Training Course for CWR Internals

Networking

Connectivity

Network Connectivity

General

- Connectivity means:
  Network Interoperability in a **heterogenous Environment** consisting of Stations with **divergent Operating-Systems:** MAC Stations, WIN98 Stations, UNIX Stations, Windows NT Stations, UNIX Stations . . .
- Connectivity between Clients and Servers with **related Operating-Systems** normally is **inherent:**
  - UNIX ⇔ SOLARIS ⇔ DGUX
  - Windows 95 ⇔ Windows 98 ⇔ Windows NT
- Connectivity between Clients and Servers with **divergent Operating-Systems** as a Rule requires Installation of **Add-on** or **3rd Party Software Products**
- **NFS-Connectivity** provides for sharing of Resources with **UNIX-based Systems**

Network Connectivity

CWR supports all state of the art Local Area Network technologies in the bandwidth range between 10 to 1000 megabits per second such as:

- **10/100/1000 Mbps Ethernet** (Ethernet, Fast Ethernet, and Gigabit Ethernet)
- **FDDI** and **TPDDI** (Copper Cable FDDI)

CWR supports heterogenous connectivity to:

- Microsoft **Windows based systems** (CREO Allegro, Heidelberg Prepress Delta, Windows Client PCs)
- **Apple Macintosh systems** (Apple Macintosh Client PC‘s)
- **UNIX systems** (via Sun Mircrosytems Network File System)
- **Printers and Proofers** (like HP DesignJet)

Connectivity to other Windows NT based Systems

like Heidelberg Prepress Delta and Creo Allegro

Connectivity to Delta and Allegro

Network connectivity to other Windows NT based Systems like Creo Allegro and Heidelberg Prepress Delta

- The connectivity to all Windows NT based systems is realized by native Windows NT network services via **NetBIOS** (Network Basic I/O System) on top of **NetBEUI** (NetBIOS Extended User Interface) or TCP/IP
- Remote Windows NT systems may access locally shared volumes and printers and the local machine may access shared remote Windows NT resources via these services
- Remote nodes are identified by the Windows browser and visualized in the Windows NT Explorer
- If several Windows (95, 98, NT) based systems exist in the system environment it makes sense to configure one of the Windows NT servers as a **WINS** (Windows Internet Name Service) server for registration of Windows based systems and optimized network browsing

Microsoft Windows Client PC Connectivity

Client PC Connectivity

PC Connectivity

- Is **System-inherent** via standard Microsoft Windows networking protocols:
  - Currently the Microsoft default network protocol is **NetBEUI**
  - NetBEUI traffic cannot travel beyond (sub-) network boundaries and is therefore only applicable for **small, non-segmented networks**
  - The preferred network protocol is **TCP/IP**
  - TCP/IP has to be installed separately (if not already pre-installed)
- Installation of TCP/IP:
  - Login as Administrator, Windows NT CDROM is required
    Start ⇨ ***Settings*** ⇨ ***Control Panel*** ⇨ ***Network*** ⇨ ***Protocols*** ⇨ ***Add*** ⇨ ***TCP/IP***
  - Reboot the system

Client PC Connectivity

PC Connectivity (2)

- Configuring TCP/IP:
  - Set the **IP-Address** from the IP-Address-Tab or select IP automatic address assignment via **DHCP**
  - Set **Routing** characteristics from the Routing-Tab
  - Specify **DNS** and **WINS** Server if applicable
- Create a **Folder for (Windows-) public Access:**
  - Select the appropriate folder from the Windows NT Explorer
  - Click **„Share as“** from the File ⇨ *Properties* ⇨ *Sharing-Tab*
  - Access to public folders can be restricted to authorized Windows stations by setting corresponding **Permissions**
  - Details on the TCP/IP configuration are described in the „**Windows NT Protocol Setup**“ document

Apple Macintosh
AppleTalk Connectivity

Mac Connectivity

Mac Connectivity

- Is accomplished by Installation and Configuration of the **Services for Macintosh** (Not available for Windows NT Workstations. Windows NT Server CDROM required):
  Start ⇨ *Settings* ⇨ *Control Panel* ⇨ *Network* ⇨ *Services* ⇨ *Add* ⇨ ***Services for Macintosh***
- After Installation set **AppleTalk Protocol Properties:**
  - **Zone** information from the General Tab
  - **Routing** characteristics from the Routing Tab

Services for Macintosh

- Provide for **File Sharing** between MAC‘s and Windows-Stations
- Allow **Printer Sharing**
- Can provide **AppleTalk Routing** / Seed Routing
- Start automatically **per Default** after installation / reboot

Mac Connectivity

Configuring Services for Macintosh (SFM)

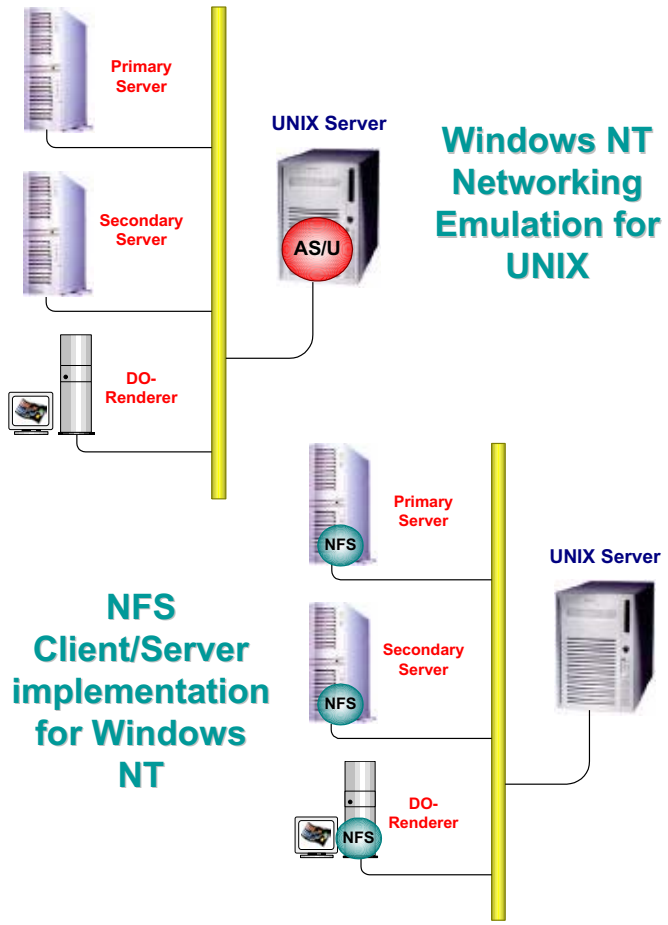
- After Installation of SFM a **Public Files Volume** „Microsoft UAM Volume“ with „Apple Share Folder“ can be accessed from MACs with appropriate access rights
- Use the **File Manager for administration** of the volume
- Open **File Manager** from the administrative tools
- Select **MacFile** for administration:
  - View / Modify Volumes
  - View / Modify Permissions
  - Associate File-Extensions with applications
- UAM Volume can be accessed from the **MAC Chooser**
- Data can be transferred to and from the **UAM Volume**
- Details of the SFM configuration are described in the „**Windows NT Protocol Setup**“ document

UNIX Connectivity

CWR Connectivity to UNIX

In general there a two main options for the connectivity between CWR and UNIX systems:

