

**USER
MANUAL**

TCP/IP Network Services

**NIS/LPR/LPD Applications
for Windows**

Version 8.50



© copyright 1993- 1996 by Esker

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means without prior written consent from Esker.

In continuing efforts to improve our products, keep up with current technology, and incorporate user's suggestions, ESKER may change the look and the characteristics of the product described in this manual at any time.

ESKER makes no warranty of any kind, expressed or implied, with regard to the contents of this manual. This is a purely technical document and does not represent a contractual obligation of any kind. ESKER shall not be held liable for incidental or consequential damages in connection with the use of the programs described herein.

Tun, Tun KERNEL, Tun NET, Tun EMUL, Tun SQL, Tun PLUS copyright ESKER
Windows, Windows for Workgroups, MS-DOS, XENIX copyright Microsoft Corporation
UNIX is a registered trademark of AT&T Bell Laboratories
SCO UNIX, SCO XENIX copyright The Santa Cruz Operation
IX386 copyright Interactive Software
PC, AT, XT, Token Ring, 3151, AIX copyright IBM, Inc.
Netware copyright NOVELL, Inc.
LAN Manager copyright Microsoft Corporation
Ethernet is a registered trademark of XEROX
NFS copyright SUN Microsystems
Netscape Navigator is a registered trademark of Netscape Communications Corporation
nsus850.doc

PREFACE

TCP/IP Network Services is a supplementary package for the **Tun EMUL** and **Tun SQL** software packages:

	WINDOWS	MS-DOS
Tun KERNEL	TCP/IP protocol stacks for Windows 3.x only	TCP/IP protocol stacks for MS-DOS (TSR)
Tun NET	TCP/IP applications (NIS, NFS Client and Server, PING, Printer redirection and sharing, FTP Client and Server, TELNET, RSH Client and Server, TAR, WALL, TFTP, TIME), and electronic mail and fax application	TCP/IP applications for MS-DOS (NFS, Printer sharing, FTP, TELNET, TAR ...)
Tun EMUL	Comprehensive terminal emulator (asynchronous emulation, IBM 3270, IBM 5250)	Comprehensive terminal emulator for MS-DOS (asynchronous emulation)
Tun SQL	ODBC drivers for Client-Server mode under TCP/IP (Oracle, Informix, Sybase DBMS, Progress, DB2) and database revamping tools	N/A
TCP/IP Network Services	Browser NIS, Printer redirection and sharing (LPR, LPD)	N/A

The software products **Tun SQL** (Client/Server for Windows) and **Tun EMUL** (Terminal Emulation for Windows) are supplied with three supplementary TCP/IP applications:

- The **Tun NIS** browser which allows centralized network resource management and easier user access to network resources.
- The **Tun LPR** application for printer redirection which enables PCs to print on remote printers.
- The **Tun LPD** application for printer sharing which enables PCs to share their printers with other network machines.

The **Tun SQL** and **Tun EMUL** manuals describe in detail the use of those packages. The objective of the present manual is to describe what the three applications delivered with **Tun SQL** and **Tun EMUL** allow the user to do.

If you have acquired the product **Tun NET** (supplied with **Tun SQL** and **Tun EMUL** in the **Tun PLUS** software suite), the applications **Tun NIS**, **Tun LPR** and **Tun LPD** are also documented in the **Tun NET** user manual. In this case, the present manual is superfluous to your needs.

Finally, the products **Tun NET**, **Tun SQL** and **Tun EMUL**, and especially **Tun PLUS**, propose the installation of the applications **Tun NIS**, **Tun LPR** and **Tun LPD** in their setup programs. The instructions for the installation of these products are described in the respective user manuals.

TABLE OF CONTENTS

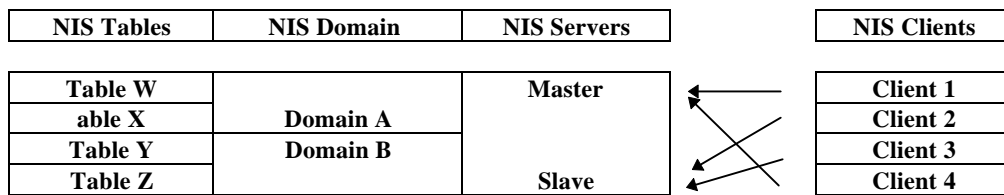
CHAPTER 1 - THE NIS BROWSER.....	5
What is NIS?.....	5
Tun products and NIS.....	5
Tun NIS setup.....	6
Starting the NIS browser.....	7
User mode	10
Administrator mode.....	13
Creating a new resource.....	18
Modifying, deleting or restoring a resource.....	24
Saving and restoring a NIS configuration.....	25
CHAPTER 2 - USING REMOTE PRINTERS.....	27
Tun products and remote printing.....	27
Setting up remote printers under Windows 3.x.....	28
Starting print redirection under Windows 3.x.....	29
Declaring a remote printer under Windows 95.....	30
Configuration under UNIX.....	32
CHAPTER 3 - SHARING PC PRINTERS.....	33
Tun products and printer sharing.....	33
Setting up printer sharing.....	34
Activating public printers.....	35
Using public printers with RSH.....	36
Using public printers with LPD.....	39
Statistics.....	40
Using public printers directly from PCS	41
CHAPTER 4 - REFERENCE GUIDE.....	42
INDEX.....	48

CHAPTER 1 - THE NIS BROWSER

WHAT IS NIS?

The objective of NIS (Network Information Service) is to allow network users to know which resources are available on the network and to be able to access them from their PCs without having to worry about the location of the resources or their configuration.

The principal of NIS is based on the following architecture: a UNIX server manages the resources which are stored as tables. In general, the NIS server is seldom a totally independent entity but a part of a master/slave architecture: the master server manages a domain, and one or more slave servers make it possible to duplicate the domain's files. Each client calls the first NIS server which replies.



The NIS server tables are known as "yp" tables (for "Yellow Pages", the original name of NIS that had to be changed since it was the trademark of British Telecom's telephone book).

Tun NIS allows NIS clients to access resources from a PC by means of a "browser". The browser serves a double purpose:

- On the one hand, it lets PC clients easily access the network resources from a Windows environment, resources that they can view and use whatever the system.
- On the other hand, it is used by the administrator to manage the resource tables that are present on the remote NIS server.

The NIS browser lets the user access remote servers and PCs, use remote printers without having to install the necessary drivers, mount NFS drives, access data files such as mail address books, data sources, and even run remote applications.

The administration of NIS tables by **Tun NIS** consists of creating resources, modifying and deleting them, and making them immediately available to the network users. Since the information is centralized, it only has to be entered once to provide the users with the most up-to-date configurations.

Tun PRODUCTS AND NIS

Tun EMUL and **Tun SQL** may resort to the NIS for one reason or another, and each has its own specific installation and configuration requirements.

When the NIS browser is called by a particular application, the user can only access the resources corresponding to this application. On the other hand, when the NIS browser is called directly from Windows, it allows access to all the tables on the NIS server that the administrator has made available.

In this chapter, only information relating to the general setup of the system is included. For precise information related to individual **Tun EMUL** or **Tun SQL** applications, please refer to the relevant section in the chapter dealing with the application. In most cases, the application's settings dialog box will include a **NIS...** button for browsing and using NIS resources. If **Tun NIS** is correctly installed on the PC, the user can simply select the desired resource.

Tun NIS SETUP

To install and configure the NIS server on a UNIX machine, proceed as follows:

1. Install the NIS server following the directions in the corresponding UNIX technical manual or bulletin.
2. Change the lines **tftpd -s** and **rexecd** in **/etc/inetd.conf** by removing the character "#".
3. Activate these tasks with the following command:

kill -1 <task number inetd>

4. Transfer the file **nissetup** from **Tun NIS** installation directory (TCPW\nissetup) under Windows, to the UNIX machine.
5. Run the shell **nissetup**.

This program automatically:

- Creates the directory **tftpboot/yp**.
- Creates the files for the empty tables in this directory and also their lock.

Files	Locks
Servers	ServersL
Lpr	LprL
Nfs	NfsL
Ftp	FtpL
Tar	TarL
Tftp	TftpL
EmulCfg	EmulCfgL
MailAdr	MailAdrL
Mail	MailL
Data	DataL
Url	UrlL
Appli	AppliL
Path	PathL

- Creates the directories **/tftpboot/yp/files** and **/tftpboot/yp/drivers**

The NIS server is ready to be administered by the NIS Browser.

STARTING THE NIS BROWSER

General remarks



Under Windows 3.x, the context menu, accessed by clicking the right mouse button, and also tooltips are not available. Information on these features are only relevant to the use of the NIS Browser under Windows 95.

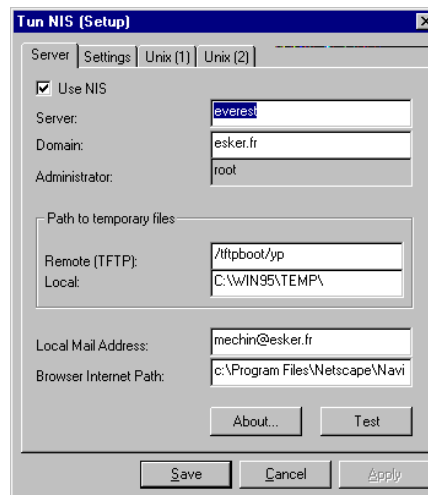
Startup

So that the NIS Browser can be started, the NIS server has to be put into operation.



Run the program **Tun Admin+** from **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu, and then click on the **Tun NIS** button.

The following window is displayed:



So that the NIS browser can be used directly or from the Tun applications installed, it is essential to select the check box **Use NIS**. The **NIS** button will then be made available in all the Tun applications which use the browser. By default, the check box is not selected; in this case the **NIS** button will not appear in the applications, and the NIS Browser can not be launched.

