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ADTRAN

Configuration Guide

Independent T1 Timing

This configuration guide describes the Independent T1 Timing feature available on certain NetVanta units. This guide explains the differences in configuration settings on all the NetVanta platforms on which the feature is available. It also contains specific configuration examples on those platforms using the ADTRAN Operating System (AOS) command line interface (CLI) and the Graphical User Interface (GUI).

This guide consists of the following sections:

Overview

In order to facilitate high-speed voice and data networks, T1 lines require a timing source to ensure that packets are delivered and assembled properly. Independent T1 timing is an AOS feature that allows multiple timing sources on different interfaces within a single NetVanta unit. Different NetVanta platforms vary in the number of timing sources that can be used for voice and data T1 interfaces, as well as in the specific commands required for configuration.

Hardware and Software Requirements and Limitations

The Independent T1 Timing feature is available on the NetVanta 6240 and 644.

The NetVanta 644 does not support data T1s.

The NetVanta 6240 can have a single voice timing domain and up to four independent data timing sources.

Configuring Independent T1 Timing on the NetVanta 644 using the CLI

The NetVanta 644 can have one or two timing domains. Interfaces T1 0/1 and T1 0/2 can be timed independently from T1 0/3 and T1 0/4, or all four interfaces can be timed via a single timing domain. If all four T1 interfaces are not timed from timing domain 1, then both T1 0/3 and T1 0/4 must be timed from domain 2.

Example 1: NetVanta 644 with Two Timing Domains

The following example illustrates how to set up two timing domains on the NetVanta 644.

Figure 1 on page 3 shows a NetVanta 644 connected to four separate private branch exchanges (PBXs). PBX 1 and 4 are both connected to the public switched telephone network (PSTN). It is possible to obtain timing from either or both of these PBXs. In this example, we will configure the NetVanta 644 to obtain timing from the PBX connected to interface T1 0/1 for the first timing domain and from the PBX connected to interface T1 0/4 for the second timing domain.

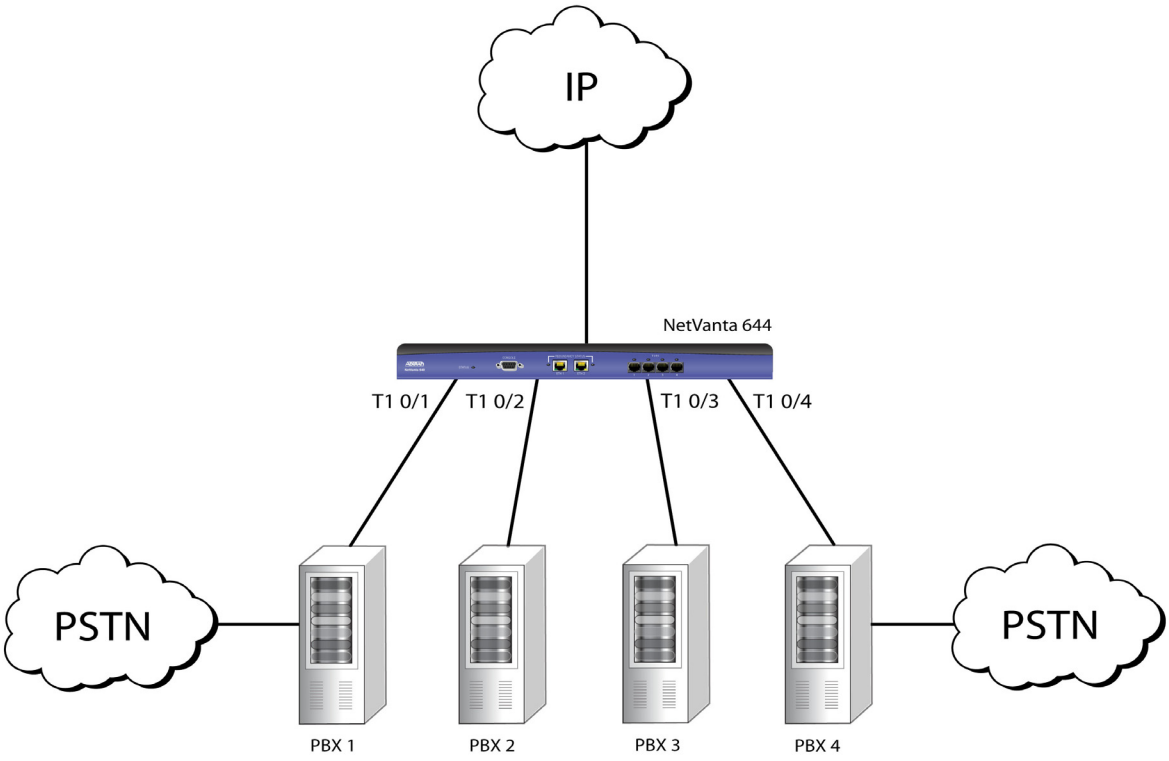

Figure 1. NetVanta 644 with Two Timing Domains

To configure the NetVanta 644 using the CLI, follow these steps:

1. 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 IP address (**10.10.10.1**), use the configured IP address.*

2. 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.*

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

   >enable

4. Enter your Enable mode password at the prompt.

5. Enter the Global Configuration mode as follows:

   #configure terminal

6. Enter the configuration mode for interface **t1 0/1**:

   (config)**#interface t1 0/1**

7. Enter the desired clock source, **line** in this scenario, for the interface using the **clock source** command:

   (config-t1 0/1)**#clock source line**

8. Set interface **t1 0/1** as the **primary** timing source for the first timing domain using the **system-timing primary** command:

   (config-t1 0/1)**#system-timing primary**

9. Enter the **no shutdown** command to activate the interface:

   (config-t1 0/1)**#no shutdown**

10. Enter the **exit** command to leave the current interface and return to configuration mode:

    (config-t1 0/1)**#exit**

11. Enter the configuration mode for interface **t1 0/4**:

    (config)**#interface t1 0/4**

12. Enter the desired clock source, **line** in this scenario, for the interface using the **clock source** command:

    (config-t1 0/4)**#clock source line**

13. Move interface **t1 0/4** to timing domain **2** using the **timing-domain** command:

    (config-t1 0/4)**#timing-domain 2**

14. Set interface **t1 0/4** as the **primary** timing source for timing domain 2 using the **system-timing primary** command:

    (config-t1 0/4)**#system-timing primary**

15. Enter the **no shutdown** command to activate the interface:

    (config-t1 0/4)**#no shutdown**

16. Enter the **exit** command to leave the current interface and return to Global Configuration mode:

    (config-t1 0/4)**#exit**

17. Enter the configuration mode for interface **t1 0/3**:

    (config)**#interface t1 0/3**

18. Move interface **t1 0/3** to timing domain **2** using the **timing-domain** command:

    (config-t1 0/3)**#timing-domain 2**

The resulting configuration will look like this:

```
interface t1 0/1
  clock source line
  timing-domain 1
  system-timing primary
  no shutdown
!
interface t1 0/2
  timing-domain 1
```



```
  no shutdown
!
interface t1 0/3
  timing-domain 2
  no shutdown
!
interface t1 0/4
  clock source line
  timing-domain 2
  system-timing primary
  no shutdown
```

By default all interfaces are set to internal timing, so the remaining interfaces will receive their timing from the primary timing sources set in their respective timing domains without entering any further commands.

Example 2: NetVanta 644 Using Internal Clock Source

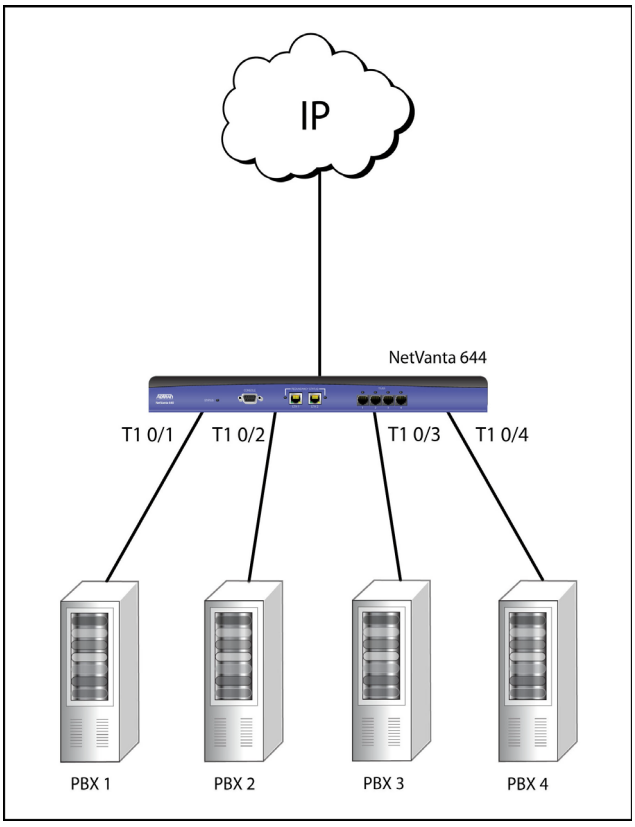

Figure 2. NetVanta 644 Using Internal Clock Source

In Configuration Example 2, all the PBXs are taking their timing from the NetVanta 644. The resulting configuration looks like this:

```
interface t1 0/1
     clock source internal
     timing-domain 1
!
interface t1 0/2
     clock source internal
     timing-domain 1
!
interface t1 0/3
     clock source internal
     timing-domain 1
!
interface t1 0/4
     clock source internal
     timing-domain 1
```