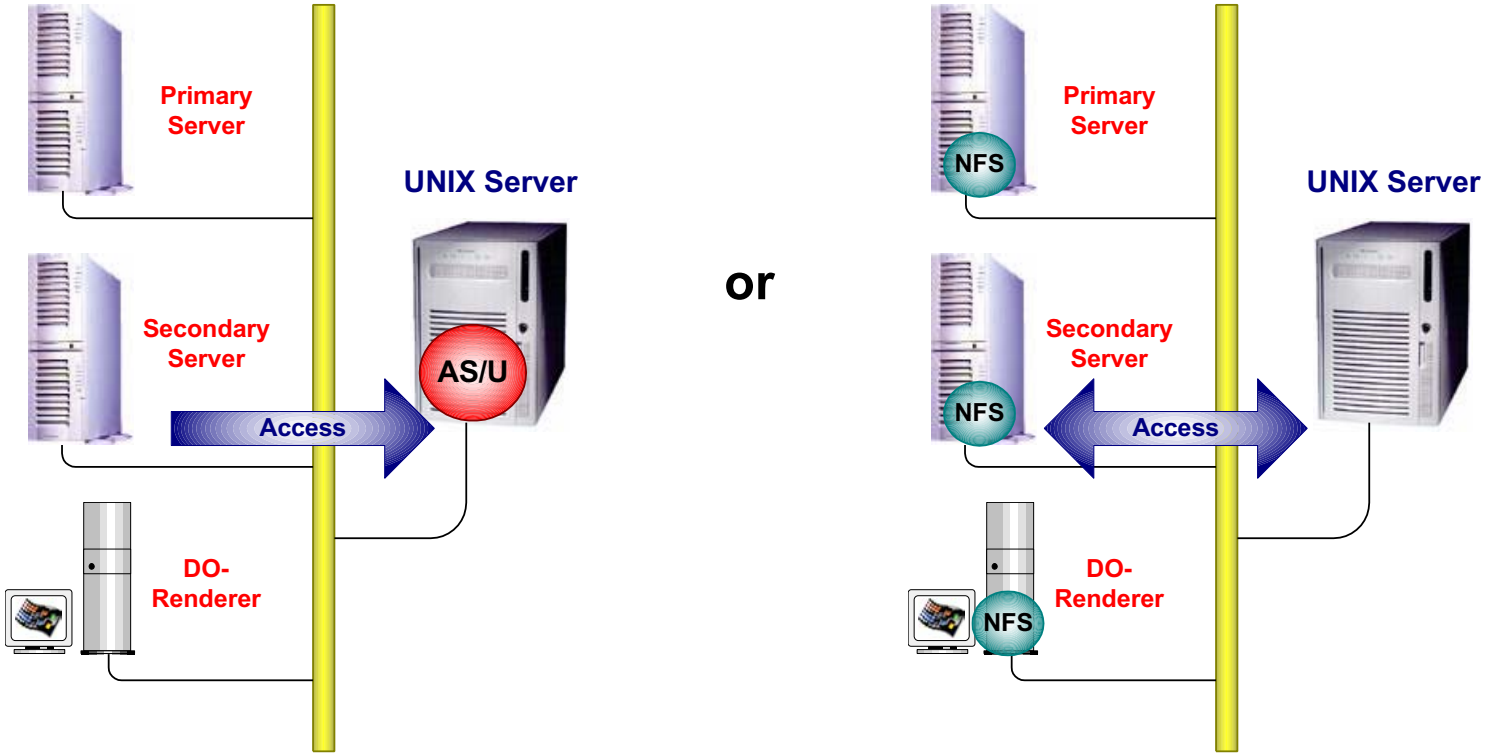
- Using a third party (or Microsoft !) **NFS implementation on the CWR Windows NT server(s)**
- Using a **Windows NT networking emulation on the UNIX** sytem(s)
- The **first option is much easier to install and administer and it is much cheaper** than the second option
- Products for both options are described on the following slides



UNIX Connectivity

Two ways to implement Windows NT / UNIX connectivity:

- Advanced Server for UNIX (ASU) Windows NT Networking Emulation on UNIX
- NFS Client/Server implementation on Windows NT 4.0

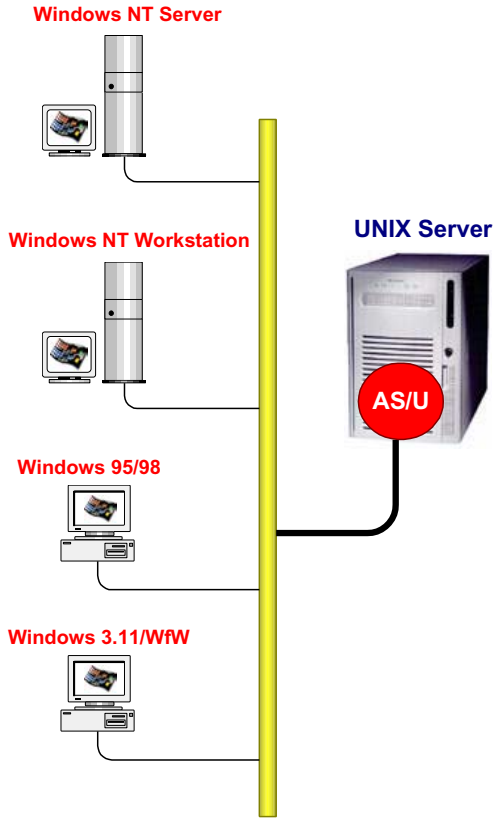


AT&T Advanced Server for UNIX

Advanced Server for UNIX

What is the AT&T Advaced Server for UNIX (AS/U) ?

- The **AS/U** is a LanManager-like networking operating system technology for UNIX that is **functional equivalent to Windows NT** (3.51) **Server**
- It enables seamless interoperability between UNIX Servers and Mircosoft Windows clients
- AS/U allows UNIX servers to act as **file and print servers** for Microsoft Windows based clients
- It provides Windows NT technology on UNIX Systems including security, access control, trusted domains and Windows Internet Name Service (**WINS**)
- It includes a NetBIOS interfaces and runs over TCP/IP or NetBEUI (vendor implementation dependent)
- The core of AS/U is the **Microsoft Server Message Block** (SMB) protocol. This protocol allows clients and servers to exchange messages an data frames
- AS/U was **developed by AT&T** and is based on AT&T and Microsoft technology
- AS/U is supported for UNIX implementations such as AIX, HP/UX, OSF/1, SCO Unix, SINIX, NCR's Unix, **Solaris**, SVR 4.0, UnixWare and **DG/UX** („DG/Advanced Server 3.51 for UNIX“ for DG/UX R4.11 or greater). There is also a (unsupported) public domain version available which is named **Samba**



Advanced Server for UNIX

How can we use AS/U in CWR environments ?

- You may use AS/U if a UNIX Server is part of the system environment of the customer and...
  - **If this UNIX Server is a file or print server** for the Windows NT machines then:
    - instead of installing a NFS Client implementation like Intergraph DiskAccess on any Windows NT based machine in your system you may use AS/U on the UNIX Server
  - **If the UNIX system is a client** to Windows NT Servers:
    - it is better to use a NFS Server implementation such as Intergraph DiskShare on any of the Windows NT Severs to which the UNIX client should have access to. AS/U has full server functionality equivalent to Windows NT Server but with only very limited client functionallity
- **Advantages of AS/U:**
  - Nothing needs to be installed or changed on the Windows NT systems to be able to access a UNIX Server
  - Only Microsoft LanManger-like network communications
- **Disadvantages of AS/U:**
  - **Much higher cost** compared to a few NFS Client/Server licenses
  - **Much more complicated to administer** than NFS implementations for Windows NT
- **The installation and administration of AS/U is outside the scope of this document**

NFS Connectivity to UNIX Systems

NFS Connectivity

Intergraph AccessNFS

- **AccessNFS™** is a **Intergraph Corporation** product suite implementing NFS connectivity for Microsoft Windows systems
- The two main products are:
  - **DiskAccess™** NFS client implementation for Windows 95 and Windows NT. This product enables a Windows system to perform as a NFS client and to access file resources located on NFS servers such as UNIX systems. Using the Windows Explorer, Network Neighborhood, or the Windows File Manager you can browse and connect to file systems located on remote UNIX machines or other NFS servers. You can access resources on the servers just with drag-and-drop ease.
  - **DiskShare™** NFS server implementation for Windows NT.
    This product allows Windows NT systems to perform as NFS servers and to share volumes and files among UNIX machines and other NFS clients. The product supports resource sharing for FAT, NTFS, CDFS, and HPFS file systems and integrates fully with the Windows NT security
- Both products fully support **NFS Version 3** as well as **NFS Version 2**

NFS Connectivity

Hummingbird NFS Maestro

- **NFS Maestro™** is a **Hummingbird Communications Ltd.** product suite implementing NFS connectivity for Microsoft Windows systems
- The two main products are:
  - **NFS Maestro Client** and **NFS Maestro Solo** provide NFS client functionality for Windows 95, Windows 98, and Windows NT 4.0 systems.
    These products enable a Windows system to perform as a NFS client and to access file resources located on NFS servers such as UNIX systems.
  - **NFS Maestro Server** provides NFS server functionality for Windows NT 4.0 systems.
    This product allows Windows NT systems to perform as NFS servers and therefore enables UNIX machines and other network attached NFS clients to access file system resources on Windows NT systems.
  - Both products fully support **NFS Version 3** as well as **NFS Version 2**

NFS Connectivity

Microsoft Windows NT Services for UNIX (SFU)

- **Windows NT Services for UNIX** is a **Microsoft Corporation** Add-On Pack for Windows NT 4.0 implementing UNIX-like services including NFS client/server functionality.
- The Add-On Pack for Windows NT offers:
  - **NFS Resource sharing**: Users of Windows NT Workstation are able to access files on UNIX systems, and UNIX workstation users are able to access resources on Windows NT Server via NFS. To provide this functionality, **Microsoft is licensing the NFS client/server software from Intergraph Corporation !**
  - **Remote administration**: Remote administration through Telnet client and server gives remote users the ability to remotely log into and execute commands on Windows NT- or UNIX-based systems
  - **Password synchronization**: One-way password synchronization will allow customers to maintain a common password between their Windows NT- and UNIX-based machines
  - **UNIX shell and commands**: Windows NT Services for UNIX will also allow users to use common UNIX commands and utilities in a Windows NT environment.