If it has not been done yet, complete the two other fields:

- The domain name which, by default, is "esker.fr". Replace "esker.fr" with your domain name.
- The path to your Internet browser (for example: c:\program files\netscape\navigator\program\netscape.exe

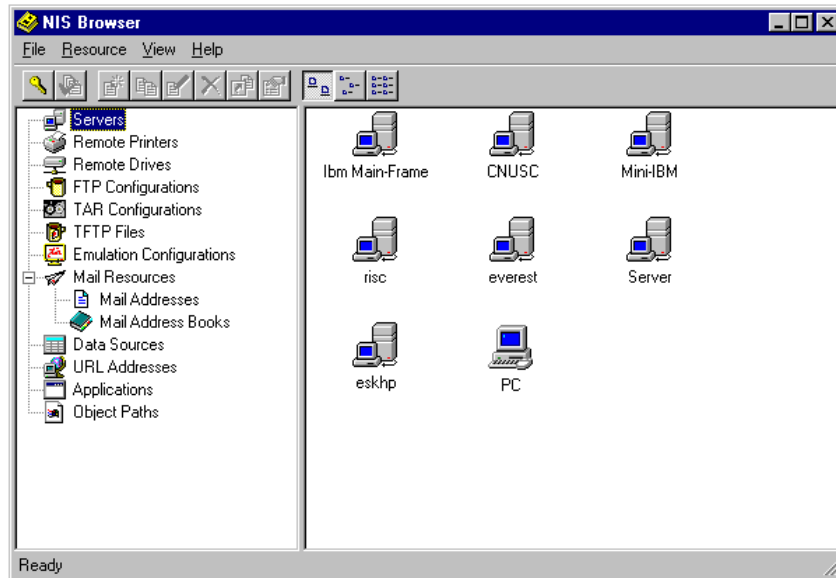
Click **Save** to save the configuration.

Now the NIS browser can be started.



Run the program by clicking on the **Tun NIS** icon in the **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu.

The NIS browser delivered with the Tun range of products is presented as a window composed of a left-hand section showing the different categories (or tables) of resources, and a right-hand section showing the content of each table.



To access the contents of a table, select the table in the left-hand section of the window.

The display of the contents of a table can be modified by selecting the appropriate option in the View menu, or by clicking the corresponding button in the NIS browser toolbar:



Large icons




Small icons
















List (only under Windows 95)

The same interface is used for user mode (the default) and administrator mode; only the functionality differs. The shift from one mode to the other is effected by clicking the option **File→Administrator Mode**

in the main menu, or by clicking the button **Administrator Mode**  in the NIS Browser toolbar. In Administrator Mode, the button remains depressed.

Resources

There are thirteen categories of resources corresponding to thirteen NIS Server tables:

	Servers	Network servers
	Remote printers	Shared network printers
	Network drives	Shared network drives
	FTP configurations	Network FTP servers
	TAR configurations	Backup devices
	TFTP files	Network TFTP servers
	Emulation configurations	Network emulation configurations
	Mail addresses	E-Mail addresses (all types)
	Mail address books	Address books accessible on the network
	Data sources	Network data sources
	URL addresses	URLs selected via the network
	Applications	Applications available through the network
	Object paths	Access to different objects available on the network

Each resource has the following characteristics:

- An icon.
- Properties.
- Associated applications.

Icons

Since there are a large number of icons used by the NIS Browser, they are not all shown here. It should be remembered, however, that each type of resource in each table has its own icon for easy identification. In addition, devices such as drives or printers that are connected to the user's PC are indicated with a green spot. Devices which are not connected are represented by a grayed icon.

USER MODE

The user may resort to three types of functionality in the NIS Browser:

- Viewing the list of available resources on the network and their properties.
- Using these resources through the applications associated with them.
- Creating shortcuts for each of the resources so as to have immediate access to these resources from the Windows desktop.

Access to the available resources

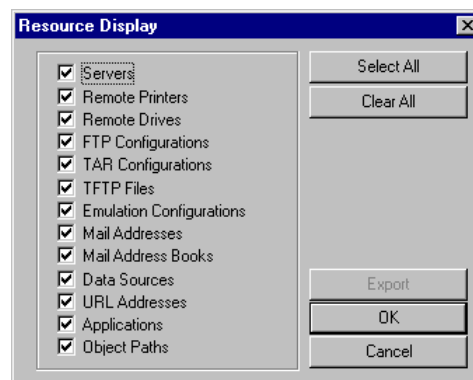
The user can display the list of resources available to him on the network by type (see the section "**Resources**" above).

Not all the resource types, however, may be visible:

- Administrator level: the administrator may choose to make such or such a type of resource available to users, and not other types. Refer to "**Administrator Mode**" for this particular choice.
- User level: the user may select only those resources he wishes to see from among the visible resources to reduce the contents of the NIS window.
- Application level: in each of the applications which use the NIS Browser, access is limited to those which are useful to the application. For example, the application **Tun TAR** allows access to the backup devices (TAR Configurations resource), but not to other resources.

To select the types of resources that can be viewed by the NIS Browser, select the option **View→Resource Display....**

The following window is displayed:



Select or deselect the check boxes appropriate to your needs.

Click the button **Select All** to select all the resources.


Click the button **Clear All** to clear all the check boxes.

Click the button **OK** when you have made your choice.

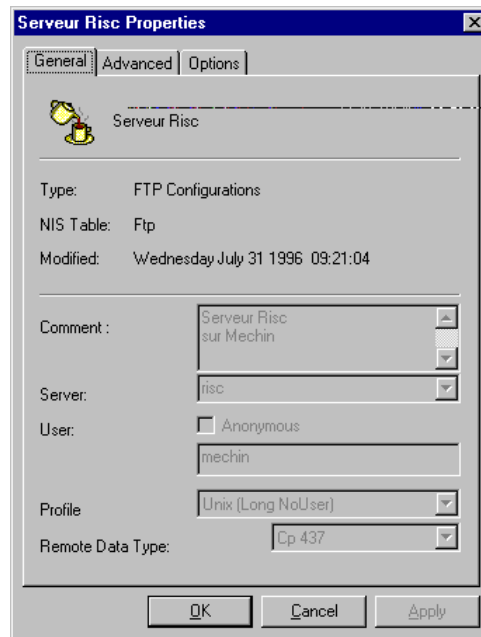
When the selection has been made, the user may then access the properties of each of the resources as described in the preceding section "**Starting the NIS Browser**".

Resource properties

To access the resource properties dialog box (to view them in user mode, or possibly modify them in administrator mode), select the resource, then use one of the following methods:

- Click the button **Resource Properties**  in the NIS Browser toolbar.
- Select the option **Properties...** in the contextual menu for the selected resource.
- Select the option **Resource→Properties...** in the general menu.

Two, three or four tabs are featured, depending on the resource selected.



On the **General** tab, the following options are always displayed:

- The icon representing the resource, as well as its name and type.
- The NIS table corresponding to the type of resource, as well as the date of the last modification of this table.
- A comment field for the resource. This comment appears as a tooltip when the mouse pointer is positioned on the icon representing the resource in the browser window (only under Windows 95).

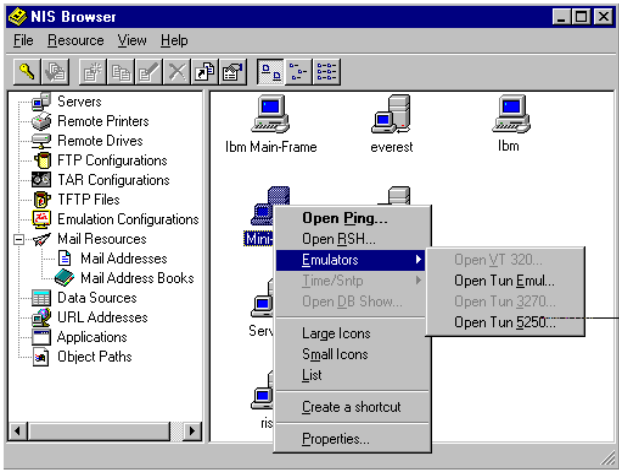
The **Advanced** tab, if there is one, contains the parameters for an advanced configuration. The **Options** tab can be used to include complementary configuration parameters.

The remaining parameters on these tabs vary from one resource to another and are described in detail in the section on the administration of the NIS tables.

Use of resources

One or more applications are associated to each resource allowing it to be exploited. This may vary from single programs (for example, a 3270 emulator) to a series of operations (for example, the installation of a printer). The available applications vary from one type of resource to another, but they also vary from one resource to another depending on individual characteristics.

To run an application, select the resource and display its contextual menu. The list of applications associated with the resource appears in the first part of the menu, with the default application shown in bold print being the one that is run when the resource icon is double-clicked. To access these applications, you can also select the **Resource** option in the main menu.



Example:
The applications *Ping* (for testing connections between PCs and servers), *Tun RSH* (for executing remote commands on the server from the PC), *Tun EMUL* (for performing terminal emulation with the server, with optional types of emulation), and *DB Show* (for declaring data sources).

When the user runs an application from the NIS Browser, he is actually executing the program installed on his PC. If the program is not installed, the application cannot be run. This is true for all the resources except the resource **Applications** which runs an application located anywhere on the network. This resource then makes it possible to use a remote application from the PC.

The following table presents the possible applications for each resource type, although not every resource will make use of them. The application in bold print is the default application executed when the user double-clicks on the resource icon.

Refer to the corresponding chapter in the **Tun SQL** and **Tun EMUL** manuals for the applications related to databases and terminal emulation.

Servers	Ping RSH Emulators (VT 320, Tun EMUL, 3270, 5250) Time/SNTP DB Show
Remote Printers	Install Uninstall
Network Drives	Connect Disconnect
FTP Configurations	Open FTP...
TAR Configurations	Open TAR...
TFTP Files	Retrieve
Emulation Configurations	Start the Emulator...
Mail Addresses	Open Mail...
Mail Address Book	-
Data Sources	Install Datasource... Use Data Source...
URL Addresses	Open the Internet Browser...
Applications	Run...
Object Paths	Open...

