# TotalNET Advanced Server 5.2 Administration Guide

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# Contents

CHAPTER 1

# Introduction

This chapter covers the following topics:



# What's New in This Release

## TotalNET Administration Suite

TotalNET Administration Suite (TNAS) allows you to configure the TotalNET network through HTML menus and dialogue boxes, just as TotalAdmin did for TotalNET Advanced Server (TAS) in previous releases of TAS. TotalAdmin constitutes one sphere of TNAS.

## New TotalAdmin

The presentation and arrangement of TotalAdmin menu items reflect the new, intuitive TNAS framework.

## HTML Documentation

You can now access TAS on-line documentation— *TAS Administration Manual*, *TAS Reference Manual*, and, if applicable, *TAS-DCE Manual*—in HTML.

## File Name Mapping

The way TAS handles filename case now defaults to case-preservation, in which TAS maps case to UNIX exactly as given by the client, instead of to lower-case.

## Improved Utility Performance

The TotalNET remote utilities, such as the ru- and nc- utilities, now support long file names, the tnpasswd utility performs more efficiently, the “CAP to MAC” utility works with TAS 5.0 file formats, the atconvert utility allows you to convert from Helios to TAS, and NetWare client utilities function more intuitively.

## Enhanced Tracing

You can now turn tracing on and off from all three realms and for all file services, and you can do so more easily than in previous releases.

## AppleTalk Printer Access from All Realms

This feature allows you to print to AppleTalk printers through TAS. TAS extends outbound and inbound support to the PAP driver.

# About This Manual

This manual provides step-by-step information for setting up, configuring, and administering TAS from the TotalAdmin sphere after you install TAS using the instructions in *TotalNET Advanced Server Release Notes*, which came with your packaging. It assumes you have both a general understanding of network administration and network administration privileges in the system.

After reading “Terminology” on page 3 below, read Chapter 2, then perform initial setup as described in Chapter 3. From there, you may administer TAS as described in Chapters 4-6.

This section covers the following topics:

## Notational Conventions

This table describes textual notations you will encounter:

| | |
|---|---|
| `courier` | A command, path, or part of a path. |
| *italics* | A variable. You must replace each occurrence of this text with a valid value for its variable. |
| **bold** | In the TotalAdmin sphere, information you must enter. |

## Terminology

**$TNHOME** — The TotalNET home directory where TAS files and programs reside, located at `/var/opt/totalnet`.

**attach points** — Aliases for directory paths in a volume. Users see attach points as volumes and cannot move up directory trees past them.

**button** — A control that executes an action or changes an attribute or feature.

**control frame** — The window in the upper left of the TNAS screen. It contains TNAS-specific options.

**icon** — A graphical representation of an object or process. This manual describes the function of each clickable icon.

**menu frame** — The window in the lower left of the TNAS screen. It displays the hierarchy of options for the sphere.

**realms** — Domains in the TAS environment. TAS has the following three realms, based on the three types of clients and transport protocols:

LM-NT-OS/2 realm — The realm for LAN Manager, Windows NT, Windows 95, and IBM OS/2 clients running NetBIOS-over-TCP/IP or NetBIOS-over-NetBEUI transports.

NetWare realm — The realm for NetWare clients running the IPX/SPX transport.

AppleTalk realm — The realm for Macintosh clients running the AppleTalk transport.

**services** — File, print, and terminal services in the TotalNET environment.

| | |
|---|---|
| **server selector** | A mechanism for displaying all TAS systems in your enterprise. From it, you can select the system to administer. |
| **sphere** | A collection of menus that allows you to perform a logical set of system administration tasks. You can add or delete these “plug-in” or “snap-in” spheres on the host server. |
| **sphere frame** | The window in the upper right of the TNAS screen. It displays all the available plug-in spheres for the server. |
| **TNAS** | TotalNET Administration Suite, a task-oriented graphic administration and configuration interface for TotalNET product administration, licensing, and system administration. TNAS includes the TotalAdmin sphere for administering TAS. |
| **TNAS session** | A way for TNAS to identify users and manage their activities separately. A session starts when a user logs in and ends when it expires or the user logs out. |
| **TotalNET system manager** | The daemon that performs general management of the TotalNET system. |
| **TotalAdmin** | The TAS administration sphere of TNAS, also called the TotalAdmin sphere. It comes bundled with TAS. |
| **transport** | Low-level networking protocol suites defined at the system level and referenced from all realms. TAS provides services for each realm over the appropriate transport protocols: NetBIOS-over-TCP/IP, NetBIOS-over-NetBEUI, IPX/SPX, and AppleTalk. |
| **volumes** | Short names for UNIX directory paths made known to TAS and its clients. File services export volumes to clients. You must define a volume and its corresponding directory path to make it accessible to network clients. Include a reference to a volume for all the file services you wish to enable for client access. |
| **work frame** | The window in the lower right of the TNAS screen. Input forms appear here. |
| **zone** | In the AppleTalk environment, a logical grouping of clients. It simplifies scanning the network for resources, such as servers and printers, in similar domains. In a DNS (Domain Name System) database, a zone consists of a subdirectory of the DNS database. It serves as a DNS name server. This may contain a single domain or |

several sub-domains. You can set up one or more name servers for each zone.

**zone list** All of the zones associated with a particular network.

## Overview of Chapters

You must complete Chapter 3 before you can perform any tasks in Part II: Administration.

Part I: Initial Setup

Chapter 1 — Descriptions of new features; the usage, terminology, and chapters of this manual; and related books.

Chapter 2 — Descriptions of TAS, TNAS terminology, TNAS and TotalAdmin icons and buttons, and the TotalAdmin menu frame for TAS administration, as well as instructions for configuring the TotalNET master server, accessing TNAS and TotalAdmin, changing the TNAS port number, stopping and restarting TNAS, viewing current TNAS sessions, setting TNAS time-outtime-out and expiration times, and licensing.

Chapter 3 — Step-by-step instructions for performing initial configuration of TAS from TotalAdmin.

Part II: Administration

Chapter 4 — Instructions for controlling the server system, administering username maps, administering secure authentication, administering users, administering volumes, administering printers, running UNIX commands, and updating UNIX file attributes.

Chapter 5 — Instructions for configuring services for the LM-NT-OS/2, NetWare, and AppleTalk realms.

Chapter 6 — Instructions for administering transport protocols for each realm.

Chapter 7 — Instructions for general troubleshooting, error and activity logging, identifying error messages and conditions and their solutions, contacting Syntax Technical Support, and generating Customer Service Request (CSR) report system information.

# Related Books

*TotalNET Advanced Server Release Notes* — Instructions for installing TAS, included with your packaging. You must complete the appropriate steps in the *TotalNET Advanced Server Release Notes* before using this administration guide or *TAS Reference Manual*.

*TAS Quick Reference* — A summary of UNIX commands, included with your packaging.

*TAS Reference Manual* — On-line instructions for performing administrative configuration of TAS from the UNIX command line. Use *TAS Reference Manual* instead of this manual to configure TAS from UNIX.

CHAPTER 2

# TAS, TNAS, and TotalAdmin

This chapter contains the following sections:



## TAS

TotalNET Advanced Server (TAS) provides a unified networking solution for complex LAN and WAN environments. TAS enables LAN Manager, Windows NT, Windows 95, Windows for Workgroups, Windows 3.x, OS/2, NetWare, and AppleTalk clients to share file, print, and terminal services transparently across a UNIX server.

TAS includes three realms:

- LM-NT-OS/2 realm — The realm for LAN Manager, Windows NT, Windows 95, and IBM OS/2 clients running NetBIOS-over-TCP/IP or NetBIOS-over-NetBEUI transports.
- NetWare realm — The realm for NetWare clients running the IPX/SPX transport.
- AppleTalk realm — The realm for Macintosh clients running the AppleTalk transport.

To administer TAS, you will use TotalNET Administration Suite (TNAS), a task-oriented graphical administration and configuration environment for the system administration, licensing, and configuration of TotalNET products.

# TNAS

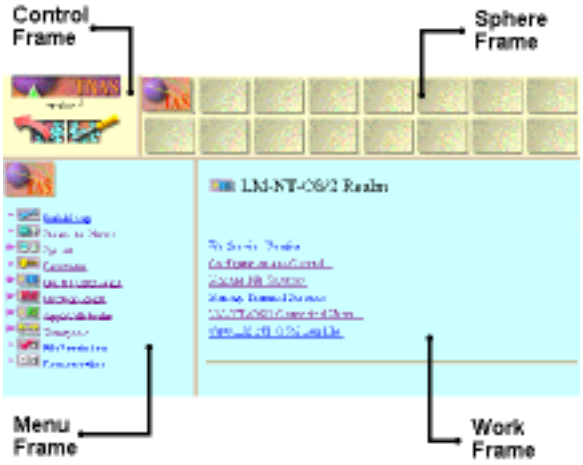


## TNAS Structure

You can configure and administer TAS with TotalNET Administration Suite (TNAS), an HTML-based menu and dialog system that allows end users without extensive UNIX administration skills to take advantage of UNIX capabilities. You should configure one TAS host as the "master" server (see"2.1 Configuring the TotalNET Master Server" on page 15). All other TAS hosts act as clients of this master. The clients periodically check in with the master server, giving it information about themselves and acquiring information about the rest of the enterprise. This mechanism, among other activities, enables users to log into TNAS on any of the other TAS hosts in the enterprise, once they have TNAS sessions on their TAS hosts. On TAS hosts on which you have the same UNIX user name and password, this login process requires no reauthentication.

TNAS runs on a UNIX host, on which TAS constitutes one TNAS sphere. TNAS generates each HTML page interactively; that is, your input on one page generates the icons, menus, text, graphics, buttons, text fields, and selection boxes that appear on subsequent pages (see the figure below). TNAS screens may vary slightly from browser to browser.

You can administer your system, licenses, and TotalNET products through TNAS. You will primarily use TotalAdmin, the TAS administration sphere of TNAS, with this guide. TNAS comes in four parts: the control frame, the sphere frame, the menu frame, and the work frame.




control frame — The TNAS administration frame. It includes the following parts:

server selector — The icon you click to generate a list of active TNAS servers, from which you can choose the server to administer. When you click the server selector, it displays a list of other TAS systems on the network, provided you have configured a TotalNET master server (see “2.1 Configuring the TotalNET Master Server” on page 15). The list appears in a new browser window and contains the names of active servers. Clicking a server name activates menus for configuration and administration of that server in the current window. It does not require that you reauthenticate yourself, provided you have the same user name and password on the new host as on the old one. When you use TNAS on a different server, your session on the original server remains active in the original window. All sessions remain active until you log out or they expire. Closing a window does not deactivate a session.

server name — The name of the current server.

“Disable Session” icon — The icon you click to exit TNAS.

TNAS administration icon — The icon you click to view active TNAS sessions, manage licenses, and set TNAS time-out and expiration times.

sphere frame — Icons representing each TotalNET product on the server. Clicking on an icon leads you to configuration and administration of the product it represents. Each sphere encompasses a collection of menus that allows you to perform a logical set of system administration tasks. With this guide, you will use the TotalAdmin sphere.

menu frame — Configuration activities for the selected sphere. If you click the TAS icon at the top of the menu, the menu extends to include sub-links. Only options relevant to the system’s configuration appear in this menu. For example, if you do not configure the AppleTalk realm, the AppleTalk Realm menu option does not appear.

work frame — Menus, sub-menus, and input forms for step-by-step configuration and administration.

## TNAS Terminology

TNAS — TotalNET Administration Suite, a task-oriented graphic administration and configuration interface for TotalNET product administration, licensing, and system administration. TNAS includes the TotalAdmin sphere for administering TAS.

icon — A graphical representation of an object or process. This manual describes the function of each clickable icon.

button — A control that executes an action or changes an attribute or feature.

sphere — A collection of menus that allows you to perform a logical set of system administration tasks. You can add or delete these “plug-in” or “snap-in” spheres on the host server.

sphere icon — An icon in the sphere frame to open a menu in the menu frame for configuration and administration of the sphere it represents.

TNAS session — A way for TNAS to identify users and manage their activities separately. A session starts when a user logs in and ends when it expires or the user logs out.

TotalAdmin — The TAS administration sphere of TNAS, also called the TotalAdmin sphere. It comes bundled with TAS.

TotalAdmin menu frame — The menu for TAS configuration. It appears when you click the TAS icon in the sphere frame.

TotalNET system manager — The daemon that performs general management of the TotalNET system.

## TNAS Icons and Buttons

TNAS icons and buttons help you navigate easily. While in TNAS, do not use your browser’s navigational buttons, as they will cause TNAS to lose session state and result in unpredictable behavior. Most TNAS icons have pop-up text boxes explaining their functions for browsers that support this feature; that is, browsers with support for the HTML “ALT” tag.

server selector — Allows you to choose the server to administer.


“Disable Session” icon — Logs you out of TNAS.


TNAS administration icon — Takes you to a menu for viewing current TNAS sessions, managing licenses, and configuring TNAS.


TAS sphere icon— Opens the TotalAdmin menu frame when clicked in the sphere frame; collapses and expands the menu when clicked in the menu frame.


“Start” button — Starts a wizard.


“Up” button — Takes you up one level in the menu hierarchy. Use this instead of your browser’s Back button.

"Help" button — Takes you to a help screen for the adjacent attribute.


Administer — Takes you to a menu of configuration choices.


Cancel — Cancels the current activity.


Delete — Deletes the selected item.


Finish — Concludes a wizard.


Modify — Takes you to a screen for modifying the attributes of the selected object.


Next — Takes you to the next step in a wizard.


OK — Carries out or accepts the action indicated.


Previous — Takes you to the previous step in a wizard.


Reset — Sets all attributes on the screen to their original values.


Submit — Enters your configuration attributes into the system.


View — Displays detailed information about the selected object.

# TotalAdmin

This section covers the following topics:



## TotalAdmin Sphere

TotalAdmin, the TAS administration sphere, allows you to configure and administer TAS from TNAS. The TotalAdmin menu frame appears when you click the TAS sphere icon in the upper left of the sphere frame. The TotalAdmin menu frame, the place in which you will begin most configuration and administration tasks, lists the links below. Some menu options do not appear if the user name you use to log in does not have root privileges or if you do not configure them during initial setup.

Initial Setup — The TAS initial setup wizard (see "TotalAdmin Wizards" on page 14).

Status At A Glance — Status of TAS services.

System — Administration and configuration of the TAS system and system objects such as volumes and printers.

Passwords — TAS user-password configuration.

LM-NT-OS/2 Realm — Configuration and administration of LAN Manager-, Windows NT-, and IBM OS/2-compatible services.

NetWare Realm — Configuration and administration of NetWare-compatible services.

AppleTalk Realm — Configuration and administration of Macintosh-compatible services.

Transports — Configuration of TCP/IP, NetBEUI, IPX/SPX, and AppleTalk transport interfaces.

File Permissions — Configuration of UNIX file permissions.

Documentation — Access to TAS on-line documentation.

## TotalAdmin Wizards

Wizards present sequences of operations for configuring TAS. Each wizard starts with a screen containing a description and a Start button. To use a wizard, simply click Start and follow the subsequent steps. TotalAdmin includes an initial setup wizard, and a file service creation wizard for each supported realm. The initial setup

wizard guides you through configuration and commencement of services. It results in a basic configuration to which you can add and make changes as needed. File service creation wizards lead you through the configuration of file services for each realm and suggest values for configurable fields.

# Accessing and Administering TNAS and TotalAdmin

This section contains instructions for the following tasks:



## 2.1 Configuring the TotalNET Master Server

A TotalNET master server acts as the central database for multiple TAS hosts and their associated information. TAS hosts in the enterprise find out about the TotalNET master through the enterprise's host-naming facility. To name a master host, you need to set up the TotalNET master command alias. A master host must have access to all TAS hosts, and preferably all other network servers.

The following steps describe how to use the system's hosts file:

1. **Check for the presence of a TotalNET system manager—`tnmaster`—from a previous TAS installation. If you have one, indicate whether you want it to serve as your desired master system.**

   If you do not have one, or if you do not want the current one to play the master system role, you may add one using the method for adding server aliases in your enterprise. For example, to configure the TotalNET system manager in the server's "hosts" file, such as the `/etc/hosts` file, you might add the following `tnmaster` IP address, tnmaster alias, and DNS address:

| IP Address | Alias |
|---|---|
| 199.240.202.10 | spirogyra |
| 199.240.202.3 | simba simba.syntax.com tnmaster tnmaster.syntax.com |
| 199.242.200.1 | syntax |

2. **Decide where to place the TotalNET master command alias, according to local administrative requirements. If you wish to have a single TotalNET master system—and, consequently, a single list of TAS hosts—for your entire enterprise, put the TotalNET master command host in your top-level domain. If you want to have a separate TotalNET master for each of your sub-domains, you can create several aliases.**

   If you use DNS, you only need to make one change to the DNS database to change the TotalNET master. You must add an alias or aliases to the appropriate DNS domain. If you use NIS, you must add an alias to the appropriate NIS map. NIS does not have the notion of nested domains. If you use a simple host-file solution you need to add the TotalNET master command alias to the host file of every TAS host in your enterprise. Because of the increasing popularity of the Internet and intranets, most sites will use DNS to establish the TotalNET master alias.

   To understand DNS “nested domains” in relation to a TotalNET master server, imagine you have a set of such domains with the innermost domain `inner.top.customer.com`. Hosts in this domain have names like `host1.inner.top.customer.com`. When searching for a host named tnmaster, the standard DNS resolver looks for the following system aliases, in order:

   - `tnmaster.inner.top.customer.com`
   - `tnmaster.top.customer.com`
   - `tnmaster.customer.com`

   In other words, DNS automatically searches enclosing domains when trying to find a system by name. This means that you can decide where to place the `tnmaster` alias, according to local administrative requirements. If you wish to have a single TotalNET master system and, consequently, a single list of TAS hosts for your entire enterprise, you can put the `tnmaster` host in your top-level domain—`tnmaster.customer.com`. If you want to have a separate TotalNET master for each of your sub-domains, you can create several aliases, such as `tnmaster.top.customer.com` and `tnmaster.yoyo.customer.com`.

## 2.2 Accessing TNAS and TotalAdmin

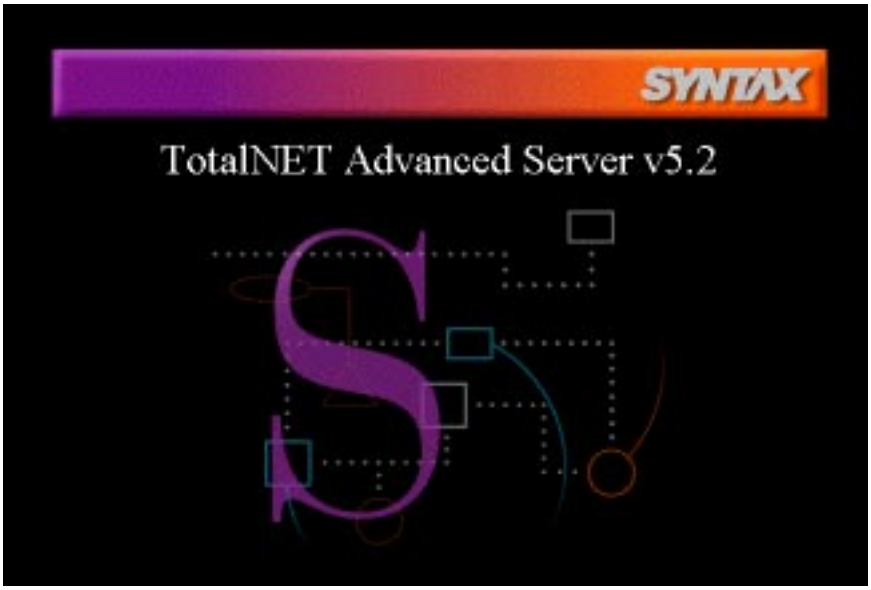
Access TNAS from any web browser with support for tables, forms, Java, and JavaScript. Supported web browsers include Netscape Navigator 3.0 or higher and Microsoft Internet Explorer 3.0.1 or higher.

Follow these steps to connect to TNAS:

1. **Using an appropriate web browser, connect to TNAS by entering the URL below. The *host* variable represents the name of the UNIX server on which TAS resides, and *nnnn* represents the TNAS port number, 7777 by default. To assign a port number of your choice, see "2.3 Changing the TNAS Port Number" on page 19.**

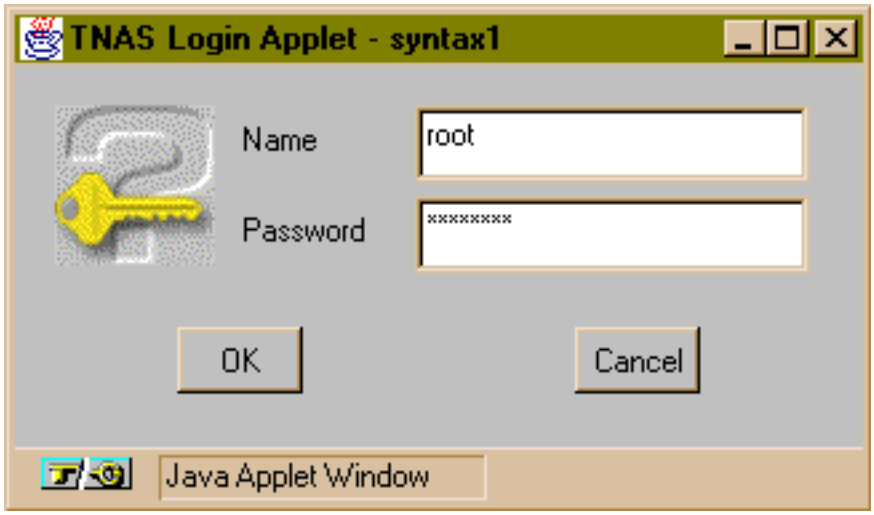
`http://`*host*`:`*nnnn*

   The TotalNET Advanced Server v5.2 screen appears, along with a TNAS icon and a TAS icon for checking status (see "4.1.4 Updating System Configuration" on page 38):




2. **Click on the center of the screen or the TNAS icon:**


   The TNAS login window appears:




**3. Log in as root with your root password.**

The following screen appears:

**4. Click on the TAS sphere icon:**

The TotalAdmin menu frame appears:


If you have not yet run the initial setup wizard, only the Initial Setup and Documentation options appear.

## 2.3 Changing the TNAS Port Number

If your system already uses the default port number, 7777, when you install TAS, the installation program searches for the port numbers 7778, then 7779, and so on, until it finds an available port. You can find the TNAS host name and port number in `$TNHOME/etc/httpd/conf/httpd.conf`.

Follow these steps to change the default TNAS port number from 7777 to a number of your choice:

1. **Access `$TNHOME/etc/httpd/conf/httpd.conf`, where `$TNHOME` represents `/var/opt/totalnet` or, for AIX, `/var/totalnet`.**

2. **Find the line that begins with Port nnnn, where nnnn represents the port number.**

3. **Change the port number to the number you want.**

4. **Save the file.**

5. **Use the following command:**

```
$TNHOME/usr/sbin/tnsystem -M -a tnas-port=nnnn
```

6. **Stop and restart TNAS with the following commands:**

```
$TNHOME/usr/sbin/tas.sh stop totaladmin

$TNHOME/usr/sbin/tas.sh start totaladmin
```

## 2.4 Stopping and Restarting TNAS

Stop and restart TNAS with the following commands:

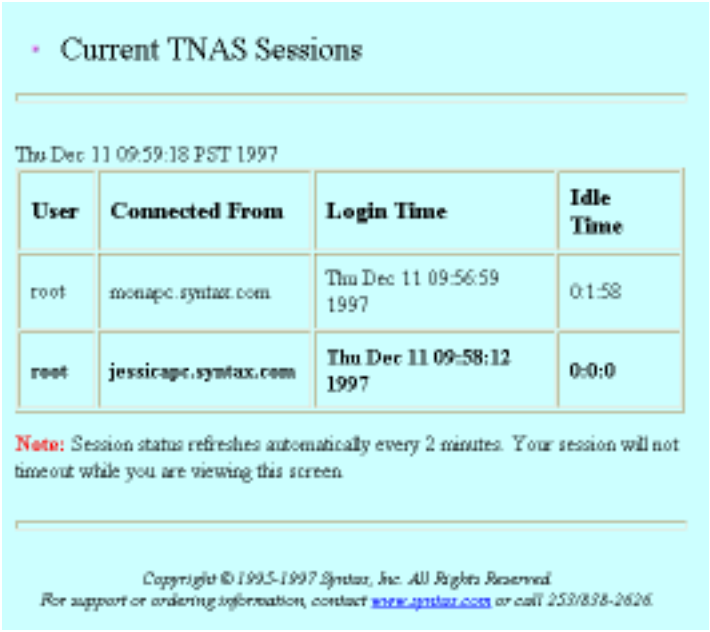
```
$TNHOME/usr/sbin/tas.sh stop totaladmin
$TNHOME/usr/sbin/tas.sh start totaladmin
```

## 2.5 Viewing Current TNAS Sessions

Follow the links below to view current TNAS sessions. This allows you to see other TNAS users—information you can use to prevent interfering with their administration.