Example 3: Timing provided from PSTN Through PBX on Interface T1 0/1

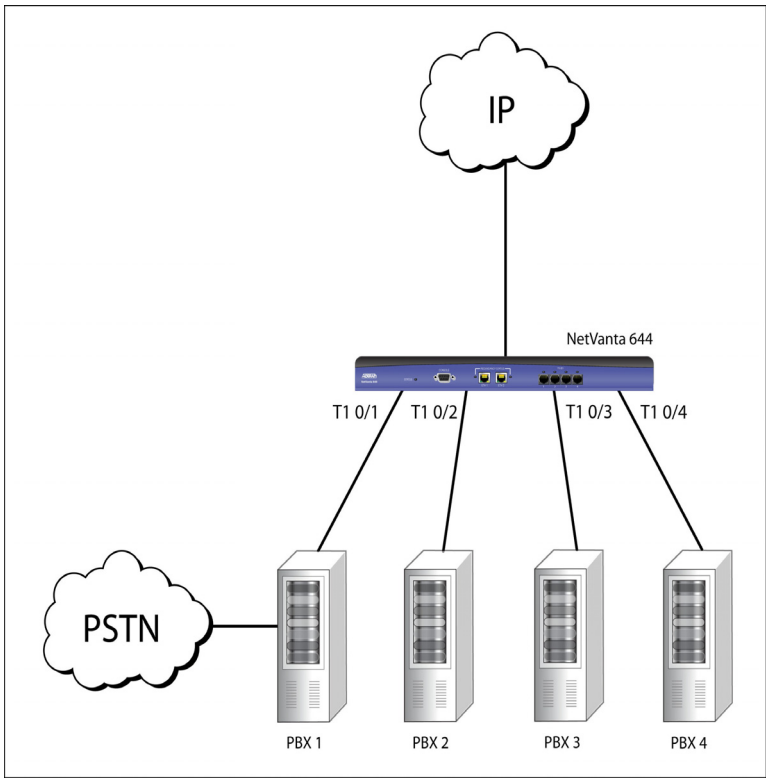

Figure 3. Timing Provided from PSTN Through PBX on Interface T1 0/1

In Configuration Example 3, PBX 1 is taking its timing from the PSTN and providing it to the NetVanta 644. PBXs 2, 3, and 4 are taking their timing from the NetVanta 644. The resulting configuration will look like this:

```
interface t1 0/1
  clock source line
  system-timing primary
  timing-domain 1
!
interface t1 0/2
  clock source internal
  timing-domain 1
!
interface t1 0/3
  clock source internal
  timing-domain 1
!
interface t1 0/4
  clock source internal
  timing-domain 1
```


Example 4: All Interfaces Provided Timing by PSTN

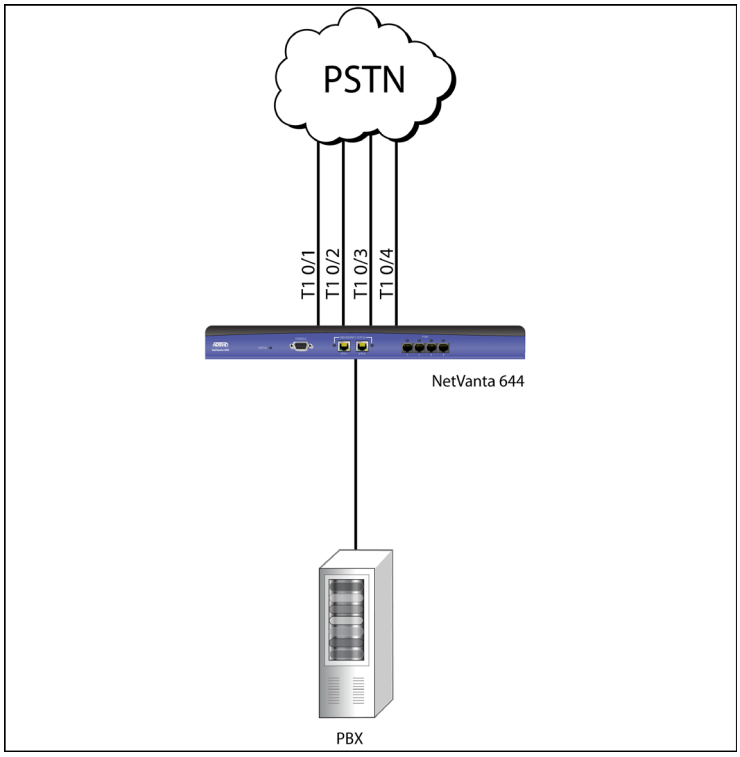

Figure 4. All Interfaces Provided Timing by PSTN

In Configuration Example 4, all four T1s from the PSTN are providing the same timing to the NetVanta 644. The resulting configuration will look like this:

```
interface t1 0/1
  clock source line
  system-timing primary
  timing-domain 1
!
interface t1 0/2
  clock source line
  system-timing secondary
  timing-domain 1
!
interface t1 0/3
  clock source line
  system-timing secondary
  timing-domain 1
!
interface t1 0/4
  clock source line
  system-timing secondary
  timing-domain 1
```