Creating shortcuts

The user can create shortcuts from the NIS Browser by selecting a resource. This functionality allows him to be able to use resources which he accesses frequently straight from the Windows desktop or Program Manager without having to open the NIS Browser. The resource may be a server to which he connects for emulation, a remote archive frequently accessed for backups, or even a URL easily accessed via the Internet browser by simply clicking on the shortcut icon.

To create a shortcut, select the resource desired, then select the option **Create A Shortcut** in the contextual menu related to the selected resource or the option **Resource** in the main menu.

You can also use the **drag 'n drop** to copy a shortcut from the NIS Browser to the desktop or the Windows 3.x Program Manager.

Under Windows 3.x, the program group **Tun NIS Favorites** is then created and contains all the shortcuts created with the NIS Browser.


ADMINISTRATOR MODE

Tun NIS configuration

Normally, the configuration of **Tun NIS** is very simple since the default parameters are generally sufficient for the best use of the server.

However, the administrator must declare the name of the domain covered by the NIS server to the browser, and put the NIS server into operation.

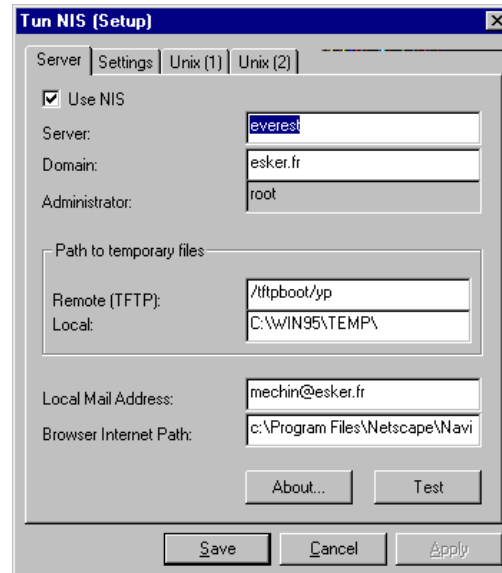
To access Tun NIS Setup, use one of the following methods:

- Run the program **Tun Admin+** from **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu, and then click on the **Tun NIS** button .

- If NIS has already been activated by the administrator (the option **Use NIS** is activated), run the program by clicking on the **Tun NIS** icon in **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu. Then switch to administrator mode.

Since the default login is root, enter the password associated with the root login on your system. Then select the option **File→Configuration** in the general menu.

The following window is displayed:



Basic configuration

So that the NIS browser can be used in the Tun applications installed, it is essential to select the check box **Use NIS**. The **NIS** button will then be made available in all the Tun applications which use the browser. By default, the check box is not selected; in this case the **NIS** button will not appear in the applications.

The only two other settings to enter for a basic configuration are:

- The domain name which, by default, is "esker.fr". Replace "esker.fr" with your domain name.
- The path to your Internet browser (for example: c:\program files\netscape\navigator\program\netscape.exe)

Click **Save** to save the configuration.

The other parameters on the **Server** tab are as follows:

- **Server:** name or IP address of your domain. If you do not know the name or IP address of the NIS server, enter the address **0.0.0.0** or **255.255.255.255** to scan the network for the server.
- **Administrator:** is the administrator's login for accessing the NIS server to maintain the tables.
- **Path to temporary files:** these two fields contain the name of the working directory on the NIS server on which the different files created will be placed, and the name of the working directory on the administrator's PC. You may change the default values if necessary.
- **Local Mail Address:** an e-mail address is created for access to the anonymous FTP accounts (the address replaces the password for anonymous access).

To test the NIS server, click the button **Test**. The following message appears if the server is functioning correctly:



Advanced configuration

The other tabs in the **Tun NIS** Setup dialog box propose advanced server settings.

None of these parameters need be modified. However, you may change the values if your configuration is not standard.

The **Settings** tab contains the following options:

- **Number of Retries:** this is the number of retries made when accessing the NIS server before the attempt is abandoned. The default value is 3.
- **Timeout:** the duration in milliseconds between each access attempt. The default value is 1000 ms (1 second).
- **Server Recognition Delay:** since there may be several NIS servers on the network, it may be necessary to wait a certain time before the server is chosen, so as to let the browser find the server which corresponds exactly to the configuration. Enter the time required in this field. The default value is 1000 ms (1 second), which means that the result of the search for the NIS server will only be given after one second allowing several possible NIS servers on the network to be queried.

The tabs **UNIX (1)** and **UNIX (2)** contain settings for the compilation and decompilation of the NIS tables, and also for the default commands and values required to update the tables from the browser. Only change these values if your configuration is not standard.

When you have entered the settings of your choice, click the button **Save** to register the changes. If you want to exit from the administration dialog box without saving the changes, click the button **Cancel**.

NIS Server stoppage

If the NIS server, for whatever reason, becomes unavailable for a certain time, it is essential to control its correct startup with the **Tun NIS** configuration tool. To do this, run **Tun NIS** from the administrator program and perform the test on the server. The server is available again if a message announcing its correct functioning appears.


Table administration

The principal of administrator mode is to let a user access the NIS server tables with a password. Tables and resources in the tables are updated locally according to the following procedure:

- The selected table is automatically locked and decompiled: the administrator can then make his changes to the table while other users use the version stored on the server.
- After modification, the table is compiled and then unlocked: users can then use the latest version updated by the administrator.

By this principle, the table that an administrator is currently modifying is no longer accessible to another administrator. Similarly, different tables may be updated simultaneously by several administrators.

The modification of one resource in a table means that the whole table is under the administrator's control and cannot be modified by another administrator.

To switch to administrator mode, click the button Administrator Mode  in the NIS Browser toolbar, or select the option **File→Administrator Mode** in the general menu.

The following window is displayed:



The user name is the one set in the configuration of **Tun NIS**. The default is **root**. Enter the password that is associated with this user name in the NIS server settings and click the **OK** button.

Restoring the sample table

When **Tun NIS** is first used, the administrator can load the first, sample table pre-set by Esker.

To do this, enter administrator mode, select the option **File→Restore NIS Tables** from the main menu and then select the file "esker.nis".

Administrator mode icons

The same screen organization is maintained in administrator mode, except that the icons are slightly modified according to the status of the resource in question. When administrator mode begins, all the resources are present and compiled in the table. They are therefore represented by the same icon as in user mode with an added green check mark (✓):



Table and resource operations

For each resource in the tables, the administrator can:

- Create a new resource.
- Change the properties of a resource.
- Delete a resource.
- Restore a deleted resource before recompilation.

After modifying one or more resources, the administrator can compile the relevant table.


Finally, the administrator can save a copy of the NIS tables locally in a file which he can later compile if necessary.

Each of these administration operations is described in the following sections.

Compiling a table

After carrying out the desired modifications, the administrator has to update the NIS table physically on the server. This consists of recompiling the table, then relocking it so that the new version will be available to the network's users.

To compile a table, use one of the following methods:

- Click the button **Compile NIS Table**  in the NIS Browser toolbar.
- Select the option **File→Compile Resources** in the general menu.
- Select another table.

The modified version of the table is available to other users.

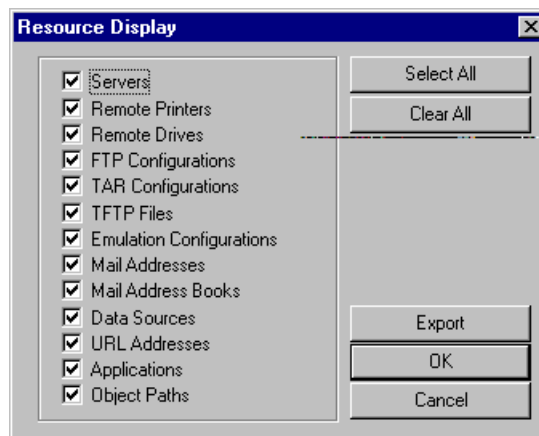
Also note that simply quitting administrator mode or exiting from the browser altogether causes the table to be recompiled, in other words, the changes are saved.

Choosing NIS Browser tables

The administrator can select the tables he wishes to make available to NIS Browser users. This may be useful, for example, if a table has not been updated and the administrator prefers not to make it publicly available.

To select the tables, the administrator proceeds like the general user choosing the tables he wishes to display on screen (refer to the section **User mode**), that is, he uses the option **View→Resource Display...**

The following window is displayed:



The only difference from user mode is that the button **Export** is now active. The administrator uses this button to impose his choice of displayed resources on the system's users. When the button is pressed, a special NIS server table (the View table) is modified.

Example :

*The administrator does not want to display the list of applications available on the NIS server. He deselects the check box **Applications**, then clicks the button **Export** to apply this choice to the users of the server. The users now have access to all the resource lists except the applications list.*

The other functions in this screen are the same as in user mode. This means that if the administrator does not want to view a particular type of resource, he deselects the resource type and clicks **OK** as in user mode.


CREATING A NEW RESOURCE

A new resource is represented by a grayed icon; for example:



represents a new server.

To create a new resource, select the table for the type of resource in question, then use one of the following methods:


- Click the **New Resource** button  in the toolbar of the NIS Browser.
- Select the **Resource** menu in the general menu, then select the option for creating a new resource (**New**).
- Click the right mouse button anywhere in the right-hand part of the NIS Browser window (with no resource selected), then select the contextual menu option which creates a new resource (**New...**).

Example:

To create a new network drive, select the option **Resource → New NFS Drive...** in the main menu

The properties window for the selected resource type is displayed.

You can also copy an existing resource so that its properties are the basis of the configuration of the new resource. To do this, select the resource to be copied and use one of the following methods:

- Click the button **Copy**  in the NIS Browser toolbar.
- Select the option **Copy...** in the contextual menu of the selected resource.
- Select the option **Resource → Copy** in the main menu.