**Control Frame->TNAS administration icon->Current TNAS Sessions**

The Current TNAS Sessions screen appears:




## 2.6 Setting TNAS Time-Out and Expiration Times

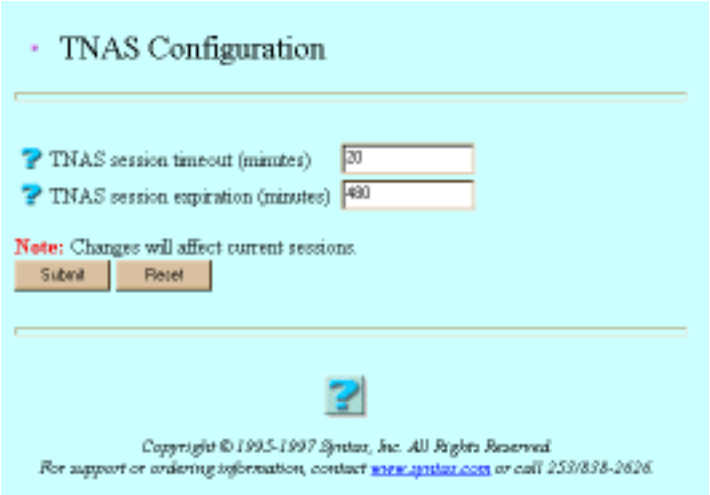
Follow the steps below to set TNAS time-out and expiration times. When time-out occurs, you must log in again, but TNAS recalls the screens at which you left your

session. When expiration occurs, TNAS does not recall your session when you log in again.

1. **Follow these links:**

   **Control Frame->TNAS administration icon->TNAS Configuration**

   The TNAS Configuration screen appears:




2. **Enter values for the following attributes, as needed:**

   TNAS session timeout (minutes) — The amount of TNAS inactivity you want to pass, in minutes, before a TNAS session times out.

   TNAS session expiration (minutes) — The amount of TNAS inactivity you want to pass, in minutes, before a TNAS session expires.

3. **Click Submit.**

   The Updating TNAS Configuration screen appears.

## 2.7 Licensing

Activate your initial license through the initial configuration wizard. Only use this section to add additional TotalNET licenses, update license information, or view current product licenses.

Without a license key, TAS supports only single-user mode, with which you can evaluate TAS. You need a license key to add users to your license. Each time you start TAS and execute a server daemon, TAS verifies the identification number of its host server, checks the user limit, and, if applicable, checks the expiration date. TAS counts licensed connections by clients' addresses. It counts a single-host client

connecting to multiple services as one user. Contact your Sun Microsystems sales representative to purchase additional user licenses.

Follow these steps to administer a TotalNET license:

1. **Follow these links:**
   **Control Frame->TNAS administration icon->Manage Licenses**

   The Select a License Key screen appears.

2. **From the list, select the product whose license key you want to delete, update, or view, or click Create to activate a key for a new product.**

3. **Click Create, Modify, Delete, or View.**

   If you clicked Create, the License Information screen below appears. Go to Step 4.

   If you clicked Modify, the License Information for productname screen, same as the License Information screen below, appears. The License Information for productname screen also lists the product, host ID, user limit, and time limit (see the descriptions below). When you modify a license key value, you create the same results as removing it and adding a new one. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. Do not go to Step 4.

   If you clicked View, a License Information screen appears. It contains the following information:

   Product — The TotalNET program you use.

   Host Id — The numeric identifier for the host. It uniquely identifies every computer.

   User Limit — The maximum number of users who may connect to TAS.

   Time Limit — The number of days remaining until license expiration.

   Do not go to Step 4.

4. **Enter a value for the following attribute:**

   New Key — Your license key. Enter the letters in the key in the case provided by your Sun License Center.

5. **Click Submit.**

   The Manage Licenses screen appears.

6. **Click OK.**

   To administer a TotalNET license from the UNIX command line, use the tnlicense command.

CHAPTER 3

# Initial Setup Steps

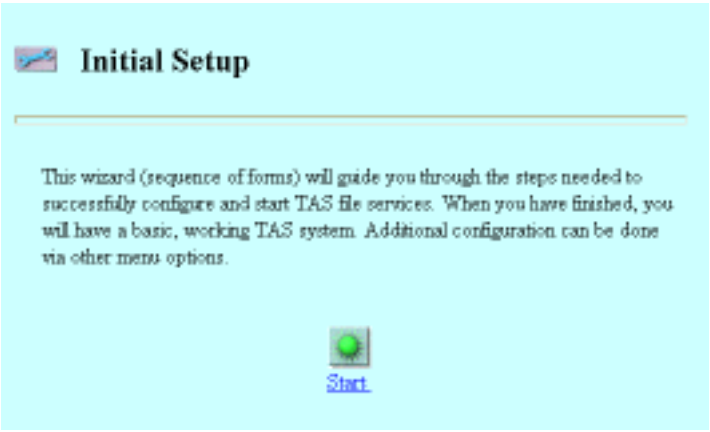
This chapter provides instructions for initial configuration of TAS from TotalAdmin. Configure TAS only after you complete all the appropriate installation steps in TAS Release Notes. You must perform initial configuration immediately after TAS installation to complete all system-level configuration tasks.

## 1. Starting the Initial Setup Wizard

Follow these steps to start the initial setup wizard:

1. **After you connect to TNAS as instructed in your *TAS Release Notes*, click the first menu link in the TotalAdmin menu frame—Initial Setup.**

   The Initial Setup screen appears:



2. **Click the “Start” button:**

Sections 2-6 of this chapter guide you through the initial setup wizard.

# 2. Entering the License Key

The initial setup wizard advances to the TAS Activation Key screen:


Without a license key, TAS supports only single-user mode, with which you can evaluate TAS. You need a license key to add users to TAS. Each time you start TAS and execute a server daemon, TAS verifies the identification number of its host server, checks the licensed user limit, and, if applicable, checks the expiration date of the license. Contact your Sun Microsystems sales representative to purchase additional licenses. After you successfully configure TAS, you do not need to enter the license key if you re-run the initial setup wizard.

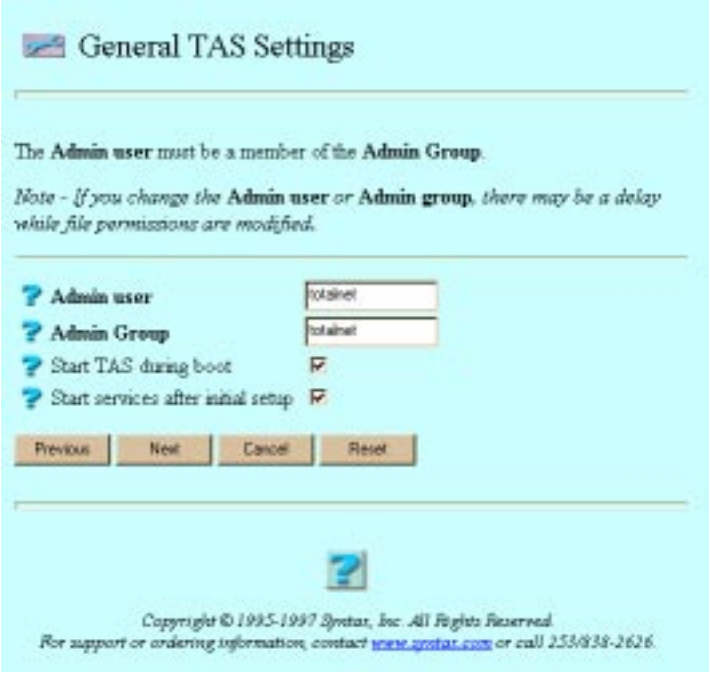
1. **Enter the value for the following attribute:**

Key — Your license key. To use TAS in single-user mode, click Next without entering anything in this field. Enter letters in the key in the case provided by your Sun License Center.

2. **Click Next.**

# 3. Configuring General TAS Settings

The initial setup wizard advances to the General TAS Settings screen:




1. **Enter values for the following attributes, as needed:**

   Admin user — The primary administrative user of TAS. The user you select must exist before you can use it here. The installation kit automatically creates the user totalnet in the group totalnet.

   Admin Group — The group of Admin user. The group you select must exist before you can use it here. The installation kit automatically creates the user totalnet in the group totalnet.

Start TAS during boot — The option to start TAS automatically when the UNIX system reboots.

Start services after initial setup — The option to automatically start services after you finish the initial setup wizard. It starts one file service per configured realm.

2. **Click Next. Changing the user or group from the default may take a few minutes.**

   The Select Realms to Configure screen appears:


3. **Select the realms you want to enable.**

4. **Click Next.**

# 4. Configuring the LM-NT-OS/2 Realm

If you did not select Enable LM-NT-OS/2 Compatibility, click Next on the screen that appears and skip to “5. Configuring the NetWare Realm” on page 30.

If you selected Enable LM-NT-OS/2 Compatibility, the initial setup wizard advances to the LM-NT-OS/2 Realm Configuration screen:


1. **Enter or select values for the following attributes, as needed**:

   Server Name — The file service name, a name not already used on the network with no spaces and 15 or fewer characters. Users connect to this service. TAS gives a default name, hostname, to this service. The hostname variable represents the name of your UNIX host server for TAS, as reported by the UNIX hostname and uname -n commands.

   Workgroup — The name of the LM-NT-OS/2-compatible clients' domain, such as workgroup or langroup.

   Transport List — NetBIOS over TCP/IP and, if TAS supports NetBEUI on your platform, NetBIOS over NetBEUI. Select one or both for your transport. If you select NetBIOS over NetBEUI and your system has multiple devices, select a name for Device for NetBEUI.

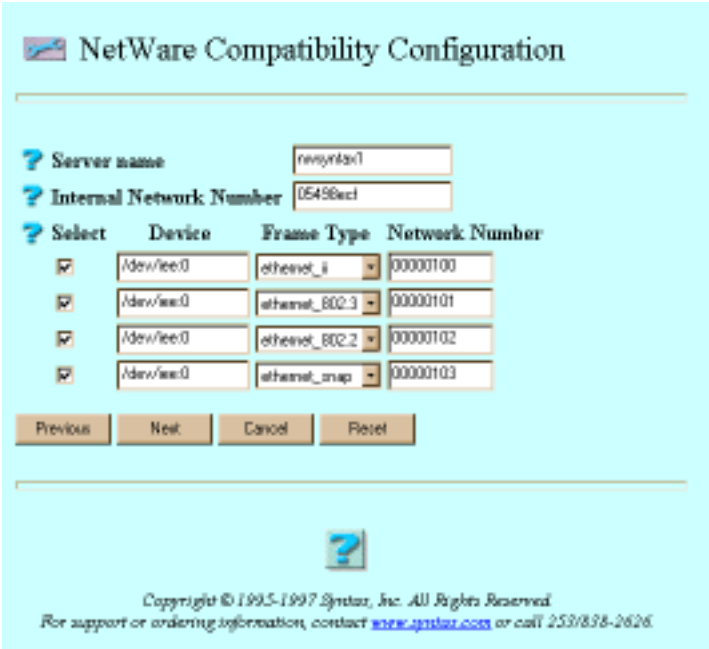
   Device for NetBEUI — The device name for your NetBIOS-over-NetBEUI transport. Select a name for this attribute only if you select NetBIOS over NetBEUI for Transport List.

2. **Click Next.**

# 5. Configuring the NetWare Realm

If you did not select Enable NetWare Compatibility, click Next on the screen that appears and skip to “6. Configuring the AppleTalk Realm” on page 32.

If you selected Enable NetWare Compatibility, the initial setup wizard advances to the NetWare Compatibility Configuration screen:




1. **Enter or select values for the following attributes, as needed:**

   Server name — The file service name, a name not already used on your network with no spaces and 47 or fewer characters. Users connect to this service. TAS gives a default name, nwhostname, to this service. The hostname variable represents the name of your UNIX host server for TAS, as reported by the UNIX hostname and uname -n commands.

   Internal Network Number — The number of the internal interface. Never delete this number. To configure the device interfaces that connect to the realm, you must have a valid internal network number and at least one interface with the device value set to a network/DLPI device name and frame type. TAS assigns an eight-digit, hexadecimal internal network number to the internal frame type. The number cannot have a value of zero, and the network can contain only one number of this value. Internal Network Number defaults to the value given by the UNIX hostid command.

Select — The list of options to enable the corresponding device, frame type, and network number designations to the right. TAS does not configure values corresponding to empty Select boxes.

Device — The list of devices you wish to configure, in the format device-file:ppa-number. The device-file variable represents the location of the device file, and the ppa-number variable represents the physical point attachment (PPA) number for the data-link provider interface (DLPI). For example, if the UNIX command netstat -i returns the network name le0, enter /dev/le:0 for this field.

Frame Type — The list of frame types you may configure for an interface. You can configure one interface with more than one frame type, provided the interface supports each frame type. You may wish to avoid configuring interfaces that correspond to unused frame types in your environment. For example, if ethernet_snap appears under Frame Type and your network does not use ethernet_snap, you can clear the Select checkbox on that line. Not counting the internal interface, TAS supports six interface types for system configuration. After you finish the initial setup wizard, you can add transport interfaces from the TotalAdmin sphere via Transports->IPX/SPX Interfaces. If the configuration file contains interfaces that do not appear in the result returned from system lookup, this page gives a warning. You can erase those redundant interfaces as described in Chapter 6.

Network Number — The number to identify a network segment. You should use the same network number for all nodes on the network segment.

The following example shows Device, Frame Type, and Network Number entries:

```
/dev/dlpi/en:0          ethernet_ii                 100

/dev/dlpi/et:0          ethernet_802.2              102

/dev/dlpi/et:0          ethernet_802.3              101

/dev/dlpi/et:0          ethernet_snap               103
```

**2. Click Next.**

# 6. Configuring the AppleTalk Realm

If you did not select Enable AppleTalk Compatibility, click Next on the screen that appears and skip to “7. Starting the Configured Server” on page 33.

If you selected Enable AppleTalk Compatibility, the initial setup wizard advances to the AppleTalk Compatibility Configuration screen:


1. **Enter or select values for the following attributes, as needed**:

   Server Name — The file service name, a name not already used on your network with 32 or fewer characters. Users connect to this service. TAS gives a default name, athostname, to this service. The hostname variable represents the name of your UNIX host server for TAS, as reported by the UNIX hostname and uname -n commands.

   EITHER Select a local zone OR Enter the local zone — The zone designation. Either select the AppleTalk network zone in which TAS resides from the list or enter a zone name other than the default in the text field. If you type a name and select one from the list, the typed name takes priority over the name in the list. The list displays those zone names discovered on your network by the AppleTalk

detection program. If you do not know the zone name information, find it by running the atkprobe command.

Select — The list of options to enable the corresponding device name to the right. TAS does not configure values corresponding to empty Select boxes.

Device — The name of the device for the AppleTalk transport.

2. **Click Finish.**

# 7. Starting the Configured Server

The Initial Setup screen reappears, this time containing the statement “Wizard successful”:


Depending on whether you checked the Start services after initial setup box when you configured general TAS settings, the installation program either starts TAS services or exits the wizard. If you did not elect to start services after initial setup, you can start TAS services by following these links:

**System->System Administration->Start Services**

**You have successfully configured TAS!**

For instructions on performing general administrative tasks, configuring services, and configuring transports, continue to the next three chapters.

CHAPTER 4

# General Administrative Tasks

This chapter covers procedures commonly performed by the network administrator. By following these procedures, you can use the TotalAdmin sphere to manage the processes and objects that provide file and print services to native client machines in LAN Manager, Windows for Workgroups, Windows 95, Windows NT, NetWare, and AppleTalk environments. You can also use TotalNET utilities from the UNIX command line to perform the same tasks. For information on configuring and managing TAS using command line utilities rather than the TotalAdmin sphere, consult *TAS Reference Manual*.

You must complete Chapter 3 before you can perform any tasks from this chapter to Chapter 7. If you do not run the initial setup wizard, TAS cannot load your transport drivers and the servers cannot start.

Configuration and administration screens in this chapter sometimes have both selection lists and text fields for your input regarding an object. If these both apply to one object or attribute and you both select a value and type one in, the value you type overrides the one you select in the list.

This chapter contains the following sections:

- "4.6 Administering Printers" on page 51 — Instructions for creating, modifying, and deleting TAS printers. Define AppleTalk-compatible printers in the AppleTalk realm (see "5.3.10 Creating and Modifying Print Services" on page 109).
- "4.7 Running UNIX Commands" on page 54 — Instructions for running UNIX commands from TotalAdmin.
- "4.8 Updating UNIX File Attributes" on page 55 — Instructions for updating UNIX file attributes from TotalAdmin.

# 4.1 Controlling the Server System

This section contains instructions for the following tasks:



## 4.1.1 Starting TAS Services

Follow these steps to start the TAS system and set all services to accept client connections:

1. **Follow these links:**
   - **System->System Administration->Start Services**

     The Confirmation screen appears.
2. **Click OK.**

   The Start all TAS Services screen appears.
3. **Click OK.**

   To start TAS services from the UNIX command line, use the tnstart command.

## 4.1.2 Shutting Down TAS Services

Follow these steps to shut down the TAS system and set all services to reject client connections:

1. **Follow these links:**
   - **System->System Administration->Shutdown Services**

     The System Shutdown screen appears:


2. **Enter values for the following attributes, as needed:**
   - Minutes until shutdown — The amount of time you want to elapse before shutdown. This option does not appear if you already initiated a shutdown.
   - Message to connected users — A brief message to send to connected file service clients as shutdown nears and when shutdown commences. TAS sends your message every five minutes until shutdown occurs. Five minutes until shutdown, TAS sets all services to reject client connections. This option does not appear if you already initiated a shutdown.
   - Cancel a pending shutdown — The option to stop a shutdown in progress. This option only appears when you already initiated a shutdown.

3. **Click Submit.**

   The Shutdown Services screen appears.

4. **Click OK.**

   To cancel the shutdown, click Cancel, select Cancel a pending shutdown, and click Submit.

   To shut down TAS services from the UNIX command line, use the tnshut command.

## 4.1.3 Checking TAS System Status

Follow these steps to check the status of services and client connections in the TAS system:

1. **Follow these links:**
   - **System->System Administration->Service Status**

   The Service Status screen appears:


2. **When finished, click OK.**

   You may also check TAS system status by clicking the Status at a Glance link and the TAS icon on the first screen that appears before you log in.

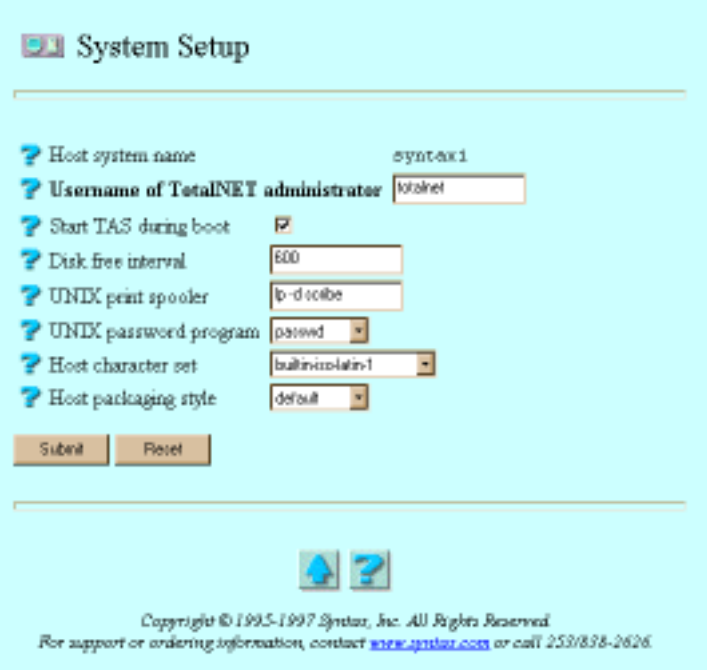
   To check TAS system status from the UNIX command line, use the tnstat command.

## 4.1.4 Updating System Configuration

Follow these steps to change system configuration attributes:

1. **Follow these links:**
   - **System->System Administration->System Setup**

   The System Setup screen appears:




2. **Enter or select values for the following attributes, as needed**:
   - Username of TotalNET administrator — The UNIX name of the TAS administrator. The TAS administrator must own the TAS home directory. This attribute defaults to totalnet.
   - Start TAS during boot — The option to cause TAS processes to start when the operating system starts.
   - Disk free interval — The number of seconds you wish to pass between recalculations of free disk space by the TNdiskfree program. This attribute defaults to 600 seconds—one recalculation every 10 minutes.
   - UNIX print spooler — If the UNIX system has more than one spooler installed, the full path name of the UNIX print spooler program you want to use.
   - UNIX password program — The UNIX program for changing users' UNIX passwords. If your system uses NIS, select yppasswd; if it uses NIS+, select nispasswd; if it uses neither, select passwd.
   - Host character set — Part of the scheme for mapping file names across realms. This attribute designates the name of the character set used by the host. It defaults to builtin-iso-latin-1—the built-in version of the ISO-8859-1 character set, a superset of ASCII.
   - Host packaging style — The field that designates the way TAS puts together, within a byte-stream, the character set used by the host. Select one of the following: default to indicate that the Host character set value determines the

packaging style, single if the host character set contains only one-byte characters, euc if it contains one-, two- and three-byte characters, shift-jis if it contains only one- and two-byte characters.

3. **Click Submit.**

   The Updating System Setup screen appears.

4. **Click OK.**

   To update system configuration from the UNIX command line, use the tnsystem command.

## 4.1.5 Accepting Services

TAS services accept client connections unless you set them to reject connections. Starting TAS also sets its services to accept connections.

Follow these steps to make all defined TAS services accept client connections:

1. **Follow these links:**
   - **System->System Administration->Accept Service Connections**

     The Confirmation screen appears.

2. **Click OK.**

   The Accept Service Connections screen appears.

3. **Click OK.**

   To accept services from the UNIX command line, use the tnaccept command.

## 4.1.6 Rejecting Services

TAS services accept client connections unless you set them to reject connections. Shutting down TAS also sets its services to reject connections.

Follow these steps to make all defined TAS services reject client connections:

1. **Follow these links:**
   - **System->System Administration->Reject Service Connections**

     The Confirmation screen appears.

2. **Click OK.**

   The Reject Service Connections screen appears.

3. **Click OK.**

   To reject services from the UNIX command line, use the command.

# 4.2 Administering Username Maps

User name maps translate multiple user names to a single UNIX user account for authentication. For example, a map from the user names Clark, CLARK, and clark to the UNIX account clark makes the authentication program see them all as clark.

Follow these steps to create, modify, or delete a user name map:

1. **Follow these links:**
   - **System->Username Maps**

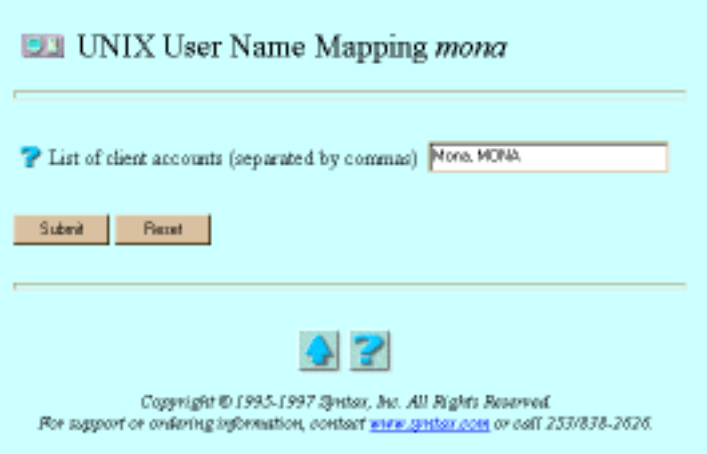
     The UNIX Username Maps screen appears.

