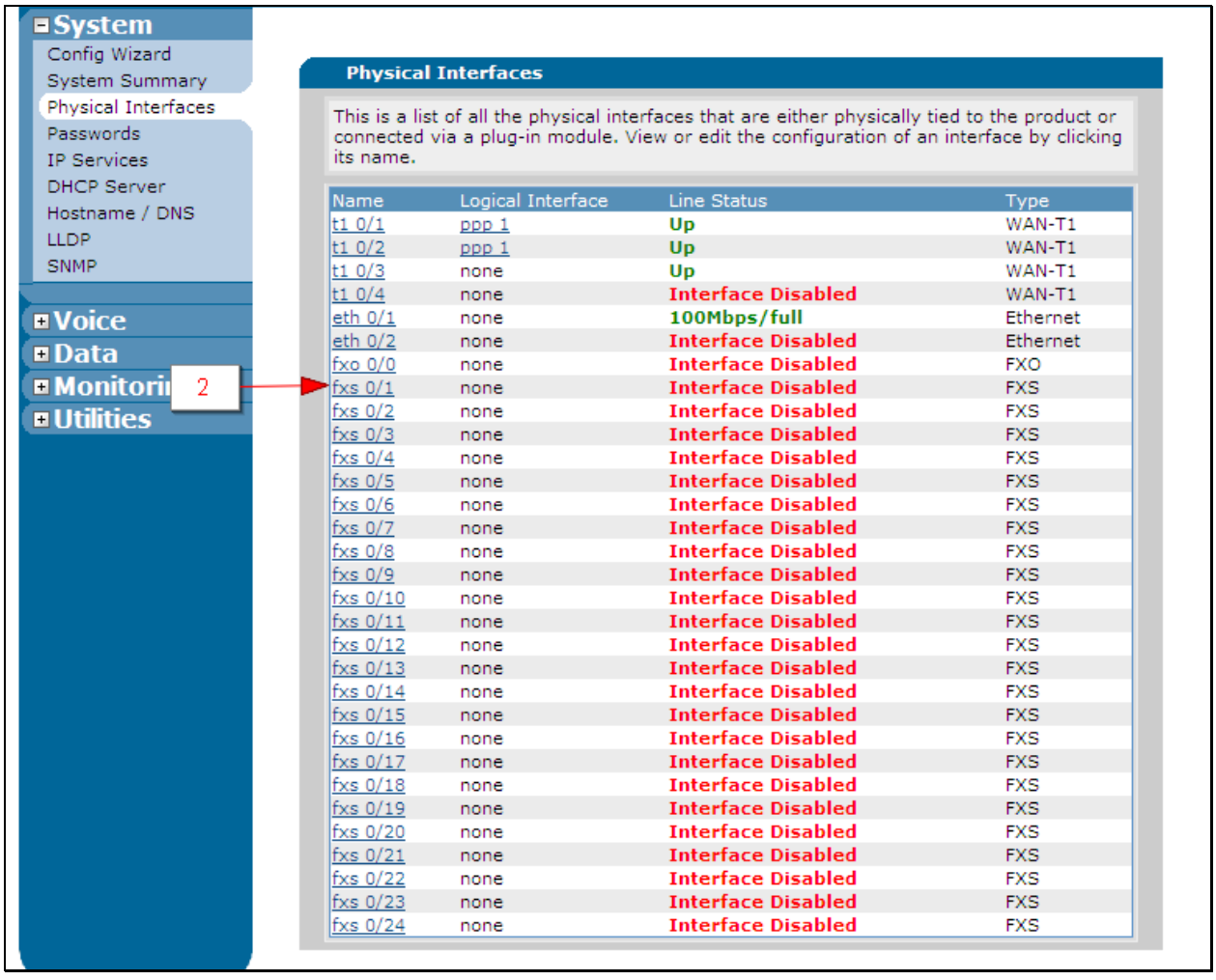
Complete the steps in the following sections to provision an FXS User on the IAD.

5.2.5.1 Configuring the FXS Interface

1. Select the **Physical Interfaces** link located under the **System** heading in the left hand margin.

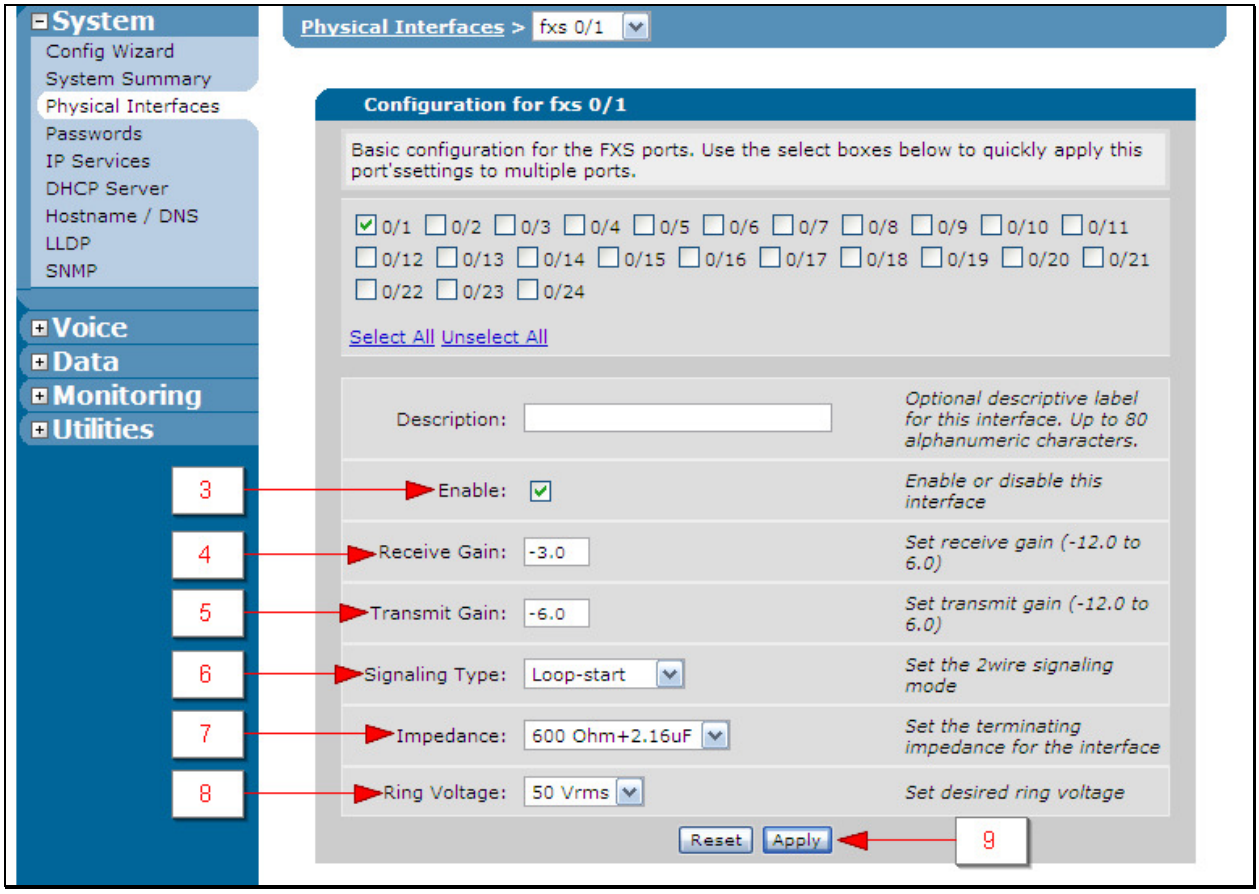


2. Under the **Name** column header, select the **fxs 0/x** link for the interface being configured.



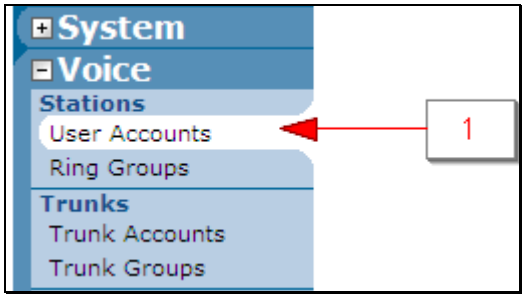
3. Select the **Enable** checkbox.
4. Enter an appropriate gain value in the **Receive Gain** textbox.
5. Enter an appropriate gain value in the **Transmit Gain** textbox.

6. Select the appropriate signaling from the **Signaling Type** dropdown box.
7. Select the appropriate impedance from the **Impedance** dropdown box.
8. Select the appropriate voltage from the **Ring Voltage** dropdown box.
9. Click the **Apply** button.