NFS Connectivity

The suggested NFS Connectivity Product

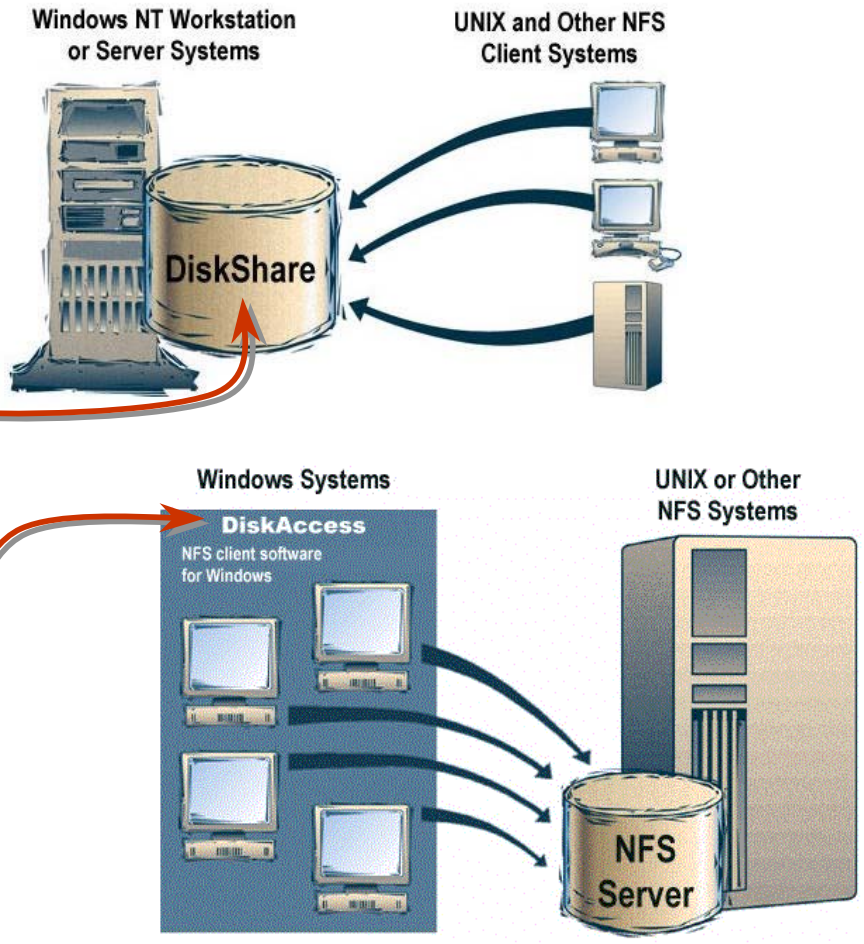
- We suggest to use the Mirosoft Services for **UNIX Add-On Pack for Windows NT 4.0** for the following reasons:
  - It is a **Microsoft product**
  - It is **based on the Intergraph Corporation AccessNFS** which has been proven as a stable good performing NFS Version 2/3 implementation
  - The Intergraph Corp. DiskShare NFS Server properly **interoperates with Heidelberg Prepress NextStep based SignaStations** which the Hummingbird NFS Maestro server does not
  - The product **only contains the required core NFS functionality** and not a series of add-ons (FTP, Telnet, ping, UNIX remote execution, etc.) which are not required for Prepress system environments
  - The product installs a „Microsoft“ RPC (Sun Remote Procedure Calls) Portmapper on Windows NT 4.0 systems. RPC-based third party products like Lagato Networker may now depend on the „Microsoft“ Portmapper. A **standard Microsoft Portmapper** helps to avoid Portmapper conflicts

Intergraph AccessNFS™ (DiscShare/DiscAccess)

NFS-Connectivity

Intergraph AccessNFS™

- For an **UNIX System** to access Resources on a **Windows NT System** Installation of an **NFS-Server** is required on the Windows NT System
- The suggested 3rd Party Product is **Intergraph DiskShare ™**
- For a **Windows NT System** to access Resources on an **UNIX System** the installation of a **NFS-Client** is required on the Windows NT System
- The suggested 3rd Party Product is **Intergraph DiskAccess ™**
- **Windows NT Services for UNIX** (**SFU**) includes Intergraph DiskAccess and DiskShare and will soon be available as **a Windows NT Add-On Pack**



NFS-Connectivity

Setting up NFS-Connectivity

- Five Steps to set up an NT-NFS-Server:
  - **Install** DiskShare™ or '**Services for UNIX Add-On**' on the NT system
  - **Configure** DiskShare™
  - **Export** Volumes on the Windows NT 4.0 System
  - **Mount** Volumes on the UNIX-System
  - **Test** Connectivity

Installation of DiskShare™

- **TCP/IP** protocol stack is already installed and configured on the NT-System
- Refer to Intergraph **User's Manual/ Online-Help** for detailed description
- **Conflicts** may occur when other 3rd Party products are installed which also require a **Portmapper Implementation**, e.g. Legato Networker™, CLARiiON Manager™
- **Portmapper Conflict resolving** depends on system configuration

Installation and Configuration of the Intergraph DiskShare™ NFS Server

NFS-Connectivity

Installation of DiskShare™/ Services for UNIX

- **License Information** is required
- Invoke **Setup** from Distribution Disk
- Follow the Instructions Dialogue
- Select **Default Destination** Directory
- Select **Complete Setup**
- **Reboot** the System
- Refer to **DiskShare Online-Help** for detailed Description and Troubleshooting
- Known Problem:
  Mix of **different Languages** (Windows NT and DiskShare™)
  - ➲ Refer to **HDPP A&B Lab Extranet Web Server** for a Work-Around

NFS-Connectivity

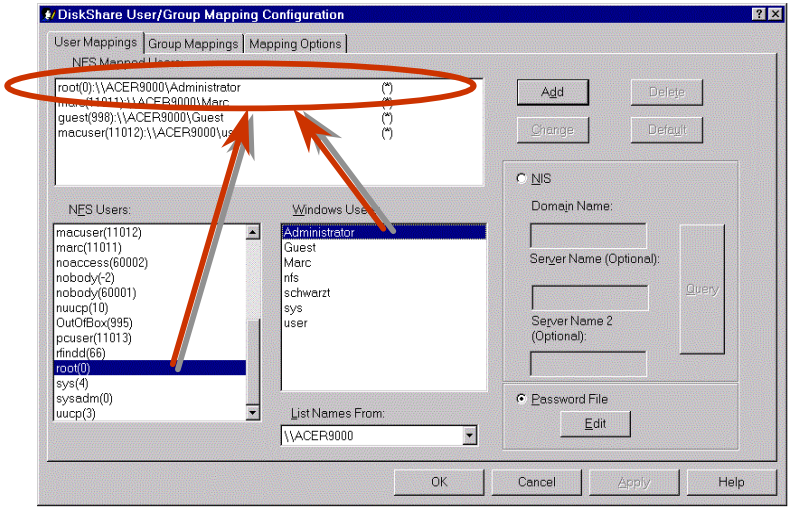
Configure DiskShare™

- Select **Automatic Start of PC-NFS daemon:**
  Control Panel ⇨ *Services* ⇨ ***pcnfsd*** ⇨ *Startup* ⇨ *Automatic*
- Select **OK** & **CLOSE** Services
- Adjust the **Number of NFS-Threads** to improve Performance depending on the Number of Processors:
  Default value is 16, add 4 for each additional processor
  Example: MaxNumber of threads=32 for a 4-Processor system
  - ➲ **Attention:** The more NFS-Threads are installed, the more preference is given to NFS-Clients, which adversly affects the **Server‘s Performance** regarding other applications