2. **From the list, select the user whose mapping scheme you want to modify or delete, or enter the name of a user whose name you want to map, in the text field. If deleting, you may select more than one name. The list contains nothing if no maps exist.**

3. **Click Create, Modify, or Delete. The Modify and Delete options do not appear if no maps exist.**

   If you clicked Create or Modify, the UNIX User Name Mapping username screen below appears. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. Do not go to Step 4.




4. **Enter a value for the following attribute:**

- List of client accounts (separated by commas) — All the names you want to map to the UNIX user account. Separate them with commas.

5. **Click Submit.**

   The UNIX Username Maps screen reappears, this time containing the statement "Update Successful".

6. **Click OK.**

   To administer username maps from the UNIX command line, use the tnumap and tnumapuser commands.

# 4.3 Administering Secure Authentication

All clients except those using share-mode file services must have file service authentication to access files and resources. TAS provides two methods for authenticating clients: UNIX open authentication and secure authentication.

Clients using open authentication send passwords in clear-text over the network. The file service process checks these passwords against those in the standard UNIX user database, such as `/etc/passwd` or NIS.

Secure authentication requires a separate, TAS-maintained user-password database. A client using this method does not send a clear-text password over the network. Instead, the client and server exchange a random message, and each encodes it with the user's password. The client sends the result of its encoding to the server, and the server compares it with the result of the server's encoding.

You can use this client-server dialog to create and update user-password entries for file services. You can also name a script file for Windows 95 clients to use when they connect to LM-NT-OS/2 realm services that support this feature.

Follow these steps to create, modify, or delete a secure authentication user:

1. **Click the Passwords link.**

   The Password Users screen appears.

2. **From the list, select the name of the secure authentication user whose password you want to modify or delete, or enter the name of a user you want to add, in the text field. If deleting, you may select more than one name. The list contains nothing if no secure authentication user names exist.**

3. **Click Create, Modify, or Delete. The Modify and Delete options do not appear if no secure authentication user names exist.**

If you clicked Create, the Specify New Passwords screen below appears. Go to Step 4.

If you clicked Modify, the Specify Passwords for username screen, same as the Specify New Passwords screen below, appears. Go to Step 4.

If you clicked Delete, the Confirmation screen appears. Click OK. Do not go to Step 4.


**4. Enter values for the following attributes, as needed:**

- User name — An existing user entry in the UNIX database. If you clicked Modify, this attribute does not appear.
- Password — The user's new password.
- Repeat password — Confirmation of the user's new password. Type in the password again.
- Password for realms — The realms for which the password changes. If you clicked Create, this option does not appear.
- Modify Windows 95 logon script only — The option to modify the logon script options only, ignoring any password options.
- Use default Windows 95 logon script — The option to cause the user's client to follow a file service's default logon script. If you select this option, do not enter information for Windows 95 logon script file.

- Windows 95 logon script file — The name of a file other than the default to execute when this user first connects. The logon script, an executable file, executes when the PC connects to the server. Make sure that the file exists and executes properly. Also, a volume or attach point named `NETLOGON`, accessible from the file service to which the user connects, must contain your Windows 95 logon script file. If you enter information for this attribute, do not select Use default Windows 95 logon script.

5. **Click Submit.**

   The Creating new Passwords for username or the Updating Passwords for username screen appears.

6. **Click OK.**

   To administer secure authentication from the UNIX command line, use the tnpasswd command.

# 4.4 Administering Users

This section contains instructions for the following tasks:


- "4.4.1 Viewing TAS Connections" on page 44
- "4.4.2 Disconnecting TAS Users" on page 45


## 4.4.1 Viewing TAS Connections

Follow these steps to list TAS connected users by UNIX name, along with their realms, connection dates and times, number of connection requests, server names and types, client names, and network addresses:

1. **Follow these links:**
   - **System->TAS Connected Users->User Information**

     The Users screen appears.

2. **Select from the list or type in the text field the names of the users whose information you want to view.**

3. **Click View.**

   The TAS Users information screen appears:

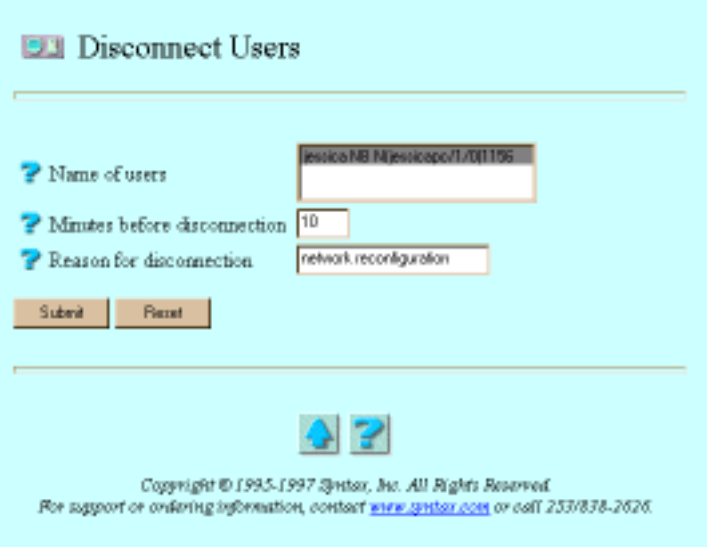

4. **When finished, click OK.**

## 4.4.2 Disconnecting TAS Users

Follow the steps below to disconnect selected users. Network clients that automatically reconnect broken connections cannot effectively disconnect.

1. **Follow these links:**
   - **System->TAS Connected Users->Disconnect Users**

     The Disconnect Users screen appears:




2. **Select or enter values for the following attributes, as needed**:
   - Name of users — The users whose sessions you want to disconnect.
   - Minutes before disconnection — The number of minutes before forced disconnection.
   - Reason for disconnection — A brief message TAS sends to client users before terminating their sessions.

3. **Click Submit.**

   The Disconnect Users screen appears.

4. **Click OK.**

   To disconnect a TAS user from the UNIX command line, use the tnkill command.

# 4.5 Administering Volumes

Volumes—short names for directory paths—reside in the UNIX file system. Network clients use volume names in net use and map commands, their Windows equivalents, or the Macintosh chooser's volume list. You can create volume directories and assign user and group ownership and file protection masks.

File services can export only those parts of the UNIX file system defined as volumes. To allow clients to access a volume, you must reference it from one or more file services.

Follow these steps to create, modify, or delete a volume:

1. **Follow these links**:
   - **System->Volumes**

     The Volumes screen appears.

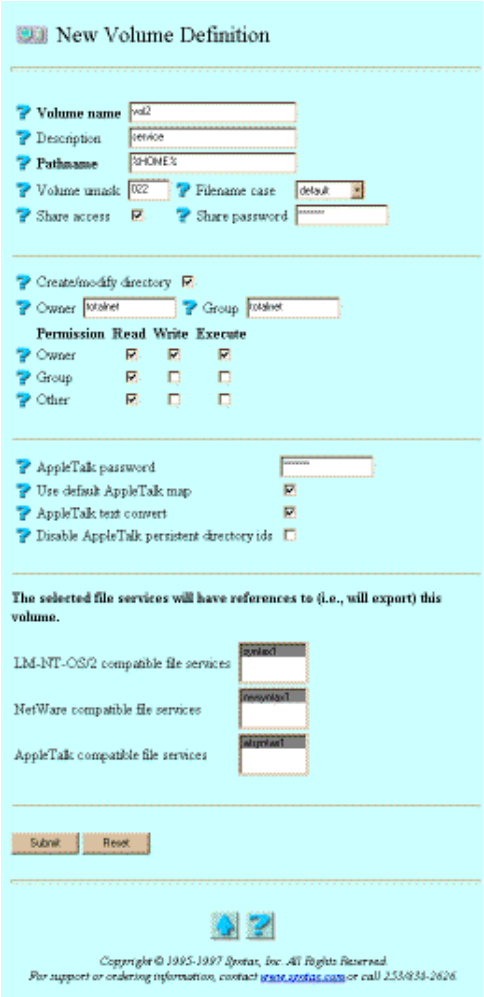
2. **From the list, select the volume you want to modify or delete, or enter the name of a volume to want to add, in the text field. For the LM-NT-OS/2 realm, volume names can contain up to 12 characters; NetWare realm volume names can contain up to 15; and AppleTalk realm volume names can contain up to 27. You can create names exceeding these maximums, but if you do, the clients whose limits such names exceed cannot see the names in their browse lists. The volume list contains nothing if no volumes exist.**

3. **Click Create, Modify, or Delete. If you have made references to the volume, you cannot delete it without first deleting the volume references from the file service. Do so by clicking Modify and clearing the selected file services at the bottom of the Update Volume Definition for *volumename* screen. Clear a service by clicking on the service or, if your web browser does not respond to that, by holding down the Control or Shift key and clicking on the service. The Modify and Delete buttons do not appear if no volumes exist.**

   If you clicked Create, the New Volume Definition screen below appears. Go to Step 4.

   If you clicked Modify, the Update Volume Definition for volumename screen, same as the New Volume Definition screen below, appears. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. Do not go to Step 4.




4. **Enter or select values for the following attributes, as needed**:
   - Volume name — The name used in net use and map commands, their Windows equivalents, or the Macintosh chooser's volume list. If you clicked Modify, this attribute does not appear.
   - Description — A volume description to appear in Network Neighborhood or Chooser windows or at the net view command.
   - Pathname — The full directory path, beginning with "/", to the UNIX directory that serves as the virtual root of the volume. Clients connect to the volume or to attach points below the volume path and cannot see files or directories above the path. Volumes may overlap; that is, one volume's root may lie within another volume. TAS resolves the following strings in volume path names at the time of connection:

- %USER% - The user name.
- %GROUP% - The user's primary group.
- %CLIENT% - The client name.
- %HOME% - The user's home directory.
- %SYSTEM% - The system name.
- %REALM% - The realm name—NW, NB, or AT.
- %SERVICE% - The file service name.
- %% - An actual percent sign.
- Volume umask — The default file permissions for files created on this volume. This designation overrides the umask defined for the file service, if any. This attribute defaults to the umask for the file service. It affects new files only; you cannot set existing files' permissions with it.
- Filename case — One of the following ways that file services handle the case in file names in the volume:

| | |
|---|---|
| **lower** | The case in which TAS stores file names on the server. This efficiently implements the case insensitivity expected by clients. Clients see file names in mixed case but can use either case for any letters in when supplying file names to access the files. This handling can cause problems for UNIX applications that expect files to have the mixed-case names as supplied by clients. |
| **default** | preserve. |
| **preserve** | The same as lower, except both clients and UNIX applications see a file name in exactly the case created by the client. Clients may use any case when supplying the file name to access the file. |

- Share access — The option to make a volume accessible through share-level security mode services, which only the LM-NT-OS/2 realm supports. If you do not select this option, users can only access the volume through user-level security services. If you select this option, TAS requires users to supply the Share password to access the volume.
- Share password — The password a user must supply to access a share-mode volume. This option has no effect unless you enable Share access. If you enter no password, TAS allows users to access the volume in share mode without passwords. If a password already exists, TAS indicates it with an asterisk (*). This password changes only if you remove it or enter a new one. Setting the password to "#" causes TAS to deny all access to this volume in share mode. A user, when making connections to TAS and prompted for a connection password, must precede each upper-case character in the password with a tilde (~).

- Create/modify directory — The option that, when selected creates or modifies the volume directory to your specifications in Pathname and this section of the screen. When you create a new directory, the parent directory must exist, because this option only creates the lowest level of the directory path.
- Owner — The owner of the UNIX directory.
- Group — The group of the UNIX directory.
- Permission (Read, Write, and Execute for Owner, Group, and Other) — UNIX file permissions on a directory, as follows:

| | |
|---|---|
| **Read** | Permission to read the names of files in the directory. |
| **Write** | Permission to create and remove files in the directory. |
| **Execute** | Permission to access the directory. |

- AppleTalk password — The password, distinct from the Share password, with which AppleTalk-compatible clients access the volume. If a password already exists, TAS indicates it with an asterisk (*). This password changes only if you remove it or enter a new one.
- Use default AppleTalk map — The option to designate file-name mappings between files, Macintosh types, and owner applications, for the AppleTalk realm.
- AppleTalk text convert — The option to direct TAS to automatically map between UNIX and Macintosh text file formats. This occurs for clients connecting to services in the AppleTalk realm only.
- Disable AppleTalk persistent directory ids — The option to disable the ability of Macintosh clients to retain the directory ID between sessions. This option causes TAS to keep directory IDs only for the duration of single client sessions, and prevents features that depend on persistent IDs, such as the MacOS alias facility, from functioning across successive sessions to a file service. In normal circumstances, you need not disable this feature. For particularly large volumes, however, the overhead required to keep track of the directory IDs may become excessive. If it does, you may want to disable it.
- LM-NT-OS/2 compatible file services — The list of LM-NT-OS/2-compatible file services. Select the file services from which to reference the volume.
- NetWare compatible file services — The list of NetWare-compatible file services. Select the file services from which to reference the volume.
- AppleTalk compatible file services — The list of AppleTalk-compatible file services. Select the file services from which to reference the volume.

5. **Click Submit.**

   The Creating new Volume Definition for volumename screen or the Updating Volume Definition for volumename screen appears.

6. **Click OK.**

   To administer volumes from the UNIX command line, use the tnvolume command.

# 4.6 Administering Printers

Network clients use printer names in net use and capture commands and their Windows equivalents. File services can export only those print queues defined as printers. To allow network clients access to a printer and its queue, define it by referencing it to the LM-NT-OS/2 and NetWare file services for the clients. In TAS 5.2, you can make AppleTalk network printers available to LM-NT-OS/2 and NetWare clients.

TAS handles printing in the AppleTalk realm with dedicated print services rather than file services. The AppleTalk-compatible print service configuration contains the printer information for AppleTalk realm clients.

Follow these steps to create, modify, or delete a printer:

1. **Follow these links**:
   - **System->Printers**

     The Printers screen appears.

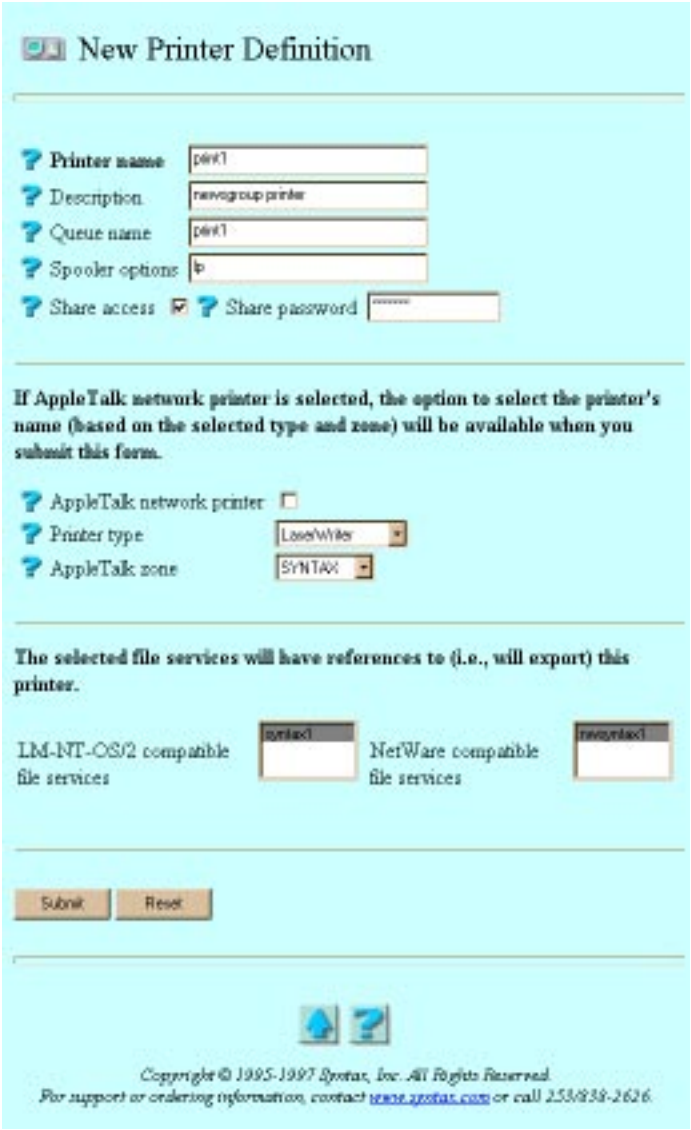
2. **From the list, select the name of the printer you want to modify or delete, or enter the name of a printer you want to add, in the text field. If deleting, you may select more than one printer. The list contains nothing if no printers exist.**

3. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no printers exist.**

   If you clicked Create, the New Printer Definition screen below appears. Go to Step 4.

   If you clicked Modify, the Update Printer Definition for printername screen, same as the New Printer Definition screen below, appears. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. Do not go to Step 4.




4. **Enter or select values for the following attributes, as needed**:
   - Printer name — The name used in net use and capture commands and their Windows equivalents. If you clicked Modify, this attribute does not appear.
   - Description — A printer description to appear in Network Neighborhood or Chooser windows or at the net view command.
   - Queue name — The UNIX print queue associated with the printer. If you do not define this attribute, it defaults to the printer name.

- Spooler options — UNIX command line options that pass to the UNIX print spool program when a print job starts.
- Share access — The option to make a printer accessible through share-level security mode services, which only the LM-NT-OS/2 realm supports. If you do not select this option, users can only access the printer through user-level security services. If you select this option, TAS requires users to supply the Share password to access the printer.
- Share password — The password a user must supply to access a share-mode printer. This option has no effect unless you enable Share access. If you enter no password, TAS allows users to access the printer in share mode without passwords. If a password already exists, TAS indicates it with an asterisk (*). This password changes only if you remove it or enter a new one. Setting the password to "#" causes TAS to deny all access to this printer in share mode. A user, when making connections to TAS and prompted for a connection password, must precede each upper-case character in the password with a tilde (~).
- AppleTalk network printer — The option to make an AppleTalk printer available on the network. The list contains available AppleTalk network printer names based on of Printer type in AppleTalk zone. The AppleTalk network printer, Printer type, and AppleTalk zone designations make up the AppleTalk entity name.
- Printer type — The type of the AppleTalk printer you want to make available. This list contains supported AppleTalk printer types. The AppleTalk network printer, Printer type, and AppleTalk zone designations make up the AppleTalk entity name.
- AppleTalk zone — The AppleTalk zone for which you want to make the printer available. The list contains the AppleTalk zones discovered in the network segment. The AppleTalk network printer, Printer type, and AppleTalk zone designations make up the AppleTalk entity name.
- LM-NT-OS/2 compatible file services — The list of LM-NT-OS/2 file services. Select the file services from which you wish to reference the printer.
- NetWare compatible file services — The list of NetWare-compatible file services. Select the file services from which you wish to reference the printer.

5. **Click Submit.**

   The Creating new Printer Definition for printername screen or the Updating Printer Definition for printername screen appears.

6. **Click OK.**

   To administer printers from the UNIX command line, use the tnprinter command.

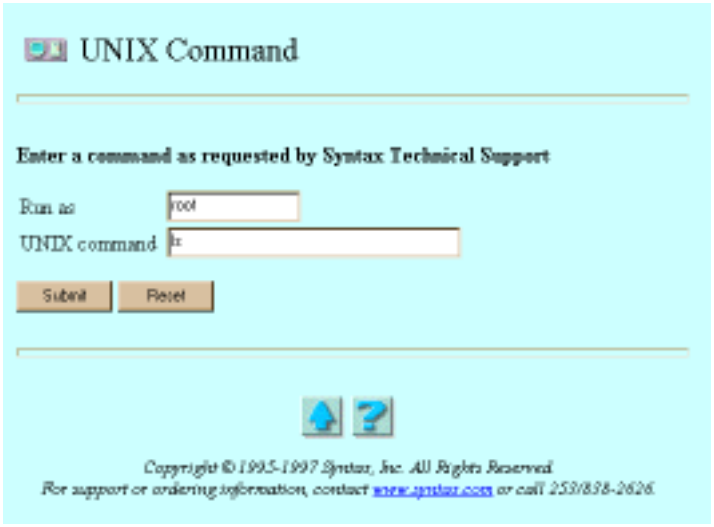
# 4.7 Running UNIX Commands

The capability to run UNIX commands from TotalAdmin provides a way for Syntax Technical Support to gather information at your site. Syntax Technical Support representatives may ask you to run certain UNIX commands via this interface as a means of solving problems. Do not use this function for general-purpose access to the UNIX command line. Use *TAS Reference Manual* to learn how to administer TAS from the UNIX command line.

Follow these steps to run a UNIX command from TotalAdmin:

1. **Follow these links:**
   - **System->UNIX Command**

     The UNIX Command screen appears:




2. **Enter values for the following attributes:**
   - Run as — The user name to want to use to run the command. This option only appears if you logged in as root.
   - UNIX command — The command you want to execute.

3. **Click Submit.**

   The UNIX Command commandname screen appears.

4. **When finished, click OK.**

# 4.8 Updating UNIX File Attributes

This section shows you how to modify the permissions of one or more UNIX files under a volume. When you reconfigure permissions, TotalAdmin displays the new permissions for the selected files. Volumes must exist for you to configure file and directory access permissions in them. To create a volume, see “4.5 Administering Volumes” on page 46.

Follow these steps to update UNIX file attributes:

1. **Click the File Permissions link.**

   The UNIX File Attributes screen appears:


2. **Select or enter values for the following attributes:**
   - Volume name — The volume containing the files you want to modify. If no volumes appear, you have configured none, or their path specification includes substitution strings like %HOME% or %USER%.
   - UNIX filename — The names of the files to modify or view. To modify more than one file, you can use UNIX wildcards, such as *.txt. You cannot use two consecutive dots in the path name you provide.

3. **Click Modify or View.**

   If you clicked Modify, the Update UNIX file attributes on filepath screen below appears. Go to Step 4.

If you clicked View, the Listing for filename screen appears. It displays the following information for each file: its permissions, number of links, owner, group, size, modification date, modification time, and file name. When finished, click OK. Do not go to Step 4.


4. **Select or enter values for the following attributes, as needed**:
   - Modify? (Owner and Group) — The option that changes the ownership of the path. To select it, select the appropriate boxes under Modify? and fill in the corresponding fields. Ownership changes in a field only if you select its corresponding box under Modify? and enter an owner name.
   - Modify? (Read, Write, and Execute Permissions for User, Group, and Other) — The option that designates permissions for the path. To select it, select the boxes under Modify? that indicate the permissions levels you want to designate and select the corresponding boxes. A permission only changes if you select a box under Modify? and a corresponding box from the Read, Write, or Execute columns.

5. **Click Submit.**

   The File Attributes screen appears.

6. **Click OK.**

CHAPTER 5

# Configuring Services

This chapter covers the procedures for configuring and administering services in the LM-NT-OS/2, NetWare, and AppleTalk realms. It contains the following sections:



Configuration and administration screens in this chapter sometimes have both selection lists and text fields for your input regarding an object. If these both apply to one object or attribute and you both select a value and type one in, the value you type overrides the one you select in the list.