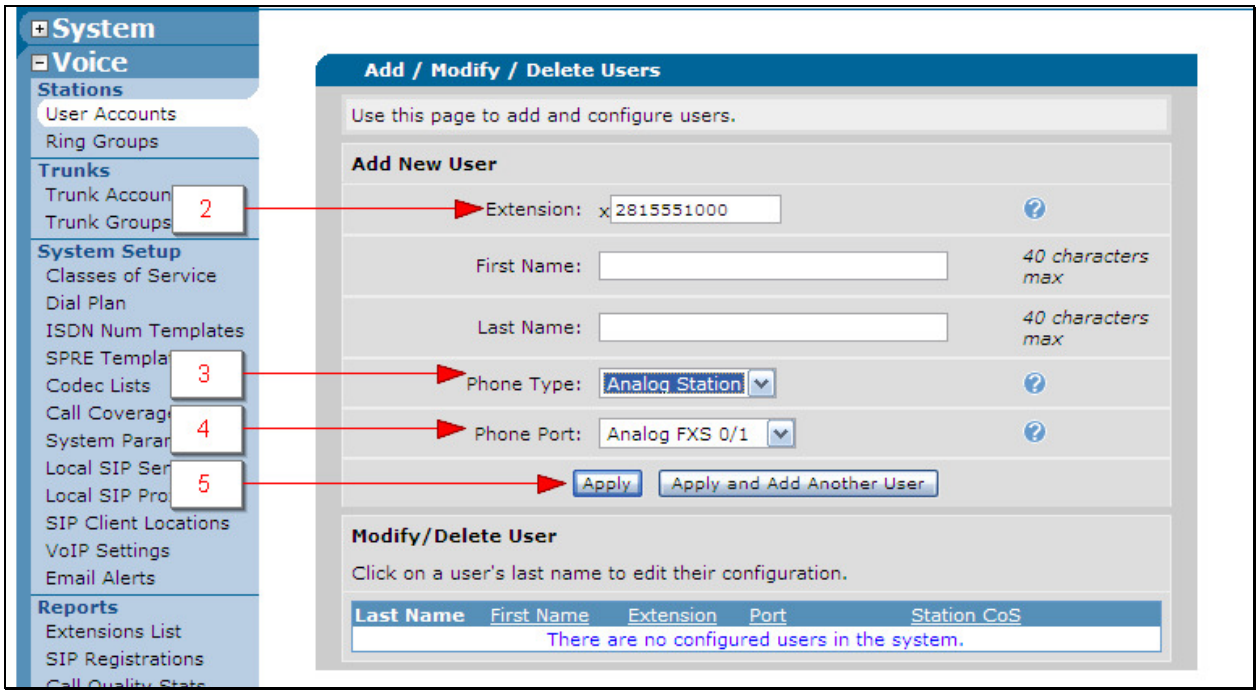
5.2.5.2 Configuring the FXS User Settings

1. Select the **User Accounts** link located under the **Voice** heading in the left hand margin.

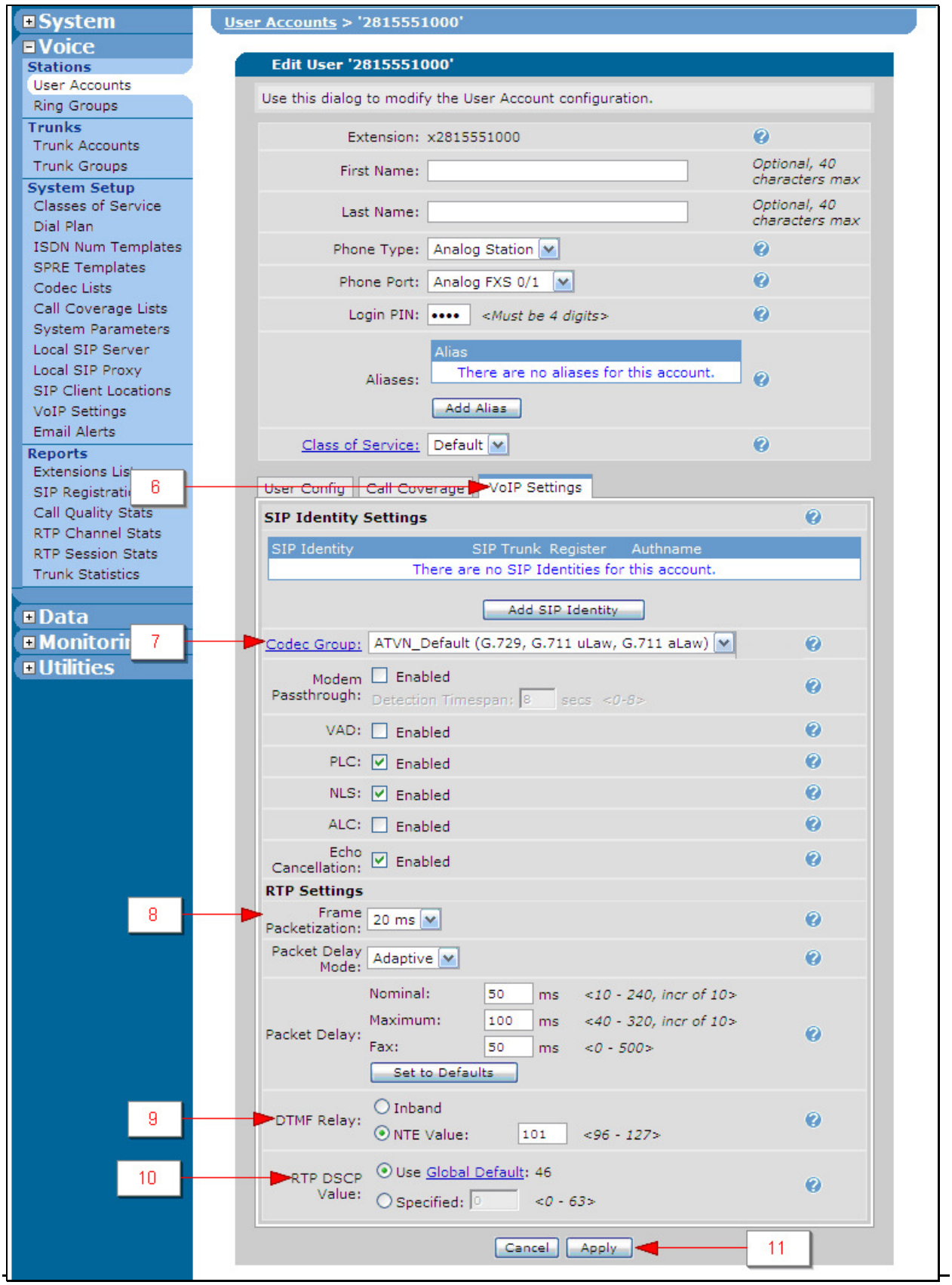


2. Enter the phone number of the user in the **Extension** textbox.
3. Select the **Analog Station** option in the **Phone Type** dropdown box.

4. Select the **Analog FXS 0/x** port being assigned to the user in the **Phone Port** dropdown box.
5. Click the **Apply** button.



6. Click the **VoIP Settings** tab.
7. Select the **ATVN_Default** option from the **Codec Group** dropdown box.
8. Select the **20 ms** option from the **Frame Packetization** dropdown box.
9. Select the **NTE Value** radial button in the **DTMF Relay** list and enter a value of **101**.
10. Select the **Use Default Value: 46** radial button in the **RTP DSCP Value** list.
11. Click the **Apply** button.



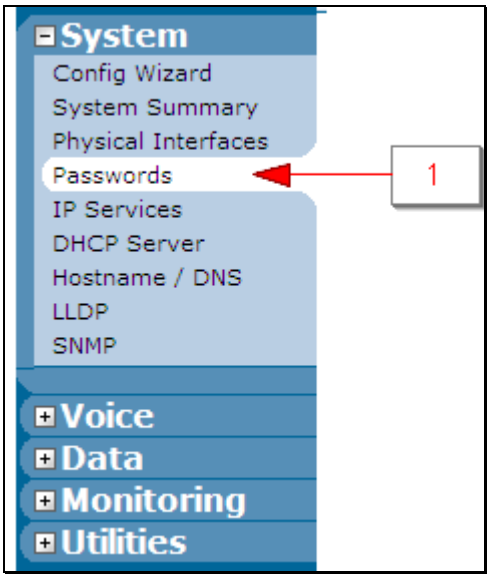
6. Administrative Tasks

The following sub-sections will detail procedures that can be used to administer the Total Access IADs. These procedures include adding a new user, editing an existing user's password, allowing admin access via the WAN interface, saving the current configuration of the IAD, downloading the current configuration of the IAD to an external system, restoring the IAD from a configuration stored on an external system, upgrading the IAD firmware, and deleting stored IAD firmware.