NFS-Connectivity

Configure DiskShare™

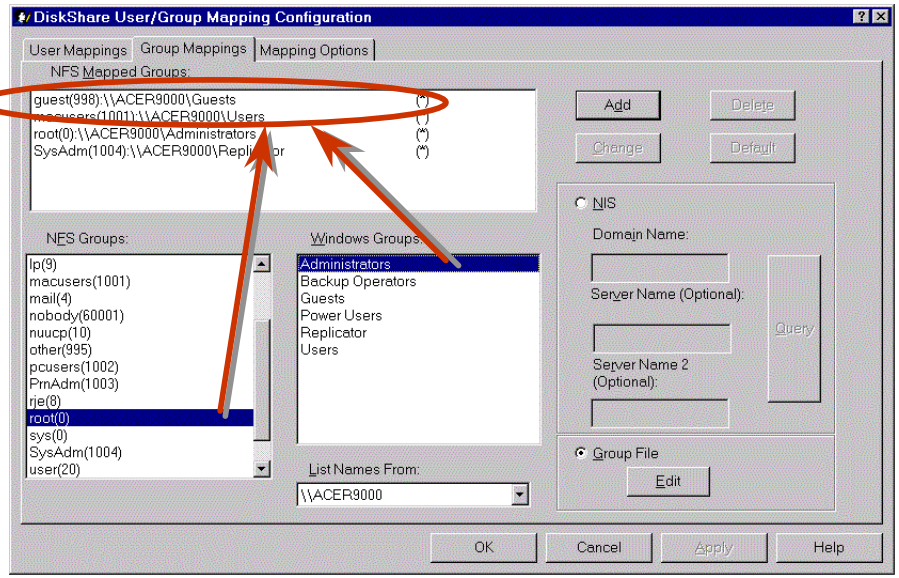
- Get **„passwd“** and **„group“** files from a UNIX-Client via FTP (binary)
- Store at Directory on NT-System: **%Winnt%\system32\drivers\etc**
- Start Programs
  - **(Windows NT Services for UNIX)**
  - **DiskShare**
  - **DiskShare User Manager**
- From the **User Mappings** Tab: Map NFS users to Windows users by selecting the appropriate entries, click **ADD** for each new entry, **OK** & **APPLY** to store



NFS-Connectivity

Configure DiskShare™

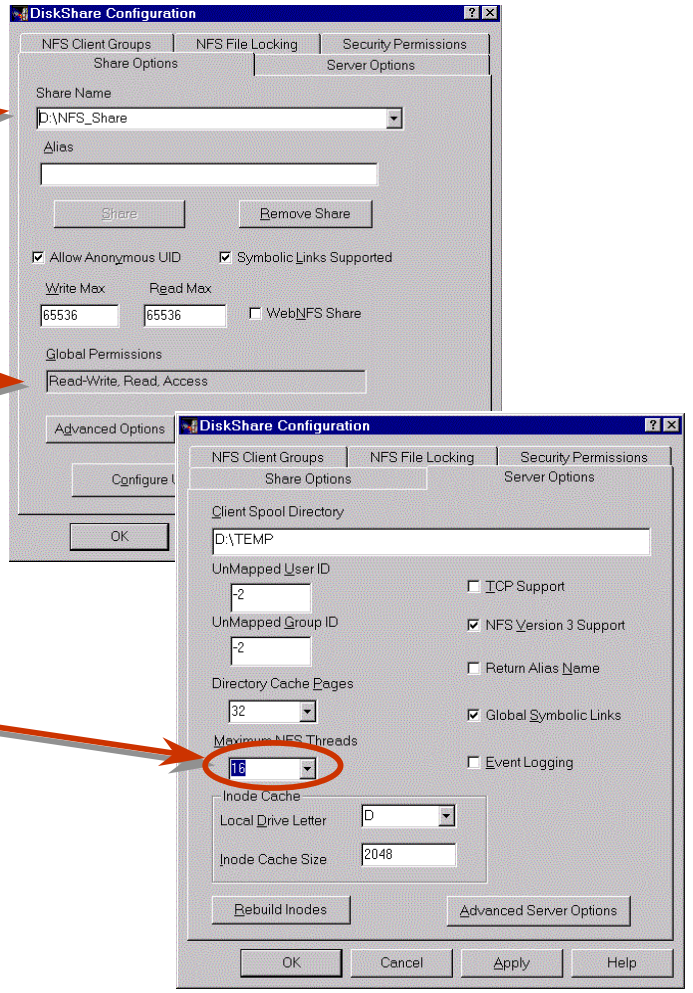
- From the Group Mappings Tab:
  Map NFS Groups to Windows Groups by selecting the appropriate entries, click **ADD** for each new entry, **OK** & **APPLY** to store



NFS-Connectivity

Exporting NT-Volumes

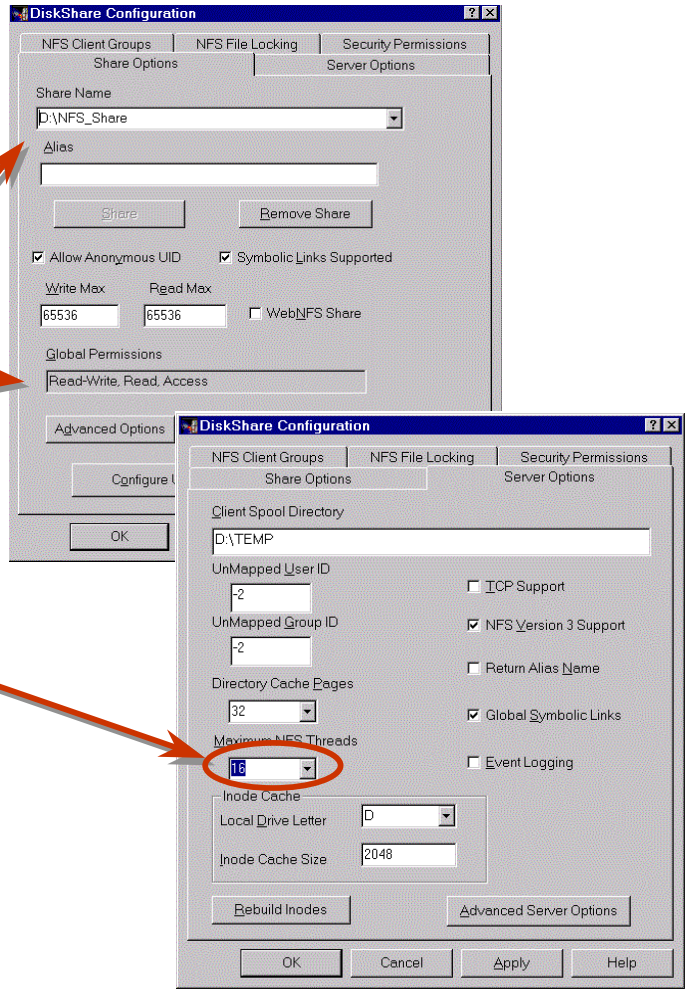
- From the **Share Options** Tab:
  Fill in **Share Name,** Click „Share“
- Configure NFS-Share Permissions to **Read-Write Access**
- Check Server Options Tab, change Entries only if required (Refer to Manual / Online-Help for Details)
- **Check NFS Threads** Number
- Leave all other **Default-Settings**



NFS-Connectivity

Exporting NT-Volumes

- From the **Share Options** Tab:
  Fill in **Share Name,** Click „Share“
- Configure NFS-Share Permissions
  to **Read-Write Access**
- Check Server Options Tab, change
  Entries only if required (Refer to
  Manual / Online-Help for Details)
- **Check NFS Threads** Number
- Leave all other **Default-Settings**



NFS-Connectivity

Mounting Volumes on a UNIX-System

- Volume Mounting **depends on the actual UNIX-System** (DG/UX, Sun Solaris, SGI IRIX, IBM AIX or other UNIX implementations)
- Some older Systems may require VI-Editing of „**/etc/fstab**“-File and invoking the „**mount**“-Command, others may provide a more convenient graphical User‘s Interface . . .
- **Refer to your Systems Administrator** for Mounting Remote File Systems on the UNIX-System

NFS-Connectivity

Connectivty Testing from UNIX-System

- **Login as root or superuser** at the UNIX-Client
- <NT-Hostname> has been added to **„/etc/hosts“** file on the UNIX-Client System
- **ping** <NT-Hostname> to check TCP/IP connection
- **rpcinfo -p** <NT-Hostname> shows if NFS Processes have been started on the NT-System
- **showmount -e** <NT-Hostname> shows which directories have been exported on the Windows NT System