## 5.1 Services for the LM-NT-OS/2 Realm

This section contains instructions for the following tasks:

## 5.1.1 Starting LM-NT-OS/2 Services

Follow these steps to start the LM-NT-OS/2 realm and set its services to accept client connection requests:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Configuration and Control->Start all LM-NT-OS/2 Services**

     The Confirmation screen appears.
2. **Click OK.**

   The Start all LM-NT-OS/2 Services screen appears.
3. **Click OK.**

## 5.1.2 Shutting Down LM-NT-OS/2 Services

Follow these steps to shut down the LM-NT-OS/2 realm and set its services to reject client connection requests:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Configuration and Control->Shutdown all LM-NT-OS/2 Services**

     The Confirmation screen appears.
2. **Click OK.**

   The Shutdown all LM-NT-OS/2 Services screen appears.
3. **Click OK.**

## 5.1.3 Checking Realm Status

Follow these steps to check the status of the TAS system, transports, services, and client connections in the LM-NT-OS/2 realm:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Configuration and Control->LM-NT-OS/2 Realm Status**

   The LM-NT-OS/2 Realm Status screen appears:


2. **When finished, click OK.**

   To check realm status from the UNIX command line, use the tnstat command.

## 5.1.4 Updating Realm Configuration

Follow the steps below to change configuration attributes for this realm. TAS provides NetBIOS-over-TCP/IP and NetBIOS-over-NetBEUI services in the LM-NT-OS/2 realm.

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Configuration and Control ->Configuration**

     The Configure LM-NT-OS/2 Realm screen appears:


2. **Enter or select values for the following attributes, as needed:**
   - Announcement interval — The number of seconds between services' broadcasts of their names on the network. If you enter no value, TAS sets the announcement interval at 300 seconds (5 minutes). To reduce the amount of broadcast traffic on a network with OS/2 or Windows for Workgroups clients, increase this value. To make servers appear more promptly on users' Network Neighborhood or Chooser lists, decrease this value. If you only have Windows 95 and NT in your LM-NT-OS/2 realm, this number makes little difference.
   - Workgroup — The group of LAN Manager-style nodes, also called the LAN Manager domain and the NT domain, on the network. Workgroup defaults to workgroup or langroup in most cases.
   - Transport list — At least one of the `tnnbu` (NetBEUI) and `tcpip` (TCP/IP) protocols, over which you can access the services in the LM-NT-OS/2 realm. Your choice of protocols depends on the protocols the client machines use.
   - Windows 95 logon script — The `.BAT` file or other executable file the client PC's operating system executes when it first connects. This file must exist in a volume or attach point named `NETLOGON` and execute properly.
   - WINS servers — The attribute that allows TAS to participate as a WINS NetBIOS node, so that PCs using WINS can locate the TAS services you define. It also allows TAS utilities and services—such as the remote utilities, nbmessage, and LMfile using proxy authentication—to use WINS to locate other machines. If you have a large network with multiple logical networks and subnets, Windows Internet Name Service (WINS) lets you treat the entire network as a single entity. That way, any PC can locate a file server in any part

of the network. To use WINS, enter the IP address of a WINS server. You may have multiple WINS servers; if so, separate their addresses by commas.

3. **Click Submit.**

   The Update LM-NT-OS/2 Realm Configuration screen appears.

4. **Click OK.**

   To update the realm configuration from the UNIX command line, use the tnrealm command.

## 5.1.5 Creating and Modifying File Services

TAS allows LM-NT-OS/2-compatible clients to share file and print resources by connecting them through the LM-NT-OS/2 realm.

Follow the steps below to create or modify a file service in the LM-NT-OS/2 realm. You can also use the file service creation wizard at LM-NT-OS/2 Realm->File Service Creation or System->File Service Creation->LM-NT-OS/2 Realm File Service to create a file service.

1. **Follow these links**:

   - **LM-NT-OS/2 Realm->Manage File Services**

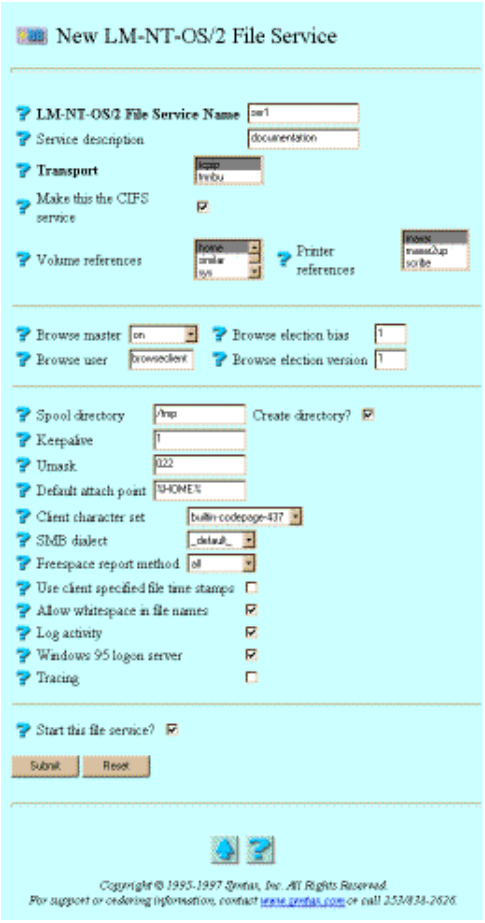
     The List of LM-NT-OS/2 File Services screen appears.

2. **From the list, select the file service you want to modify, or enter the name of a service you want to create in the text field. A file service name can contain up to 15 ASCII characters and no spaces, and it must not begin with an asterisk (*). The list contains nothing if no file services exist.**

3. **Click Create or Administer. The Administer button does not appear if no file services exist.**

   If you clicked Create, the New LM-NT-OS/2 File Service screen below appears. Go to Step 4.

   If you clicked Administer, the LM-NT-OS/2 File Service servicename screen appears. Click Configuration, or click the appropriate link from the following, then click OK on the subsequent screen: Accept Service Connections, Reject Service Connections, Status, Start Service, Shutdown Service. If you click Configuration, the Update LM-NT-OS/2 File Service servicename screen, same as the New LM-NT-OS/2 File Service screen below, appears. Go to Step 4.




4. **Enter or select values for the following attributes, as needed:**
   - LM-NT-OS/2 File Service Name — The file service to which users connect, according to its appearance in their Network Neighborhood lists. The file service name conventionally appears in lower-case on clients and in upper-case on the network. Windows, DOS, and OS/2 clients convert service names to uppercase. If you clicked Administer and Configuration, this attribute does not appear.
   - Service description — The description used within TAS for the service. It consists of an arbitrary line of text.
   - Transport — The transports supported in the LM-NT-OS/2 realm: TCP/IP (tcpip) and TAS NetBEUI (tnnbu). You may select one or both transports, depending on the protocols your clients use.
   - Make this the CIFS service — The option to allow some PCs, such as Windows NT 4.0 PCs, to locate and connect to servers using TCP/IP name resolution or

IP addresses, bypassing the need for NetBIOS. To enable CIFS (Common Internet File System), you must enable the TCP/IP transport for this service and ensure that no other service has CIFS enabled. You should also match the service name to the system host name, if possible.

- Volume references — A list of the volumes this file service references and exports. You can configure the referenced volumes and their attributes via System->Volumes. Select the volumes you want to reference.
- Printer references — A list of the printers this file service exports. You can configure the referenced printers and their attributes via System->Printers. Select the printers you want to reference.
- Browse master — LM-NT-OS/2 file service participation in the browse master election. The service attempts to become browse master for the LM-NT-OS/2 realm. This attribute defaults to off. If you select domain, the file service becomes the domain browse master—browse master for its network segment—by means of rigged elections. You may only configure one service in a domain as the domain browse master.
- Browse user — The UNIX user identity you want LM-NT-OS/2 realm clients who log in solely for accessing Network Neighborhood windows to assume. This attribute defaults to the TotalNET administrator. It has no effect with Browse master set to off.
- Browse election bias — Configuration of the LM-NT-OS/2 realm to attempt to win the browse-master election. Select a value from 0 to 255. TAS associates the following numbers and operating systems: 1 for Windows for Workgroups and Windows 95, 16 for Windows NT workstations, and 32 for Windows NT servers. A value of 255 causes the service to try as hard as possible to win the election. The value defaults to 0, indicating that this attribute does not exist. This attribute has no effect with Browse master set to off.
- Browse election version — Decision between two hosts with the same operating system in a browser election. Select a value from 0 to 65535. A value of 65535 causes the service to try as hard as possible to win the election. The value defaults to 0, indicating that this attribute does not exist. This attribute has no effect with Browse master set to off.
- Spool directory — The directory in which TAS spools print data files for the service. The attribute defaults to /tmp. On some UNIX systems, the /tmp directory has the “sticky bit” set. This prevents the system from deleting spooled files after users print them. On such systems, do not use this directory as the spool directory.
- Create directory? — The option to create the specified spool directory if it does not already exist.
- Keepalive — The number of minutes between dispatches of keepalive packets. The server sends keepalive probes to detect active client sessions. Keepalive here refers to a NetBIOS keepalive. Use it only with inactive TCP keepalives or TCP keepalives with too lengthy of an interval. This attribute defaults to 1 minute.

- Umask — The default file access permissions for TAS clients. The three-digit umask number represents the UNIX file protection mask. It works the same as the UNIX umask command. Refer to the UNIX umask(1) man page for more information on how the system interprets umask digits.
- Default attach point — The server directory to which clients connect when they do not specify volume names. The attach point defaults to the first volume defined for this file service.
- Client character set — The character set that TAS assumes all of this service's clients use. It defaults to builtin-codepage-437. Select a different character set if necessary.
- SMB dialect — The dialect level at which the service identifies itself to client PCs. Choosing default allows the file server to set its identification to the highest level supported by both the server and the client machine. Other levels include the following:

| core | lanman 1.0 | lanman 2.0 | lanman 2.1 |
|---|---|---|---|
| basic service | performance-enhanced network IO | long OS/2 and NT file names | long Windows95 file names |
| | named pipe support | OS/2 extended file attributes | |
| | secure authentication | | |

- Freespace report method — The method for calculating the amount of free disk space. Systems that do not support the UNIX statfs() system call or its equivalent do not support this option. If set to the default all, this attribute makes TAS report to clients all of the free space on all of the partitions. If set to

root, this attribute makes TAS report only the free disk space on the TAS volume for this connection.

- Use client specified file time stamps — The option to stamp files created or modified on the server by clients with the clients' date and time rather than the server's date and time.
- Allow whitespace in file names — The option to allow LM-NT-OS/2-compatible clients to use spaces in file names.
- Log activity — The option to enable activity logging. This directs this file service to record client activity in activity.tn in the TAS home directory. When a client disconnects, TAS appends a line of data about the client's session to the log file at activity.tn. This attribute defaults to no activity logging.
- Windows 95 logon server — The option to cause the LM-NT-OS/2 file service to act as a logon server for its domain. Only Windows 95 clients support this attribute. If you select this option, you must also have a NETLOGON volume reference or attach point for this file service; the absence of a NETLOGON volume reference causes unexpected errors for clients when they connect.
- Tracing — The option to direct this file service to write debugging traces to a file. Syntax Technical Support can use the trace file to help diagnose problems.
- Start this file service? — The option to start this file service when you click Submit. If you clicked Administer and Configuration, this attribute does not appear.

5. **Click Submit.**

   The Create New LM-NT-OS/2 File Service servicename screen or the Update LM-NT-OS/2 File Service servicename screen appears.

6. **Click OK.**

   To administer a file service from the UNIX command line, use the tnservice command.

## 5.1.6 Shutting Down File Services

Follow these steps to shut down a file service:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Manage File Services**

     The List of LM-NT-OS/2 File Services screen appears.

2. **From the list, select the file service you want to shut down.**

3. **Click Administer.**

   The LM-NT-OS/2 File Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in the LM-NT-OS/2 Realm screen appears.

6. **Click OK.**

## 5.1.7 Deleting File Services

Follow the steps below to delete file services in the LM-NT-OS/2 realm. These steps include instructions for shutting down the file services you want to delete, because you must shut down a file service to delete it.

1. **Follow these links**:
   - **LM-NT-OS/2 Realm->Manage File Services**
     The List of LM-NT-OS/2 File Services screen appears.

2. **From the list, select the file service you want to delete.**

3. **Click Administer.**
   The LM-NT-OS/2 File Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in the LM-NT-OS/2 Realm screen appears.

6. **Click OK.**

7. **Repeat Steps 1-5 for each service you want to delete.**

8. **Follow these links**:
   **LM-NT-OS/2 Realm->Manage File Services**
   The List of LM-NT-OS/2 File Services screen reappears.

9. **From the list, select the file services you want to delete.**

10. **Click Delete.**
    The Confirmation screen appears.

11. **Click OK.**

    The Delete LM-NT-OS/2 File Service screen appears.

12. **Click OK.**

## 5.1.8 Accepting Services

LM-NT-OS/2 file services accept client connection requests unless you set them to reject connection requests. Starting TAS also sets its services to accept connection requests.

Follow these steps to make LM-NT-OS/2 file services accept client connection requests:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Configuration and Control->Accept Service Connections**

     The Confirmation screen appears.

2. **Click OK.**

   The Accept all LM-NT-OS/2 Service Connections screen appears.

3. **Click OK.**

   To accept services from the UNIX command line, use the tnaccept command.

## 5.1.9 Rejecting Services

LM-NT-OS/2 file services accept client connection requests unless you set them to reject connection requests. Shutting down TAS also sets its services to reject connection requests.

Follow these steps to make LM-NT-OS/2 file services reject client connection requests:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Configuration and Control->Reject Service Connections**

     The Confirmation screen appears.

2. **Click OK.**

   The Reject all LM-NT-OS/2 Service Connections screen appears.

3. **Click OK.**

   To reject services from the UNIX command line, use the tnreject command.

## 5.1.10 Administering Attach Points

Follow these steps to create, modify, or delete attach points—points on directory paths at which clients must provide credentials—in the LM-NT-OS/2 realm:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Manage File Services**

     The List of LM-NT-OS/2 File Services screen appears.

2. **From the list, select the file service in which you want to administer an attach point.**

3. **Click Administer.**

   The LM-NT-OS/2 File Service servicename screen appears.

4. **Click Attach Points.**

   The List of Defined Attach Points screen appears.

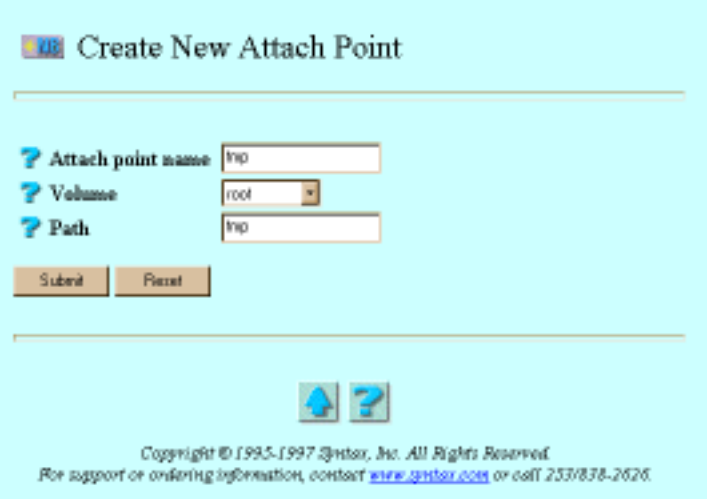
5. **From the list, select the attach point you want to modify or delete, or enter the name of an attach point you want to create in the text field. If deleting, you may select more than one attach point. The list contains nothing if no attach points exist.**

6. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no attach points exist.**

   If you clicked Create, the Create New Attach Point screen below appears. Go to Step 7.

   If you clicked Modify, the Update Attach Point attachpoint screen, same as the Create New Attach Point screen below, appears. Go to Step 7.

   If you clicked Delete, the Confirmation screen appears. Click OK. The Delete Attach Points screen appears. Click OK. Do not go to Step 7.




7. **Enter or select values for the following attributes:**
   - Attach point name — The attach point. If you clicked Modify, this attribute does not appear.
   - Volume — The list of volumes exported by this service. TAS defines volumes at the system level. File services can reference defined volumes; such references export the volumes.
   - Path — The directory below the selected volume, used as the virtual root by clients who connect to this attach point.

8. **Click Submit.**

   The Create New Attach Point screen or the Update Attach Point attachpoint screen appears.

9. **Click OK.**

   To administer attach points from the UNIX command line, use the tnattach command.

## 5.1.11 Configuring Security

Follow these steps to configure LM-NT-OS/2 file authentication or service mode options:

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->Manage File Services**

The List of LM-NT-OS/2 File Services screen appears.

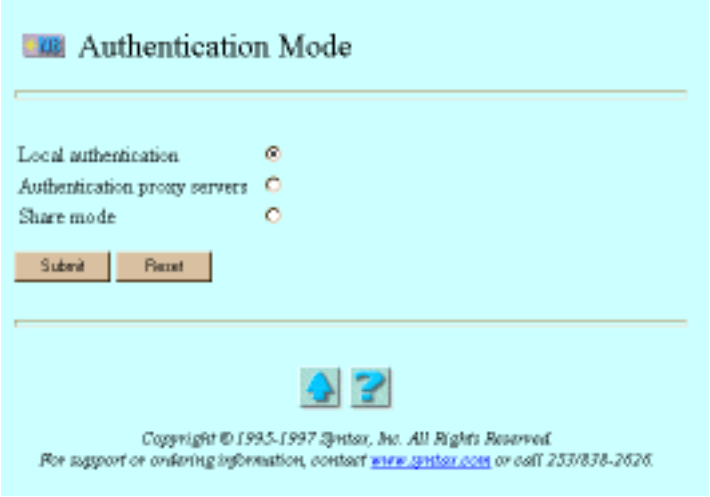
2. **From the list, select the file service for which you want to configure authentication or service mode options.**

3. **Click Administer.**

   The LM-NT-OS/2 File Service servicename screen appears.

4. **Click Authentication and Service Mode Options.**

   The Authentication Mode screen appears:




5. **Select one of the following options:**

   - Local authentication — Authentication by a file server in the LM-NT-OS/2 realm. If the server cannot verify a client's user ID and password, it refuses the connection. If the realm uses local authentication, it does not consult a proxy server. You may choose open authentication or secure authentication. With open authentication, client and server exchange clear-text passwords. With secure authentication, client and server exchange a series of messages that allows the server to verify that the client knows the correct password, without transmitting the password or any representation of it.
   - Authentication proxy servers — Authentication by another LM-NT-OS/2-compatible server. If this other, proxy server cannot verify a client's user ID and password, it refuses the connection. If it accepts the connection, the local server looks up the user name in the local database—either /etc/passwd or NIS—to get the user's UNIX ID.
   - Share mode — Group-level access. No security exists in share mode, which allows clients to connect to shared volumes anonymously. If you choose Share mode, the file service's configuration no longer records user-mode (local or

proxy) authentication information. You will not see proxy servers' names if you later change to Authentication proxy servers.

**6. Click Submit.**

If you selected Local Authentication, the Update Local Authentication for servicename screen appears. Select or enter values for the following attributes, as needed:

- Password encryption — The option to keep passwords from transmitting across the network. Without password encryption, any UNIX user can potentially connect to the server. In this open authentication environment, client and server exchange clear-text passwords. Password encryption, the secure authentication method, provides improved security, but you must maintain a separate user-password database for it. When you enable password encryption and secure authentication, only users added via Passwords can connect. With secure authentication, client and server exchange a series of messages that allows the server to verify that the client knows the correct password, without transmitting the password or any representation of it. Most LAN Manager-style clients support secure authentication.
- Username map — The option to allow file services to validate clients by mapping them to valid UNIX users. You must define username maps before selecting this option (see "4.2 Administering Username Maps" on page 41).
- Allow null passwords — The option to allow UNIX users without passwords to access the server. By default, TAS denies such users access to the server, for better security. This option has no effect if you enable Password encryption or Authentication proxy servers.
- User restrictions — The option to restrict the users who can connect to this service. Select it by selecting either Allow or Deny and entering the names of the users in the adjacent Users field. If you enter no user names, TAS ignores this attribute. Separate user names with commas.

If you selected Authentication proxy servers, the Update Authentication Proxy Server for servicename screen appears. Enter or select values for the following attributes, as needed:

- Authentication proxy servers — The list of servers TAS will contact as a proxy server, each in turn, until one of them responds. Separate servers with commas.
- Username map — The option to allow file services to validate clients by mapping them to valid UNIX users. You must define username maps before selecting this option (see "4.2 Administering Username Maps" on page 41).
- Allow null passwords — The option to allow UNIX users without passwords to access the server. By default, TAS denies such users access to the server, for better security. This option has no effect if you enable Password encryption or Authentication proxy servers.
- User restrictions —The option to restrict the users who can connect to this service. Select it by selecting either Allow or Deny and entering the names of

the users in the adjacent Users field. If you enter no user names, TAS ignores this attribute. Separate user names with commas.

If you selected Share mode, the Update Share Mode Options for servicename screen appears. Enter a value for the following attribute, as needed:

- Share user — The UNIX user name for the service to associate with files that its clients create in share mode.

7. **Click Submit.**

   The Update Local Authentication for servicename screen, the Update Authentication Proxy Server for servicename screen, or the Share Mode for servicename screen appears.

8. **Click OK.**

   To configure security from the UNIX command line, use the tnservice command.

## 5.1.12 Creating and Modifying Terminal Services

Terminal services allow client-based terminal emulator programs to connect to the UNIX host. For many clients, you can simply use the built-in TCP/IP protocol and a vendor-provided—or third-party—telnet program. TAS LM-NT-OS/2 terminal services provide the same capability using NetBIOS—either TCP/IP or NetBEUI—as a transport. To connect to TAS LM-NT-OS/2 terminal services, you need a terminal emulator that supports NetBIOS, such as Kermit. Usually, clients with only NetBEUI available use TAS LM-NT-OS/2 terminal services.

Follow these steps to create or modify a terminal service:

1. **Follow these links**:
   - **LM-NT-OS/2 Realm->Manage Terminal Services**

     The List of LM-NT-OS/2 Terminal Service screen appears.

2. **From the list, select the terminal service you want to modify, or enter the name of a service you want to create in the text field. The list contains nothing if no terminal services exist.**

3. **Click Create or Administer. The Administer button does not appear if no terminal services exist.**

   If you clicked Create, the Create New LM-NT-OS/2 Terminal Service screen below appears. Go to Step 4.

   If you clicked Administer, the LM-NT-OS/2 Terminal Service servicename screen appears. Click Configuration, or click the appropriate link from the following, then click OK on the subsequent screen: Accept Service Connections, Reject Service Connections, Status, Start Service, Shutdown Service. If you click Configuration, the Update LM-NT-OS/2 Terminal Service servicename screen, same as the Create New LM-NT-OS/2 Terminal Service screen below, appears. Go to Step 4.


4. **Enter or select values for the following attributes, as needed**:
   - LM-NT-OS/2 Terminal Service Name — The terminal service. If you clicked Administer and Configuration, this attribute does not appear.
   - Service description — The description used within TAS for the service. It consists of an arbitrary line of text.
   - Transport — The protocol stacks over which you may offer the service. The LM-NT-OS/2 realm can use tcpip (TCP/IP) and tnnbu (TotalNET NetBIOS-over-NetBEUI).
   - Start this terminal service? — The option to start this terminal service when you click Submit. If you clicked Administer and Configuration, this attribute does not appear.

5. **Click Submit.**

   The Create New LM-NT-OS/2 Terminal Service servicename screen or the Update LM-NT-OS/2 Terminal Service servicename screen appears.

6. **Click OK.**

   To administer terminal services from the UNIX command line, use the tnservice command.

## 5.1.13 Shutting Down Terminal Services

Follow these steps to shut down a terminal service:

1. **Follow these links**:

- **LM-NT-OS/2 Realm->Manage Terminal Services**
  The List of LM-NT-OS/2 Terminal Service screen appears.

2. **From the list, select the file service you want to shut down.**

3. **Click Administer.**
   The LM-NT-OS/2 Terminal Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in the LM-NT-OS/2 Realm screen appears.

6. **Click OK.**

## 5.1.14 Deleting Terminal Services

Follow the steps below to delete terminal services in the LM-NT-OS/2 realm. These steps include instructions for shutting down the terminal services you want to delete, because you must shut down a terminal service to delete it.

1. **Follow these links**:
   - **LM-NT-OS/2 Realm->Manage Terminal Services**
     The List of LM-NT-OS/2 Terminal Service screen appears.

2. **From the list, select the file service you want to delete.**

3. **Click Administer.**
   The LM-NT-OS/2 Terminal Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in the LM-NT-OS/2 Realm screen appears.