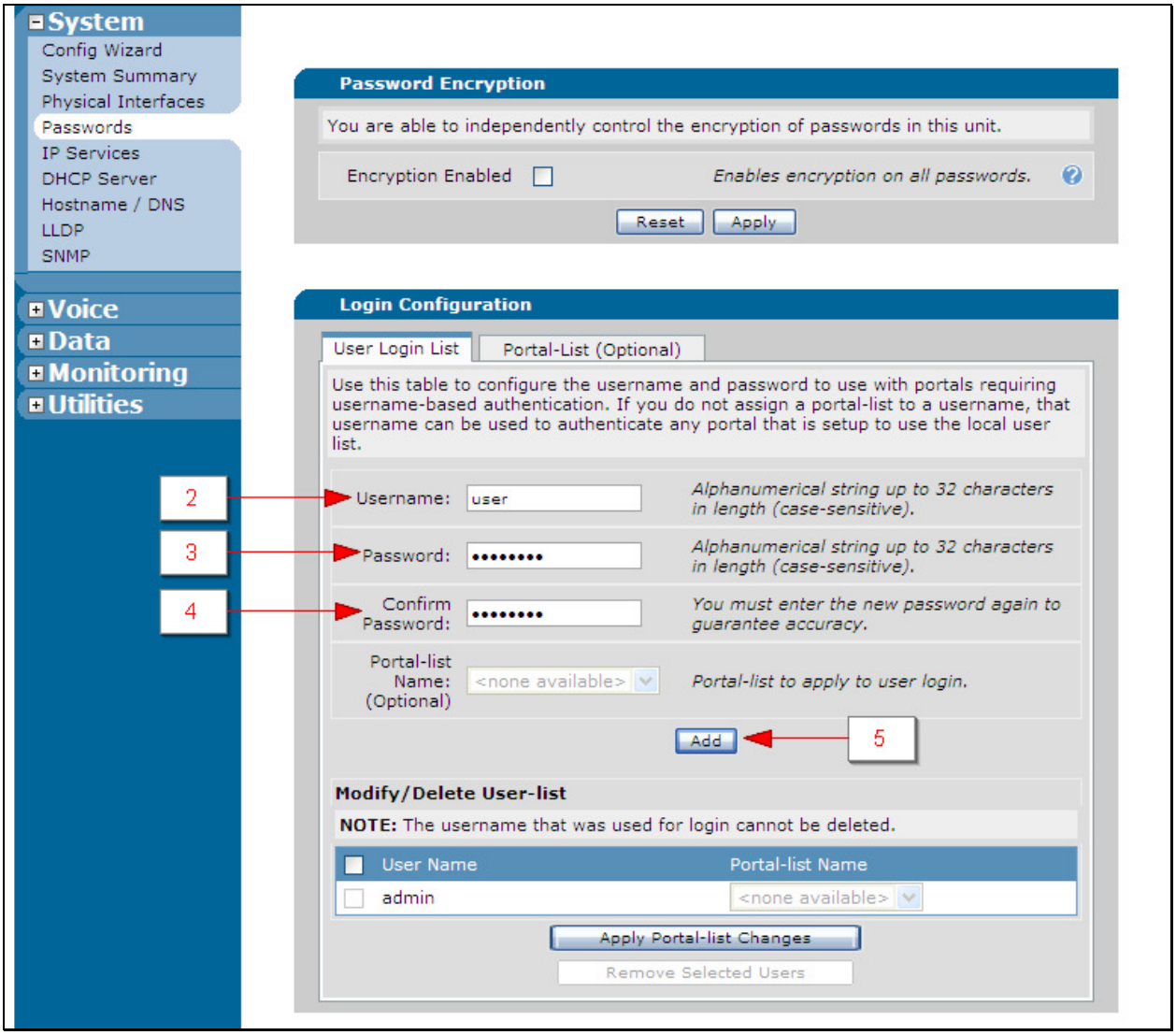
6.1 Adding a New User

Complete the following steps to add a new user to the IAD.

1. Select the **Passwords** link located under the **System** heading in the left hand margin.



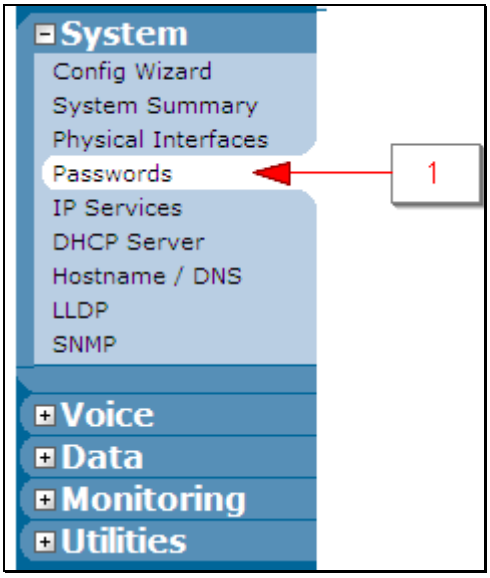
2. Enter the name of the new user in the **Username** textbox.
3. Enter the password assigned to the new user in the **Password** textbox.
4. Re-enter the password assigned to the new user in the **Confirm Password** textbox.
5. Click the **Add** button.



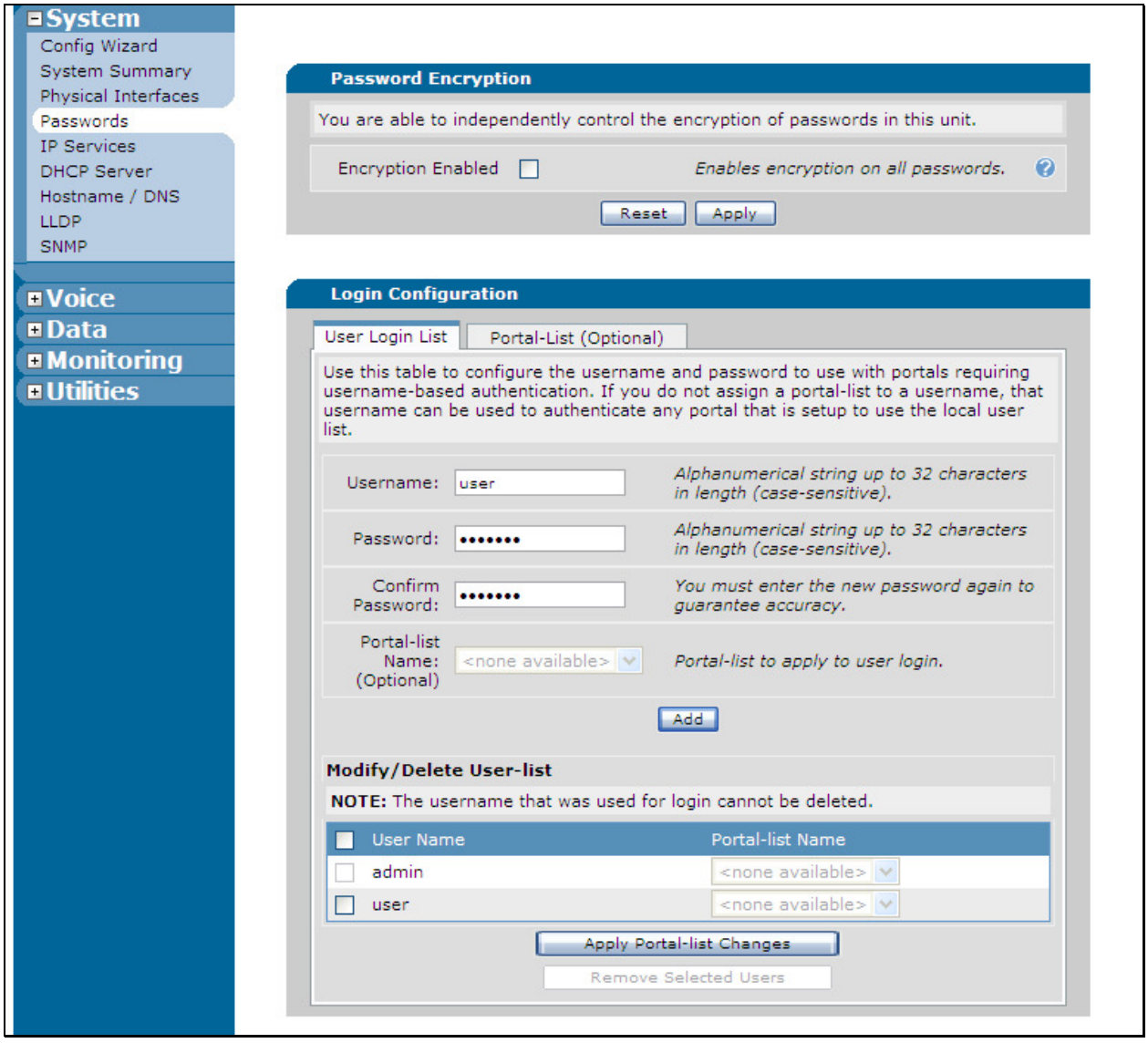
6.2 Editing an Existing User

Complete the following steps to edit the password of an existing user on the IAD.

1. Select the **Passwords** link located under the **System** heading in the left hand margin.



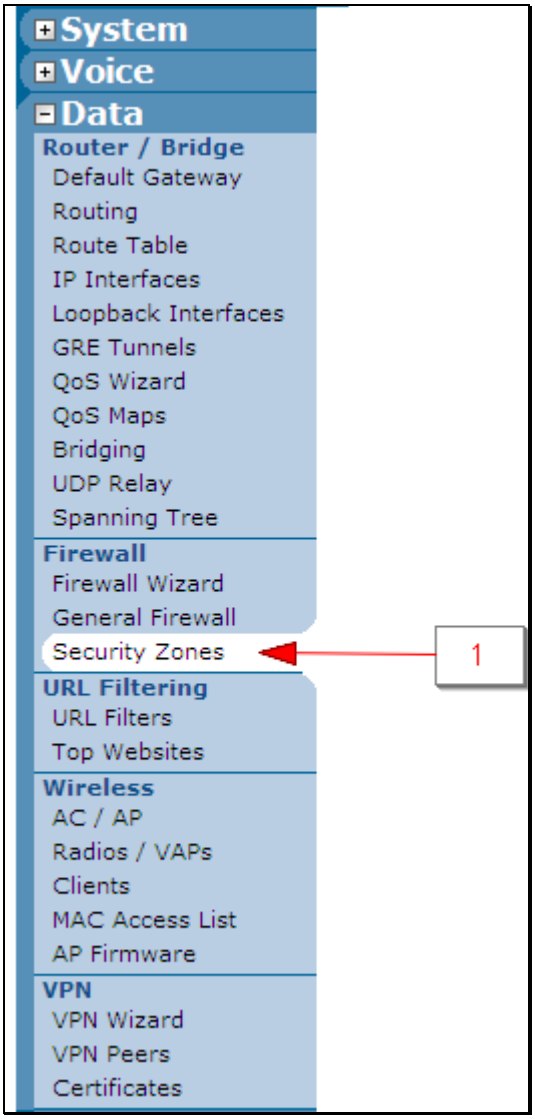
2. Enter the name of the user being edited in the **Username** textbox.
3. Enter the new password being assigned to the existing user in the **Password** textbox.
4. Re-enter the new password being assigned to the existing user in the **Confirm Password** textbox.
5. Click the **Add** button.