Example 5: Timing Source Provided by Two PSTNs

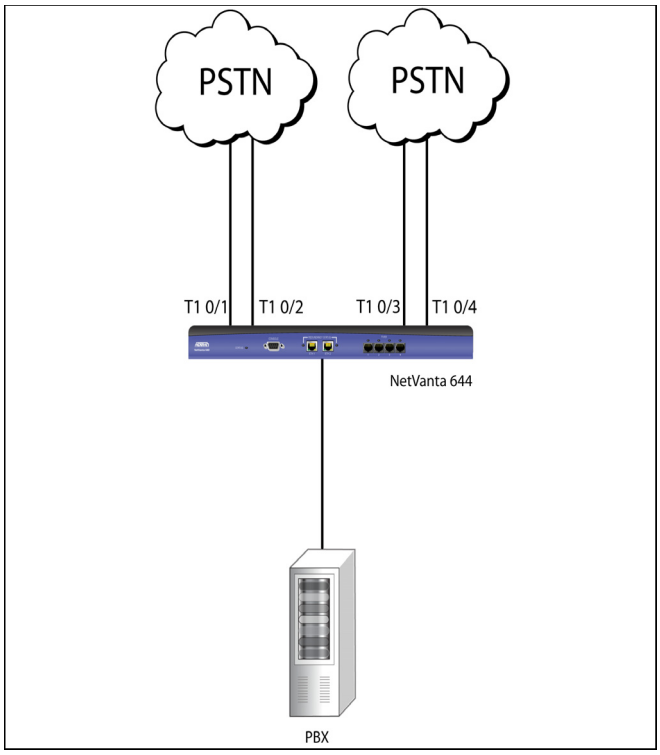

Figure 5. Timing Source Provided by Two PSTNs

In Configuration Example 5, T1 0/1 and T1 0/2 from the PSTN are providing one timing source to the NetVanta 644, and T1 0/3 and T1 0/4 are providing a different timing source. The resulting configuration will look like this:

```
interface t1 0/1
  clock source line
  system-timing primary
  timing-domain 1
!
interface t1 0/2
  clock source line
  system-timing secondary
  timing-domain 1
!
interface t1 0/3
  clock source line
  system-timing primary
  timing-domain 2
!
interface t1 0/4
  clock source line
  system-timing secondary
  timing-domain 2
```


Configuring Independent T1 Timing on the NetVanta 644 using the GUI

> NOTE *The following configuration example is based on Figure 1 on page 3.*

1. Open a new page in your Internet browser.
2. Enter your NetVanta 644's IP address in the browser's address field in the following form: **http://**<*ip address*>, for example:

   http://10.10.10.1
3. Enter your **User name** and **Password** in the appropriate fields and select **OK**.

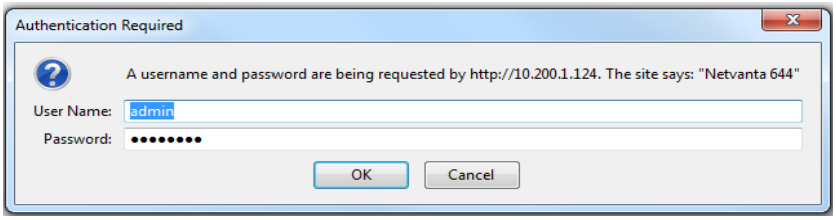

Figure 6. NetVanta 644 Login

> NOTE *The default user name is **admin**, and the default password is **password**.*

4. Select **Physical Interfaces** from the menu on the left. Then select the **t1 0/1** interface hyperlink from the list of physical interfaces.