6. **Click OK.**

7. **Repeat Steps 1-5 for each service you want to delete.**

8. **Follow these links**:
   **LM-NT-OS/2 Realm->Manage Terminal Services**

The List of LM-NT-OS/2 Terminal Service screen reappears.

9. **From the list, select the terminal services you want to delete.**

10. **Click Delete.**
    The Confirmation screen appears.

11. **Click OK.**
    The Delete LM-NT-OS/2 Terminal Service screen appears.

12. **Click OK.**

## 5.1.15 Enabling Multiple Users per Client Connection

Follow these steps to enable allow multiple users per client connection, called "multiplexing", for Solaris 2.5.1 platforms with ClearCase:

1. **Follow these links:**
   **LM-NT-OS/2 Realm->Configuration and Control->Load Multi-user Kernel Drivers**

   The Confirmation screen appears.

2. **Click OK.**
   The Load Multi-user Kernel Drivers screen appears.

3. **Click OK.**

## 5.1.16 Disabling Multiple Users per Client Connection

Follow these steps to disable TAS multiplexing:

1. **Follow these links:**
   **LM-NT-OS/2 Realm->Configuration and Control->Unload Multi-user Kernel Drivers**

   The Confirmation screen appears.

2. **Click OK.**
   The Unload Multi-user Kernel Drivers screen appears.

3. **Click OK.**

## 5.1.17 Sending Messages to Users

Follow the steps below to send a message to one or more connected users. Users must have message reception enabled, by a program such as Winpopup, to receive messages properly.

1. **Follow these links:**
   - **LM-NT-OS/2 Realm->LM-NT-OS/2 Connected Users->Send Message to Users**

     The Send Message to Users screen appears:


2. **Select or enter values for the following attributes:**
   - Name of users — The users to receive the message.
   - Message — The message to send.

3. **Click Submit.**

   The Send Message to Users screen reappears, this time containing the statement “Command Successful”.

4. **Click OK.**

   To send a message to LM-NT-OS/2 users from the UNIX command line, use the nbmessage command.

# 5.1.18 Disconnecting Users

Follow the steps below to disconnect connected users. Windows 95 and NT clients usually attempt to re-establish broken connections, so the disconnection may not last. To prevent this from happening, set the file services to reject client connection requests (see “5.1.9 Rejecting Services” on page 68).

1. **Follow one of these sets of links:**
   - **LM-NT-OS/2 Realm->LM-NT-OS/2 Connected Users ->Disconnect Users**
   - **LM-NT-OS/2 Realm->Manage File Service->[select a service] ->Administer->Disconnect Users**

   The Disconnect Users screen appears:


2. **Select or enter values for the following attributes, as needed**:
   - Name of users — The users to disconnect.
   - Minutes before disconnection — The time, in minutes, before you want to disconnect the users.
   - Reason for disconnection — A brief message to the users to disconnect. Users must have message reception enabled, by a program such as Winpopup, to see this message.

3. **Click Submit.**

   The Disconnect Users screen reappears, this time containing the statement “Command Successful”.

4. **Click OK.**

   To disconnect a user from the UNIX command line, use the tnkill command.

## 5.1.19 Viewing Realm Connections

Follow these steps to list LM-NT-OS/2 realm connections:

Follow one of these sets of links:

- **LM-NT-OS/2 Realm->LM-NT-OS/2 Connected Users ->Connection Information**
- **LM-NT-OS/2 Realm->Manage File Services->[select a service] ->Administer->Connection Information**

  The Connection Information screen appears.

1. **From the list, select a user whose information you want to view.**

2. **Click Submit.**

   The Connection Information in LM-NT-OS/2 Realm screen appears:


3. **When finished, click OK.**

# 5.2 Services for the NetWare Realm

This section contains instructions for the following tasks:

## 5.2.1 Starting NetWare Services

Follow these steps to start the NetWare realm and set its services to accept client connection requests:

1. **Follow these links:**
   - **NetWare Realm->Configuration and Control->Start all NetWare Services**

     The Confirmation screen appears.
2. **Click OK.**

   The Start all NetWare Services screen appears.
3. **Click OK.**

## 5.2.2 Shutting Down NetWare Services

Follow these steps to shut down the NetWare realm and set its services to reject client connection requests:

1. **Follow these links:**
   - **NetWare Realm->Configuration and Control->Shutdown all NetWare Services**

     The Confirmation screen appears.

2. **Click OK.**

   The Shutdown all NetWare Services screen appears.

3. **Click OK.**

## 5.2.3 Checking Realm Status

Follow these steps to check the status of the TAS system, transports, services, and client connections in the NetWare realm:

1. **Follow these links:**
   - **NetWare Realm->Configuration and Control->NetWare Realm Status**

   The NetWare Realm Status screen appears:


2. **When finished, click OK.**

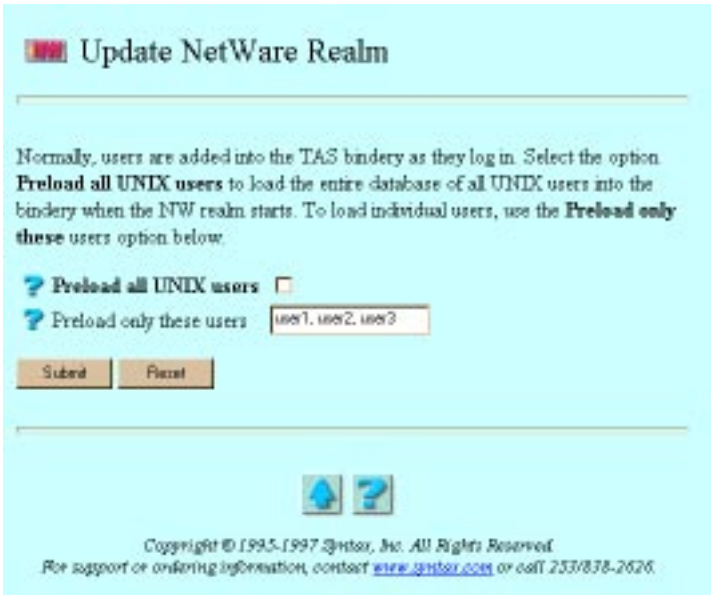
   To check realm status from the UNIX command line, use the tnstat command.

## 5.2.4 Updating Realm Configuration

Follow the steps below to change configuration attributes for this realm. By default, TAS loads user information into the bindery incrementally, as users log in.

1. **Follow these links:**
   - **NetWare Realm->Configuration and Control->Configuration**

     The Update NetWare Realm screen appears:




2. **Select one of the following options:**
   - Pre-load all UNIX users — The option to direct TAS to add all UNIX user names from the UNIX database—either /etc/passwd or NIS—into the TAS bindery when the realm starts. Pre-loading users reduces the time it takes them to log in for the first time, but the time the server takes to start up and initialize the bindery increases slightly per user. This can take a long time on systems with large numbers of users; do not select this option for sites with more than 500 users or for sites running NIS.
   - Preload only these users — The option to preload selected users to the bindery when the server starts. Enter those user names in this field. Pre-loading users reduces the time it takes them to log in for the first time, but the time the server takes to start up and initialize the bindery increases slightly per user.

3. **Click Submit.**

   The Update NetWare Realm Configuration screen appears.

4. **Click OK.**

To update realm status configuration from the UNIX command line, use the tnrealm command.

## 5.2.5 Creating and Modifying File Services

TAS allows NetWare-compatible clients to use UNIX file and print resources.

Follow the steps below to create or modify a file service in the NetWare realm. You can also use the file service creation wizard at NetWare Realm->File Service Creation or System->File Service Creation ->NetWare Realm File Service to create a file service.

1. **Follow these links**:
   - **NetWare Realm->Manage File Services**

     The List of NetWare File Services screen appears.

2. **From the list, select the file service you want to modify, or enter the name of a service you want to create in the text field. A file service name can contain up to 47 lower-case, printable, ASCII characters and no spaces, slashes, colons, semicolons, commas, asterisks, or question marks. The list contains nothing if no file services exist.**

3. **Click Create or Administer. The Administer button does not appear if no file services exist.**

   If you clicked Create, the New NetWare File Service screen below appears. Go to Step 4.

   If you clicked Administer, the NetWare File Service servicename screen appears. Click Configuration, or click the appropriate link from the following, then click OK on the subsequent screen: Accept Service Connections, Reject Service Connections, Status, Start Service, Shutdown Service. If you click Configuration, the Update NetWare File Service servicename screen, same as the New NetWare File Service screen below, appears. Go to Step 4.


4. **Enter or select values for the following attributes, as needed**:
   - NetWare file service name — The file service to which users connect, according to its appearance in their Network Neighborhood lists. The file service name conventionally appears in lower-case on clients and in upper-case on the network. If you clicked Administer and Configuration, this attribute does not appear.
   - Service description — The description used within TAS for the service. It consists of an arbitrary line of text.
   - Volume references — A list of the volumes this file service references and exports. You can configure the referenced volumes and their attributes via System->Volumes. Select the volumes you want to reference.
   - Printer references — A list of printers each file service exports. You can configure the referenced printers and their attributes via System->Printers. Select the printers you want to reference.

- Keepalive — The number of minutes between dispatches of keepalive packets. The server sends keepalive probes to detect active client sessions. This attribute defaults to one minute.
- Umask — The default file access permissions for TAS clients. The three-digit umask number represents the UNIX file protection mask and works the same as the UNIX umask command. Refer to the UNIX umask(1) man page for more information on how the system interprets digits.
- Client character set — The character set that TAS assumes all of this service's clients use. It defaults to builtin-codepage-437. Select a different character set if necessary.
- Freespace report method — The method for calculating the amount of free disk space. Systems that do not support the UNIX statfs() system call or its equivalent do not support this option. If set to the default all, this attribute makes TAS report to clients all of the free space on all of the partitions. If set to root, this attribute makes TAS report only the free disk space on the TAS volume for this connection.
- Allow whitespace in file names — The option to allow NetWare clients to use spaces in file names.
- Log activity — The option to enable activity logging. This directs this file service to record client activity in activity.tn in the TAS home directory. When a client disconnects, TAS appends a line of data about the client's session to the log file at activity.tn. This attribute defaults to no activity logging.
- Allow packet burst mode — The option to enable TAS's use of packet-burst mode, a method that NetWare hosts use to improve performance. TAS uses packet burst mode by default.
- Tracing — The option to direct this file service to write debugging traces to a file. Syntax Technical Support can use the trace file to help diagnose problems.
- Start this file service? — The option to start this file service when you click Submit. If you clicked Administer and Configuration, this attribute does not appear.

5. **Click Submit.**

   The Create New NetWare File Service servicename screen or the Update NetWare File Service servicename screen appears.

6. **Click OK.**

   To administer a file service from the UNIX command line, use the tnservice command.

## 5.2.6 Shutting Down File Services

Follow these steps to shut down a file service:

1. **Follow these links**:

- **NetWare Realm->Manage File Services**
  The List of NetWare File Services screen appears.

2. **From the list, select the file service you want to shut down.**

3. **Click Administer.**
   The NetWare File Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in NetWare Realm screen appears.

6. **Click OK.**

## 5.2.7 Deleting File Services

Follow the steps below to delete file services in the NetWare realm. These steps include instructions for shutting down the file services you want to delete, because you must shut down a file service to delete it.

1. **Follow these links:**
   **NetWare Realm->Manage File Services**

   The List of NetWare File Services screen appears.

2. **From the list, select the file service you want to delete.**

3. **Click Administer.**
   The NetWare File Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in NetWare Realm screen appears.

6. **Click OK.**

7. **Repeat Steps 1-5 for each service you want to delete.**

8. **Follow these links:**

- **NetWare Realm->Manage File Services**

  The List of NetWare File Services screen reappears.

9. **From the list, select the file services you want to delete.**

10. **Click Delete.**

    The Confirmation screen appears.

11. **Click OK.**

    The Delete NetWare File Service screen appears.

12. **Click OK.**

## 5.2.8 Accepting Services

NetWare file services accept client connection requests unless you set them to reject connection requests. Starting TAS also sets its services to accept connection requests.

Follow these steps to make NetWare file services accept client connection requests:

1. **Follow these links**:
   - **NetWare Realm->Configuration and Control->Accept Service Connections**

     The Confirmation screen appears.

2. **Click OK.**

   The Accept NetWare/servicename Service Connections screen appears.

3. **Click OK.**

   To accept services from the UNIX command line, use the tnaccept command.

## 5.2.9 Rejecting Services

NetWare file services accept client connection requests unless you set them to reject connection requests. Shutting down TAS also sets its services to reject connection requests.

Follow these steps to make NetWare file services reject client connection requests:

1. **Follow these links**:

   **NetWare Realm->Configuration and Control->Reject Service Connections**

   The Confirmation screen appears.

2. **Click OK.**

The Reject NetWare/servicename Service Connections screen appears.

3. **Click OK.**

   To reject services from the UNIX command line, use the tnreject command.

## 5.2.10 Administering Attach Points

Follow these steps to create, modify, or delete attach points—points on directory paths at which clients must provide credentials—in the NetWare realm:

1. **Follow these links:**
   - **NetWare Realm->Manage File Services**

     The List of NetWare File Services screen appears.

2. **From the list, select the file service in which you want to administer an attach point.**

3. **Click Administer.**

   The NetWare File Service servicename screen appears.

4. **Click Attach Points.**

   The List of Defined Attach Points screen appears.

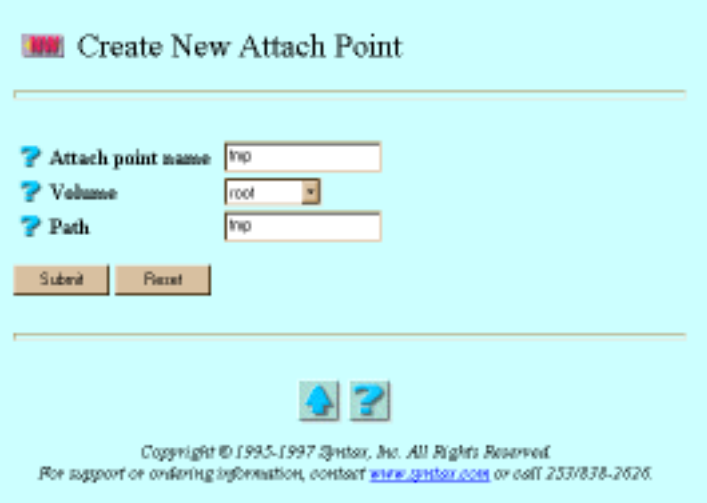
5. **From the list, select the attach point you want to modify or delete, or enter the name of an attach point you want to create in the text field. If deleting, you may select more than one attach point. The list contains nothing if no attach points exist.**

6. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no attach points exist.**

   If you clicked Create, the Create New Attach Point screen below appears. Go to Step 7.

   If you clicked Modify, the Update Attach Point attachpoint screen, same as the Create New Attach Point screen below, appears. Go to Step 7.

   If you clicked Delete, the Confirmation screen appears. Click OK. The Delete Attach Points screen appears. Click OK. Do not go to Step 7.




7. **Enter or select values for the following attributes:**
   - Attach point name — The attach point. If you clicked Modify, this attribute does not appear.
   - Volume — The list of volumes exported by this service. TAS defines volumes at the system level. File services can reference defined volumes; such references export the volumes.
   - Path — The directory below the selected volume, used as the virtual root by clients who connect to this attach point.

8. **Click Submit.**

   The Create New Attach Point attachpoint screen or the Update Attach Point attachpoint screen appears.

9. **Click OK.**

   To administer attach points from the UNIX command line, use the tnattach command.

## 5.2.11 Configuring Security

Follow these steps to configure NetWare file authentication:

1. **Follow these links:**
   - **NetWare Realm->Manage File Services**

The List of NetWare File Services screen appears.

2. **From the list, select the file service for which you want to configure authentication.**

3. **Click Administer.**

   The NetWare File Service servicename screen appears.

4. **Click Authentication and Service Mode Options.**

   The Authentication Mode screen appears:


5. **Select one of the following options:**

   - Local authentication — Authentication by a file server in the NetWare realm. If the server cannot verify a client's user ID and password, it refuses the connection. If the realm uses local authentication, it does not consult a proxy server. You may choose open authentication or secure authentication. With open authentication, client and server exchange clear-text passwords. With secure authentication, client and server exchange a series of messages that allows the server to verify that the client knows the correct password, without transmitting the password or any representation of it.
   - Authentication proxy servers — Authentication by another NetWare-compatible server. If this other, proxy server cannot verify a client's user ID and password, it refuses the connection. If it accepts the connection, the local server looks up the user name in the local database—either /etc/passwd or NIS—to get the user's UNIX ID.

6. **Click Submit.**

If you selected Local authentication, the Update Local Authentication for servicename screen appears. Select or enter values for the following attributes, as needed:

- Password encryption — The option to keep passwords from transmitting across the network. Without password encryption, any UNIX user can potentially connect to the server. In this open authentication environment, client and server exchange clear-text passwords. Password encryption, the secure authentication method, provides improved security, but you must maintain a separate user-password database for it. When you enable password encryption and secure authentication, only users added via Passwords can connect. With secure authentication, client and server exchange a series of messages that allows the server to verify that the client knows the correct password, without transmitting the password or any representation of it.
- Username map — The option to allow file services to validate clients by mapping them to valid UNIX users. You must define username maps before selecting this option (see “4.2 Administering Username Maps” on page 41).
- Allow null passwords — The option to allow UNIX users without passwords to access the server. By default, TAS denies such users access to the server, for better security. This option has no effect if you enable Password encryption or Authentication proxy servers.
- User restrictions — The option to restrict the users who can connect to this service. Select it by selecting Allow or Deny and entering the names of the users in the adjacent Users field. If you enter no user names, TAS ignores this attribute. Separate user names with commas.
- DCE authentication — The option to cause this service to use DCE rather than the native UNIX password facility for authentication. If this service uses Password encryption or Share mode or if you defined Authentication proxy servers, this other authentication method takes precedence. This option appears only if you have TAS-DCE, and it does not control the acquisition of DCE credentials. DCE-enabled host systems always require appropriate DCE credentials, if possible. See TAS-DCE Guide.

If you selected Authentication proxy servers the Update Authentication Proxy Server for servicename screen appears. Enter or select values for the following attributes, as needed:

- Authentication proxy servers — The list of servers TAS will contact as a proxy server, each in turn, until one of them responds. Separate servers with commas.
- Username map — The option to allow file services to validate clients by mapping them to valid UNIX users. You must define username maps before selecting this option (see “4.2 Administering Username Maps” on page 41).
- Allow null passwords — The option to allow UNIX users without passwords to access the server. By default, TAS denies such users access to the server, for better security. This option has no effect if you enable Password encryption or Authentication proxy servers.

- User restrictions — The option to restrict the users who can connect to this service. Select it by selecting either Allow or Deny and entering the names of the users in the adjacent Users field. If you enter no user names, TAS ignores this attribute. Separate user names with commas.

7. **Click Submit.**

   The Update Local Authentication for servicename screen or the Update Authentication Proxy Server for servicename screen appears.

8. **Click OK.**

   To configure security from the UNIX command line, use the tnservice command.

## 5.2.12 Creating and Modifying Terminal Services

Terminal services allow client-based terminal emulator programs to connect to the UNIX host. For many clients, you can simply use the built-in TCP/IP protocol and a vendor-provided—or third-party—telnet program. TAS NetWare terminal services provide the same capability using SPX as a transport. To connect to TAS NetWare terminal services, you need a terminal emulator that supports SPX. Usually, clients with only IPX/SPX available use TAS NetWare terminal services.

Follow these steps to create or modify a terminal service:

1. **Follow these links:**
   - **NetWare Realm->Manage Terminal Services**

     The List of NetWare Terminal Service screen appears.

2. **From the list, select the terminal service you want to delete, or enter the name of a service you want to create in the text field. The list contains nothing if no terminal services exist.**

3. **Click Create or Administer. The Administer button does not appear if no terminal services exist.**

   If you clicked Create, the Create New NetWare Terminal Service screen below appears. Go to Step 4.

   If you clicked Administer, the NetWare Terminal Service servicename screen appears. Click Configuration, or click the appropriate link from the following, then click OK on the subsequent screen: Accept Service Connections, Reject Service Connections, Status, Start Service, Shutdown Service. If you click Configuration, the Update NetWare Terminal Service servicename screen, same as the Create New NetWare Terminal Service screen below, appears. Go to Step 4.


4. **Enter or select values for the following attributes, as needed**:
   - NetWare Terminal Service Name — The terminal service. If you clicked Administer and Configuration, this attribute does not appear.
   - Service description — The description used within TAS for the service. It consists of an arbitrary line of text.
   - Start this terminal service? — The option to start this terminal service when you click Submit. If you clicked Administer and Configuration, this attribute does not appear.

5. **Click Submit.**

   The Create New NetWare Terminal Service servicename screen or the Update NetWare Terminal Service servicename screen appears.

6. **Click OK.**

   To administer a terminal service from the UNIX command line, use the tnservice command.

## 5.2.13 Shutting Down Terminal Services

Follow these steps to shut down a terminal service:

1. **Follow these links**:

   **NetWare Realm->Manage Terminal Services**

   The List of NetWare Terminal Service screen appears.

2. **From the list, select the terminal service you want to shut down.**

3. **Click Administer.**
   The NetWare Terminal Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in NetWare Realm screen appears.

6. **Click OK.**

## 5.2.14 Deleting Terminal Services

Follow the steps below to delete terminal services in the NetWare realm. These steps include instructions for shutting down the terminal services you want to delete, because you must shut down a terminal service to delete it.

1. **Follow these links:**
   **NetWare Realm->Manage Terminal Services**
   The List of NetWare Terminal Service screen appears.

2. **From the list, select the terminal service you want to delete.**

3. **Click Administer.**
   The NetWare Terminal Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in NetWare Realm screen appears.

6. **Click OK.**

7. **Repeat Steps 1-5 for each service you want to delete.**

8. **Follow these links:**
   **NetWare Realm->Manage Terminal Services**
   The List of NetWare Terminal Service screen reappears.

9. **From the list, select the file services you want to delete.**

10. **Click Delete.**

    The Confirmation screen appears.

11. **Click OK.**

    The Delete NetWare Terminal Service screen appears.

12. **Click OK.**

## 5.2.15 Creating and Modifying NVT Services

Terminal services allow client-based terminal emulator programs to connect to the UNIX host. For many clients, you can simply use the built-in TCP/IP protocol and a vendor-provided—or third-party—telnet program. TAS NVT services provide the same capability using NVT as a transport. To connect to TAS NVT services, you need a terminal emulator that supports NVT. Usually, clients with only IPX/SPX available use TAS NVT services.

Follow these steps to create or modify an NVT service:

1. **Follow these links**:

   **NetWare Realm->Manage NVT Services**

   The List of NetWare NVT Service screen appears.

2. **From the list, select the NVT service you want to modify, or enter the name of a service you want to create in the text field. The list contains nothing if no NVT services exist.**

3. **Click Create or Administer. The Administer button does not appear if no NVT services exist.**

   If you clicked Create, the Create New NetWare NVT Service screen below appears. Go to Step 4.

   If you clicked Administer, the NetWare NVT Service servicename screen appears. Click Configuration, or click the appropriate link from the following, then click OK on the subsequent screen: Accept Service Connections, Reject Service Connections, Status, Start Services, Shutdown Services. If you click Configuration, the Update NetWare NVT Service servicename screen, same as the Create New NetWare NVT Service screen below, appears. Go to Step 4.


4. **Enter or select values for the following attribute, as needed:**
   - NetWare NVT Service Name — The NVT service. If you clicked Administer and Configuration, this attribute does not appear.
   - Service description — The description used within TAS for the service. It consists of an arbitrary line of text.
   - Start this NVT service? — The option to start this NVT service when you click Submit. If you clicked Administer and Configuration, this attribute does not appear.

5. **Click Submit.**

   The Create New NetWare NVT Service servicename screen or the Update NetWare NVT Service servicename screen appears.

6. **Click OK.**

   To administer NVT services from the UNIX command line, use the tnservice command.