NFS-Connectivity

Connectivty Testing from UNIX-System

- **mount -t nfs <NT Server Name>:<NT NFS Share Volume> <local UNIX Mount Path>** to mount exported directory of the NT-Machine to the mountpoint of a UNIX-Client
  Example: *mount -t nfs av3700:/D/NFS_Share /net/av3700/NFS_Share*
- **touch <mountpoint>/testfile** to check if user root has write access to the exported directory
- **ls -l <mountpoint>** to check if Testfile has been created
- **create a 120 MB File**, e.g. UNIX_file120mb
- **timex dd** if=UNIX_file120mb of= <mountpoint>/UNIX_file120mb bs=64k to write 120 MB from UNIX-Client to NT-System. Time is measured
- **remove** the Testfile UNIX_file120mb
- **umount <mountpoint>** to dismount exported directory of NT-System from UNIX-Client

NFS-Connectivity

DiskShare Tools

- **Show Mounts Program**
  Displays Information on the Shares currently available:
  Start ⇨ Programs ⇨ (Windows NT Services for UNIX) ⇨ DiskShare ⇨ ***Show Mounts***
  - List exported File Systems on NFS Server **[showmount -e <name>]**
  - List Remote Mounts **[showmount -a <name>]**
  - List remotely mounted Directories **[showmount -d <name>]**
- **RPC Information Programm**
  Displays Information about specific aspects of RPC operations:
  Start ⇨ Programs ⇨ (Windows NT Services for UNIX) ⇨ DiskShare ⇨ ***RPC Information*** ***[rpcinfo -b, -t, -u]***
- **Extensions to Windows NT Performance Monitor:**
  Shows NFS requests and the amount of data tranferred via NFS

Installation and Configuration of the Intergraph DiskAccess™ NFS Client

NFS-Connectivity

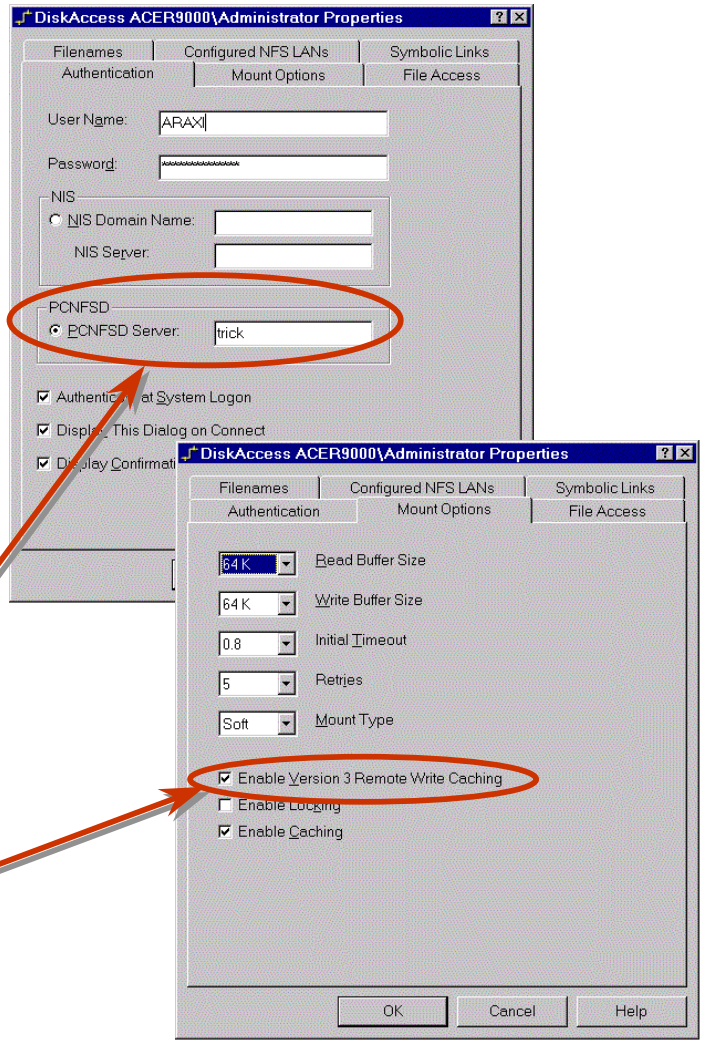
Installation of DiskAccess™ / Services for UNIX

- **License Information** is required
- Invoke **Setup** from Distribution Disk
- Follow the Instructions Dialogue
- Select the **Default Destination** directory
- Select **Complete Setup**
- **Re-Install Servicepack 3**
- **Reboot** the system
- Refer to **DiskShare Online-Help** for detailed description
- **Known Problems:** Transfers from client volumes configured as Apple Shares. Refer to the **HDPP A&B Lab Extranet Web Server** for a Work-Around

NFS-Connectivity

Configure DiskAccess™

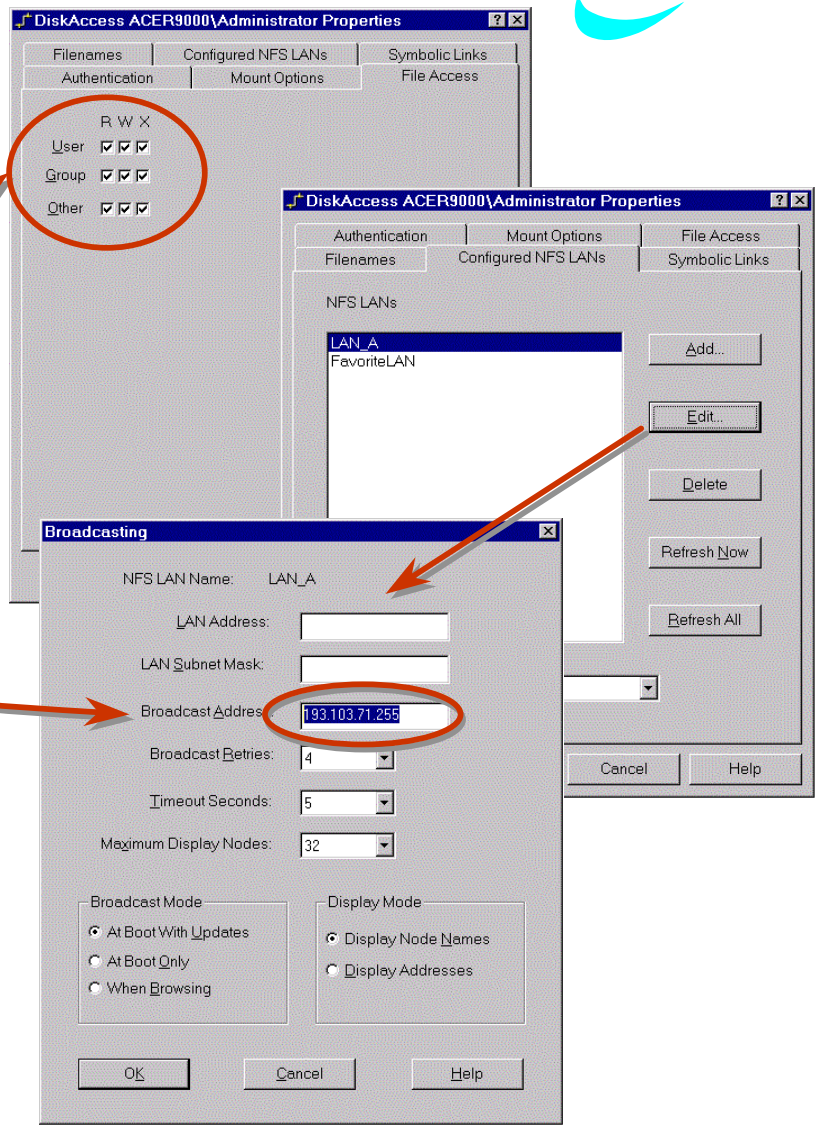
- Start ⇨ Programs ⇨ (Windows NT Services for UNIX) ⇨ Disk Access ⇨ **DiskAccess Configuration**
- **Authentication Tab:** Fill in **Username / Password** for a Login Account at a remote NFS server. Mark **PCNFSD Server** (the server which verifies UNIX-style identification), and fill in the name of a NFS server running a **pcnfsd process**
- **Mount Options Tab: Enable Version 3 Remote Write Caching**