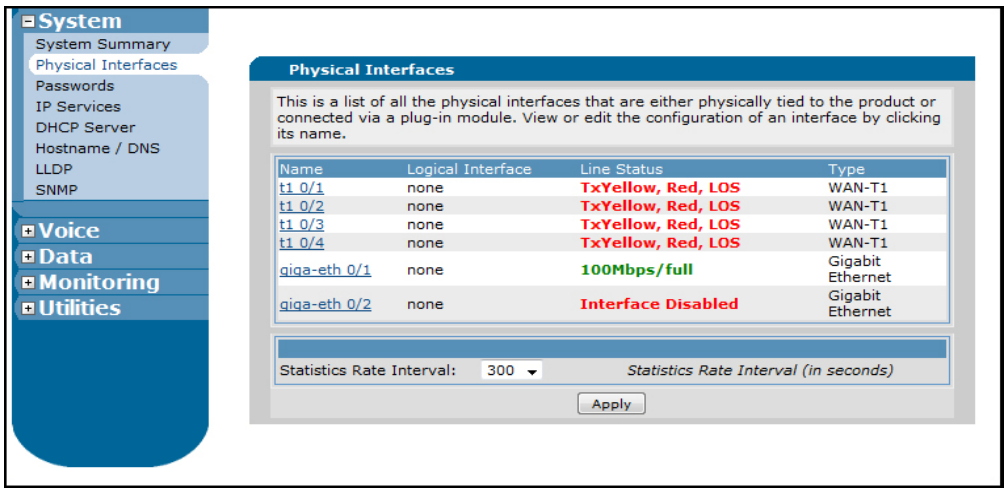

Figure 7. Physical Interfaces Menu

5. Select the **Line** option from the **Clocking** drop-down menu.

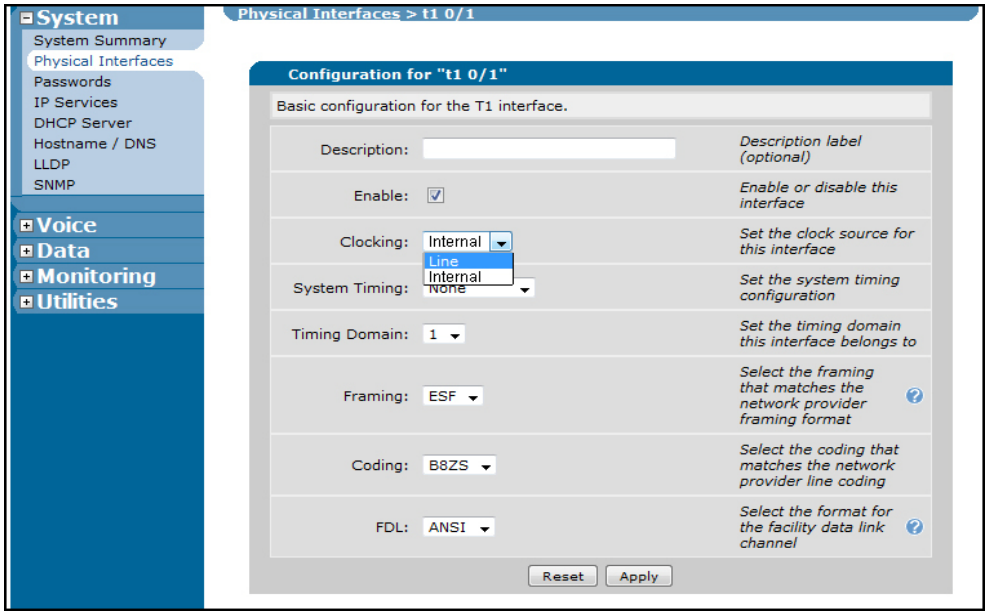

Figure 8. Clocking Drop-Down Menu

6. Select **Primary** from the **System Timing** drop-down menu.

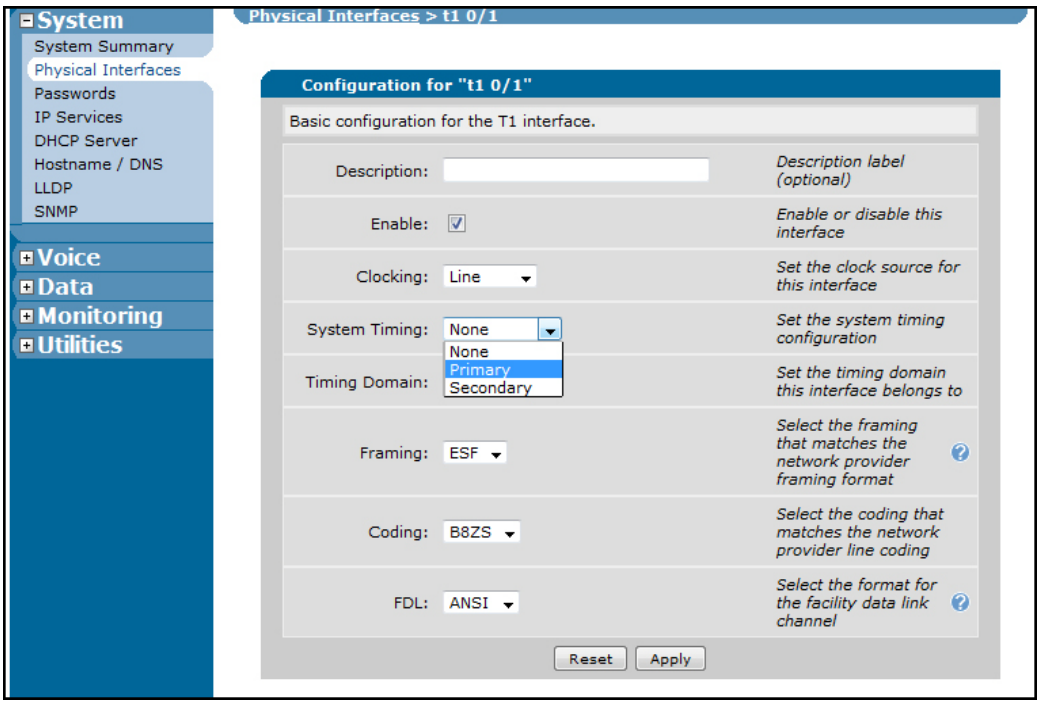

Figure 9. System Timing Drop-Down Menu

7. Ensure that the **Timing Domain** is set to **1**, this is the default setting. Select **Apply** to save the changes.
8. Repeat Steps 4 and 7 using interface **T1 0/3**, selecting timing domain **2** in step 7.
9. Repeat Steps 4 through 7 using interface **T1 0/4**, selecting timing domain **2** in step 7.

Configuring Independent T1 Timing on the NetVanta 6240 Using the CLI

The NetVanta 6240 can have a single voice timing domain and up to four independent data timing sources.

Example 1: One Voice and Two Data Timing Sources

The following example illustrates how to set up the voice timing domain and set up two data T1s with two separate timing sources.

Figure 10 on page 12 shows two data T1s connected to separate ISPs receiving services that provide timing on interfaces T1 0/1 and T1 0/2. Interface T1 0/4 is connected to a PBX receiving timing from the PSTN.

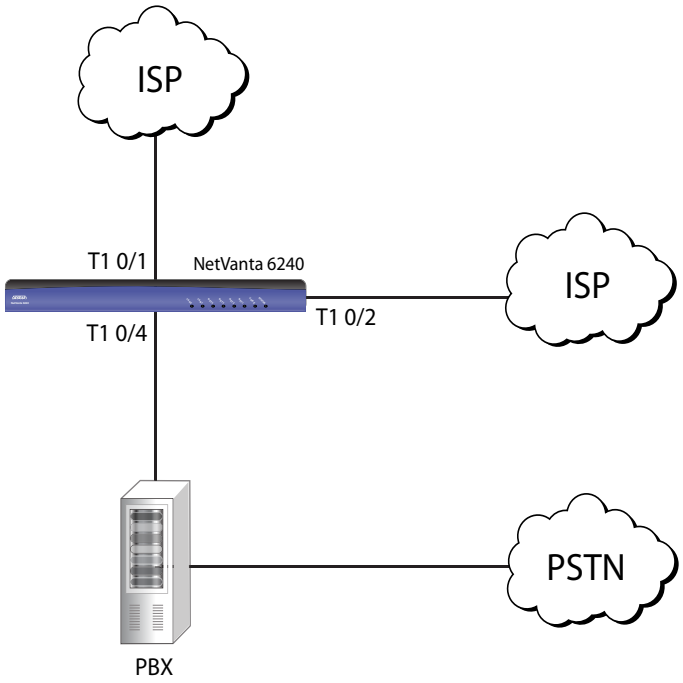

Figure 10. One Voice and Two Data Timing Sources

To configuring Example 1 on the NetVanta 6240 using the CLI, follow these steps:

1. 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 IP address (**10.10.10.1**), use the configured IP address.*

2. 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.*

3. Enter the Enable mode by entering **enable** at the prompt as follows:
   >enable
4. Enter your Enable mode password at the prompt.
5. Enter the Global Configuration mode as follows:
   #configure terminal
6. Enter the global timing source command to indicate that voice timing is being provided by interface **t1 0/4**:
   (config)**#timing source 0/4**
7. Enter the configuration mode for interface **t1 0/4**:
   (config)**#interface t1 0/4**
8. Enter the desired clock source, **line** in this scenario, for the interface using the **clock source** command:
   (config-t1 0/4)**#clock source line**
9. Enter the **no shutdown** command to activate the interface:
   (config-t1 0/4)**#no shutdown**
10. Enter the **exit** command to leave the current interface and return to Global Configuration mode:
    (config-t1 0/4)**#exit**
11. Enter the configuration mode for interface **t1 0/1**:
    (config)**#interface t1 0/1**
12. Enter the desired clock source, **line** in this scenario, for the interface using the **clock source** command:
    (config-t1 0/1)**#clock source line**
13. Enter the **no shutdown** command to activate the interface:
    (config-t1 0/1)**#no shutdown**
14. Enter the **exit** command to leave the current interface and return to Global Configuration mode:
    (config-t1 0/1)**#exit**