## 5.2.16 Shutting Down NVT Services

Follow these steps to shut down an NVT service:

1. **Follow these links:**

   **NetWare Realm->Manage NVT Services**

   The List of NetWare NVT Service screen appears.

2. **From the list, select the NVT service you want to shut down.**

3. **Click Administer.**
   The NetWare NVT Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in NetWare Realm screen appears.

6. **Click OK.**

## 5.2.17 Deleting NVT Services

Follow the steps below to delete NVT services in the NetWare realm. These steps include instructions for shutting down the NVT services you want to delete, because you must shut down an NVT service to delete it.

1. **Follow these links**:
   **NetWare Realm->Manage NVT Services**
   The List of NetWare NVT Service screen appears.

2. **From the list, select the NVT service you want to delete.**

3. **Click Administer.**
   The NetWare NVT Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service in NetWare Realm screen appears.

6. **Click OK.**

7. **Repeat Steps 1-5 for each service you want to delete.**

8. **Follow these links**:
   **NetWare Realm->Manage NVT Services**
   The List of NetWare NVT Service screen reappears.

9. **From the list, select the file services you want to delete.**

**10. Click Delete.**

The Confirmation screen appears.

**11. Click OK.**

The Delete NetWare NVT Service screen appears.

**12. Click OK.**

## 5.2.18 Sending Messages to Users

Follow the steps below to send a message to one or more connected users. Users must have message reception enabled to receive messages properly.

1. **Follow these links:**

   **NetWare Realm->NetWare Connected Users->Send Message to Users**

   The Send Message to Users screen appears:


2. **Select or enter values for the following attributes:**
   - Name of users — The users to receive the message.
   - Message — The message to send.

3. **Click Submit.**

   The Send Message to Users screen reappears, this time containing the statement "Command Successful."

4. **Click OK.**

To send a message to NetWare users the UNIX command line, use the nwmessage command.

## 5.2.19 Disconnecting Users

Follow these steps to disconnect connected users:

1. **Follow one of these sets of links:**
   - **NetWare Realm->NetWare Connected Users->Disconnect Users**
   - **NetWare Realm->Manage File Services->[select a service] ->Administer->Disconnect Users**

   The Disconnect Users screen appears:


2. **Select or enter values for the following attributes, as needed:**
   - Name of users — The users to disconnect.
   - Minutes before disconnection — The time, in minutes, before you want to disconnect the users.
   - Reason for disconnection — A brief message to the users to disconnect. Users must have message reception enabled to see this message.

3. **Click Submit.**

   The Disconnect Users screen reappears, this time containing the statement "Command Successful".

4. **Click OK.**

To disconnect a user from the UNIX command line, use the tnkill command.

## 5.2.20 Viewing Realm Connections

Follow these steps to list NetWare realm connections:

1. **Follow one of these sets of links:**
   - **NetWare Realm->NetWare Connected Users->Connection Information**
   - **NetWare Realm->Manage File Services->[select a service] ->Administer->Connection Information**

     The Connection Information screen appears.

2. **From the list, select a user whose information you want to view.**

3. **Click Submit.**

   The Connection Information in NetWare Realm screen appears:


4. **When finished, click OK.**

# 5.3 Services for the AppleTalk Realm

This section contains instructions for the following tasks:



## 5.3.1 Starting AppleTalk Services

Follow these steps to start the AppleTalk realm and set its services to accept client connection requests:

1. **Follow these links:**
   **AppleTalk Realm->Configuration and Control->Start all AppleTalk Services**
   The Confirmation screen appears.

2. **Click OK.**
   The Start all AppleTalk Services screen appears.

3. **Click OK.**

## 5.3.2 Shutting Down AppleTalk Services

Follow these steps to shut down in the AppleTalk realm and set its services to reject client connection requests:

1. **Follow these links:**
   - **AppleTalk Realm->Configuration and Control->Shutdown all AppleTalk Services**

     The Confirmation screen appears.

2. **Click OK.**

   The Shutdown all AppleTalk Services screen appears.

3. **Click OK.**

## 5.3.3 Checking Realm Status

Follow these steps to check the status of the TAS system, transports, services, and client connections in the AppleTalk realm:

1. **Follow these links:**
   - **AppleTalk Realm->Configuration and Control->AppleTalk Realm Status**

     The AppleTalk Realm Status screen appears:


2. **When finished, click OK.**

To check realm status from the UNIX command line, use the tnstat command.

## 5.3.4 Creating and Modifying File Services

TAS allows AppleTalk-compatible clients to share file and print resources by connecting them through the AppleTalk realm.

Follow the steps below to create or modify a file service in the AppleTalk realm. You can also use the file service creation wizard at AppleTalk Realm->File Service Creation or System->File Service Creation->AppleTalk Realm File Service to create a file service.

1. **Follow these links:**
   - **AppleTalk Realm->Manage File Services**

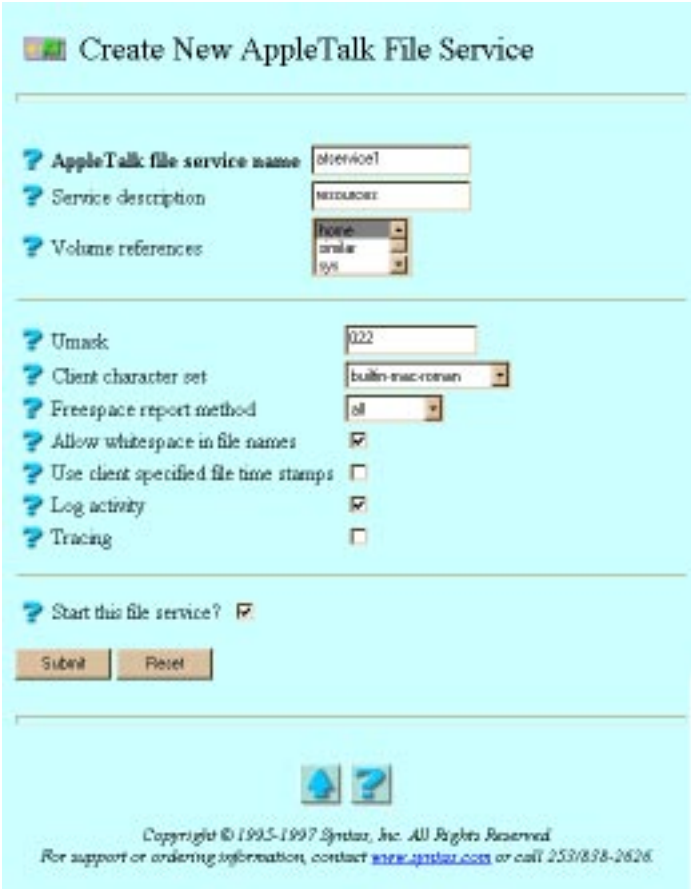
     The List of AppleTalk File Services screen appears.

2. **From the list, select the file service you want to modify, or enter the name of a service you want to create in the text field. A file service name can contain up to 15 ASCII characters and no spaces, and it must not begin with an asterisk (*). The list contains nothing if no file services exist.**

3. **Click Create or Administer. The Administer button does not appear if no file services exist.**

   If you clicked Create, the Create New AppleTalk File Service screen below appears. Go to Step 4.

   If you clicked Administer, the AppleTalk File Service servicename screen appears. Click Configuration, or click the appropriate link from the following, then click OK on the subsequent screen: Accept Service Connections, Reject Service Connections, Status, Start Service, Shutdown Service. If you click Configuration, the Update AppleTalk File Service servicename screen, same as the Create New AppleTalk File Service screen below, appears. Go to Step 4.




4. **Enter or select values for the following attributes, as needed**:
   - AppleTalk file service name — The file service to which users connect, according to its appearance in their Chooser lists. The file service name conventionally appears in lower-case on clients and in upper-case on the network. If you clicked Administer and Configuration, this attribute does not appear.
   - Service description — The description used within TAS for the service. It consists of an arbitrary line of text.
   - Volume references — A list of the volumes this file service references and exports. You can configure the referenced volumes and their attributes via System->Volumes. Select the volumes you want to reference.
   - Umask — The default file access permissions for TAS clients. This three-digit octal-number represents the UNIX file protection mask and works the same as the UNIX umask command. Refer to the UNIX umask(1) man page for more information on how the system interprets digits.

- Client character set — The character set that TAS assumes all of this service's clients use. It defaults to builtin-mac-roman. Select a different character set if necessary.
- Freespace report method — The method for calculating the amount of free disk space. Systems that do not support the UNIX statfs() system call or its equivalent do not support this option. If set to the default all, this attribute makes TAS report to clients the free space on all of the partitions. If set to root, this attribute makes TAS report only free disk space on the partition in which the virtual root of a client's connection resides.
- Allow whitespace in file names — The option to allow AppleTalk clients to use spaces in file names.
- Use client specified file time stamps — The option to stamp files created or modified on the server by clients with the clients' date and time rather than the server's date and time.
- Log activity — The option to enable activity logging. This directs this file service to record client activity in activity.tn in the TAS home directory. When a client disconnects, TAS appends a line of data about the client's session to the log file at activity.tn. This attribute defaults to no activity logging.
- Tracing — The option to direct this file service to write debugging traces to a file. Syntax Technical Support can use the trace file to help diagnose problems.
- Start this file service? — The option to start this file service when you click Submit. If you clicked Administer and Configuration, this attribute does not appear.

5. **Click Submit.**

   The Create New AppleTalk File Service servicename screen or the Update AppleTalk File Service servicename screen appears.

6. **Click OK.**

   To administer a file service from the UNIX command line, use the tnservice command.

## 5.3.5 Shutting Down File Services

Follow these steps to shut down a file service:

1. **Follow these links**:

   **AppleTalk Realm->Manage File Services**

   The List of AppleTalk File Services screen appears.

2. **From the list, select the file service you want to shut down.**

3. **Click Administer.**

The AppleTalk File Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service on AppleTalk Compatible Realm screen appears.

6. **Click OK.**

## 5.3.6 Deleting File Services

Follow the steps below to delete file services in the AppleTalk realm. These steps include instructions for shutting down the file services you want to delete, because you must shut down a file service to delete it.

1. **Follow these links:**
   - **AppleTalk Realm->Manage File Services**
     The List of AppleTalk File Services screen appears.

2. **From the list, select the file service you want to delete.**

3. **Click Administer.**
   The AppleTalk File Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service on AppleTalk Compatible Realm screen appears.

6. **Click OK.**

7. **Repeat Steps 1-5 for each service you want to delete.**

8. **Follow these links:**
   **AppleTalk Realm->Manage File Services**
   The List of AppleTalk File Services screen reappears.

9. **From the list, select the file services you want to delete.**

10. **Click Delete.**
    The Confirmation screen appears.

11. **Click OK.**
    The Delete AppleTalk File Service screen appears.

12. **Click OK.**

## 5.3.7 Accepting Services

AppleTalk file services accept connection requests unless you set them to reject connection requests. Starting TAS also sets its services to accept connection requests.

Follow these steps to make AppleTalk file services accept client connection requests:

1. **Follow these links**:
   **AppleTalk Realm->Configuration and Control->Accept Service Connections**
   The Confirmation screen appears.

2. **Click OK.**
   The Accept all AppleTalk Service Connections screen appears.

3. **Click OK.**
   To accept services from the UNIX command line, use the tnaccept command.

## 5.3.8 Rejecting Services

AppleTalk file services accept connection requests unless you set them to reject connection requests. Shutting down TAS also sets its services to reject connection requests.

Follow these steps to make AppleTalk file services reject client connection requests:

1. **Follow these links**:
   **AppleTalk Realm->Configuration and Control->Reject Service Connections**
   The Confirmation screen appears.

2. **Click OK.**
   The Reject all AppleTalk Service Connections screen appears.

3. **Click OK.**
   To reject services from the UNIX command line, use the tnreject command.

## 5.3.9 Administering Attach Points

Follow these steps to create, modify, or delete attach points—points on directory paths at which clients must provide credentials—in the AppleTalk realm:

1. **Follow these links:**
   - **AppleTalk Realm->Manage File Services**

     The List of AppleTalk File Services screen appears.

2. **From the list, select the file service in which you want to administer an attach point.**

3. **Click Administer.**

   The AppleTalk File Service servicename screen appears.

4. **Click Attach Points.**

   The List of Defined Attach Points screen appears.

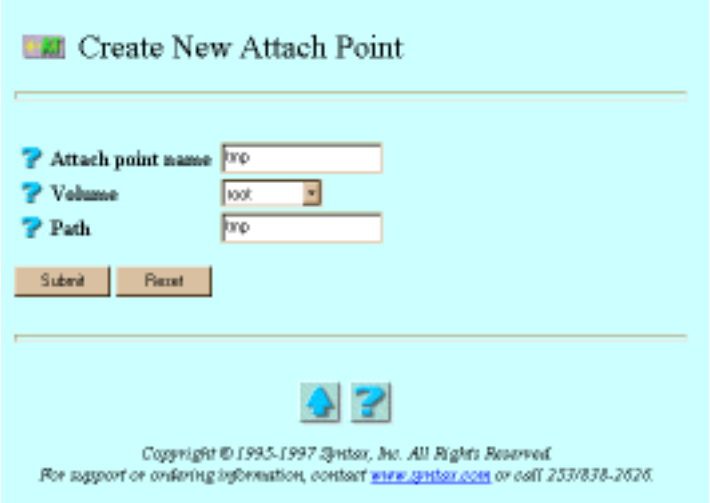
5. **From the list, select the attach point you want to modify or delete, or enter the name of an attach point you want to create in the text field. If deleting, you may select more than one attach point. The list contains nothing if no attach points exist.**

6. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no attach points exist.**

   If you clicked Create, the Create New Attach Point screen below appears. Go to Step 7.

   If you clicked Modify, the Update Attach Point attachpoint screen, same as the Create New Attach Point screen below, appears. Go to Step 7.

   If you clicked Delete, the Confirmation screen appears. Click OK. The Delete Attach Points screen appears. Click OK. Do not go to Step 7.




7. **Enter or select values for the following attributes:**
   - Attach point name — The attach point. If you clicked Modify, this attribute does not appear.
   - Volume — The list of volumes exported by the service. TAS defines volumes at the system level. File services can reference defined volumes; such references export the volumes.
   - Path — The directory below the selected volume, used as the virtual root by clients who connect to this attach point.

8. **Click Submit.**

   The Create New Attach Point attachpoint screen or the Update Attach Point attachpoint screen appears.

9. **Click OK.**

   To administer attach points from the UNIX command line, use the tnattach command.

## 5.3.10 Creating and Modifying Print Services

Follow these steps to create or modify an AppleTalk print service:

1. **Follow these links:**

   **AppleTalk Realm->Manage AppleTalk Print Services**

   The List of AppleTalk Print Services screen appears.

2. **From the list, select the print service you want to delete, or enter the name of a service you want to create in the text field. The list contains nothing if no print services exist.**

3. **Click Create or Administer. The Administer button does not appear if no print services exist.**

   If you clicked Create, the Create New AppleTalk Print Service screen below appears. Go to Step 4.

   If you clicked Administer, the AppleTalk Print Service servicename screen appears. Click Configuration, or click the appropriate link from the following, then click OK on the subsequent screen: Accept Service Connections, Reject Service Connections, Status, Start Service, Shutdown Service. If you click Configuration, the Update AppleTalk Print Service screen, same as the Create New AppleTalk Print Service screen below, appears. Go to Step 4.


4. **Enter or select values for the following attributes, as needed**:

- AppleTalk print service name — The print service to which users connect. If you clicked Administer and Configuration, this attribute does not appear.
- Service description — The description used within TAS for the service. It consists of an arbitrary line of text.
- User — The UNIX user identity you want to execute the UNIX command line given in the command directive for the service. The server process inherits the appropriate group list for the user name. This attribute defaults to root.
- User authentication with an AppleTalk file service — The option to allow the user to log on to an AppleTalk-compatible file service to print. The user name can appear on the title page of the print job.
- Name of the spooler (include path from root) — The name of the UNIX print spooler that the server can execute, needed by the server when printing clients' spooled jobs. Provide the full path of the spooler; for example, `/bin/lp` or `/bin/lpr`.
- Destination printer — The UNIX printer this print server should use.
- List Spooler options — Command line arguments for the print spooler.
- Start this print service — The option to start this print service when you click Submit. If you clicked Administer and Configuration, this attribute does not appear.

5. **Click Submit.**

   The Create New AppleTalk Print Service servicename screen or the Update AppleTalk Print Service servicename screen appears.

6. **Click OK.**

   To administer AppleTalk print services from the UNIX command line, use the tnservice command.

## 5.3.11 Shutting Down Print Services

Follow these steps to shut down a print service:

1. **Follow these links**:

   **AppleTalk Realm->Manage AppleTalk Print Services**

   The List of AppleTalk Print Services screen appears.

2. **From the list, select the print service you want to shut down.**

3. **Click Administer.**

   The AppleTalk Print Service servicename screen appears.

4. **Click Shutdown Service.**

The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service on AppleTalk Realm screen appears.

6. **Click OK.**

## 5.3.12 Deleting Print Services

Follow the steps below to delete print services in the AppleTalk realm. These steps include instructions for shutting down the print services you want to delete, because you must shut down a print service to delete it.

1. **Follow these links:**
   **AppleTalk Realm->Manage AppleTalk Print Services**
   The List of AppleTalk Print Services screen appears.

2. **From the list, select the print service you want to delete.**

3. **Click Administer.**
   The AppleTalk Print Service servicename screen appears.

4. **Click Shutdown Service.**
   The Confirmation screen appears.

5. **Click OK.**
   The Shutdown servicename Service on AppleTalk Realm screen appears.

6. **Click OK.**

7. **Repeat Steps 1-5 for each service you want to delete.**

8. **Follow these links:**
   **AppleTalk Realm->Manage Print Services**
   The List of AppleTalk Print Services screen reappears.

9. **From the list, select the file services you want to delete.**

10. **Click Delete.**
    The Confirmation screen appears.

11. **Click OK.**

The Delete AppleTalk Print Services screen appears.

**12. Click OK.**

## 5.3.13 Administering Suffixes for AppleTalk Maps

An AppleTalk map associates file suffixes with Macintosh applications. The client operating system uses these associations to determine which application it should invoke when it accesses a file.

Follow these steps to create, modify, or delete suffixes for AppleTalk maps:

1. **Follow these links**:

   **AppleTalk Realm->Suffixes for AppleTalk Map**

   The List of Suffixes for AppleTalk Map screen appears.

2. **From the list, select the suffix you want to modify or delete, or enter a suffix you want to create in the text field. If deleting, you may select more than one map. The list contains nothing if no maps exist.**

3. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no maps exist.**

   If you clicked Create, the Create New Suffix for AppleTalk Map screen below appears. Go to Step 4.

   If you clicked Modify, the Update Suffix suffixname for AppleTalk Map screen, same as the Create New Suffix for AppleTalk Map screen below, appears. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. The Delete Suffix for AppleTalk Map screen appears. Click OK. Do not go to Step 4.


4. **Enter or select values for the following attributes:**
   - Suffix name — The name of the suffix to associate with the AppleTalk map. If you clicked Modify, this attribute does not appear.
   - Type code — The four-character Macintosh type code to associate with TAS files for the suffix.
   - Creator — The Macintosh creator code—a four-byte sequence of characters that uniquely identifies a Macintosh program.
   - Conversion discipline — The discipline for file conversions between client and server. Macintosh text files use carriage returns for new lines, whereas UNIX files use linefeeds.
   - Comment — Information you would like to associate with the suffix type.

5. **Click Submit.**

   The Create New Suffix suffixname for AppleTalk Map screen or the Update Suffix suffixname for AppleTalk Map screen appears.

6. **Click OK.**

   To administer suffixes for AppleTalk maps from the UNIX command line, use the tnsuffix command.

## 5.3.14 Configuring Security

Follow these steps to configure AppleTalk file authentication:

1. **Follow these links:**

   **AppleTalk Realm->Manage File Services**

   The List of AppleTalk File Services screen appears.

2. **From the list, select a file service for which you want to configure authentication.**

3. **Click Administer.**

   The AppleTalk File Service servicename screen appears.

4. **Click Authentication and Service Mode Options.**

   The Update Local Authentication for servicename screen appears:


5. **Select or enter values for the following attributes, as needed:**

   - Password encryption — The option to keep passwords from transmitting across the network. Without password encryption, any UNIX user can potentially connect to the server. In this open authentication environment, client and server exchange clear-text passwords. Password encryption, the secure authentication method, provides improved security, but you must maintain a separate user-password database for it. When you enable password encryption and secure authentication, only users added via Passwords can connect. With secure authentication, client and server exchange a series of

messages that allows the server to verify that the client knows the correct password, without transmitting the password or any representation of it. Most AppleTalk-compatible clients support password encryption.

- Username map — The option to allow file services to validate clients by mapping them to valid UNIX users. You must define username maps before selecting this option (see “4.2 Administering Username Maps” on page 41).
- Allow null passwords — The option to allow UNIX users without passwords to access the server. By default, TAS denies such users access to the server, for better security. This option has no effect if you enable Password encryption.
- User restrictions — The option to restrict the users who can connect to this service. Select it by selecting either Allow or Deny and the names of the users in the adjacent Users field. If you enter no user names, TAS ignores this attribute. Separate user names with commas.
- User name for guest login — The name assigned to LM-NT-OS/2 share-mode clients for accessing the AppleTalk realm.
- Allow clients to save passwords — The option to allow clients to save their passwords on the server.
- Allow clients to change passwords — The option to allow clients to change their server passwords.

6. **Click Submit.**

   The Update Local Authentication for servicename screen appears.

7. **Click OK.**

   To configure security from the UNIX command line, use the tnservice command.

## 5.3.15 Disconnecting Users

Follow these steps to disconnect connected users:

1. **Follow one of these sets of links:**

   **AppleTalk Realm->AppleTalk Connected Users->Disconnect Users**

   **AppleTalk Realm->Manage File Services->[select a service] ->Administer->Disconnect Users**

   The Disconnect Users screen appears:


2. **Select or enter values for the following attributes, as needed:**
   - Name of users — The users to disconnect
   - Minutes before disconnection — The time, in minutes, before you want to disconnect the users.
   - Reason for disconnection — A brief message to the users to disconnect. Users must have message reception enabled to see this message.

3. **Click Submit.**

   The Disconnect Users screen reappears, this time containing the statement "Command Successful".

4. **Click OK.**

   To disconnect a user from the UNIX command line, use the tnkill command.

## 5.3.16 Viewing Realm Connections

Follow these steps to list AppleTalk realm connections:

1. **Follow one of these sets of links:**

   **AppleTalk Realm->AppleTalk Connected Users->Connection Information**

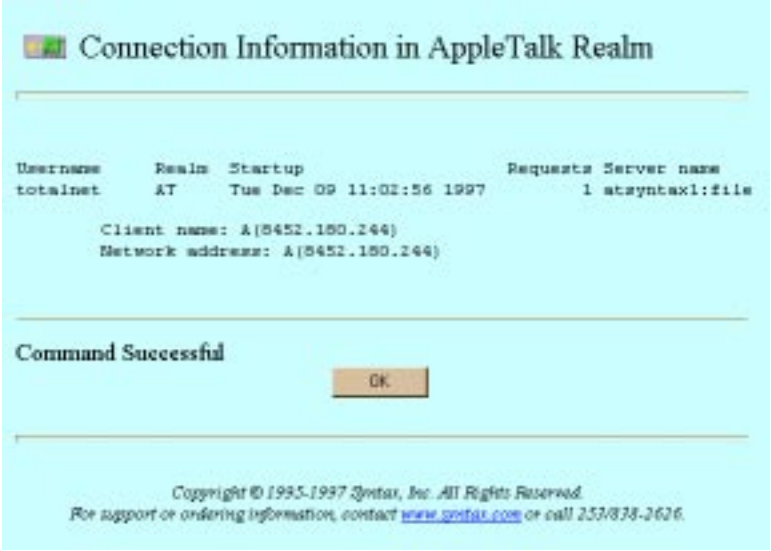
   **AppleTalk Realm->Manage File Services->[select a service] ->Administer->Connection Information**

   The Connection Information screen appears.