The properties dialog box of the initial resource is displayed. Proceed as for the modification of the properties of a resource and refer to the relevant section for the selected resource below.

Name syntax

Under Windows 3.x, the backslash character (\) is not allowed to be used for the name of a resource. The characters (,), and the comma (,) are not allowed to be used for the name of a resource if you wish to create a shortcut for that resource.

Under Windows 3.x and Windows 95, the file paths to files and applications for the "Emulation Configurations", "Address Books", "Applications", and "Object Paths" types of resource take the following form:

c:\...\...	local file (used for a file available on every machine)
\\server\path\file	file available for Workgroups (the PC server must remain switched on to allow access to the resource)
nfs://server/path/file	file accessible using Tun NFS
tftp://server/path/file	file accessible using Tun TFTP (the path must be authorized by TFTP)
nis:resource name	reference to a NIS "Object Paths" type of resource which contains the actual path of the file or application

The syntax used for URL addresses is as follows:

type://server/path/

where type should be replaced by *http*, *ftp* or any other protocol supported by Netscape Navigator or your Internet browser.

Note: The name of a printer resource should not be longer than 30 characters.
--

Server properties

General tab

- Enter the name of the server as you want it to appear in the NIS browser. Respect the authorized formats (See **Name syntax** above).
- Enter an optional comment: the comment will appear as a tooltip when the mouse pointer is placed on the icon of the resource.
- Enter the actual name or IP address of the server .
- Select the type of server: telnetd, 3270 Site, 5250 Site or PC. If your server does not correspond to one of these types, do not select any of the options.
- Select the server attributes and enter the corresponding port number if the default option is not suitable for your configuration: TIME, SNTP, POP e-mail server, SMTP and Tun SQL server.

Printer properties

General tab

- Enter the name of the printer as you want it to appear in the NIS Browser. Respect the authorized formats (refer to the section **Name syntax** above). The name of a printer resource should not be longer than 30 characters.
- Enter an optional comment: the comment will appear as a tooltip when the mouse pointer is placed on the icon of the resource.
- Select the type of printer: "Lpr" for a printer redirected with Tun LPR, otherwise Workgroups.
- Enter the server name as well as the shared name of the printer.
- In the case of a Lpr printer, select the protocol to be used by the TCP connection when printing and enter, if necessary, the UNIX print command (for RSH and REXEC protocols) as well as the UNIX user name to be used to start the print job.

For more information on this last point, please refer to the chapter **Printer Redirection**".

Advanced tab

The parameters on the **Advanced** tab are those supplied by the printer on the test page obtained by accessing the printer properties and printing the printer's test page from the drive to which it is connected.

To perform this operation from a PC running Windows 95, open the properties dialog box for the printer (double-click on the **My Computer** icon in the Windows 95 desktop followed by the **Printers** icon), then select the option **Properties** in the contextual menu for the printer. Click the button **Print Test Page**.

Example contents of a test page:

```

Congratulations!

If you can read this information, you have correctly installed you HP LaserJet
4/4M Plus PS.

The information below describes your printer driver and port settings.

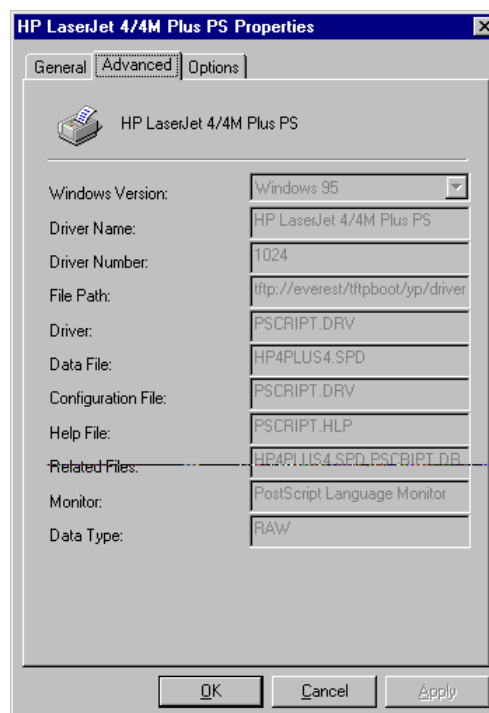
Printer name:          HP LaserJet 4/4M Plus PS
Printer model:         HP LaserJet 4/4M Plus PS
Driver name:           PSCRIPT.DRV
Data file:             HP4PLUS4.SPD
Config file:           PSCRIPT.DRV
Driver version:        4.00
Color support:         No
Port name:             \\Pccd\hp_printer
Data format:           RAW

Files used by this driver:
C:\WIN95\SYSTEM\HP4PLUS4.SPD
C:\WIN95\SYSTEM\PSCRIPT.DRV           (4.00.950)
C:\WIN95\SYSTEM\PSCRIPT.HLP
C:\WIN95\SYSTEM\PSCRIPT.INI
C:\WIN95\SYSTEM\TESTPS.TXT
C:\WIN95\SYSTEM\APPLE380SPD
C:\WIN95\SYSTEM\FONTS.MFM
C:\WIN95\SYSTEM\ICONLIB.DLL          (4.00.950)
C:\WIN95\SYSTEM\PSMON.DLL            (4.00.950)

This is the end of the printer test page.

```

The information supplied on this page can be used to complete the fields on the **Advanced** tab:



Tab Fields	Test Page Information
Driver name	Printer model
Driver number	Driver version (converted to binary)
Driver	Driver name
Data file	Data file
Configuration file	Config
Related files	Files used by this driver
Data type	Data format

Only supply the path for the directory created for the drivers during the UNIX installation (see "**Tun NIS setup**"), and separate each file with a comma without using spaces. The names must be written in capitals.

The other fields are for the help file (same as the driver file name only with the extension **.hlp**), and the monitor.

Network drive properties

General tab

- Enter the name of the network drive as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax**).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Select the type of network disk: **Nfs** if it is a disk that is accessible with Tun NFS or Workgroups.
- Enter the name of the relevant NFS server as well as the path to the UNIX directory and the user name required to access to the remote drive.

FTP configuration properties

General tab

- Enter the name of the FTP configuration as you wish it to appear in the NIS browser. Respect the authorized formats (see **Name syntax** above).
- Enter a comment (optional); this comment will appear as a tooltip if the user rests the mouse pointer over the resource icon.
- Enter the name of the relevant FTP server to be used for the FTP connection. Select the check box **Anonymous** for anonymous FTP access.
- Enter the type of server used and the type of data on the server.

Advanced tab

- Enter the name of the subdirectory which will act as the access directory to save the user from unnecessary directory changes on the server. Select the check box **Stay under home directory** to prevent the user from being able to move up the directory structure on the server.
- Select the option **Ascii** or **Binary** to set the default type of data transfer for the connection. If you choose the option **Ascii**, specify the type of data transfer exchanged with the UNIX system in the area **Transfer Data Type**.
- Change the service port number, if necessary, in the field **Service**.
- Change the default data size, if necessary; the default value is 8.
- Deselect the default direct and passive modes.

Tar configuration properties

General tab

- Enter the name of the Tar configuration as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax**).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Enter the name or the IP address of the server on which the backup device is installed, and also the user name in which the backup will be carried out.
- Enter the name of the relevant NFS server as well as the path to the UNIX directory and the user name required to access to the remote drive.

TFTP file properties

General tab

- Enter the name of the TFTP file as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax**).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Enter the name of the remote server containing the file.
- Enter the names of the source and destination files.

Emulation configuration properties

General tab

- Enter the name of the emulation configuration as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax**).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Select the type of emulation required, as well as the configuration file to be used. Respect the authorized formats (see **Name syntax**).

To obtain more information on the last two points, please refer to the **Tun EMUL** manual.

Mail address properties

General tab

- Enter the name of the e-mail address as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax**).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Select the type of address desired, and enter the e-mail address of the mailbox used.

Address book properties

General tab

- Enter the name of the address book as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax**).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Enter the name of the file containing the address book. Respect the authorized formats (see **Name syntax**).

Data source properties

General tab

- Enter the name of the data source as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax** above).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Enter the name of the driver associated with the data source.
- Enter the name of the server containing the data base, as well as the service name used (i.e. the server process linked to the DBMS with the database to be used - tunodbc.ora, for example).
- Enter the name of the data source and (optionally) a description.
- Enter the name of the user authorized to access the data source, and the associated password.

To obtain more information on these four points and the settings on the other tabs, please refer to the **Tun SQL** manual.

URL address properties

General tab

- Enter the name of the URL address as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax** above).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Enter the complete URL address. Respect the authorized formats (see **Name syntax**).

Application properties

General tab

- Enter the name of the application as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax** above).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Select the desired type of application.
- Enter the file path of the program. Respect the authorized formats (see **Name syntax**).

Object path properties

General tab

- Enter the name of the object as you wish it to appear in the NIS Browser. Respect the authorized formats (see **Name syntax** above).
- Enter a comment (optional); this comment will appear in the tooltip when the user rests the mouse pointer over the resource's icon.
- Enter the file path of the object. Respect the authorized formats (see **Name syntax**).
- Enter the type of object (optional).

MODIFYING, DELETING OR RESTORING A RESOURCE


Changing resource properties

A resource which has been modified will be displayed without a green check mark, and its icon is visible in user mode:



represents a server whose properties have been modified but which has not yet been compiled in the NIS table.

To modify the properties of a resource, double-click its icon or else select the icon and use one of the following methods:

- Click the button **Modify Resource**  in the NIS Browser's toolbar.
- Select the option **Modify...** in the contextual menu for the resource.
- Select the option **Resource→Modify** through the main menu.

The resource properties box is displayed. Refer to the preceding section "**Creating a new resource**" and modify the resource properties.


Deleting a resource

A resource which is to be deleted during compilation of the table is represented by the same icon as in administrator mode, only it is marked with a red cross:



represents a server which will be deleted when the table is recompiled.