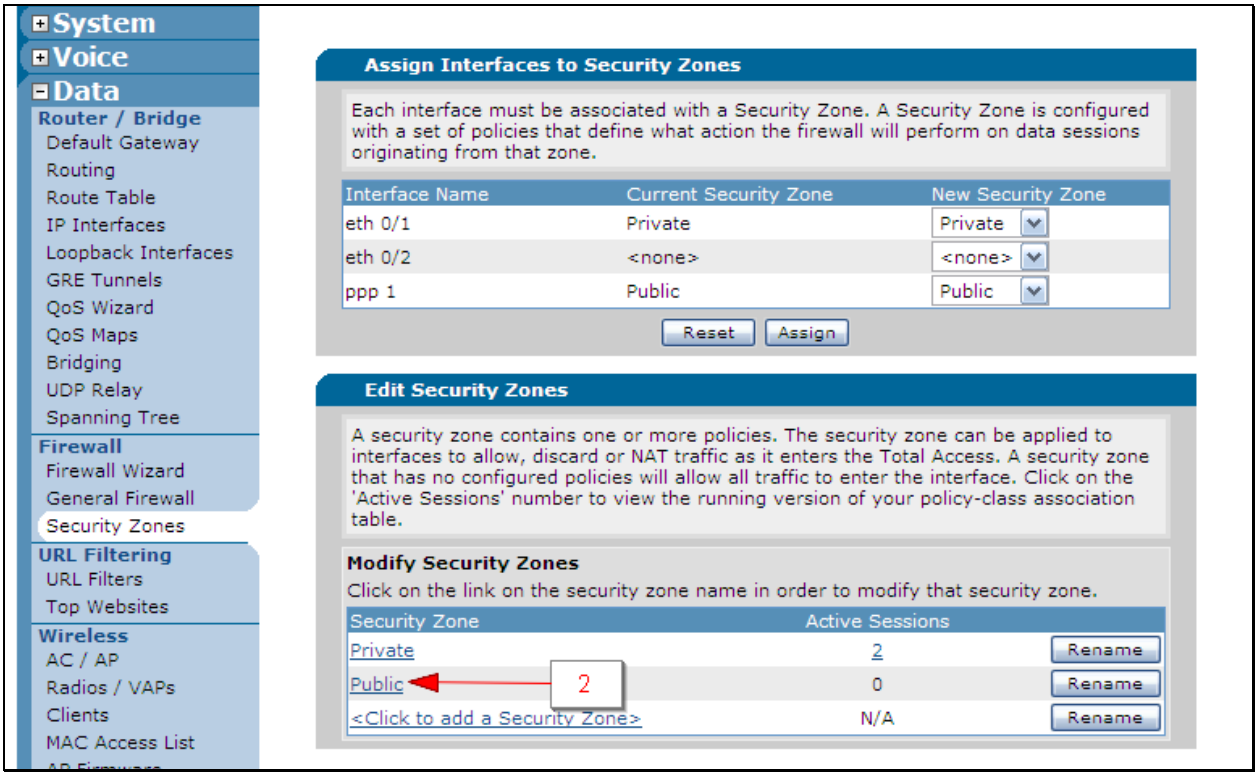
6.3 Allowing Admin Access via the WAN

Complete the following steps to allow user logins via the WAN interface for the purposes of administering the IAD.

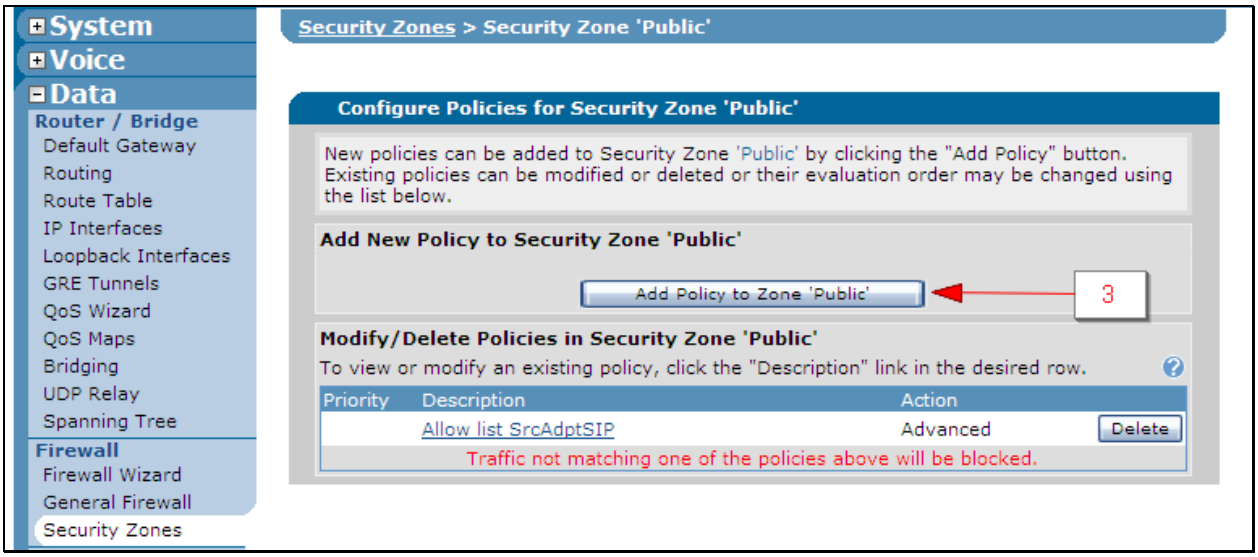
1. Select the **Security Zones** link located under the **Data** heading in the left hand margin.



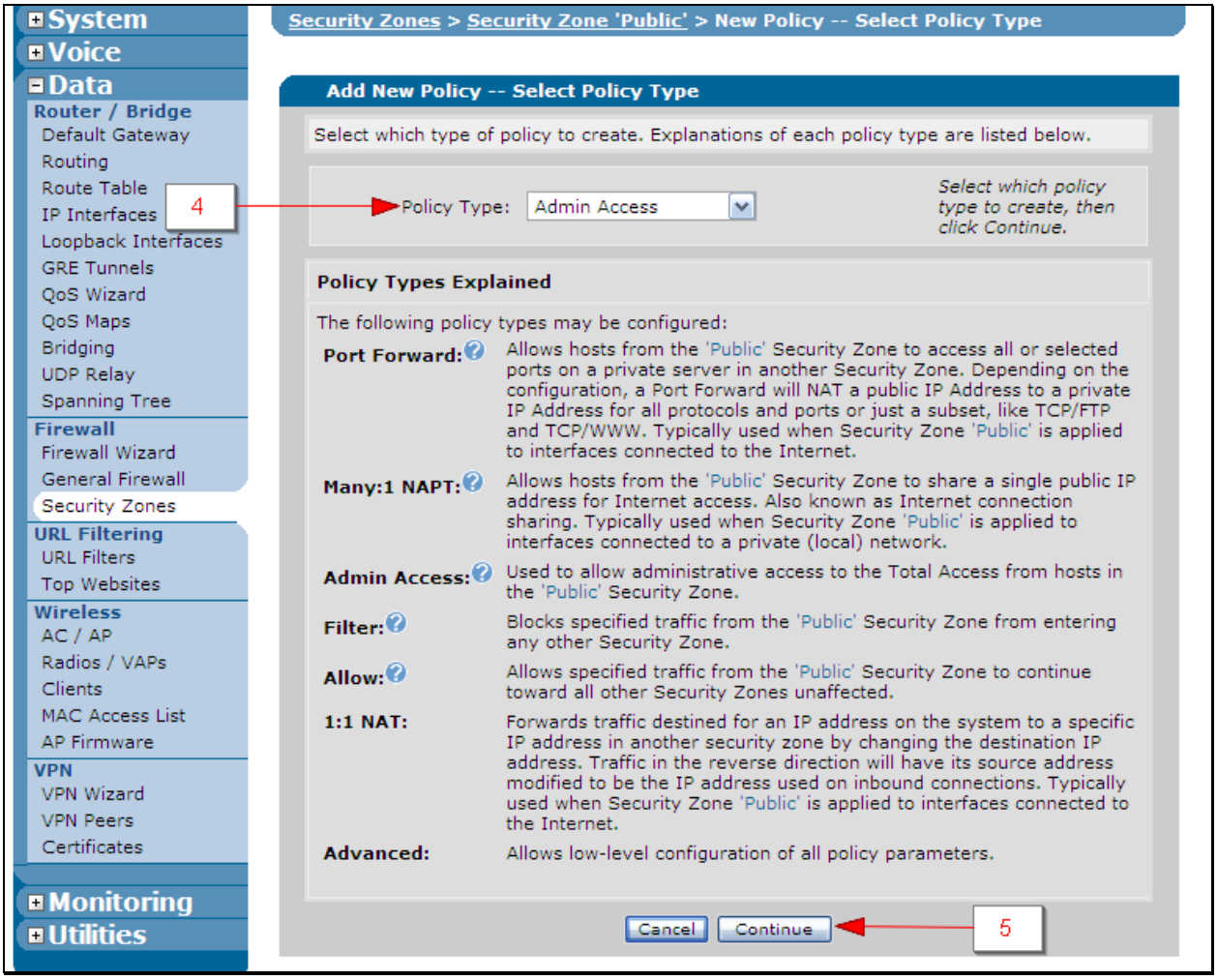
2. Click the **Public** link under the **Security Zone** column header.