2. **From the list, select a user whose information you want to view.**

3. **Click Submit.**

   The Connection Information in AppleTalk Realm screen appears:




4. **When finished, click OK.**

CHAPTER 6

# Configuring Transports

This chapter covers procedures for administering transports and interfaces in the LM-NT-OS/2, NetWare, and AppleTalk realms.

TAS transports—low-level networking protocols defined at the system level and referenced from all realms—consist of the following:

- TotalNET NetBIOS-over-TCP/IP (tcpip) and TotalNET NetBEUI (tnnbu) in the LM-NT-OS/2 realm
- TotalNET IPX/SPX (tnipx) in the NetWare realm
- TotalNET AppleTalk (tnatk) in the AppleTalk realm

Configuration and administration screens in this chapter sometimes have both selection lists and text fields for your input regarding an object. If these both apply to one object or attribute and you both select a value and type one in, the value you type overrides the one you select in the list.

This chapter contains the following sections:

- "6.7 Administering Service Advertisement Protocol" on page 127 — Instructions for creating, modifying, and deleting SAPs.
- "6.8 Modifying AppleTalk Configuration" on page 128 — Instructions for modifying AppleTalk transport attributes.
- "6.9 Administering AppleTalk Interfaces" on page 129 — Instructions for creating, modifying and deleting AppleTalk interfaces.

# 6.1 Modifying TCP/IP Configuration

The NetBIOS-over-TCP/IP interface can support multiple subnets across routers, so that LAN Manager, Windows NT, Windows for Workgroups, Windows 95, and OS/2 clients can communicate using NetBIOS broadcasts.

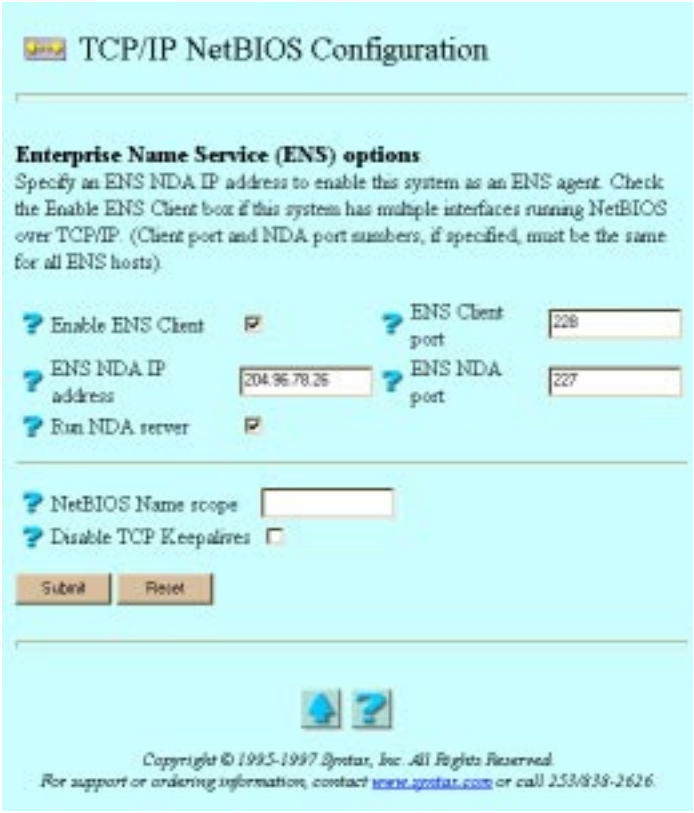
To enable this, you use the built-in Enterprise Name Service (ENS). ENS consists of at least one UNIX ENS agent (ENSA) on each broadcast subnet and a NetBIOS Directory Agent (NDA), which serves as a directory for mapping NetBIOS names to IP addresses. To configure ENS, define the IP address and port number, if different from the default, of the host running NDA.

You can set up any multi-homed host—one with multiple network interfaces, each running NetBIOS-over-TCP—as an ENS client. This allows the host to claim the same NetBIOS names on each network interface without complaint from ENS. All hosts in this network segment must have the same ENS client port. You can also define a NetBIOS name scope if you do so consistently among all relevant NetBIOS nodes.

Follow these steps to modify the TCP/IP configuration:

1. **Follow these links:**
   - **Transports->TCP/IP NetBIOS Configuration**

     The TCP/IP NetBIOS Configuration screen appears:




**2. Select or enter values for the following attributes, as needed:**

- Enable ENS Client— The option to allow multi-homed hosts—those with multiple interfaces, each running NetBIOS-over-TCP/IP—to claim the same NetBIOS name on each interface without complaint from the ENS agent. This option has no effect if the system does not contain an active ENS or if the system has only one interface.
- ENS Client port — The port number to which TAS sends ENS client broadcasts. The broadcasts inhibit complaints from the ENS agent about duplicate NetBIOS name claims from this host. Choose a value from 1 to 65535.
- ENS NDA IP address — The IP address of the host acting as the Network Directory Agent (NDA). Entering an address enables this host as an ENS agent.
- ENS NDA port — The destination IP port number for transmitting data to the NDA. If you have ENS in your network, include this option on every ENSA on the network, if the system does not accept the default port number 227. Use this attribute only if you designate an ENS NDA IP address. Choose a value from 1 to 65535.
- Run NDA server — The option to cause the network directory agent (NDA) to run on this system. Only one instance of NDA should run in your network,

and all other systems' NetBIOS ENS NDA IP address fields should point to this system. NDA normally starts during system initialization.

- NetBIOS Name scope — The invisible string appended to all NetBIOS names that services in the LM-NT-OS/2 realm use and recognize. You may enter any printable ASCII string, up to 256 characters. TAS services and service clients in the LM-NT-OS/2 realm must use identical name scopes to communicate successfully.
- Disable TCP Keepalives — An option that, when selected, disables all TCP session keepalives.

3. **Click Submit.**

   The TCP/IP NetBIOS Configuration screen appears.

4. **Click OK.**

   To modify TCP/IP configuration from the UNIX command line, use the tntransport command.

## 6.2 Administering TCP/IP Interfaces

Use this section to add TCP/IP network interfaces for TAS to use. The interfaces' IP addresses must already exist on the TAS host; including them in this list simply makes them available for TAS processes. TAS IP addresses appear in dotted internet notation.

Follow these steps to create or delete TCP/IP interfaces in the LM-NT-OS/2 realm:

1. **Follow these links:**

   **Transports->TCP/IP Addresses**

   The List of TCP/IP Addresses screen appears.

2. **From the list, select the TCP/IP address you want to delete or enter an address you want to create in the text field. The Delete button does not appear if no TCP/IP addresses exist.**

3. **Click Create or Delete.**

   If you clicked Create, the TCP/IP Address tcpipaddress screen appears. Click OK.

   If you clicked Delete, the Confirmation screen appears. Click OK. The TCP/IP Addresses screen appears. Click OK.

   To administer TCP/IP interfaces from the UNIX command line, use the tniface command.

# 6.3 Administering Static NetBIOS Name Mappings

UDP broadcast datagrams normally resolve NetBIOS names owned by remote servers and workstations. You can augment this dynamic resolution by defining static NetBIOS name-to-IP address mappings.

A static NetBIOS name mapping consists of a NetBIOS name from one to 15 characters, a name type from 0 to 255, and a corresponding IP address. TAS resolves a NetBIOS name by first searching the list of static NetBIOS names and, failing that, broadcasting a query for the desired name. You can augment name resolution to effectively cross routers by using the Enterprise Name Service (see “6.1 Modifying TCP/IP Configuration” on page 120) or Windows Internet Naming Service.

Follow these steps to create, modify, or delete static NetBIOS names:

1. **Follow these links**:

   **Transports->Static NetBIOS Name mappings**

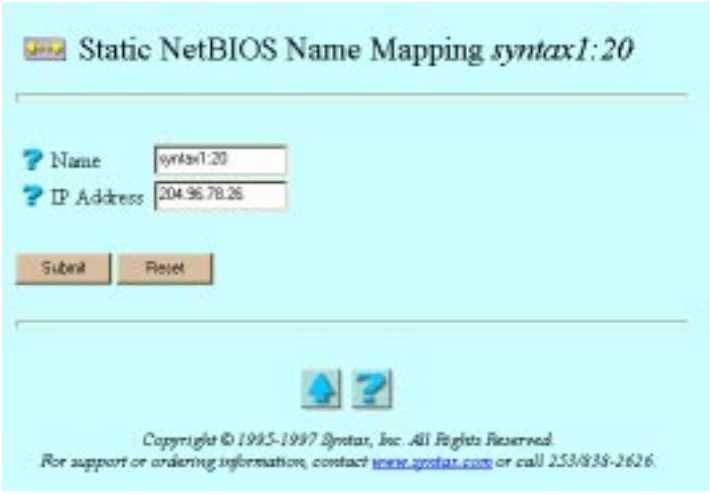
   The Static NetBIOS Name mappings screen appears.

2. **From the list, select the NetBIOS name you want to modify or delete, or enter the name you want to create in the text field. If deleting, you may select more than one name. You must use a valid service name and follow it with a type code, usually :20. The list contains nothing if no NetBIOS name mappings exist.**

3. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no static NetBIOS name mappings exist.**

   If you clicked Create or Modify, the Static NetBIOS Name Mapping servicename screen below appears. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. The Static NetBIOS Names screen appears. Click OK. Do not go to Step 4.




4. **Enter values for the following attributes:**
   - Name — The NetBIOS name. If you clicked Modify, this attribute does not appear.
   - IP Address — The IP address to which Name should map.

5. **Click Submit.**

   The Static NetBIOS Name Mapping servicename screen appears.

6. **Click OK.**

   To administer static NetBIOS name mappings from the UNIX command line, use the tnsname command.

## 6.4 Administering NetBEUI Interfaces

Follow these steps to create or delete NetBEUI interfaces on Solaris and AIX platforms:

1. **Follow these links:**

   **Transports->NetBEUI Interfaces**

   The List of NetBEUI Interfaces screen appears.

2. **From the list, select the NetBEUI interfaces you want to delete, or enter the name of the interface you want to create in the text field.**

3. **If you want to create the interface, click Create. If you want to delete it, click Delete. The Delete button does not appear if no NetBEUI interfaces exist.**

   If you clicked Create, the NetBEUI interface creation successful screen appears. Click OK.

   If you clicked Delete, the Confirmation screen appears. Click OK. The NetBEUI Interface screen appears. Click OK.

## 6.5 Modifying IPX/SPX Configuration

Default values for IPX/SPX configuration generally suffice. Modify them only if so directed by Syntax Technical Support or to solve a specific problem. IPX/SPX configuration includes routing advertisement designations; IPX Routing Information Protocol (RIP) interpacket gap and maximum entry specifications; IPX Service Advertisement Protocol (SAP) response interpacket gap, maximum entry, and maximum packet size specifications; and maximum SPX packet size designation.

To modify the IPX/SPX configuration from the UNIX command line, use the tntransport command.

## 6.6 Administering IPX/SPX Interfaces

Follow the steps below to create, modify, or delete IPX/SPX transport interfaces. You can determine valid device names for most UNIX host systems by using the netstat -i command from the UNIX command line.

1. **Follow these links**:

   **Transports->IPX/SPX Interfaces**

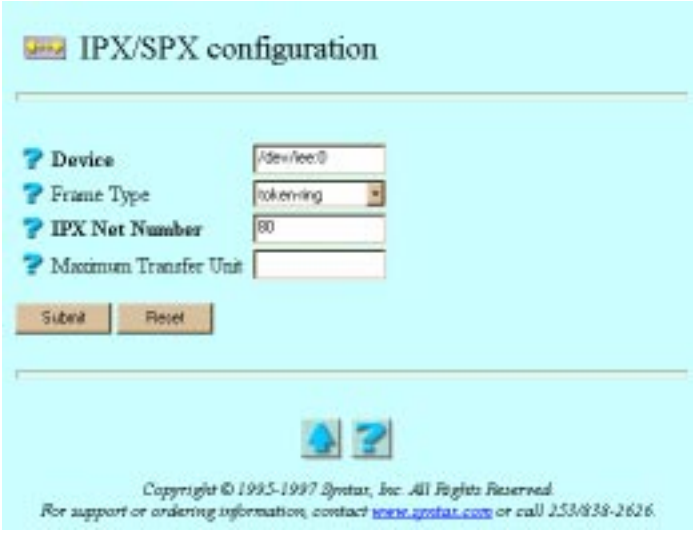
   The IPX/SPX Interface List screen appears.

2. **Click Create, Modify, or Delete. The list, the Modify button, and the Delete button do not appear if no IPX/SPX interfaces exist.**

   If you clicked Create, the IPX/SPX configuration screen below appears. Go to Step 3.

If you clicked Modify, the IPX/SPX configuration on ipxspxinterface screen, same as the IPX/SPX configuration screen below, appears. Go to Step 3.

If you clicked Delete, the Confirmation screen appears. Click OK. The IPX/SPX Interface screen appears. Click OK. Do not go to Step 3.




3. **Select or enter values for the following attributes, as needed**:
   - Device — The device name for the network interface. For systems using DLPI, such as Solaris 2.x, Device takes the form devicename:ppa-number or the special value internal. You must fill in this field to create an interface. If you clicked Modify, this attribute does not appear.
   - Frame Type — One of the following frame types to use on this interface:
     - `ethernet_ii`
     - `ethernet_802.2`
     - `ethernet_802.3`
     - `ethernet_snap`
     - `token-ring`
     - `token-ring_snap`
     - `internal`

     This attribute defaults to `ethernet_ii` for Ethernet DLPI devices, `token-ring` for Token Ring DLPI devices, and `internal` for special internal networks. If you clicked Modify, this attribute does not appear.
   - IPX Net Number — The hexadecimal IPX network number for this interface.

- Maximum Transfer Unit — The maximum transfer unit size for the IPX/SPX network interface. This attribute defaults to the value that the DLPI driver for DLPI services reports, or 8192 for internal devices.

4. **Click Submit.**

   The IPX/SPX Interfaces ipxspxinterface screen appears.

5. **Click OK.**

   To administer IPX/SPX interfaces from the UNIX command line, use the tniface command.

# 6.7 Administering Service Advertisement Protocol

Service Advertisement Protocol (SAP) allows networked devices, such as network servers and routers, to exchange information on available network services.

Workstations use the information made available through SAP to obtain the network addresses of servers that offer the services they need. You can add entries to the IPX SAP table for services you have installed. For more information about SAP, consult your Novell documentation.

Follow these steps to create, modify, or delete SAPs:

1. **Follow these links**:

   **Transports->Service Advertisement Protocol Configuration**

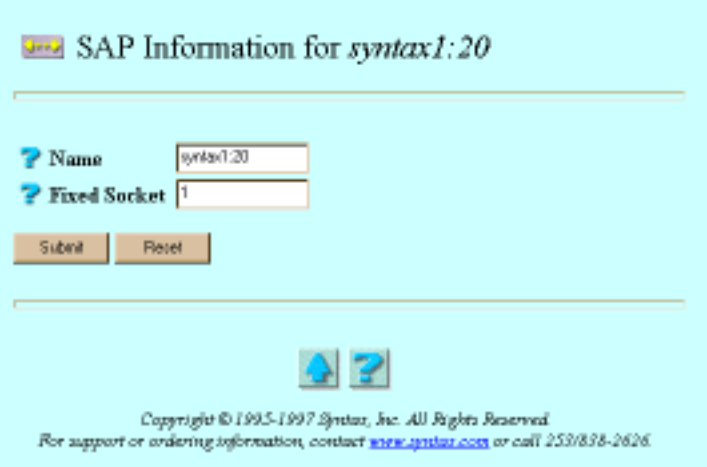
   The Service Advertisement Protocol List screen appears.

2. **From the list, select the SAP you want to modify or delete, or enter the name of a SAP you want to create in the text field. If deleting, you may select more than one SAP. You must use a valid service name and follow it with a type code, usually :20. The list contains nothing if no SAPs exist.**

3. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no SAP exists.**

   If you clicked Create or Modify, the SAP Information for servicename screen below appears. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. The Service Advertisement Protocol screen appears. Click OK. Do not go to Step 4.




4. **Enter values for the following attributes, as needed:**
   - Name — The SAP service name. If you clicked Modify, this attribute does not appear.
   - Fixed Socket — The service's fixed-socket number. The value for the fixed socket consists of a hexadecimal number up to four digits long.

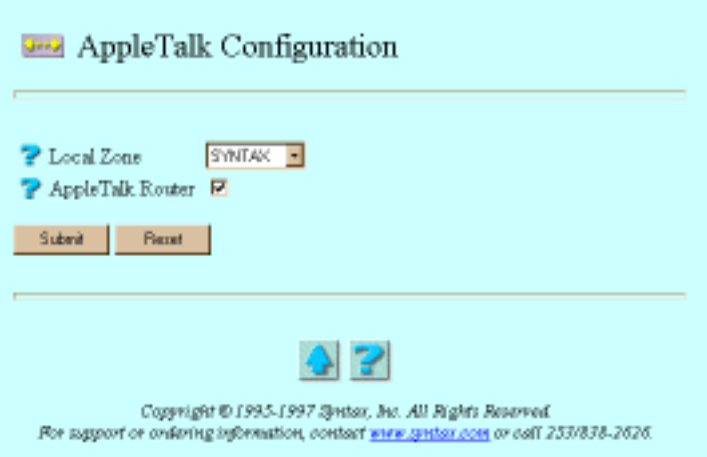
5. **Click Submit.**
   The Service Advertisement Protocol sapname screen appears.

6. **Click OK.**
   To administer SAP from the UNIX command line, use the tnadvert command.

## 6.8 Modifying AppleTalk Configuration

Follow these steps to modify AppleTalk transport attributes:

1. **Follow these links:**
   **Transports->AppleTalk Configuration**
   The AppleTalk Configuration screen appears:




2. **Enter or select values for the following attributes, as needed:**
   - Local Zone — The name of the local AppleTalk zone for this system.
   - AppleTalk Router — The option to direct the AppleTalk protocol stack to route packets between multiple network interfaces. Select this option to set up any and all of your AppleTalk interfaces as seed routers.

3. **Click Submit.**

   The AppleTalk Configuration screen reappears, this time containing the statement "Update Successful".

4. **Click OK.**

   To administer AppleTalk configuration from the UNIX command line, use the tntransport command.

## 6.9 Administering AppleTalk Interfaces

Follow these steps to create, modify, or delete AppleTalk interfaces:

1. **Follow these links:**

   **Transports->AppleTalk Interfaces**

   The AppleTalk Interface List screen appears.

2. **From the list, select the interface you want to modify or delete, or enter the name of an interface you want to create in the text field. If deleting, you may select more than one interface. The list contains nothing if no AppleTalk interfaces exist.**

3. **Click Create, Modify, or Delete. The Modify and Delete buttons do not appear if no AppleTalk interfaces exist.**

   If you clicked Create or Modify, the AppleTalk configuration on interfacename screen below appears. Go to Step 4.

   If you clicked Delete, the Confirmation screen appears. Click OK. The AppleTalk Interface screen appears. Click OK. Do not go to Step 4.


4. **Enter or select values for the following attributes, as needed**:
   - Name — The interface name. If you clicked Modify, this attribute does not appear.
   - Use DDP Checksum — The option to cause TAS to control the use of DDP checksums in AppleTalk packets.
   - Zone List — The AppleTalk zone names available on the local segment, separated by commas. In the AppleTalk environment, a zone consists of a logical grouping of clients. It simplifies scanning the network for resources, such as servers and printers, in similar domains. If you enter information here,

you must also enter information for Default Zone and Net Range. These three attributes combine to enable this interface as a seed router.

- Default Zone — A zone name from the zone list. If you enter information here, you must also enter information for Zone List and Net Range. These three attributes combine to enable this interface as a seed router.
- Net Range — A network number or a range of network numbers, in the number-number form. If you enter a value here, you must also enter values for Zone List and Default Zone. These three attributes combine to enable this interface as a seed router.

5. **Click Submit.**

   The AppleTalk Interface interfacename screen appears.

6. **Click OK.**

   To administer AppleTalk interfaces from the UNIX command line, use the tniface command.

CHAPTER 7

# Troubleshooting

This chapter explains how to correct problems with the TAS system. It includes instructions for collecting diagnostic information for customer support engineers using `trace` and `csr.tn`, as well as a compilation of common error messages that users might see and instructions for resolving them. This chapter contains the following sections:

- "General Troubleshooting" on page 133 — A systematic approach to isolating problems.
- "Realm-Specific Error and Activity Logs" on page 138 — Information on generating records of errors and activity, at the realm level.
- "Error Messages and Solutions" on page 139 — A list of error message with instructions for resolving them.
- "Error Conditions and Solutions" on page 146 — Solutions to error conditions not necessarily accompanied by error messages.
- "Contacting Technical Support" on page 152 — Information needed to receive comprehensive technical assistance.

## General Troubleshooting

You can resolve many problems that occur in the TAS system if you start from the simplest possible causes for an error and work towards the more complex. Such a systematic approach helps you develop a theory, test it, and isolate and correct the problem.

The list of questions below provides a starting point for resolving problems this way. They address the following categories:

- "General Connections" on page 134

# General Connections

## Does the user have a valid UNIX account?

To make sure that the server recognizes the user name, attempt to open a telnet session from the client, with that user name.

## If you cannot complete a process from a PC, can you complete it from UNIX?

If you can perform the process from UNIX, you may have incorrect attach point configuration or client connection—but keep in mind that you cannot replicate all actions performed from a PC, on UNIX. Open a telnet session and try the process from UNIX. For example, if you have printing problems, telnet to the server and use the lpr command to send a file to the printer. If the action works under UNIX, check the client and server configurations from the TotalAdmin sphere.

## Did you correctly configure the transport protocol?

Check this using another program. For example, to check the TCP/IP configuration, use ping from UNIX.

# LM-NT-OS/2 Connections

## Do the client and server reside on different subnets but connect via NetBIOS-over-NetBEUI?

If they do, the client cannot connect to the server because this protocol setup only works within the subnet. You must have NetBIOS-over-TCP/IP to connect a client and server on different subnets. NetBIOS-over-NetBEUI does not route.

## Does the client attempt to access a service using NetBIOS-over-TCP/IP on the other side of the router?

In order for a client to find a NetBIOS name on the other side of a router, it must have the ability to map an IP address to that NetBIOS name. You can accomplish this by using static tables, Windows Internet Naming Service (WINS), or Enterprise Name Server (ENS) to configure the client to resolve the service name to its associated IP address.

## Does the client use the same SMB dialect as the server?

Some older client software does not use the extended SMB protocol in the same way as the server. Follow these links:

- **LM-NT-OS/2 Realm->Manage File Services->[select the service]->Administer->Configuration**

For SMB dialect, select core.

To force the client to revert to the core protocol from the UNIX command line, use this command:

```
tnservice -M -r NB -s servicename -a smb-protocol-level=on
```

# NetWare Connections

## Do IPX network numbers correspond to interface frame types?

For the server network interface, make sure that you have configured the correct frame type and associated it with the correct hexadecimal NetWare network number. To find out the correct rame type/network number combination, look at Novell server configurations or run ipxprobe after shutting down IPXd. If your network does not contain a Novell server, you can use any hexadecimal number unique for the frame type.

TotalNET IPX supports full routing, which means that you can configure it to use more than one network interface, and it supports multiple frame types on each interface. TAS treats a single physical network as a collection of distinct logical networks using distinct interface frame types and performs routing among the logical networks just as it does their physical networks, so each frame type on the system must associate with a different net number.

You can configure each interface for a number of frame types with corresponding network numbers. For instance, interface_1 might have frametype_x with netnumber_x and frametype_y with netnumber_y, and interface_2 might have frametype_x with netnumber_x and and frametype_z with netnumber_z. You must

use a unique net number for the internal frame type in the NetWare realm. Never delete the internal frame type.

Follow these links:

- **Transports->IPX/SPX Interfaces->[select the IPX/SPX interface]->Modify**

To check frame types and network numbers from the UNIX command line, use the command

```
tniface -R -n tnipx
```

## Can you see the server with “slist”?

To view all of the NetWare servers currently active on the network, access Network Neighborhood or, in DOS, use the slist command. If the NetWare server you need does not appear on the slist list, advertisements from the server do not reach your client. You may have a disabled server or a problem with Service Advertisement Protocol (SAP) advertisements. To see if you enabled your server, click Status at a Glance.