To delete a resource, first of all select it, then use one of the following methods:

- Click the button **Delete/Restore Resource**  in the NIS Browser toolbar.
- Use the **Delete** or **Del** key on the keyboard.
- Select **Delete/Restore...** in the contextual menu for the resource.
- Select the option **Resource→Delete/Restore** through the general menu.

The resource properties dialog box is displayed. Check the contents of the resource, then click the button **Delete** to confirm the deletion. The resource will be deleted from the table when the administrator compiles it.

Restoring a resource before compilation

A resource deleted from the table (with a red cross on its icon) is only really deleted after recompilation of the table. Consequently, it is always possible to restore the resource and avoid its definitive deletion as long as the table has not been recompiled.

To restore a resource that is designated for deletion, follow the same steps as for the deletion of the resource (see the preceding section "Deleting a resource"), only use the **Restore** option.

SAVING AND RESTORING A NIS CONFIGURATION

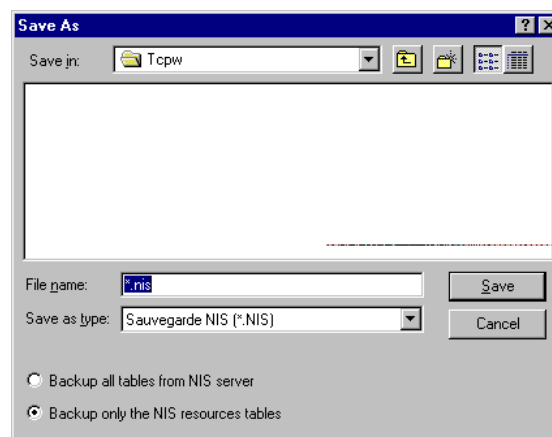
The administrator can save a NIS server configuration locally, so as to have a backup copy of a particular configuration. This could be useful to restore a previous configuration and to modify "manually" a configuration. For the latter operation, a clear understanding of the structure of the NIS tables and their contents is necessary.

Saving a NIS configuration

The saving of a NIS configuration may be partial or total: partial when only the NIS server resource tables are saved, and total when the entire server, including the resource tables, is updated.

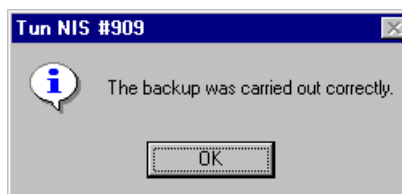
To save a configuration, use the option **File→Save NIS Tables** from the main menu.

The following window is displayed:



- Select the directory in which you wish to save the configuration.
- Select the type of Save, partial or total. By default, the Save is partial.
- Enter the file name, with the extension **.nis**.
- Click the button **Save**.

If the save operation has been carried out correctly, the following message is displayed:



To use a configuration file, open it with Wordpad or a similar application.

Example of *a.nis*:

```

---NIS:Path (esker.fr) --- OK -----
3270_16 1|1|||bmp||C:\EMULSYNC\3270_16.bmp
as400
1|1|||pan||tftp://194.51.34.1/tftpboot/yp/files/as400.pan
---NIS:Appli (esker.fr) --- OK -----
Notepad 1|1|||999|\pcmechin\temp\notepad.exe
---NIS:Url (esker.fr) --- OK -----
Microsoft\Server 1|1|||http://www.msn.com
URL\Esker 1|1|||http://www.esker.fr
---NIS:proto.nam (esker.fr) --- OK -----
hello hello 63 HELLO
HELLO hello 63 HELLO
ospf ospf 89 OSPF

```

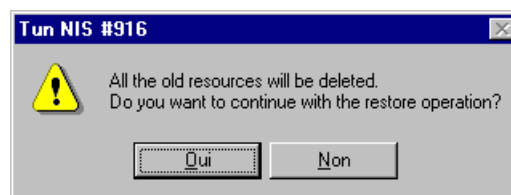
In this example are four tables from the domain esker.fr, namely, Path, Appli, Url, proto.nam. Three of the tables are resource tables.

The syntax of the file is always the same: the name of the table preceded by "NIS" and followed by the domain name. Then, one after the other, the resources contained in the table with the name of the resource and the fields related to the resource separated by vertical lines. No spaces are used at the beginnings or ends of the lines.

Restoring a NIS configuration

To restore a configuration saved locally, select the option **File→Restore NIS Tables** from the main menu and select the corresponding file.

The following message is displayed:

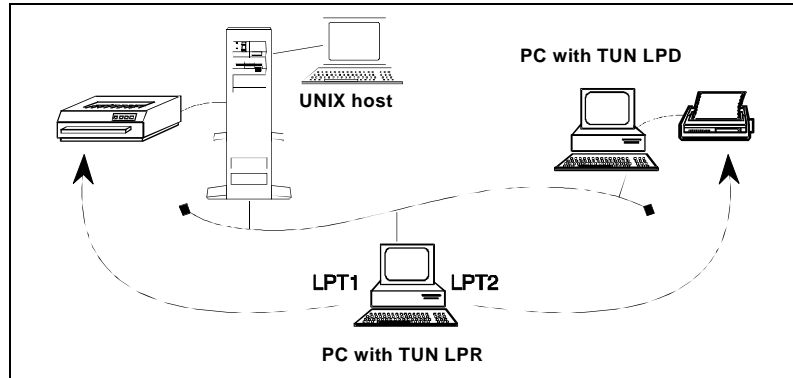


Click **Yes** if you really want to replace the current configuration with the restored configuration. The modifications are only taken into account when the table is recompiled. Remember, however, that if you restore a saved configuration, you will not be able to return to the configuration that you have replaced unless it too has been saved to file.

CHAPTER 2 - USING REMOTE PRINTERS

Tun PRODUCTS AND REMOTE PRINTING

Any Microsoft Windows application can use remote printers as easily as if they were local.



Tun LPR allows a PC to use a network printer or a printer directly connected to a UNIX system or to another PC. This functionality is known as printer redirection. A Windows program can thus use a choice of network printers to edit its documents.



Print redirection under Windows 3.x is handled by the network device driver, TUNNET.DRV (declared in SYSTEM.INI), which redirects a PC's local printer ports using TCP connections. When a local application sends a print job to a redirected LPT port, a TCP socket is opened on the specified remote machine, and the job is sent out over the network.



Remote printing with **Tun LPR** under Windows 95 is performed by a Printer Provider and a Network Provider, which renders this functionality perfectly compatible with the Windows 95 environment. Unlike Windows 3.x, the physical ports (LPT1, LPT2...) are no longer redirected.

To carry out the print job, the TCP connection respects the **RSH**, **REXEC** and **LPD** protocols. The connection is immediately closed once there are no further characters to print.

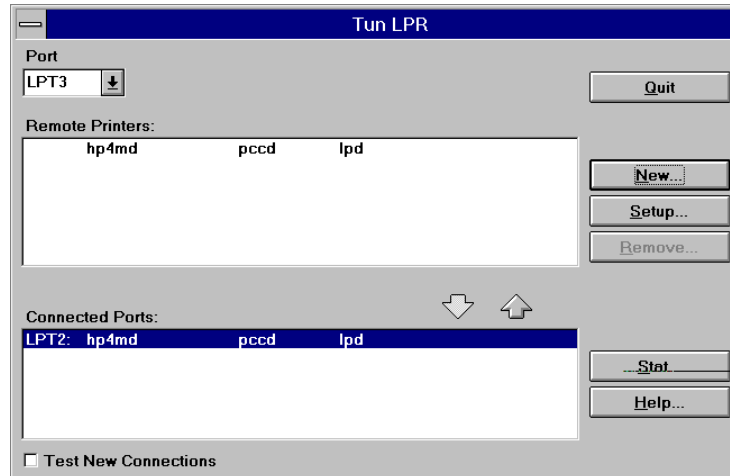
Notes:	This connection mechanism has the advantage of <i>not requiring permanent host processes</i> or connections. If a PC with redirected ports is re-booted, it does not leave residual processes on the host. Print redirection can run on any UNIX host - every UNIX server with TCP/IP has RSH/REXEC services, and many are equipped with LPD.
---------------	---

SETTING UP REMOTE PRINTERS UNDER WINDOWS 3.X



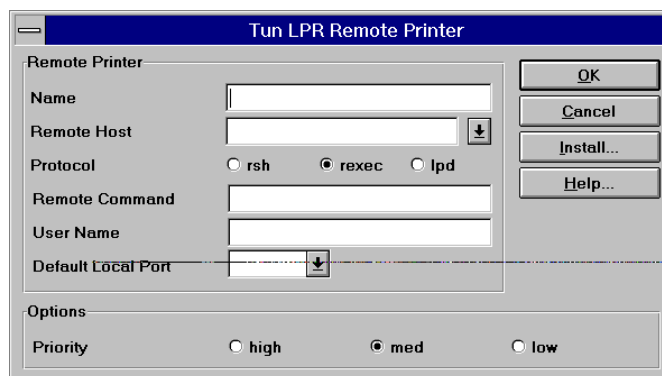
Run the program **Tun Admin+** from **Tun EMUL** or **Tun SQL** groups, and then click on the **Tun LPR** button.

You can also use the Windows Print manager, **Printers→Network connections** to open the printer configuration menu.



Follow these steps to set up printer redirection:

- Select the **Local Port** to redirect.
- Click on **New** or **Setup** to define a **Remote Printer** (described below).
- Activate / deactivate printers using the arrows (↑ & ↓).



The entry fields are as follows:

Name

An alias name for the printer which will appear in Windows modules such as the Print Manager.

Remote Host

Enter the name or IP address of the server that you wish to print to. Pressing the button to the right of the field opens the current Host table.