NFS-Connectivity

Configure DiskAccess™

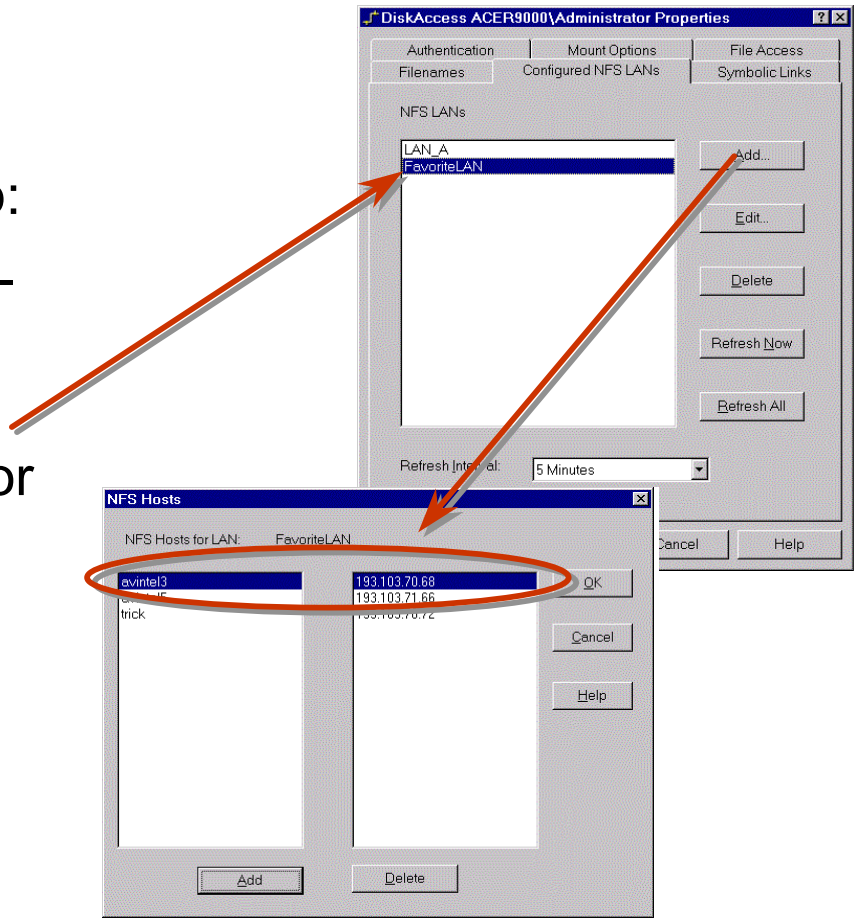
- File Access Tab: **Enable R/W/X** for User, Group & Other
- Leave **Default Settings** for **File Names** & **Symbolic Links**
- Configured NFS LANs Tab:
  - Provide **Broadcast Addresses** and LAN-Names if you want to browse specific **LAN-Segments** for all configured NFS-Servers on that segments



NFS-Connectivity

Configure DiskAccess™

- Configured NFS LANs Tab:
  - Provide individual Host-Addresses and Server Names in the **FavoriteLAN-** Folder for Servers you connect to **most frequently**



NFS-Connectivity

Exporting UNIX Volumes

- Volume Exporting **depends on the actual UNIX-System**
- Refer to your **Systems Administrator** for details

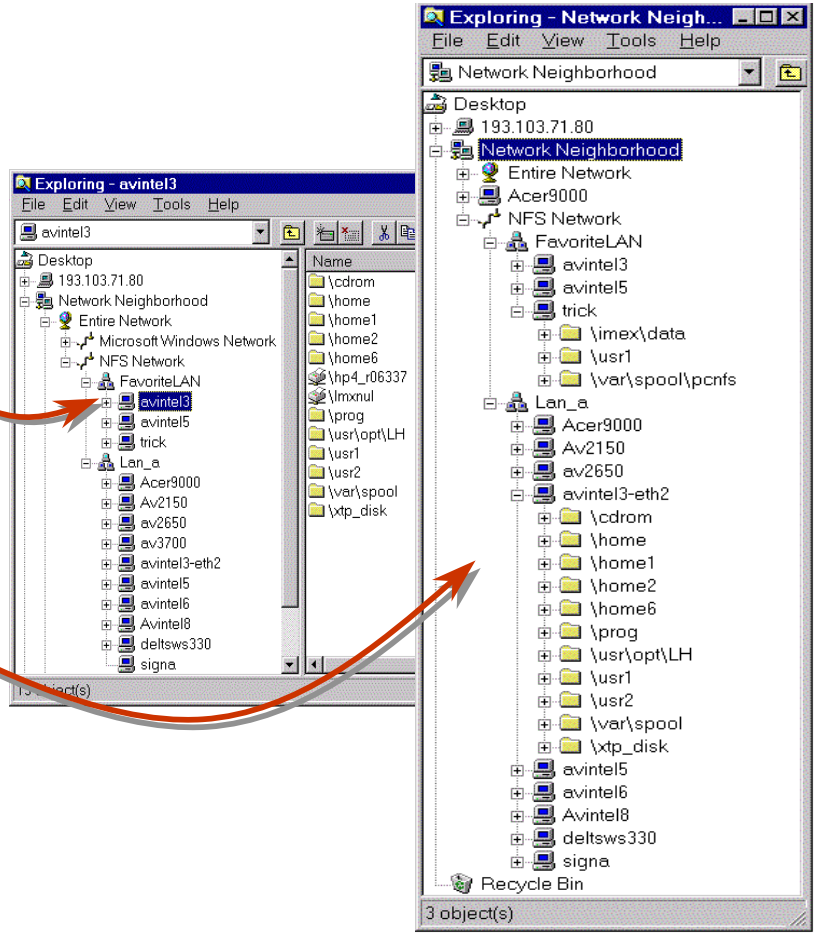
Mounting UNIX Filesystems on NT

- From the Windows NT **Explorer / File Manager:**
  - Map / Connect a Network Drive
  - Select a Drive Letter
  - Key in Server Name and Pathname of the exported Directory
    server_name:/path_name
- The DiskAccess Properties Sheet allows for the change of the Authentication parameters (pcnfsd server, user name, and password)
- The directory structure on the remote server shows up in the windows NT Explorer / File Manager window
- List the contents of the mounted remote volume, and navigate through the remote filesystem

NFS-Connectivity

Mounting UNIX Filesystems (2)

- Using **Network Neighborhood:** Network Neighborhood ⇨ Entire Network ⇨ NFS Network ⇨ **Select Remote Server**
- A window is created for the selected server
- List the contents of directories and navigate through the remote filesystem
- Note: Base default configuration settings are used





HP Printer/Proofer Connectivity

Network Access to HP Proofers

Network connectivities supported by HP DesignJet Proofers

- The **HP DesignJet** (755, 2000, 3500) Proofers can be accessed via an Ethernet (or LocalTalk) connection and support several network protocols:
  - **AppleTalk** (LocalTalk & EtherTalk)
  - **DLC/LLC** (Data Link Control / Logical Link Control)
  - **Novell IPX/SPX** (Internetwork Packet Exchange / Sequenced Packet Exchange)
  - **TCP/IP**
- For connecting a HP designJet Proofer to a CWR Windows NT Server either the **DLC** Protocol or the **TCP/IP** Stack should be used

DLC versus TCP/IP for HP DesignJet Access

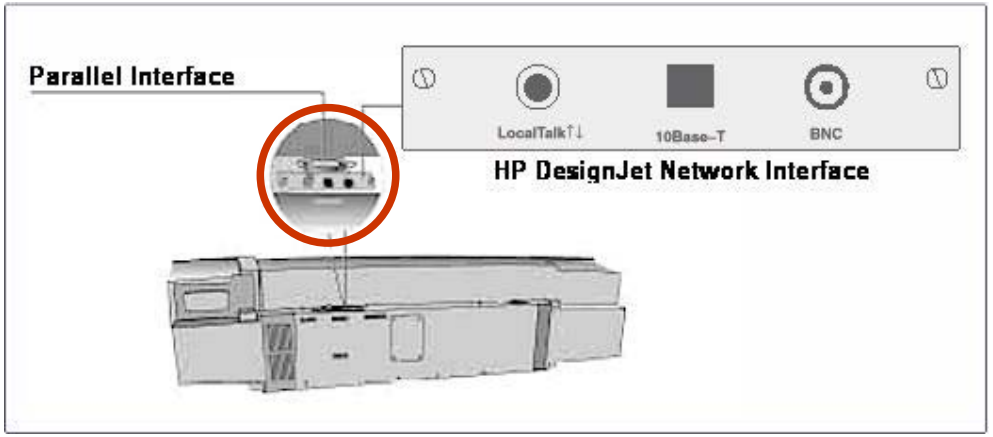
- The **D**ata **L**ink **C**ontrol (DLC) is a network protocol included in Windows NT 4.0
- DLC is a special purpose protocol and is primarily used to:
  - provide **connectivity to IBM Mainframes**
  - provide **connectivity to LAN printers**
- DLC is a non-routable protocol just based on MAC (Media Access Control) addressing
- **DLC may only be used to connect to HP printers/proofers if the printer resides in the same physical network as the CWR Windows NT Server(s).**