If you suspect a problem with SAP advertisements, contact a Technical Support engineer for further assistance. Before contacting Syntax, see “Contacting Technical Support” on page 152.

## Does the server process the client utilities?

Different versions of login programs used by NetWare vary greatly. For example, if you wish to use Novell 3.12 utilities to connect to a NetWare realm service, you must turn on secure authentication for that service, since the 3.12 utilities only send encrypted passwords. You do not need to turn on secure authentication for clients of versions later than 3.12, however, because they can send clear-text passwords.

Syntax provides login utilities for the NetWare realm in `$TNHOME/NW/sys/login`. They provide similar functionality to programs used by NetWare. To turn on secure authentication, follow these links:

- **NetWare Realm->Manage File Services->[select the service] ->Administer->Authentication and Service Mode Options ->Local authentication->Submit**

Select the Password encryption option.

To configure secure authentication from the UNIX command line, use the tnservice command.

## Does each file have three parts?

UNIX stores Macintosh files in three forks: the data fork, the resource fork, and the finder information fork. The data fork contains the actual data contained in the file, the resource fork indicates the application to launch when you open the file, and the finder information fork maintains data about the file's creator, type, location on the desktop, and icon.

TAS stores these parts in separate directories. When you create a file from a Macintosh client, TAS writes the data fork writes to the current directory, the resource fork to the subdirectory `.tnatr:reso-fork`, and the finder information to the file `.tnatr:intf`. If TAS cannot locate all of these pieces, the file may not launch correctly. In versions of TAS previous to 5.x, TAS writes the data fork to the current directory, the resource fork to the `.resource` directory and the finder information to the `.finderinfo` directory.

## Does the finder information map file exist and contain the correct information?

The finder maintains information about files, such as the file's creator, type, location on the desktop, and icon. When the server cannot locate finder information, it attempts to generate reasonable default values for this information based on data in the map file. These values may not contain the correct information.

An AppleTalk map associates file suffixes with Macintosh applications. The client operating system uses these associations to determine which application it should invoke when it accesses a file.

Follow these links to check mapping configuration:

- **AppleTalk Realm->Suffixes for AppleTalk Map->[select a suffix]->Modify**

The Modify button does not appear if no maps exist.

To check mapping configuration from the UNIX command line, use the tnsuffix command.

## Do the Macintosh and PC versions of the program share the same data format?

Occasionally, these platforms cannot share files of the same program.

# Realm-Specific Error and Activity Logs

TAS generates a number of logs that you can use to monitor and manage the TAS system. Within each realm, a log generates during startup, and error messages sent within the realm append to the log as they occur.

You can enable an activity log that records information about all connections to file services; do so by enabling the Log activity attribute when you configure a file service. This attribute applies per service. The report generated by csr.tn or by clicking Generate Support Info includes the activity log.

## Error Logs

Realm error logs reside in each realm's folder. The NetWare realm's log resides in `$TNHOME/NW/log`, the LM-NT-OS/2 realm's log resides in `$TNHOME/NB/log`, and the AppleTalk realm's log resides in `$TNHOME/AT/log`. These logs provide startup information for the realm and error messages generated during startup in a common log format. If a client cannot connect to a service in a particular realm, you can check the log for that realm for TAS startup errors.

To access such a log from TotalAdmin, follow these links:

- realm->View realm Log File

## Activity Logs

To maintain a log of connection activity for a realm, you must enable the activity attribute on each relevant file service. This attribute applies per service. The activity log file `activity.tn` then registers the following statistics whenever service terminates in the realm:

- UNIX account name
- server machine name
- server start time
- file service realm
- client machine name
- client network address
- number of transactions requested
- number of kilobytes read
- number of kilobytes written

- number of kilobytes printed
- total connection time

To cause an activity log to generate each time a client connects to the server, follow these steps:

1. **Follow these links**:
   *realm*->Manage File Services->[select service]->Administer->Configuration

2. **Select the Log activity option.**
   To enable activity logs from the UNIX command line, open a telnet session to the server and use the following command:

```
./tnservice -M -r NB -s service -a activity=on
```

# Error Messages and Solutions

This section provides solutions to error conditions accompanied by error messages.

The chart below details the exit codes that appear as tn-utilities error messages. The rest of this section lists causes and solutions for other common error messages.

| | |
|---|---|
| 0 | Success |
| 1 | Usage |
| 2 | Incompatibility |
| 3 | Invalid command line |
| 4 | General memory allocation |
| 5 | Disabled system |
| 6 | Invalid realm, system, or service |
| 7 | Application Interface error |
| 8 | System call failure |
| 9 | C library failure |

| | |
|---|---|
| 10 | Invalid characters in volume, for specified realm |
| 11 | Invalid characters in service, for specified realm |
| 12 | Service name too long for specified realm |
| 13 | Denied permission; superuser access only |

## Access denied

The user does not have privileges to either read a file, write a file, execute a program, or search a directory.

## Cannot access a directory

The NetWare-compatible client cannot access a UNIX directory. Verify that the directory has the execute permission bit set and resides below the virtual root of the volume.

## Cannot access network drive

The Windows interface on the network has one of these problems:

- The correct driver has not loaded. Under the Windows Setup program on the client, check the Network option and verify that the correct network driver has loaded. For example, for a Microsoft-compatible client, the words Microsoft Network should appear. If they do not, click Change System Settings on the Options menu, then select the correct driver from the list under Network.
- The drive connected using the Windows file manager and the existing file manager saved the settings. The user chose, under Windows Control Panel->Networks, to restore all connections at startup, and consequently used the drive letter for DOS to make a different redirection.

## Cannot create socket on server

The system socket call failed on TAS startup for one of the following reasons:

- You did not shut down NetBIOS. If the UNIX operating system contains NetBIOS, shut it down before starting TAS.
- The system has used all of its sockets.
- Another process has claimed one of the reserved NetBIOS ports.

## Cannot log in to server as supervisor

The server uses the UNIX operating system to authenticate users, so the user account must exist on the UNIX host before you can log in. A Novell server's system administrator defaults to supervisor; the UNIX equivalent defaults to root. Typically, you must log in as root to administer the UNIX operating system.

## Incorrect password

The server has not validated the user's name or password. Make sure the name and password fulfill the following requirements:

- Correct spelling.
- Correct format for upper-case characters. A tilde (~) must precede each one.
- Satisfaction of the following system limitations:
  - NetBIOS has a 14-character maximum.
  - NetWare has a 30-character maximum with TAS.
  - AppleTalk has an 8-character maximum.
  - Users with account names or passwords longer than eight characters may have difficulty making connections. On many UNIX systems, only the first eight characters of the password matter, so you may establish a connection by providing only the first eight characters of the password.
  - On systems with password aging supported and enabled, the password may have lost validity. Have the user log in to the UNIX host at the console or with a terminal emulator such as telnet and update the password.
  - The user name lists as restricted. Follow these links:

- *realm*->Manage File Services->[select the file service] ->Administer->Authentication and Service Mode Options

  If you chose the LM-NT-OS/2 or NetWare realm, choose the authentication type. In the screen that appears, check User restrictions. If the user name does not appear in the Users field with Allow selected, enter it. If the name appears in the Users field with Deny selected, delete it.

## Incorrect response from network

The name discovery phase succeeded, but the system rejected the connection request, for one of the following reasons:

- The user made a connection attempt to a TAS host immediately after the user's previous connection terminated ungracefully, such as by client PC reboot, and the connection definition file still exists. Run `tnck`.

- A user attempted to connect to a service with an invalid command in its service definition file.
- You caused TAS to reject new connection attempts. Follow these links to make TAS accept connections:
- **System->System Administration->Accept Service Connections->OK**
- To accept services from the UNIX command line, use the tnaccept command.
- TAS has reached its user limit. Multiple connections from a single client to the same service name count as a single user, but each connection to a new service name, even if it comes from the same client, counts as a separate user. Contact your Sun Microsystems sales representative to purchase additional licenses.
- The time limit on your evaluation copy of TAS has expired.

## Invalid connections in “tninfo” report

The output of tninfo shows a connection that does not exist. The `tninfo` report normally shows only one connection per Ethernet address. Occasionally, a duplicate may list when the server has not yet recognized a connection termination. An ungraceful disconnection by the client, as when the client turns off the PC or reboots without logging out, usually causes this.

To detect dead connections, enable the keepalive function for the LM-NT-OS/2 and NetWare realms. This tells the server to send keepalive packets, similar to Novell watchdog packets, to determine whether clients remain attached. After sending the first keepalive packet, the server sends another packet every minute for 10 minutes. If it receives no response during this time, the server assumes that the connection died and updates the connection database accordingly. The client no longer lists in the `tninfo` report.

Follow these links to enable keepalives:

- realm**->Manage File Services->[select the service]->Administer->Configuration**

For Keepalive, enter the number of minutes you want to have between dispatches of keepalive packets.

To enable keepalives from the UNIX command line, use the following command, where n represents the number of minutes for the server to wait after a connection establishes before sending the first keepalive packet:

```
tnservice -M -r NW -s nwhera:file -a keepalive=n
```

## Invalid drive was specified

A problem exists with the drive letter in a client command. This can occur when a client attempts to redirect a local drive, such as a diskette drive or a hard drive partition.

## Network device type incorrect

The user has attempted to redirect either a drive to a print device or a printer port to a directory.

## Network path not found

The client did not receive a response from a server when it broadcast a request for a NetBIOS name, for one of the following reasons:

- The user supplied an invalid service name when attempting to connect to a TAS host. Follow these links or use the tnstat command to make sure the service status contains the correct service name: LM-NT-OS/2 Realm->Configuration and Control-> LM-NT-OS/2 Realm Status.
- When a client attempted to connect to a TAS host, the named service did not run. Follow the links LM-NT-OS/2 Realm->Configuration and Control->LM-NT-OS/2 Realm Status or use the tnstat command to see if the service status runs. If it does not run, restart LM-NT-OS/2 services by following “5.1.2 Shutting Down LM-NT-OS/2 Services” on page 58, then “5.1.1 Starting LM-NT-OS/2 Services” on page 58.
- The user misspelled the server name. Use `tnservice -l` or check the service configuration at LM-NT-OS/2 Realm->Manage File Services->[select the service]->Administer->Configuration to verify the spelling.
- The system has reached its NetBIOS session limit. Check the initialization file of the client protocol software to verify that the system allows sufficient NetBIOS sessions.
- The server cannot run NetBIOS.
- The NBname daemon does not run. NBname exits if it detects another network node with the same NetBIOS name. TAS then ignores name requests. Check the NetBIOS error log $TNHOME/NB/log on the host for an error message. Change the NetBIOS name, if necessary, and restart TAS as described in “4.1.2 Shutting Down TAS Services” on page 36, then “4.1.1 Starting TAS Services” on page 36, or with the tnshut and tnstart commands.
- The server and client reside on different networks—they reside on different sides of a router or a bridge—and NetBIOS broadcasts do not propagate. Use the TAS Enterprise Name Server (ENS) as described in “6.1 Modifying TCP/IP Configuration” on page 120 or by using the tntransport command. Alternatively, you could configure routers to propagate broadcasts using a p-node NetBIOS setup, but this substantially increases network traffic and lowers network capacity.
- IP addresses have incorrect formats or content. Check the IP addresses with the tniface command or by following these links: Transports ->TCP/IP Addresses. On the server, you can find an IP address using the ifconfig command. The address should have four segments separated by periods, as in the following example, where A, B, C, and D represent sets of decimal numbers:

- *A.B.C.D*

  Determine the address with this table:

| **If A is:** | **the network number is:** |
|---|---|
| < 128 | `A` |
| 128 - 191 | `A.B` |
| > 191 | `A.B.C` |

- The network mask for the client does not match that for the server. This table gives the default network masks for IP addresses:

| **If A is:** | **the network mask is:** |
|---|---|
| < 128 | `255.0.0.0` |
| 128 - 191 | `255.255.0.0` |
| > 191 | `255.255.255.0` |

- The broadcast addresses cannot work together. The original TCP/IP did not define a way to broadcast packets on the Internet. When this became desirable, enterprising corporations developed several different mechanisms, not all of which interoperate. To try a different broadcast style on the PC, see the client TCP/IP documentation.

## No servers listed by “slist”

In a PC’s `net.cfg` file, you can list several frame types to use over the network card. The network uses only the first entry when transmitting packets. If a server host does not have the configuration to use the same type of frame as the client, the client cannot see that server; the server does not list from the `slist` utility or on the Windows NetWare interface.

## Remote computer not listening

This problem may occur with an inactive NBdaemon process. Follow the links LM-NT-OS/2 Realm->Configuration and Control->LM-NT-OS/2 Realm Status or use

the tnstat command to verify that you started TAS. If you have not, follow “4.1.1 Starting TAS Services” on page 36 or use the tnstart command.

## Routing information database corrupted on large internetwork

NetWare servers broadcast routing information every 60 seconds using the Routing Information Protocol (RIP), and they broadcast service information every thirty seconds using the Service Advertising Protocol (SAP). On a very large internetwork or wide-area network, the RIP or SAP database can grow so large that the time necessary to download it exceeds the interval between downloads, especially if you have a low-speed WAN link. This can cause the apparent disappearance of volumes, printers, or servers or extreme delays in packet re-routing, if a node fails.

Novell will replace RIP and SAP with NetWare Link State Protocol (NLSP). NLSP associates multiple network interfaces with a single network number, distributing traffic across multiple network segments. If a node fails, NLSP can quickly establish an alternate path. NLSP builds a map of the network incrementally and sends updates only as needed. NetWare 3.11, 3.12, 4.11, and 4.12 servers support NLSP. They can still work with existing SAP/RIP servers.

## Server not found

The name-discovery phase succeeded, but the system cannot find the requested resource on the server, for one of the following reasons:

- A user attempted a connection to a TAS host with an invalid UNIX name. Verify the validity of the user name at realm->realm Connected Users->Connection Information. Check the spelling and case. Make sure a tilde (~) precedes each upper-case character.
- You set the NetBIOS naming scope incorrectly. The naming scope must match the one designated by NetBIOS Name scope at Transports->TCP/IP NetBIOS Configuration. You may also check it with the tntransport command. NetBIOS Name scope also defaults to no naming scope. If you do not set the NetBIOS Name scope attribute, TAS ignores the client’s naming scope.
- When a user attempted a connection to a TAS host, an attach point defined in TAS’s configuration of .profile.file in the user’s home directory matched a UNIX user name or directory. Change the name of the attach point at realm->Manage File Services->[select the service]->Administer->Attach Points or with the tnattach command and retry the connection.
- The user attempted connection to a directory with a user limit, and the directory has reached its limit. Try again later.

- A user attempted to establish a print service connection to a nonexistent printer. Verify that either the server configuration contains a reference to the printer, at realm->Manage File Services->[select the service]->Administer->Configuration->Printer references or with the tnservice command, or the user's `.profile.file` contains a `prdefault` or `printer` command for the requested printer.
- An attempted extended connection contains a path to a nonexistent directory. Verify the directory exists and try again. Stop and restart TAS if you modify the directory configuration by following "4.1.2 Shutting Down TAS Services" on page 36, then "4.1.1 Starting TAS Services" on page 36, or with the tnshut and tnstart commands.

## Too many redirections

The user has attempted to exceed the number of connections allowed by the client computer's network operating system, NetBIOS, or TCP/IP. Update `nb_sessions`, `tcp_sockets`, or `udp_sockets` entries in the `net.cfg` file to allow more redirections. If you do not want to allow more redirections, cancel a redirection, then try again.

## Unknown board ID

The age of the network card driver exceeds the age of the physical network board. Replace the board interface software with a newer version.

# Error Conditions and Solutions

This section provides solutions to several error conditions not necessarily accompanied by error messages.

## Authentication Error on Windows NT 4.0 and Windows 98

A TAS authentication error occurs when a user runs Windows NT 4.0 client with Service Pack 3 (SP3) installed, or Windows 98. If the user attempts to browse a TAS server for shared volumes, or to connect to a TAS volume, the following TAS error message is displayed:

```
Incorrect password or unknown username for \\serverName.
```

This error occurs even if the user enters a valid UNIX username and password.

By default, Windows NT 4.0 SP3 and Windows 98 clients use secure authentication. The PC and the TAS server engage in a "challenge/response" exchange, which ensures that they agree on the validity of a password, without sending the actual password over the wire.

The client uses the password to encode a nonsense string (supplied by the server). The client then returns the encoded string to the server. The server performs a similar encoding and, if the nonsense strings match, authenticates the client.

To support this authentication scheme, TAS must maintain a private password file, distinct from the UNIX password file. To enable authentication, you must populate the TAS private password file with UNIX user names and passwords.

Complete these steps to enable secure TAS authentication and eliminate this error:

1. **Click the TNAS TAS Administration and Configuration sphere icon to display TAS administration and configuration options.**

2. **Click LM-NT-OS/2 Realm.**

3. **In the LM-NT-OS/2 Realm panel, click: Manage File Services->**

4. **Select the file service you want to manage and click Administer.**

5. **On the resulting screen, click Authentication and Service Mode Options.**

6. **Enable Local authentication and click Submit.**

7. **Enable Password encryption and click Submit.**

8. **Click OK.**

9. **To establish entries in the TAS private password file, click these links in the TAS frame:**

   **Passwords->*type in the UNIX user name*->Create**

   A user must have a valid UNIX account for you to enter the name into the TAS password file.

10. **In the resulting form, enter and renter the user's password and click Submit. This user will now be authenticated correctly.**

11. **Repeat steps 7-9 for each UNIX user requiring TAS authentication.**

## Jobs do not Print on Solaris Printers

Solaris printers appear available to TAS clients. Printers can be mounted and print jobs seem to spool to Solaris printers correctly. However, jobs are never printed.

In order for TAS PC client to print to a Solaris printer, TAS configuration must be modified as follows:

1. **In the TNAS Main Menu (Left Frame), click System.**

2. **In the System Configuration and Administration Menu (Right Frame), click Printers.**

3. **Select the Solaris printer to update and click Modify.**

4. **Enter `-c` in the Spooler Options box, and click Submit.**

   Jobs will now print successfully on the Solaris printer.

## Application on UNIX server inaccessible

The user cannot execute a program residing on a TAS host, for one of the following reasons:

- The application's file permissions deny access to the user. Log in as the owner of the directory that contains the application, or as root, and correct the file permissions, at realm->Manage File Services ->[select the service]->Administer->Configuration->Umask or with the tnservice command. Remember, DOS programs need to have UNIX read permission.
- The application has a attribute that tells DOS the drive on which it resides, but the redirected drive uses a different letter.

## Compilation problems in DOS window

Compiling programs on a network drive in a Windows DOS prompt window can cause data corruption or dropped connections. For Windows for Workgroups and Windows 3.1, add the following line in the section labeled `[386Enh]()` in the PC's Windows `system.ini` file:

- `InDOSPolling=True`

## Connection failure

Some network boards have more than one cable connection, and some have transceivers on their boards. Make sure the physical hardware jumpers can use the same connection as the software settings.

## Dead sessions not dropped

When a user turns off or reboots a client PC, the network connection breaks. If this happens during a data transfer, TAS notices immediately and terminates the appropriate process. If it happens when no traffic passes between client and server, TAS notices only after a few minutes. This timeout period, dependent on the host system, typically lasts about five minutes. After the timeout period elapses, TAS terminates the appropriate process.

TAS, by default, relies on the host's underlying transport layer keepalives to keep track of dead sessions. If other applications, such as telnet, do not drop dead connections, the transport vendor may not have keepalives implemented. You may have configured TAS to use NetBIOS keepalives instead by changing the keepalive attribute at realm ->Manage File Services->[select the service]->Administer ->Configuration or with the tnservice command.

## Disconnected clients still appear connected

When a PC client terminates a session—that is, disconnects a redirected drive—the associated process attempts to close the session in an orderly fashion. This includes removing the file name.number from the directory `$TNHOME/TAS/tn/tndb`. The *name* variable represents the machine name of the client PC, and number represents the UNIX ID number of the associated process.

If the client cannot remove this file, it exits without error, but when you check connection status or issue a tnwho or tninfo command, the client appears connected. Verify that totalnet owns the program srm, which does the actual removing of entries from the circuits directory, that srm has a mode of 4511, that totalnet owns the circuits directory, and that the circuits directory has a mode of 755.

## DOS commands yield unexpected results

Certain DOS commands may behave unexpectedly, for the following reasons:

- Networked drives where the user does not have write permission in the root directory do not support DOS pipes—commands that include the "|" character. This occurs because a DOS pipe tries to create a temporary file in the root of the current drive.

- Some DOS applications, such as edlin, delete a file and then rewrite it to modify it. If the file links to another UNIX file, the link disappears, and a new, independent file takes its place.
- Some DOS commands report errors that do not seem to relate to their causes. For example, the DOS type command returns `Invalid path or filename:` when it receives the `Access denied` message from the server. This can happen when DOS tries to type an inaccessible file. Verify that the device, path, and file names have validity on the server and that the user has access privileges to them.

## File locking errors

Files do not properly lock or unlock because the client PC rebooted and file locks did not clear. Run tnck to clear the locks.

## Free disk space indicated incorrectly

Client disk space calculation limitations have become too great. DOS has problems with any disk device, whether redirected or local, that reports cluster sizes of 64 kilobytes or larger. Large UNIX systems or machines with, for example, several CD-ROM drives mounted, may represent drives totaling more than four gigabytes. DOS cannot handle numbers of this magnitude.

## NetBIOS does not start

When NetBIOS does not start, make sure that the NetBIOS processes completely shut down. Use the ps command to find out whether the NBname or NBdaemon process runs even after you use shut down TAS services. This problem occurs only when a process aborts abnormally. Use the UNIX kill command to terminate the offending process, then follow “4.1.1 Starting TAS Services” on page 36 or use the tnstart command.

## Performance of network slow

Copying files to or from redirected drives, printing jobs over the network, or executing remote commands yields unduly slow responses, for one of the following reasons:

- The network segment has overloaded. Redesign your network to reduce the workload.
- The network generates too many broadcasts. Consider breaking the LAN into smaller segments.

- NFS generates a high amount of network traffic. If you rely heavily on NFS mounts for remote file systems, replace some by installing TAS on the remote hosts. If a client has to connect to a TAS host and file service requests route over an NFS connection to another computer, twice as much network traffic takes place than when the client connects directly to the second computer.
- TCP packet buffers or window sizes require modification. The procedure for modification on clients depends on the brand of TCP/IP installed. Check the documentation for the client's TCP/IP. In TAS, check, and possibly adjust, the values of the recvbuf and sendbuf attributes, using the tntransport command.

## "Ping" does not work

This happens for one of the following reasons:

- The software settings in the configuration file do not match the physical hardware settings. Correct either one to match the other.
- The `ifconfig` command pings to the wrong address. Verify the network mask and the sending and receiving IP addresses.
- The target has an invalid IP address or does not have its TCP stack running. Check the destination computer to make sure it works properly.
- A network card with two network connectors uses a different type of network connector than the software. Adjust the hardware or software to use the proper connector.
- The network lacks one or more terminators. Install terminators at the ends of the network.

## Printing problems

These happen for one of the following reasons:

- The network driver has not loaded. Under the Windows Setup program on the client, check the Network option to verify that the correct network driver has loaded.
- For Windows for Workgroups and Windows 3.1, the UNIX spooler misinterprets a PostScript file. When you print a PostScript file, your client sends a "CTRL-D" as the first character. The UNIX spooler, which cannot handle this, stops the print process and deletes the spool file. To correct this, add the following command to the client's Windows `win.ini` file under the section header `[PostScript Printer,LPT1:]()`:
- `CTRL-D=0:`

- In some DOS applications, print jobs do not send until the user exits the program, because the PC buffers the print job and does not spool it until the application closes.

# Contacting Technical Support

Contact your local Sun Technical Support Center. Sun Technical Support Centers are listed at: `http://www.sun.com/services/contacting/solution.html`.
Before contacting technical support, please have the following information ready:

- your Sun Spectrum contract or ID number
- your version of TAS
- your UNIX version
- the type of machine on which you installed TAS
- circumstances leading to the problem, including other operating systems, software, and hardware involved
- Any error messages displayed or logged