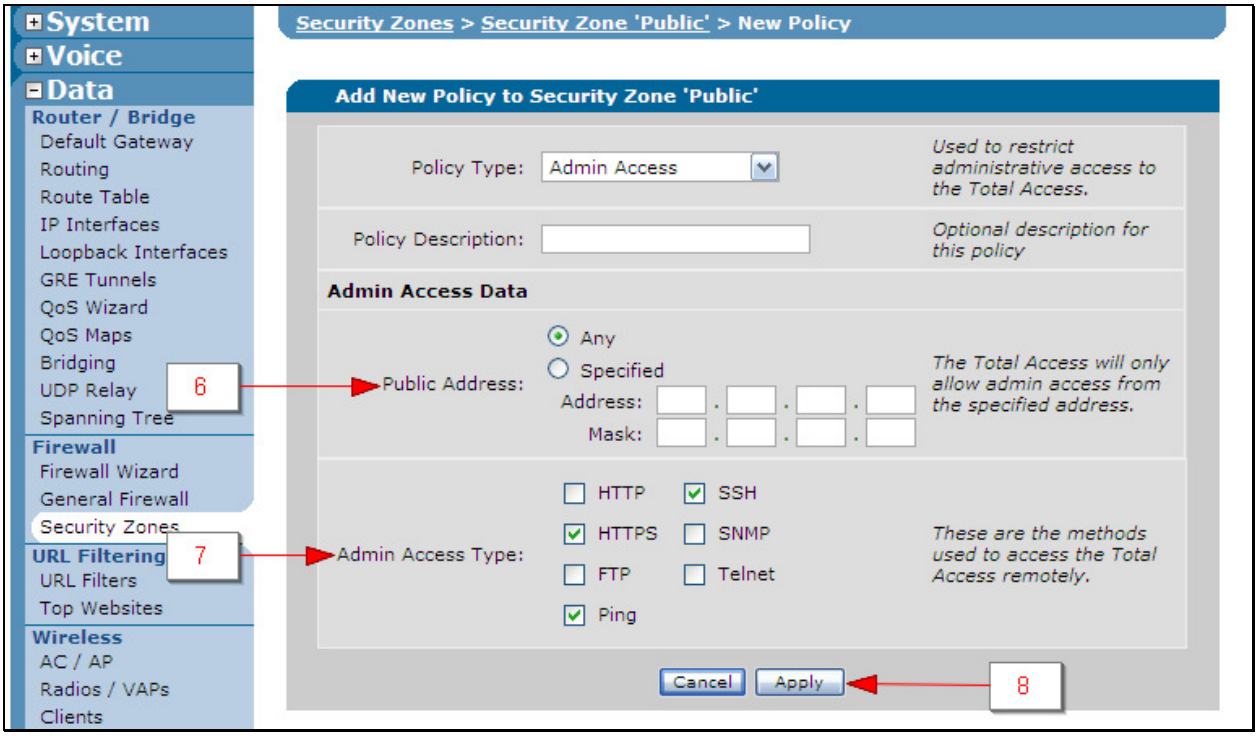
3. Click the **Add Policy to Zone 'Public'** button.



4. Select the **Admin Access** policy from the **Policy Type** dropdown box.
5. Click the **Continue** button.



6. If applicable, enter a specific **Address** and **Netmask** to limit access to certain addresses.
7. Select from the **Admin Access Type** checkboxes the types of access that will be allowed.
8. Click the **Apply** button.

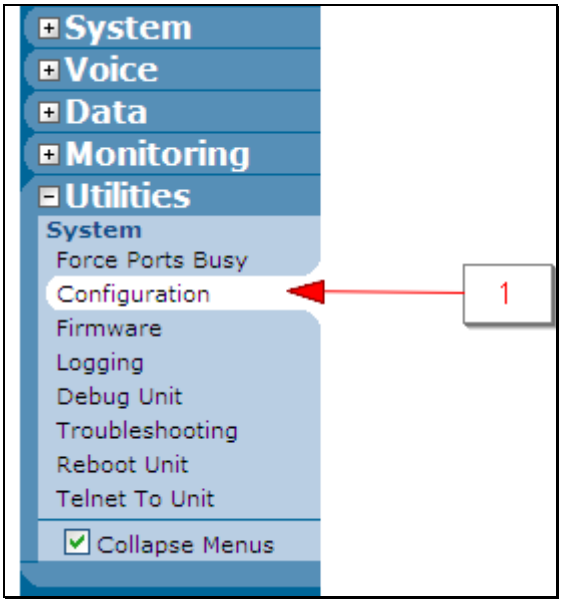


6.4 Saving the IAD Configuration

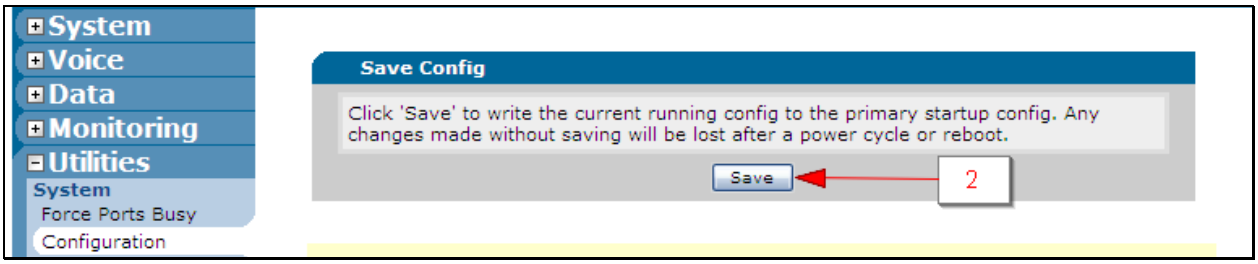
Complete the following steps to save the current IAD configuration into flash memory.

***WARNING!!!** The following steps must be performed before rebooting the IAD if changes to the configuration have been made since the last reboot. Failure to do so will result in loss of these configuration changes once the IAD has rebooted.*

1. Select the **Configuration** link located under the **Utilities** heading in the left hand margin.



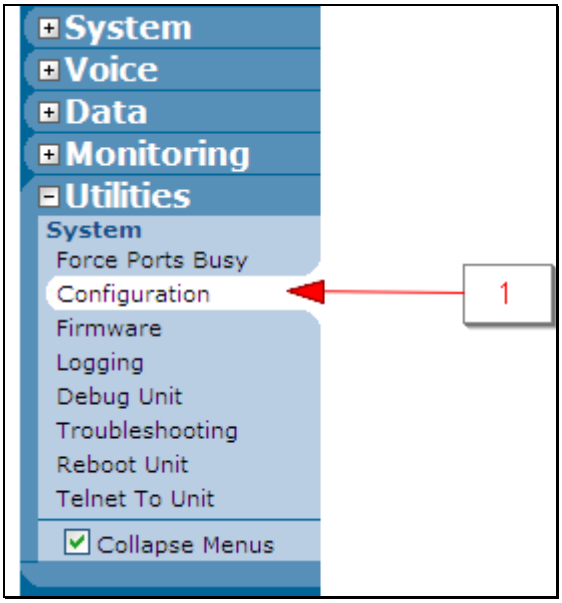
2. Click the **Save** button.



6.5 Downloading the IAD Configuration

Complete the following steps to download and store the IAD configuration to an external system.

1. Select the **Configuration** link located under the **Utilities** heading in the left hand margin.



2. Click the **Download** button.

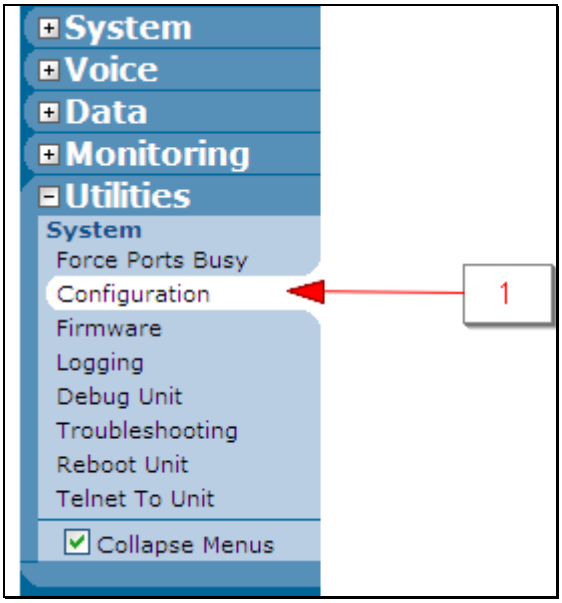
3. When prompted, select a location to store the file.

6.6 Restoring the IAD Configuration

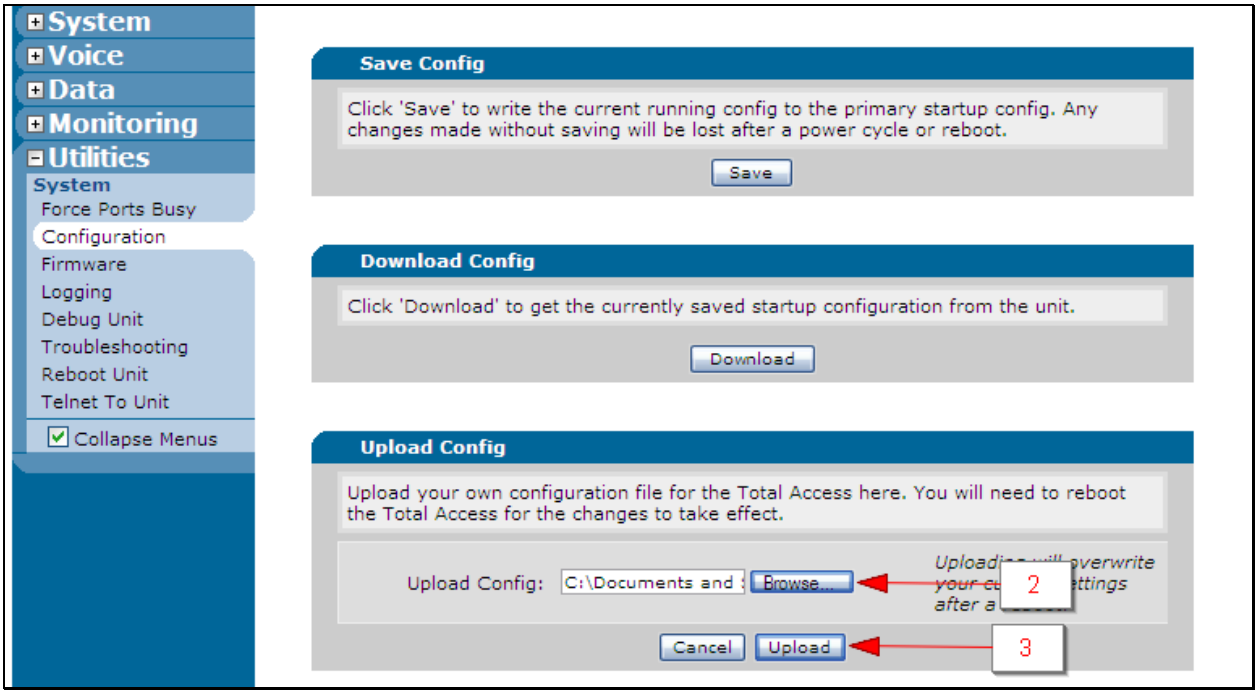
Complete the following steps to restore the IAD to a previous configuration using a configuration file stored on a local computer.