  Otherwise TCP/IP must be used

Network Access to HP Proofers

Network Setup of HP DesignJet Printers

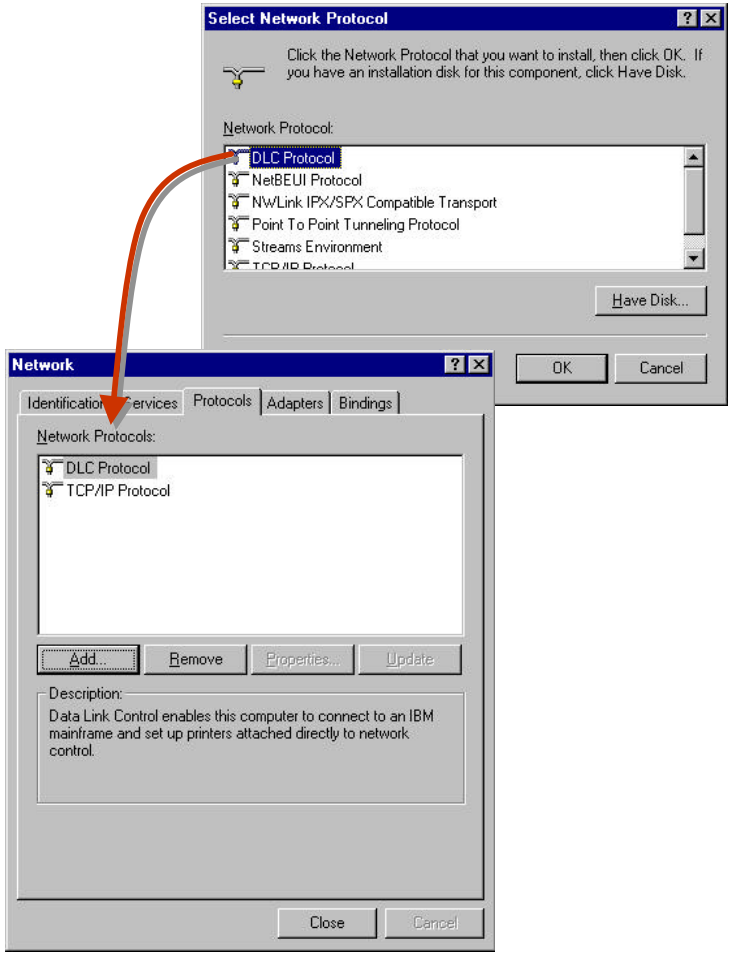
- Install the **Network Interface Card** of the HP DesignJet Proofer (if not already pre-installed)
- **Follow the instructions of the HP manual** to setup the required network protocol
- In the case of **TCP/IP** you need to assign an IP address for the proofer. You need the following information:
  - IP Address for the proofer
  - Netmask
  - Default Gateway (Router IP Address)
- After setting up the proofer you need to **install the printer/proofer support under the Windows NT 4.0 server**



Network Access to HP Proofers

Installing DLC Protocol access to a HP DesignJet Proofer unter Windows NT 4.0

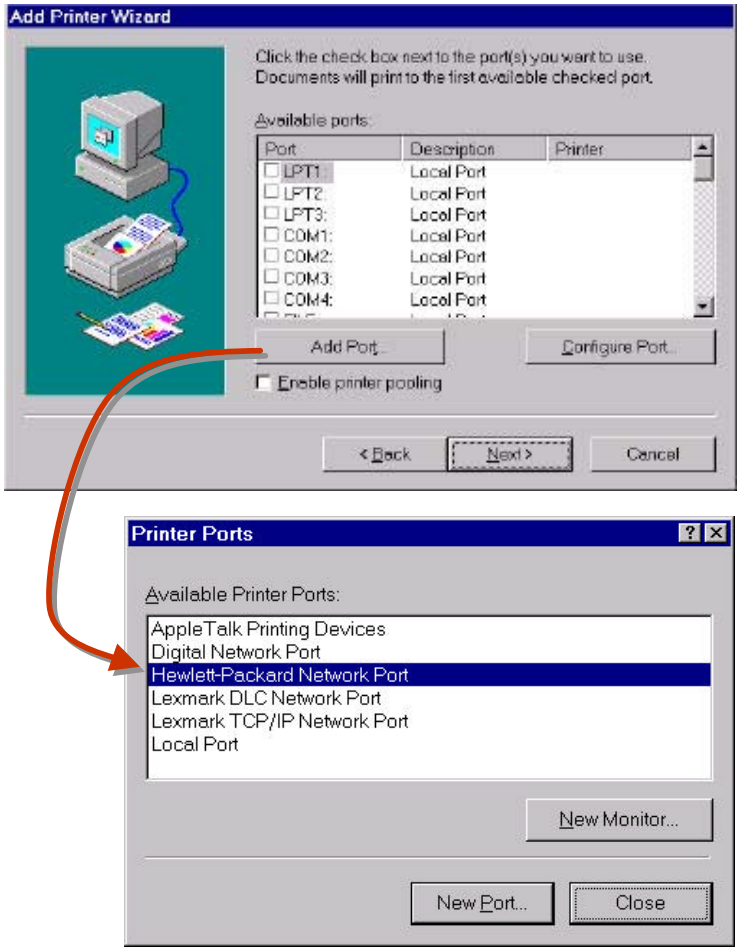
- **Install the DLC protocol under Windows NT** (if not already installed):
  - Open the Windows NT „**Control Panel**“ and doubleclick the icon „**Network**“
  - Choose the register card „**Protocols**“ and click on the „**Add**“ button
  - Choose the DLC protocol in the „**Select Network Protocol**“ window and click on the „**OK**“ button
  - **Follow the instructions on the screen to sucessfully install the DLC protocol**
  - Finally **restart the Windows NT** to activate the DLC protocol
  - **Re-install Windows NT 4.0 Service Pack 3**



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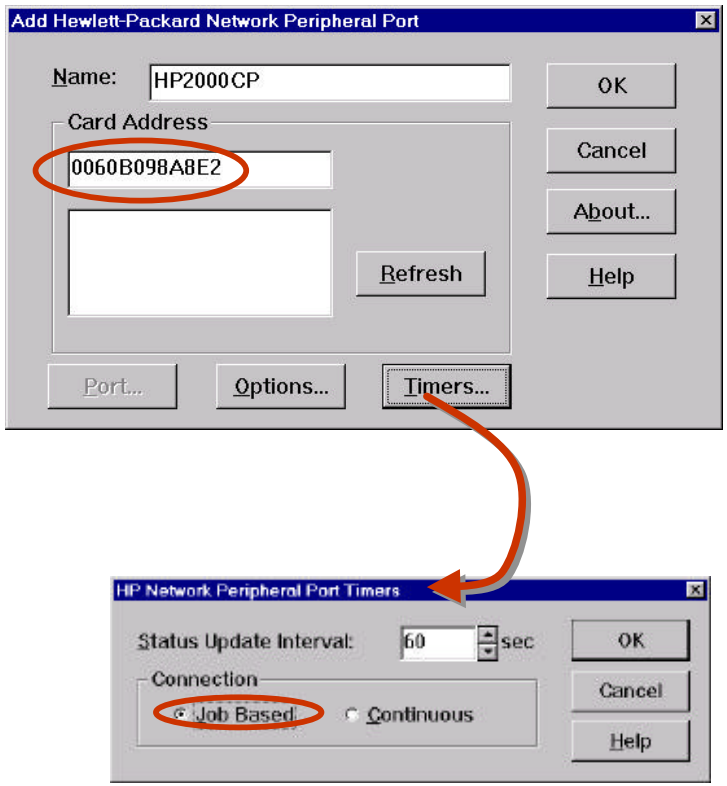
- **Install the HP DesignJet as a printer under Windows NT 4.0**
  - Choose „**Start**“-“**Settings**“-“**Printers**“ to open the Printers window
  - Doubleclick on „**Add Printer**“, select a printer on „**My Computer**“, and click on the „**Next>**“ button to continue
  - Click on the „**Add Port...**“ button to add a HP Printer port
  - Select a „**Hewlett Packard Network Port**“ in the „**Printer Ports**“ window and click on „**New Port**“ to create a port of that type
  - Now you have to specify the HP printer port parameters