Protocol

Use these check boxes to specify the protocol that will be used by the TCP connection to transfer print jobs to the remote machine. There are three options:

rsh	Runs on any UNIX host with TCP/IP, but requires prior configuration
rexec	Runs on any UNIX host with TCP/IP, does not require prior configuration, but asks for a password every time the user prints.
lpd	Not available on all UNIX hosts, but does not require prior configuration

When possible, it is best to use the LPD protocol (UNIX versions such as AIX, SunOS, Solaris, HP-UX). UNIX configuration for using RSH is described further in this section.

Remote Command

Fill in this field if you are using RSH or REXEC. Enter the name of the UNIX print (or **cat**) command that will handle the LPT port redirection. The most frequently used type of command is **lp**, but you may also use others (i.e. **cat > /tmp/file_name**). Enter the complete command, i.e.:

lp -dhpjet or cat>/tmp/file_name

Remote queue

Enter the name of a valid UNIX print queue when using **LPD** to print. The UNIX command **lpstat -t** will give you a list of the currently-available print queues. Enter only the name of the queue, i.e. **hpjet**

User Name

Enter the name of the UNIX user whose access rights will be used during printing.

Default Local Port

This field shows the name of the PC's parallel port that you wish to redirect: LPT1 through LPT9. Whichever port you select will appear as a normal local port to applications, but will really send print jobs out onto the network. It is best to specify a port that does not physically have a printer attached to it.

Priority

You may select **High**, **Med** or **Low** to affect the rate at which print jobs will be sent from the PC. A high rate will send jobs faster, but may temporarily slow down other Windows applications.

Saving your changes

After you have filled in the relevant fields described above (for up to three different printers), click on the down arrow. LPT ports that have been redirected are listed in the lower portion of the LPR window. You may disconnect active printers by clicking on the up arrow.

STARTING PRINT REDIRECTION UNDER WINDOWS 3.X



In **Tun LPR** for Windows 3.x, print redirection relies on the Network Device Driver **TUNNET.DRV**, which is loaded into memory when Windows is started. The installation procedure adds the following statement to the **[boot]** section of the **SYSTEM.INI** file:

```
network.drv=C:\TUN\TCPW\TUNNET.DRV
or
secondnet.drv=C:\TUN\TCPW\TUNNET.DRV
```

As **TUNNET.DRV** is not really an "application," the above statement is the only way to activate or deactivate it.

DECLARING A REMOTE PRINTER UNDER WINDOWS 95



The declaration of a remotepriinter is carried out in two stages:

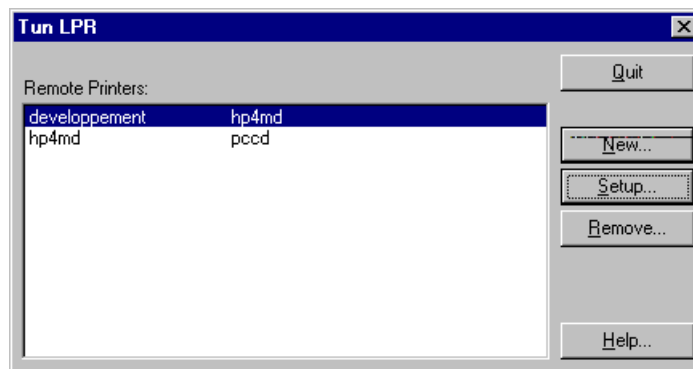
- declare the remote printer settings using **Tun Admin+**.
- install the printer under Windows 95 using the program **Add Printer**.

Declaration using Tun Admin+

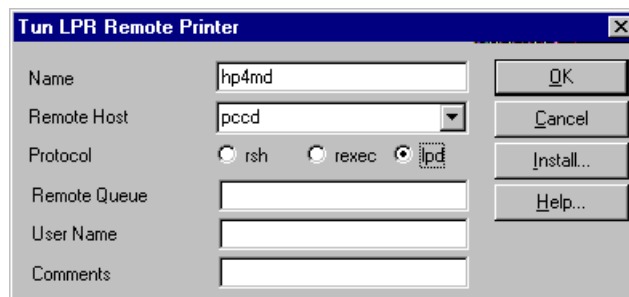


Run the program **Tun Admin+** in **Tun EMUL** or **Tun SQL** groups from the Windows 95 Start menu, and then click on the **Tun LPR** button.

The following window is displayed:



The list shown should be empty when this screen is displayed for the first time. Click on the button **New...** to declare a remote printer. The following window is displayed:



Name

This field allows the user to give a symbolic name to the remote printer.

Remote Host

This is the name or the IP address of the remote machine which the printer you wish to use is connected to. You may select one of the machines in the local host table for this field. For a network printer, this field is the IP address or the name of the printer.

Protocol

This refers to the type of protocol which is to be used by the TCP connection to transfer the print job to the remote machine. There are three possibilities:

rsh	Works on all UNIX machines but requires previous configuration of the server.
rexec	Works on all UNIX machines, does not require prior configuration of the server but requests a password for each print job.
lpd	Does not work on every UNIX machine, requires no prior configuration of the server, and does not require a password for each print job.

If the server you wish to use implements the LPD protocol (AIX, SunOs, Solaris, HP-UX), it is better to use it. The configuration of the UNIX server for the use of the RSH protocol is described later.

Remote Command

This field only appears if you have selected the RSH or the REXEC protocols. It is intended to take the name of the UNIX command which will receive the characters to be printed on its standard entry. It is common to use the command "lp" in this field but you may enter a different one (e.g. cat >/tmp/tmp).

Remote Queue

This field only appears if you have chosen the LPD protocol. It is intended to take the name of the UNIX print queue which the characters to be printed will be sent to. You can use the command "lpstat -t" directly on the UNIX machine to obtain the list of print queues. This field should not be completed in the case of a network printer.

User Name

This is the name of the UNIX user on whose account you wish to command a print job. The field is ignored in the case of a network printer.

The button **Install...** displays the standard Windows dialog box for declaring printers.

Installation under Windows 95



To install a printer thus declared, open the Windows folder **Printers**. For greater facility, the installation program is also available through the option **Setup→Install** in the **Tun LPR** dialog box (through **Tun Admin+**). The following window is displayed:



Click on the object **Add Printer** to install the printer. This runs the Windows Wizard.

To the question "How is this printer attached to your computer?" answer by selecting the check box **Network printer**.

To the question "Network path or queue name?" give the name of the printer as it was declared in Tun Admin. If you cannot remember, click on the button **Browse...** to display the list of printers under the entry **Tun LPR**.

The remaining questions asked by the Wizard do not concern a network printer.

From the moment the remote printer is acknowledged by Windows, it can be used like an ordinary printer.

CONFIGURATION UNDER UNIX

If you use the REXEC or LPD protocol, there is nothing to set up on the UNIX server to be able to use the printers connected to it. All that is required is to know the right UNIX command to execute or the name of the print queue to use.

If you wish to use the RSH protocol, you have to configure the UNIX server.

The PC running **Tun LPR** must be declared in the following manner on the UNIX host in order to obtain access rights:

1. Declare the PC in the file **/etc/hosts** on the UNIX machine (using the name of the PC entered in the field **Local Host Name** in the TCP/IP startup parameters on the PC).
2. In the \$HOME directory of the user whose login name will be used for RSH connections, create or modify the **.rhosts** file, and enter the **Local Host Name** of the PC. The format of the **.rhosts** file is simply the names or IP addresses of the PCs authorized to establish connections with an account name, each entered on a separate line. For example:

```
mike_pc
graphics_pc
pc1
pc2
```

Example:

You have installed a PC with the following characteristics on the network:

IP Address	124.131.120.99
Local Host Name	pccalphonse
User Name (used in Windows apps)	alphonse

1. *Add the following line to the file **/etc/hosts** on each server that this PC will access:*

```
pccalphonse          124.131.120.99
```

2. *Check to make sure that the user **alphonse** is declared on each UNIX host.*
3. *Supposing that the **home** directory for the user **alphonse** is **/usr/alphonse**, you should create or edit the file **/usr/alphonse/.rhosts** and include the name of the PC **pccalphonse***

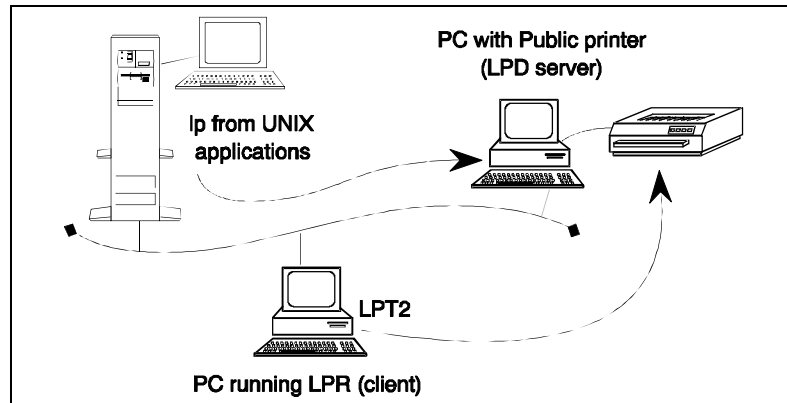
This file contains the names of all the machines allowed to use this particular user account, entered on separate lines, one under the other.

CHAPTER 3 - SHARING PC PRINTERS

Tun PRODUCTS AND PRINTER SHARING

Tun LPD is a program that allows PCs to share their printers with other network users (UNIX machines, other PCs...).

A UNIX program (management or calculating applications, etc.) can use a PC's printer to perform print jobs. This functionality is known as "printer sharing".



The principal is as follows:

- A PC with a public printer runs the **Tun LPD** program. This program is actually an **LPD** and **RSH** server that sends print jobs to the Windows Print Manager.
- Printers that are declared **public** are referred to by their logical name, that is, the name of the Print Manager queue. For example:

```
printer1=HP LaserJet 4/4M on LPT2  
printer2=Postscript on LPT1
```

- When a UNIX machine wants to print on a PC's printer, it opens an **LPD** or **RSH** connection with the PC, and specifies the name of the printer to use.
- Characters that are sent across the connection towards the PC are received by **Tun LPD**, and then sent to the appropriate Print Manager print queue.