> ***WARNING!!!*** *Any changes made to the IAD that are not in the stored configuration file will be lost upon application of the file.*

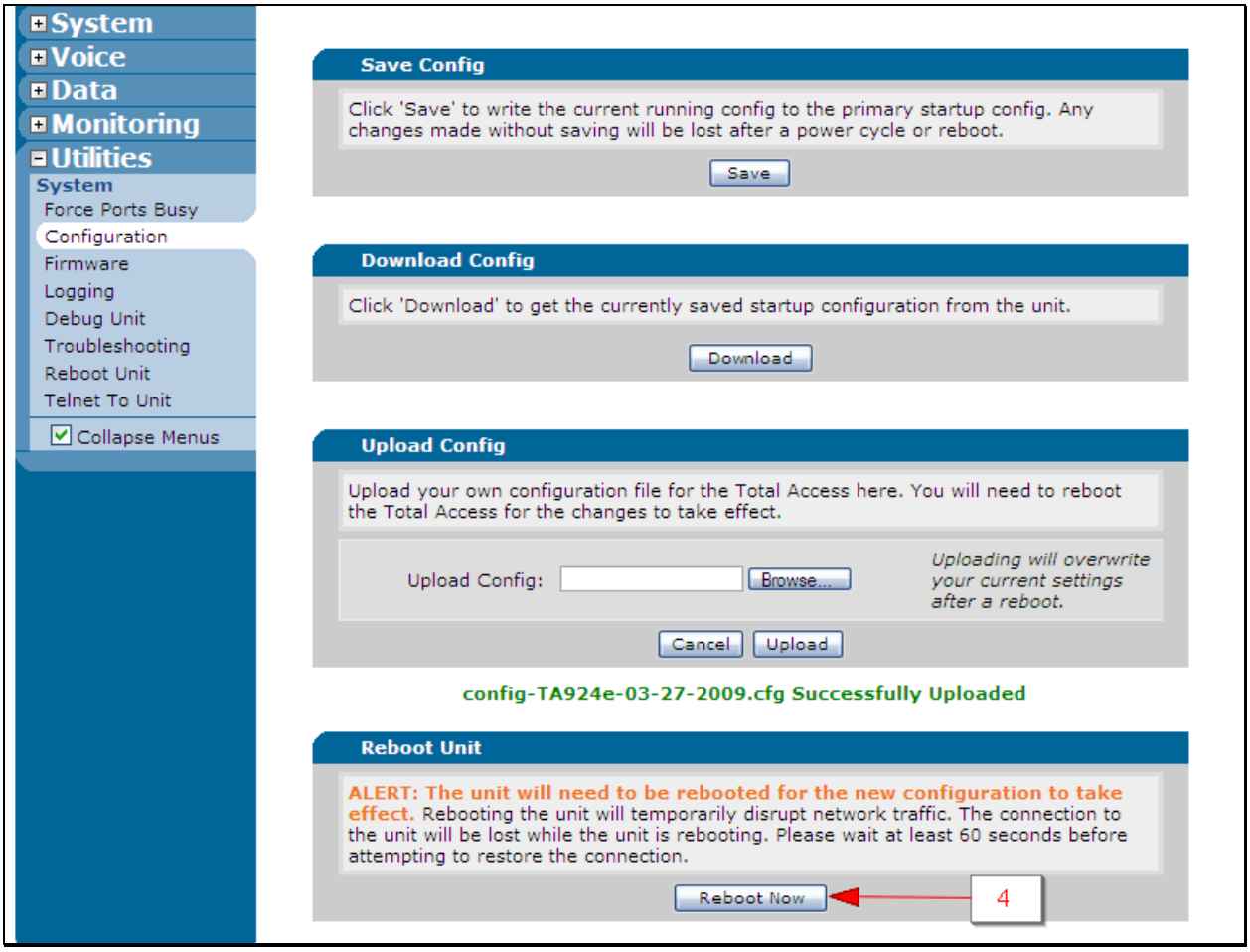
1. Select the **Configuration** link located under the **Utilities** heading in the left hand margin.



2. Click the **Browse** button and select from the local file system the configuration file being restored.
3. Click the **Upload** button.



4. Once the file upload has completed, click the **Reboot** button to restart the box and apply the configuration.

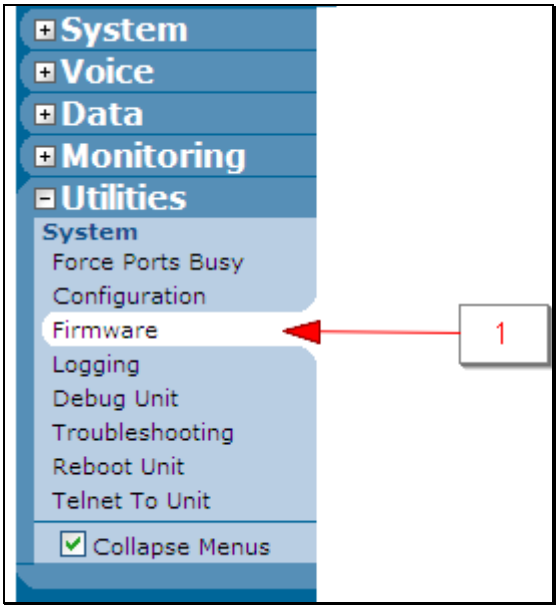


6.7 Upgrading the IAD Firmware

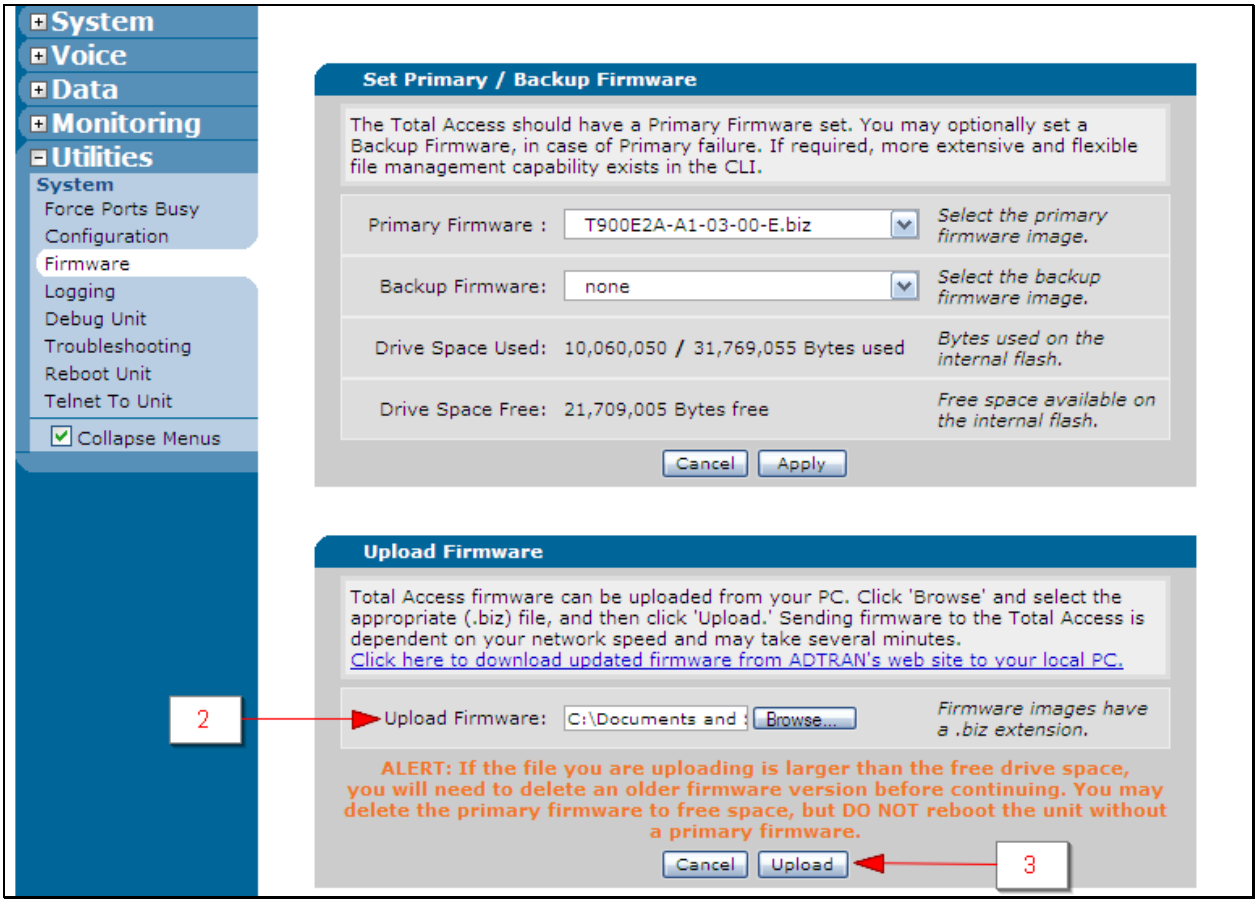
Complete the following steps to upgrade the current version of the IAD firmware.

NOTE: If the IAD does not have enough disk space to store the new firmware, complete the steps in the "Deleting Stored IAD Firmware" section before attempting the update.