15. Enter the configuration mode for interface **t1 0/2**:

    (config)**#interface t1 0/2**

16. Enter the desired clock source, **line** in this scenario, for the interface using the **clock source** command:

17. (config-t1 0/2)**#clock source line**

The resulting configuration will look like this:

```
interface t1 0/1
  clock source line
  no shutdown
!
interface t1 0/2
  clock source line
  no shutdown
!
interface t1 0/4
  clock source line
  no shutdown
!
!

timing-source t1 0/4
```

Configuring Independent T1 Timing on the NetVanta 6240 using the GUI

1. Open a new page in your Internet browser.
2. Enter your NetVanta 6240's IP address in the browser's address field in the following form: **http://**<*ip address*>, for example:

   http://10.10.10.1

3. Enter your **User name** and **Password** in the appropriate fields and select **OK**.

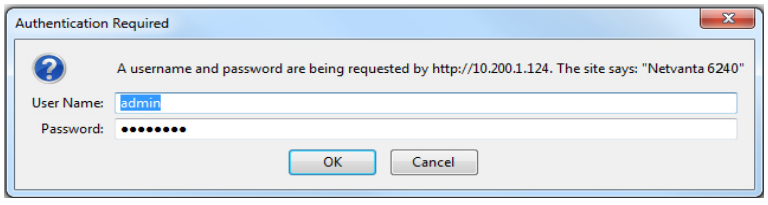

Figure 11. NetVanta 6240 Login

NOTE *The default user name is **admin**, and the default password is **password**.*

4. Select **System Summary** from the menu on the left. Then select the **Current System Clock Source** hyperlink.

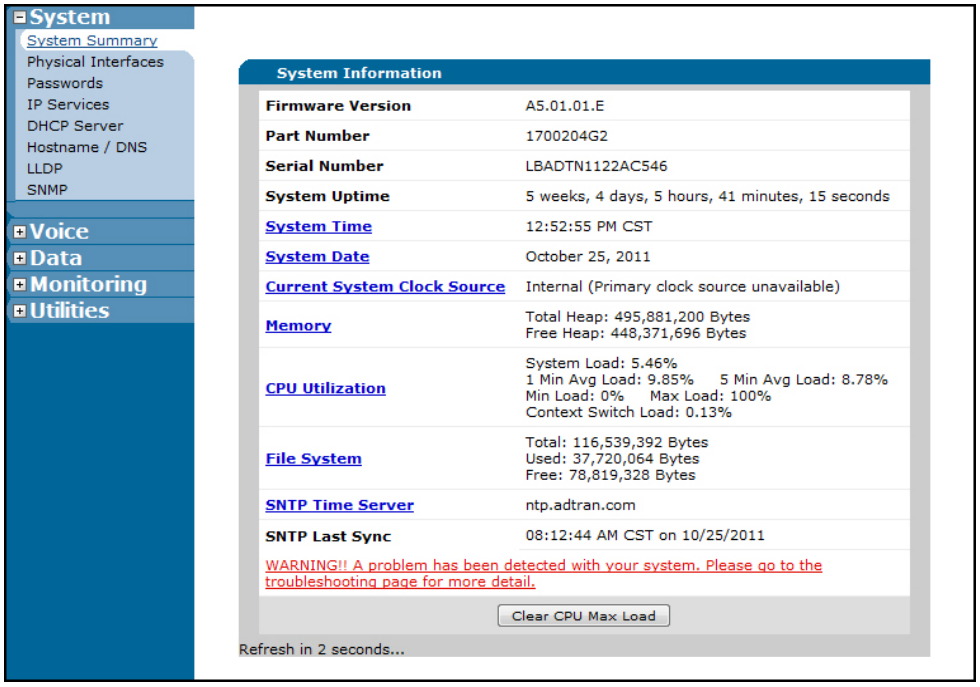

Figure 12. System Summary Menu

5. Select the **t1 0/4** interface from the **Primary Clock Source** drop-down menu. Select **Apply** to save the changes.