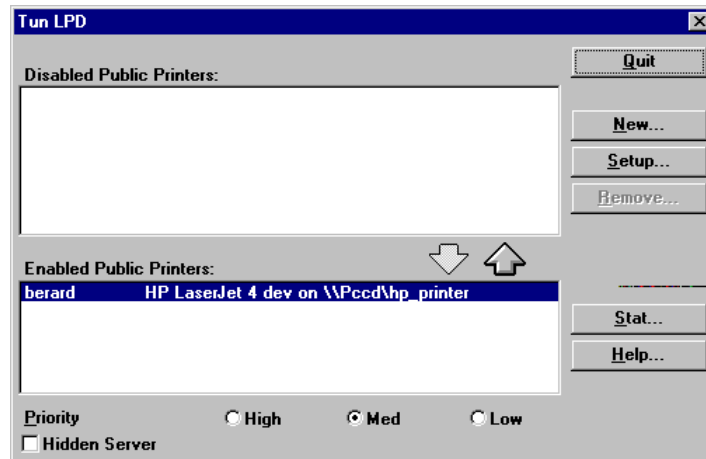
The procedure behaves as if a UNIX "pipe" were created between the printing application and the serving PC's parallel port.

Notes:	Tun LPD has the advantage of <i>not</i> establishing a permanent connection between PCs and UNIX machines. Therefore, there are no residual processes left on the UNIX machine if the PC is rebooted. Tun LPD is able to run with <i>any</i> UNIX server. All UNIX machines equipped with TCP/IP contain an RSH (RCMD, REMSH) client.
---------------	--

SETTING UP PRINTER SHARING



Run the program **Tun Admin+** from **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu, and then click on the **Tun LPD** button.

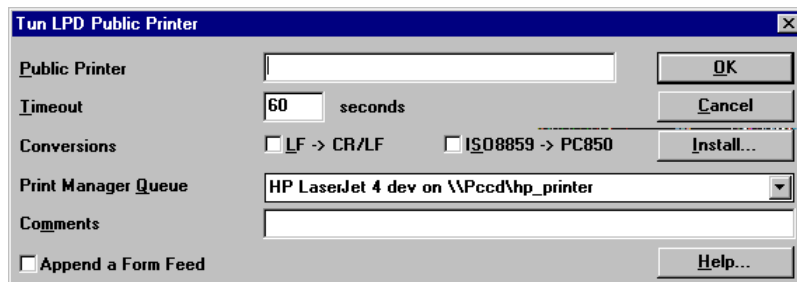


Note: If a public printer has been activated, this dialog box gives the user the choice of running the server LPD as a background process (if this is not already the case).

This window may also be displayed by clicking on the LPD icon in the **Tun SQL** or **Tun EMUL** group and then selecting **Setup**.

It is possible to hide the LPD server icon by selecting the check box **Hidden Server**. This is useful to avoid having too many icons displayed in the Windows environment when the keys **Alt Tab** or **Ctrl Tab** are used.

To add printers and assign them to print queues, click on **New** to display this screen:



The fields shown in the above screen should be completed as follows:

Public Printer

This field contains a logical name for the public printer, which is easier than having to refer to the full Windows print queue name each time you want to print. The logical name will be used by the LPD or RSH client to print to the correct printer.

Timeout

Expressed in seconds, the value given in the **Timeout** field determines the length of time after which **Tun LPD** will consider that a print job is finished. If **Tun LPD** has not received characters within the timeout period, it will close its connection with the client.

With a default value of 60 seconds, this option releases the **Tun LPD** application in case a client machine locks up during a print job.

Data Conversion during printing

CR/LF Conversion

If this option is used, all LF characters received from a remote machine will be converted into CR/LF. As UNIX only uses LF to mark the end of a line, and DOS/Windows uses CR/LF, this option enables files sent by UNIX machines to be printed correctly.

ISO8859 Conversion

This field indicates whether or not **Tun LPD** should apply an ISO8859 character conversion filter. If your UNIX system uses ISO8859 character tables to encode national characters (accents, special characters), you should use this option in order to print correctly on a Windows printer.

Print Manager Queue

Enter the real name of the Windows print queue in this field. You may choose from a list of currently configured printers by clicking on the button to the right of the field. In fact, **Tun LPD** really shares Windows print queues and not parallel ports.

Append a Form Feed

Selecting this check box forces a form feed at the end of the print run. This option is useful for printouts originating in a UNIX server which do not always carry a final form feed.

Saving your changes

After setting-up public printers, click on **OK** to save your changes.

Note: You may activate several public printers on a single PC.

ACTIVATING PUBLIC PRINTERS

Tun LPD must be running in order for public printers to be available to other users.



Run the program **Tun Admin+** from **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu, and then click on the **Tun LPD** button.



You can also run the program by directly clicking on the **Tun LPD** icon in **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu.

If public printers are going to be used regularly, it may be best to place the **Tun LPD** icon in the Windows Startup group so that it will be loaded automatically every time Windows is started.

USING PUBLIC PRINTERS WITH RSH

As indicated earlier, **Tun LPD** is an LPD/RSH server. For this reason, using a public printer from a UNIX machine requires access to an LPD or RSH client command.

Using RSH from a UNIX host

Usually the RSH client command is called **rsh**, but on some systems it is called **rcmd** (SCO UNIX), or **remsh** (Motorola). This section describes the mechanism for sending print jobs to public printers. UNIX spoolers for the most common UNIX servers are dealt with further on in this chapter.

To print a file from a UNIX machine on a PC printer without using a spooler, execute the following command:

```
cat file | rsh pc_name printer1
```

or

```
cat file | rsh pc_name lp -dprinter1
```

In this command:

cat file 	types a file and "pipes" the characters into another UNIX command
file	name of a file (i.e. /etc/passwd).
rsh	name of the RSH client command (it can be replaced by rcmd or remsh).
pc_name	is the name or IP address of the PC with the public printer (running VXPRINT).
printer1	logical name of the public printer (assigned during setup).

This type of command may be included in a spooler **model**, as discussed in the next section.

Remote query of public printers

To find out which parallel ports have been made public on a PC, execute the following command:

```
rsh pc_name lpts
```

rsh	is the name of the RSH client command (possibly replaced by rcmd or remsh).
pc_name	is the name or IP address of the PC with the public printer (running Tun LPD).
lpts	is a command recognized by Tun LPD that returns the list of available print queues.

The message displayed by this command might be:

```
printer1 : HP LaserJet 4/4M
printer2 : Postscript
```

Print options from the UNIX side

Even when **Tun LPD** is configured to use conversion parameters (ISO8859, CR/LF), it is still possible to force the use of different parameters from the UNIX side. In order to do this, add one of the following options to the remote shell command shown above, just after the port name. For example:

-oa	Forces CR/LF conversion
-oi	Requests conversion from ISO8859 to CP850 (extended ASCII on a PC)
-op	Prints without converting extended characters (>128)
-ob	No conversion. Causes LF characters not to be converted into CR/LF.

For example, the following command requests CR/LF conversion and uses the ISO8859 filter.

```
cat /etc/hosts | rsh denis_pc printer1 -oa -oi
```

Connecting a System V spooler using RSH

Most spoolers on UNIX System V use a shell "model" in order to print to peripheral devices.

However complex a spooler model may be, there is always a line invoking the UNIX **cat** command. This line is often preceded or followed by a series of **echo** commands used to send "form feeds" or banners.

For a printer model to be able to send characters and files to a print queue through Tun LPD, you need to find the lines in the model that actually carry out the printing procedure, and enclose them in parentheses (). By doing this, it is then possible to "pipe" the output of the print command to an "rsh" command.

Note: It is recommended that both the virtual printer and the PC to which it is attached be turned on when configuring and testing remote print queues.

Creating a print queue on SCO UNIX

Here is an example of a printer model that has been tested on a SCO UNIX system:

```
# printer model for wlpd printing for multiple
# printers devices on SCO-UNIX
# print syntax is: lp -dprintername [-oa|-ob]
#           #           [-oi|-ot] [-onoff] files
# where      -oa for LF -> CR/LF conversion
#            -ob for non LF -> CR/LF conversion
#            -oi for iso8859 conversion
#            -ot for non iso8859 conversion
#            -noff for no form feed at the end of
#                printing

while true
do
  A=`echo "\007" | rcmd pcname printername`
  if echo $A | grep "001"
  then
    break
  fi
  sleep 5
  echo "Printer Problem PC ${A}" >/dev/console
done
copies=$4
options=$5
shift; shift; shift; shift; shift
files="$*"
SWconvert=""
SWiso=""
SWff=ff
for option in $options
do
  case $option in
    convert|a|c)
```

```

        SWconvert="-a";;
        noconvert|b)
        SWconvert="-b";;
        iso|iso8859|i)
        SWiso="-i";;
        noiso|t|p)
        SWiso="-p";;
        noff)
        SWff=noff;;
        esac
    done
(
    i=1
    while [ $i -le $copies ]
    do
        for file in $files
        do
            cat $file
            if [ "$SWff" != "noff" ]
            then
                echo "\014\c"
            fi
        done
        i=`expr $i + 1`
    done
) |rcmd pname printername $SWconvert $SWiso
exit 0

```

Note: In the **rcmd** command on the last line, **pname** refers to the name or IP address of the PC running Tun LPD, and **printername** is the printer's logical name as defined during setup.

Enabling a new print queue

The easiest way to add a print queue to a SCO UNIX system using the above model is to use the commands given below rather than **system administration** menus (such as **sysadmsh**):

```

/usr/lib/lpshut
/usr/lib/lpadmin -p tun -m model -v /dev/null
/usr/lib/lpsched
/usr/lib/accept tun
enable tun

```

In this example:

tun	is the name of the print queue to create
model	is the name of the file containing the model shown above
/dev/null	is the device driver assigned to the printer port

USING PUBLIC PRINTERS WITH LPD

On UNIX systems, remote printing to LPD servers is a function in the print subsystem. Therefore, in order to use LPD, you must first create a print spooler on the UNIX machine.