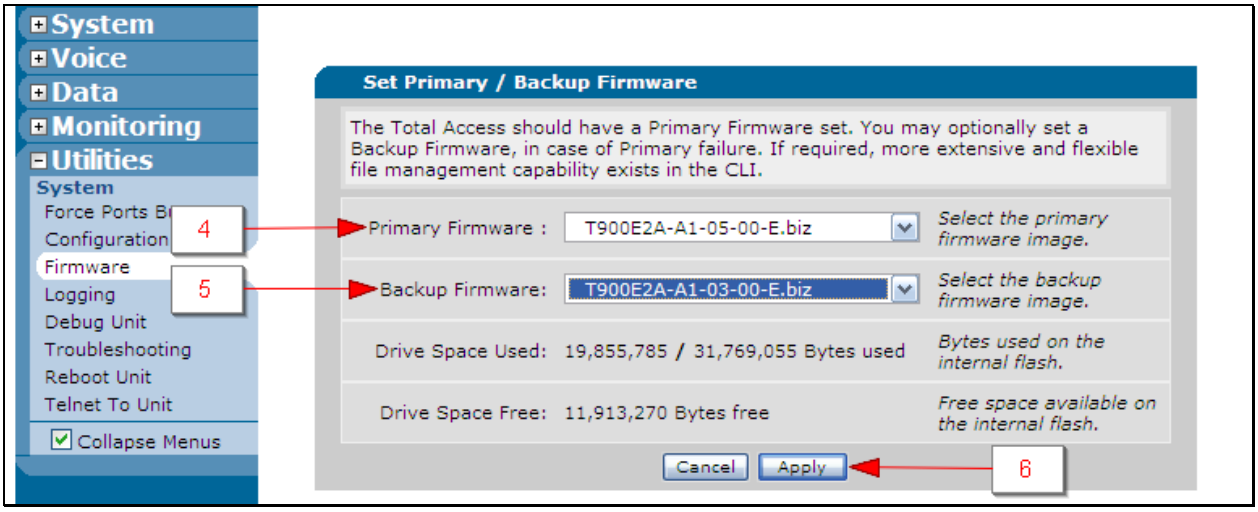
1. Select the **Firmware** link located under the **Utilities** heading in the left hand margin.



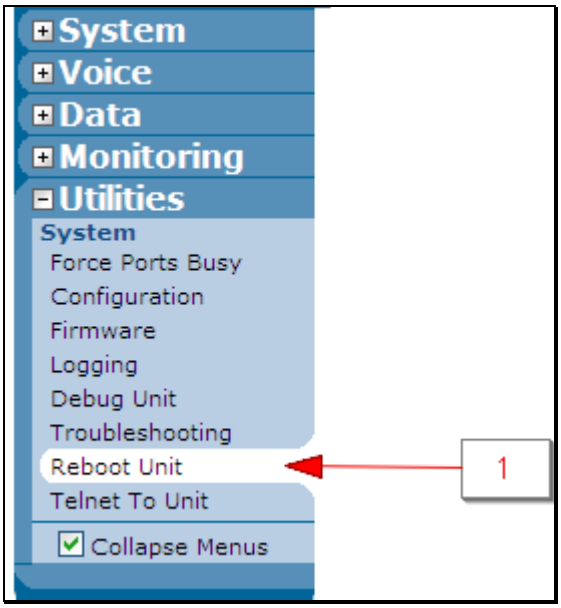
2. Click the **Browse** button and select from the local file system the firmware file being loaded.
3. Click the **Upload** button.



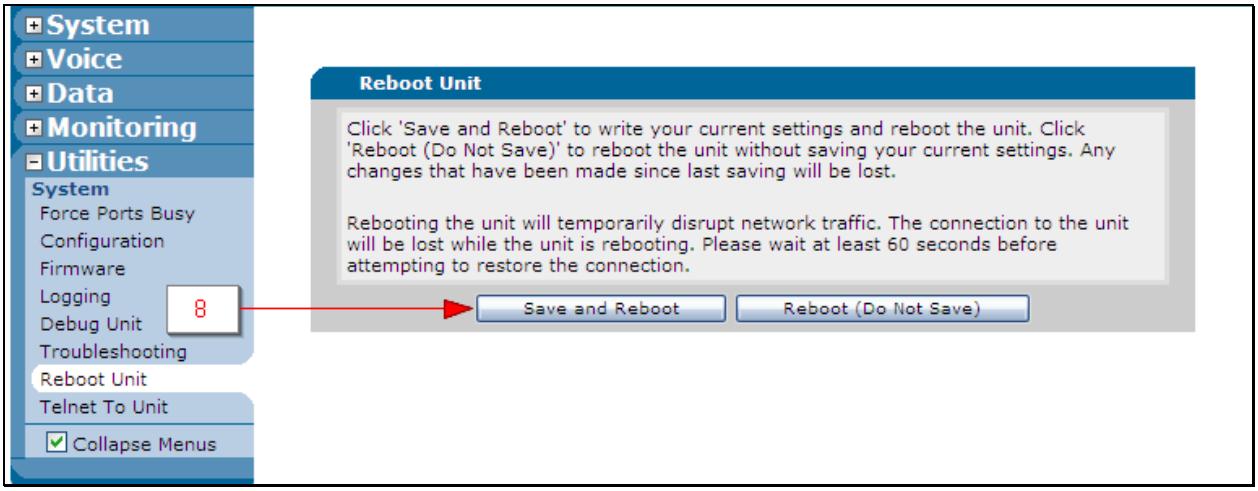
4. Select the newly uploaded firmware in the **Primary Firmware** dropdown box.
5. Select the previous primary firmware in the **Backup Firmware** dropdown box.
6. Click the **Apply** button.



7. Select the **Reboot Unit** link located under the **Utilities** heading in the left hand margin.



8. Click the **Save and Reboot** button.

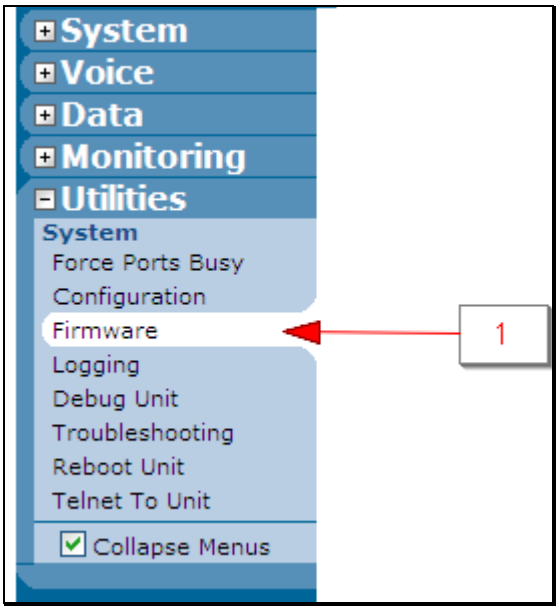


6.8 Deleting Stored IAD Firmware

Complete the following steps to delete an IAD firmware file in order to free up disk space.

WARNING!!! *It is possible to delete the primary firmware, but not recommended because of the adverse affects it will have on the IAD if rebooted. Because of this, BroadSoft BroadCloud recommends that only the secondary firmware be deleted using the steps that follow.*

1. Select the **Firmware** link located under the **Utilities** heading in the left hand margin.



2. Select the firmware from the **Delete Firmware** dropdown.
3. Click the **Delete** button.

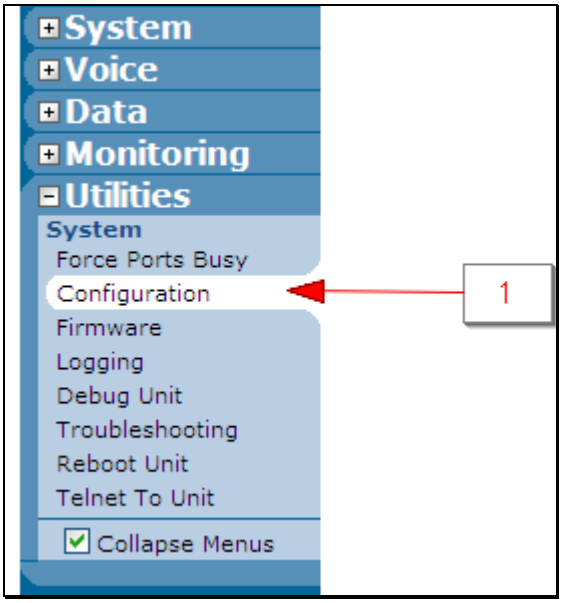
Appendix A - TA900 Ethernet WAN Configuration

Some deployments may require that the single Ethernet port on the TA900 be used as a WAN port. This configuration effectively removes all router functionality on the TA900 and converts it to a client of the network on which it resides. The following steps will detail how this configuration is applied to transform the TA900 from a router to a network client.