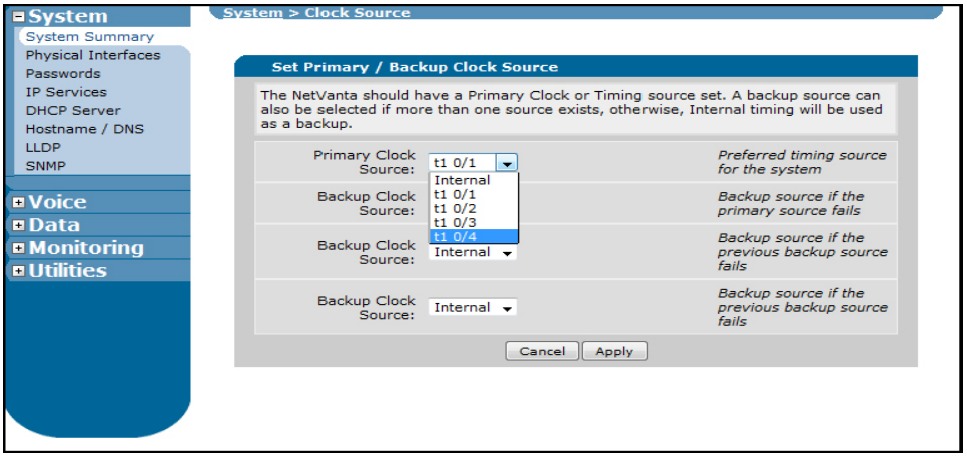

Figure 13. Clock Source Menu

6. Select **Physical Interfaces** from the menu on the left. Then select the **t1 0/1** interface hyperlink from the list of physical interfaces.

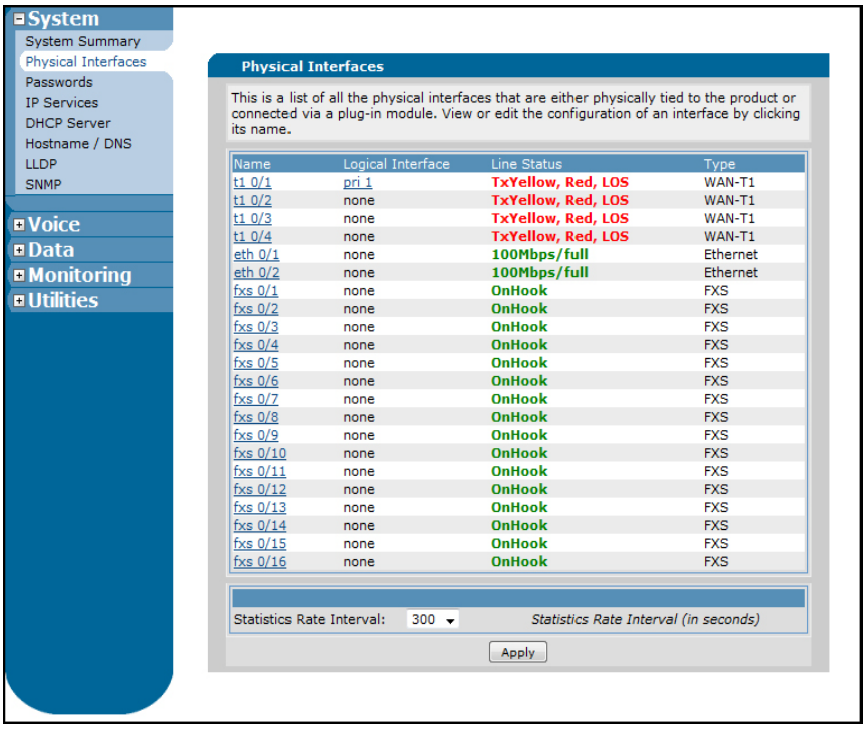

Figure 14. Physical Interfaces Menu

7. Select the **Line** option from the **Clocking** drop-down menu. Select **Apply** to save the changes.

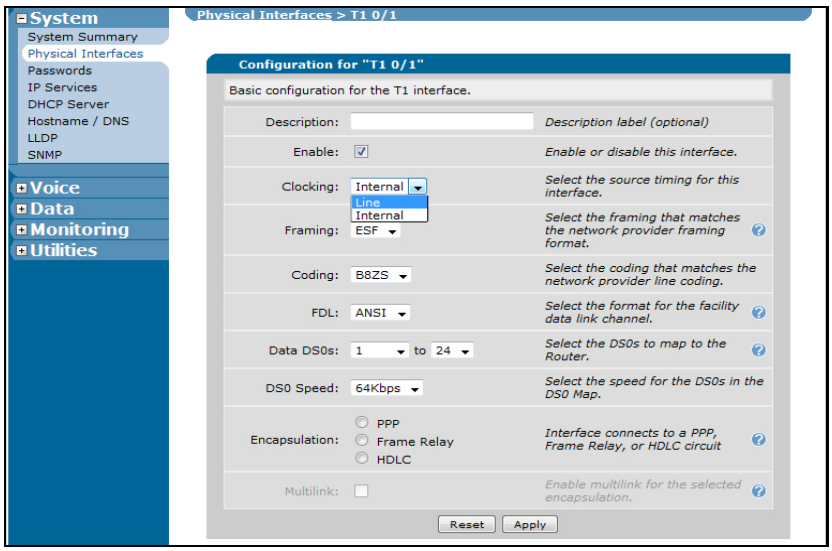

Figure 15. Clocking Drop-Down Menu

8. Repeat Steps 6 and 7 for interfaces **T1 0/2** and **T1 0/4**.