The procedure for declaring printers on UNIX varies widely from system to system, but this section gives a brief overview of some of the most popular systems.

Note: Not all UNIX systems include the LPD protocol (i.e. SCO, Motorola). If this is the case, use RSH for printing to public printers.

LPD on SUN

On SUN servers (SunOS, Solaris 1.1) you may declare remote printers by inserting the following lines in the file `/etc/printcap`:

```
wlpd|wlpd line printer:\
lp=:rm=pc_name:rp=printer1:sd=/tmp/wlpd:mx=0:
```

In this example:

rm	" remote machine " specifies the name of the PC with the public printer. The PC " pc_name " must be entered in the <code>/etc/hostfile</code> on the UNIX machine.
rp	" remote printer " indicates the public printer's logical name
sd	" spool directory " indicates the name of the UNIX directory that will serve as a print queue. You will need to create this directory using mkdir command.

After inserting the above lines in `/etc/printcap`, you may print to a public printer using the command:

```
lpr -Pwlpd /etc/passwd
```

wlpd is the name of the print queue as described above

LPD on IBM RS/6000 (AIX)

To declare a remote printer on an IBM RS/6000 (AIX) machine, insert the following lines into the file `/etc/qconfig`:

```
wlpd:
  device=wlpd
  up = TRUE
  host = pc_name
  s_statfilter = /usr/lpd/aixshort
  l_statfilter = /usr/lpd/aixlong
  rq = printer1
wlpd:
  backend = /usr/lpd/rembak
```

host	specifies the name of the PC with the public printer. The PC pc_name must be entered in the <code>/etc/hosts</code> file on the UNIX machine.
rq	" remote queue " indicates the logical name of the public printer (as configured on the PC)

After inserting the above lines in `/etc/qconfig`, you will be able to print using the command:

```
lp -Pwlpd /etc/passwd
```

wlpd is the name of the UNIX print queue as described above

LPD on HP 9000 (HP-UX)

On HP 9000 (HP-UX) machines, it is best to create remote printers using the system administration program **sam**. Run **sam** and follow these steps:

- Printers and Plotters→
- Printers/Plotters
- Actions
- Add Remote Printer/Plotter
- Complete the fields with the name of the PC and with the public printer and the logical name of the printer

After declaring a remote printer, you will be able to print to it using the command:

```
lp -dwlpd /etc/passwd
```

wlpd is the name of the UNIX print queue as described above

STATISTICS

It is possible to obtain statistical information on the functioning of the Tun LPD server. To do this, click on the icon of the Tun LPD server when it is running to display the system menu. Then choose the option **Stat...** which displays the following window:

The screenshot shows a window titled "Tun LPD Jobs". It contains three input fields for statistics, each with a value of 0:

- Total job count: 0
- Total byte count: 0
- Total error count: 0

To the right of these fields are two buttons: "OK" and "Refresh". Below the statistics is a table with the following headers: Printer, Timeout, Termination, State, LF, ISO8859, Service, Title. The table body is currently empty. At the bottom of the window, there are three radio buttons: "Services not ready", "Services started" (which is selected), and "Services suspended".

The screen displays the number of jobs and also the number of characters received by the **Tun LPD** server, and supplies information on current printing operations. As the screen does not provide updated information in real time, this can be obtained by clicking on the **Refresh** button.

USING PUBLIC PRINTERS DIRECTLY FROM PCs

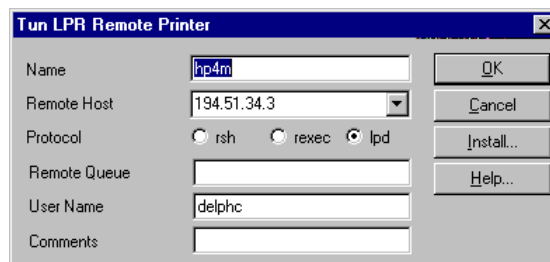
With **Tun LPR**, PCs may print directly to public printers without going through a UNIX system. In other words, the print redirection client (LPR) may declare another PC running LPD as the remote host. To configure direct PC-to-PC printing using LPR:



Run the program **Tun Admin+** from **Tun EMUL** or **Tun SQL** groups under Windows 3.x or from the Windows 95 Start menu, and then click on the **Tun LPR** button.

Then follow these steps :

- Click on **New...** or **Setup...**:



- Fill in the fields just as you would for redirecting an LPT port to a UNIX host:
 - **Name** A local alias name for the remote printer
 - **Remote Host** The name of the **PC** with the public printer
 - **Remote Queue** Enter the **logical name** of the public printer (as declared on the other PC) in this field. You may use either RSH or LPD to print (it is best not to use REXEC).
- Click on **OK** to save your settings, and then on the down arrow to connect
- Print to the redirected port as if it were a normal local LPT port.

CHAPTER 4 - REFERENCE GUIDE

INDEX

WADM2.EXE WADM2_32.EXE	Tun Administrator
WLPD.EXE WLPD32.EXE	Sharing PC printers
WMOUNT.EXE WMNT32.EXE	Drive mounting utility
WNISS.EXE WNISS32.EXE	Network Information Service program
WUMOUNT.EXE WUMNT32.EXE	Drive unmounting utility

WADM2

WADM2

Tun Administrator

Syntax

wadm2	under Windows 3.x
wadm2_32	under Windows 95

Description

WADM2.EXE (WADM2_32.EXE) is the Tun Administrator program for the applications **Tun NIS**, **Tun LPR** and **Tun LPD**.

WLPD

WLPD

Sharing PC printers

Syntax

<code>wlpd</code>	under Windows 3.x
<code>wlpd32</code>	under Windows 95

Description

WLPD.EXE (WLPD32.EXE) allows a PC to share its printer with other machines on the network.

WMOUNT

WMOUNT

Drive mounting utility

Syntax

```
wmount [-c"name"] [-d"disk"] [-k"Niskey"] [-n"name"] [-p"password"] [-r"directory"] [-u"user"] [-v] [-w]
```

under Windows 3.x

```
wmnt32 [-c"name"] [-d"disk"] [-k"Niskey"] [-n"name"] [-p"password"] [-r"directory"] [-u"user"] [-v] [-w]
```

under Windows 95

Description

The program WMOUNT.EXE (WMNT32.EXE) is used for mounting network drives.

The command line options for WMOUNT.EXE (WMNT32.EXE) are:

-c"name"	configuration name for the mount (excludes the use of -w and -k , associated with -r)
-d"disk"	name of the local drive to mount (e.g. -dE)
-k"Niskey"	mounts a drive from a NIS resource (excludes the use of r and -n)
-n"name"	mounts a drive from a saved NFS configuration (excludes the use of -r and -k)
-p"password"	password (associated with -u)
-r"directory"	mount directory (e.g. "\\pc01\temp" in Workgroups, "mechin:/temp" in NFS)
-u"user"	user name
-v	verbose mode
-w	Workgroup path type (associated with -r)

WNISS

WNISS

Network Information Service

Syntax

```
wniss [-k"Niskey"[-y14] [-y15]] [-o"file"] [-s"file"] [-v]
```

under Windows 3.x

```
wniss32 [-k"Niskey"[-y14] [-y15]] [-o"file"]  
[-s"file"] [-v]
```

under Windows 95

Description

The Tun Network Information Service (NIS) allows the user to access and administer network resources. The program presents an efficient, user-friendly graphical interface between the PC and the UNIX **yp** tables.

The command line options for WNISS.EXE are:

-k"Niskey"	NIS resource (excludes the use of -o and -s , must be associated with -y)
-y14	the NIS resource is an application (excludes the use of -y15 , associated with -k)
-y15	the NIS resource is an object (excludes the use of -y14 , associated with -k)
-o"file"	object path (excludes the use of -s and -k)
-s"file"	path to a script or executable (excludes the use of -o and -k)
-v	verbose mode

WUMOUNT

WUMOUNT

Driver unmounting utility

Syntax

```
wumount [-d"disk"] [-k"Niskey"] [-n"name"] [-v] [-x]
```

under Windows 3.x

```
wumnt32 [-d"disk"] [-k"Niskey"] [-n"name"] [-v] [-x]
```

under Windows 95

Description

The program WUMOUNT.EXE (WUMNT32.EXE) is used for uninstalling network drives.

The WUMOUNT.EXE (WUMNT32.EXE) command line options are:

-d"disk"	name of the local disk to uninstall (e.g. -dE)
-k"Niskey"	uninstalls a drive from a NIS resource (cannot be used with -n and -d)
-n"name"	uninstalls a drive from a saved NFS configuration (cannot be used with -k or -d)
-v	verbose mode
-x	deletes the NFS configuration (used with -n)

INDEX

- .rhosts 32
-
- /—
- /etc/hosts 32, 39
/etc/printcap 39
/etc/qconfig 39
- D—
- Data Conversion 35
Declaring a remote printer 30
- L—
- LPD on HP 9000 (HP-UX) 40
LPD on IBM RS/6000 (AIX) 39
LPD on SUN 39
- N—
- NIS 5, 46
NIS browser 7
NIS resource 18
NIS resources 5, 9, 24
 Address books 22
 Applications 23
- Data sources 23
Emulation configurations 22
FTP configurations 21
Mail addresses 22
Network drives 21
Object paths 23
Printers 19
Servers 19
TAR confurations 22
TFTP files 22
URL addresses 23
NIS tables 5, 16, 17
- S—
- Spooler model 37
Spool directory 39
- T—
- Tun NIS 5
- W—
- WADM2.EXE 43
WLPD.EXE 44
WMOUNT.EXE 45
WNISS.EXE 46
WUMOUNT.EXE 47