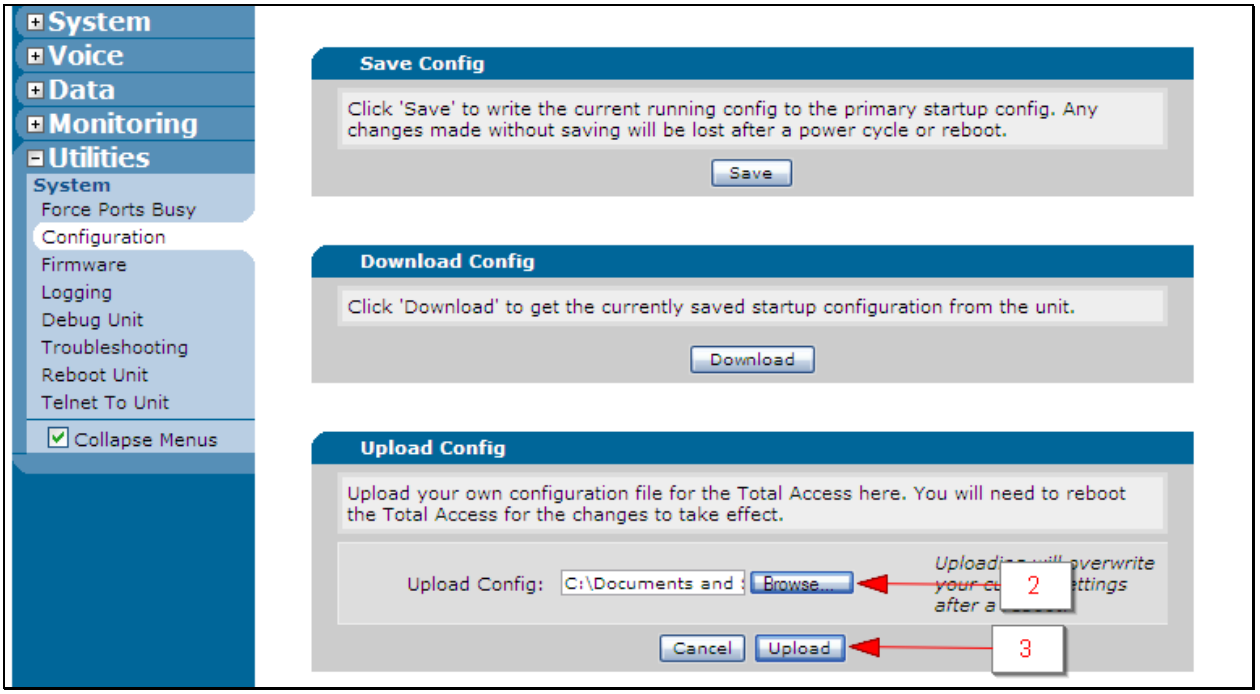
NOTE: The following section assumes that the TA900 is currently configured with the default router configuration and the TA900 is being accessed via a PC connected to the ETH 0/1 LAN port.

NOTE: The steps outlined here only apply to the TA900 family of IADs. The TA900e IADs can be left in the default router configuration with no adverse affects on their ability to provide voice service.

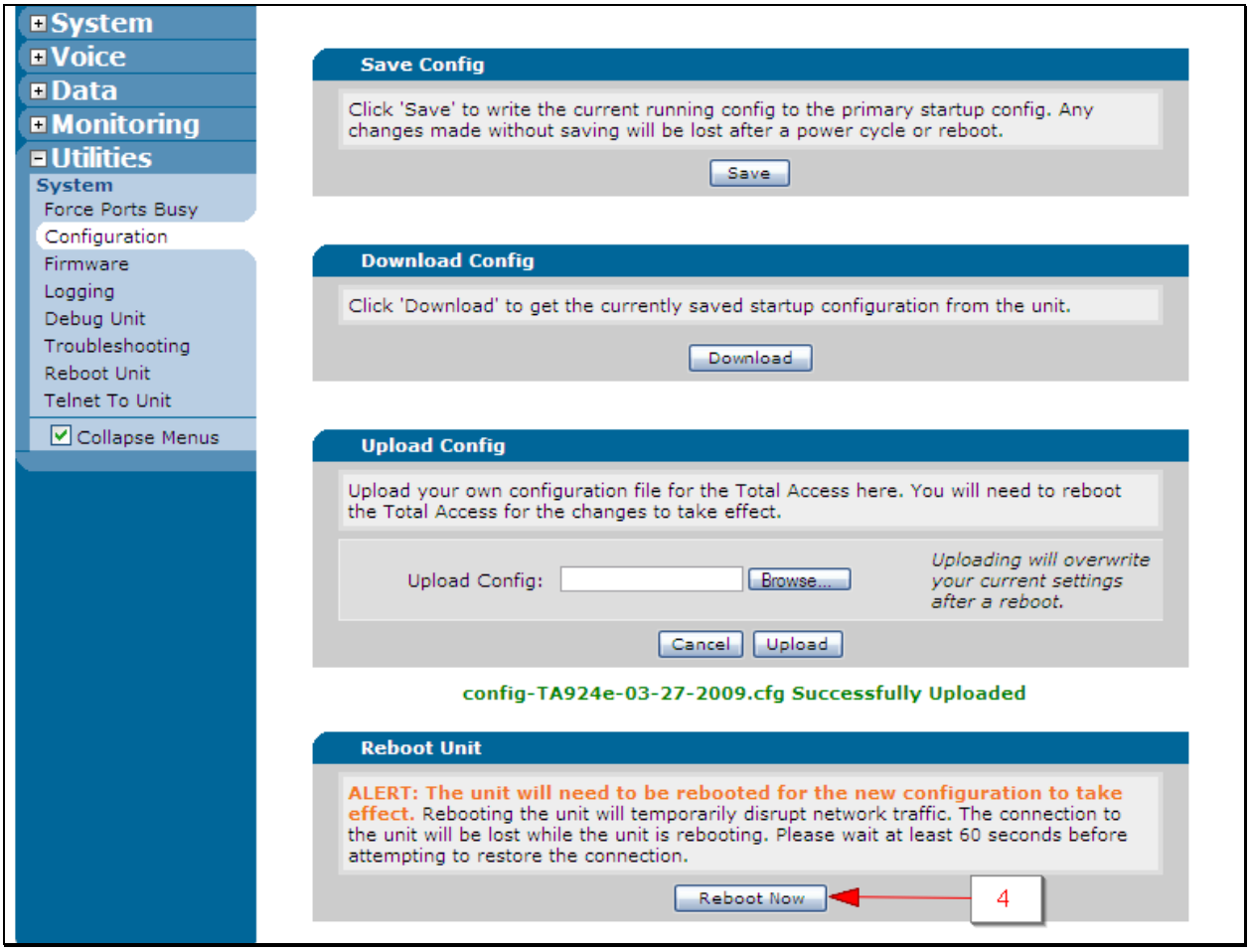
1. Select the **Configuration** link located under the **Utilities** heading in the left hand margin.



2. Click the **Browse** button and select from the local file system the appropriate default Ethernet WAN configuration provided by BroadSoft BroadCloud.
3. Click the **Upload** button.



4. Once the file upload has completed, click the **Reboot** button to restart the box and apply the configuration.



5. Disconnect the PC from the ETH 0/1 port.
6. Connect the ETH 0/1 port to the existing network at which time the TA900 will use DHCP to acquire an IP address from the network.
7. Reference the DCHP server on the network to learn the IP address that was assigned to the TA900.
8. From a PC on the same network as the TA900, open an internet browser, insert the IP address in the URL box, press return, and log into the TA900 using the default user name admin and the default password password.
9. Complete the steps defined in the Mandatory Voice Configuration section of this document to finalize the initial turn-up of the TA900 for use in the BroadSoft BroadCloud VoIP Network.

Appendix B - T1 Cable Pin Outs

Connecting the Total Access T1 Interface requires the use of a cable terminated with RJ45 connectors on both ends. The pin out of the cable will need to be either straight through T1 or crossover T1 cable. Depending on the CPE one of the following pin outs must be used.

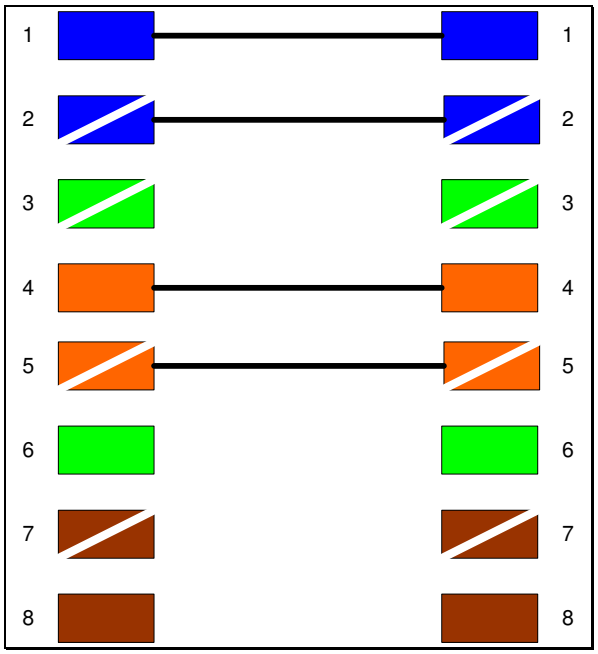


Figure 1: T1 Straight Cable Pin Out

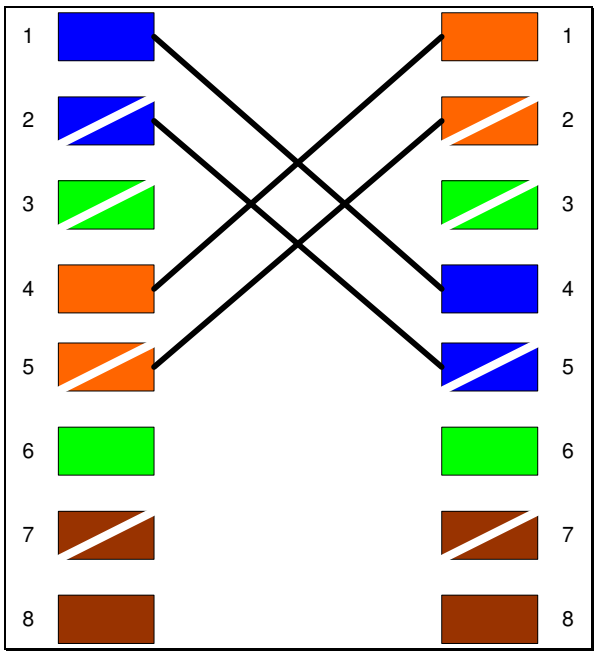


Figure 2: T1 Crossover Cable Pin Out

7.