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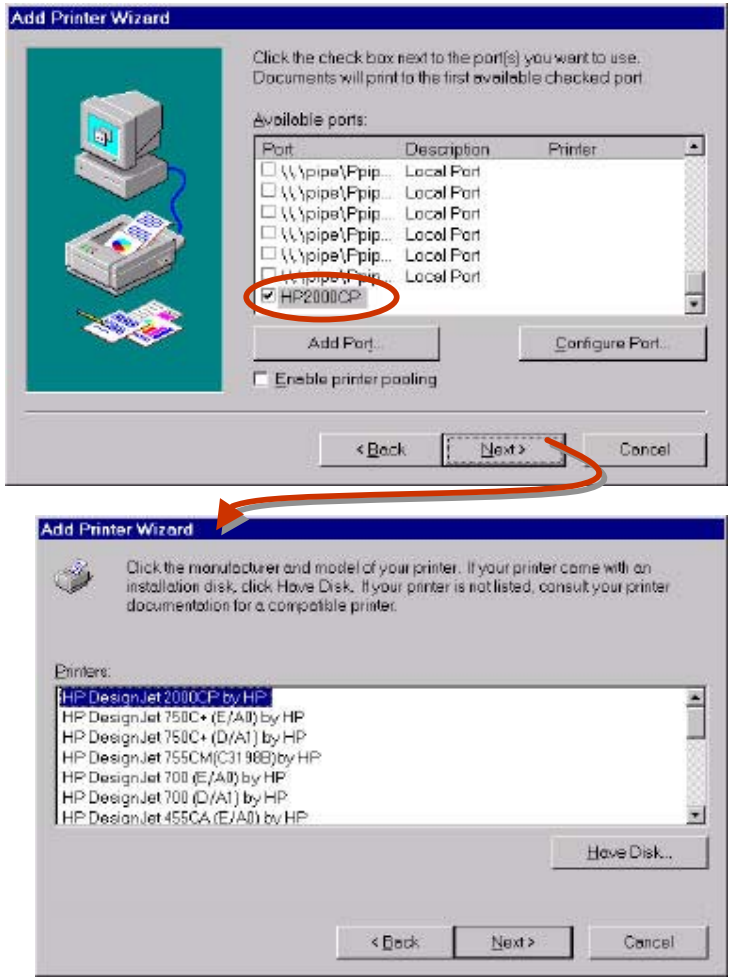
- **HP DesignJet as a printer installation under Windows NT 4.0 (continued)**
  - In the „**HP Network Peripheral Port**“ window you have to specify the „**Name:**“ of the printer port and the „**Card Address**“ (physical network address / MAC address) of the printers network adapter. Please refer to the HP manual how to get this information
  - Click on the „**Timers...**“ button to open the „**HP Peripheral Port Timers**“ window and choose „**Job Based**“ connection to release the printer after print jobs. This will allow other machines to use the printer as well
  - Click on the „**OK**“ button of both „**HP Peripheral Port**“ windows to complete the configuration



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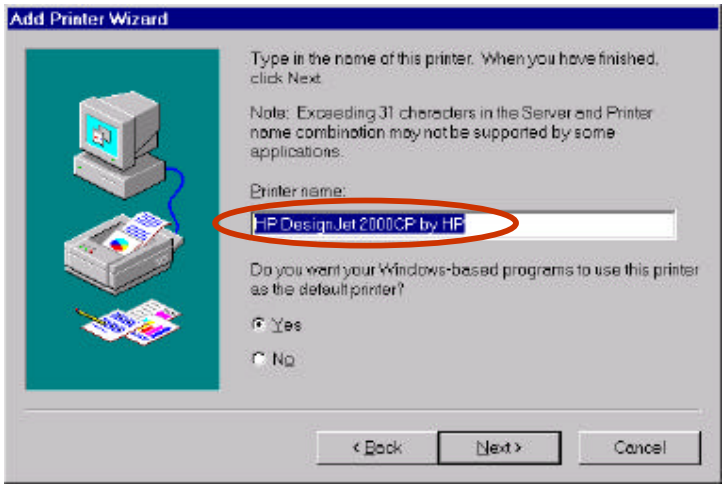
- **HP DesignJet as a printer installation under Windows NT 4.0 (continued)**
  - When you have specified the HP DLC printer parameters the new printer port will show up in the list of available printer ports
  - Click on the „**Next>**“button to continue
  - Now you will be asked to install the driver for the HP printer. Click on the „**Have Disk**“ button and insert the HP Windows NT 4.0 driver disk (deliverd with the printer) into the floppy disk drive of your Windows NT server
  - Select the appropriate driver (e.g. HP DesignJet 2000CP by HP) and click on the „**Next>**“ button to install the driver
  - Follow the instructions on the screen to complete the installation

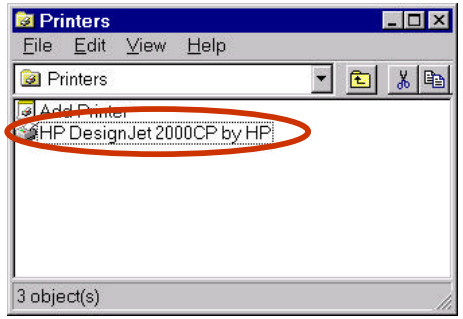


Network Access to HP Proofers

Installing DLC Protocol access to a HP DesignJet Proofer unter Windows NT 4.0

- **HP DesignJet as a printer installation under Windows NT 4.0 (continued)**
  - To complete the printer/proofer installation you have to define a „**Printer name:**“ for the printer to identify it on your Windows NT 4.0 system.
  - Then click on „**Next>**“ to finish the installation of the printer
  - Now the printer entry shows up in the „**Printers**“ window and the printer may be accessed
  - Please refer to the HP users manual for for detailed information on the configuration of the printer

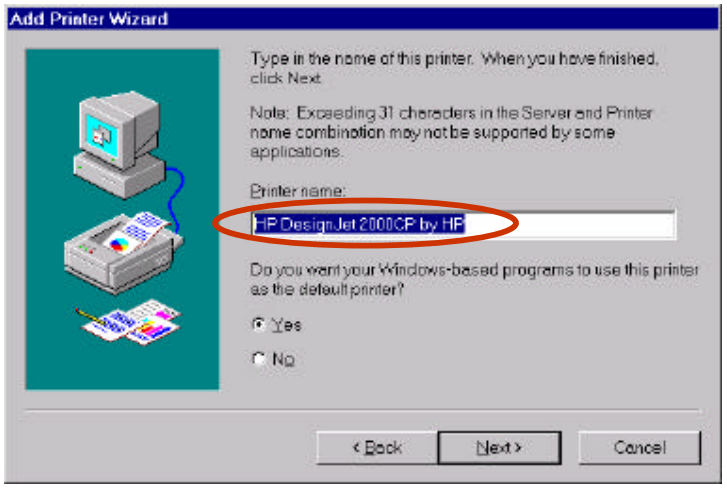


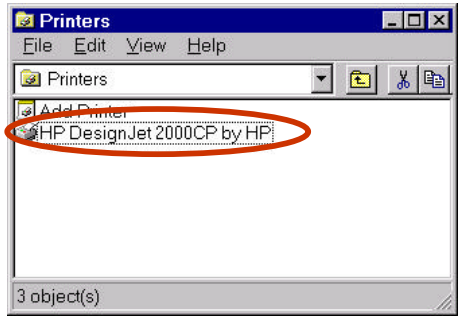


Network Access to HP Proofers

Installing DLC Protocol access to a HP DesignJet Proofer unter Windows NT 4.0

- **HP DesignJet as a printer installation under Windows NT 4.0 (continued)**
  - To complete the printer/proofer installation you have to define a „**Printer name:**“ for the printer to identify it on your Windows NT 4.0 system.
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  - Now the printer entry shows up in the „**Printers**“ window and the printer may be accessed
  - Please refer to the HP users manual for for detailed information on the configuration of the printer

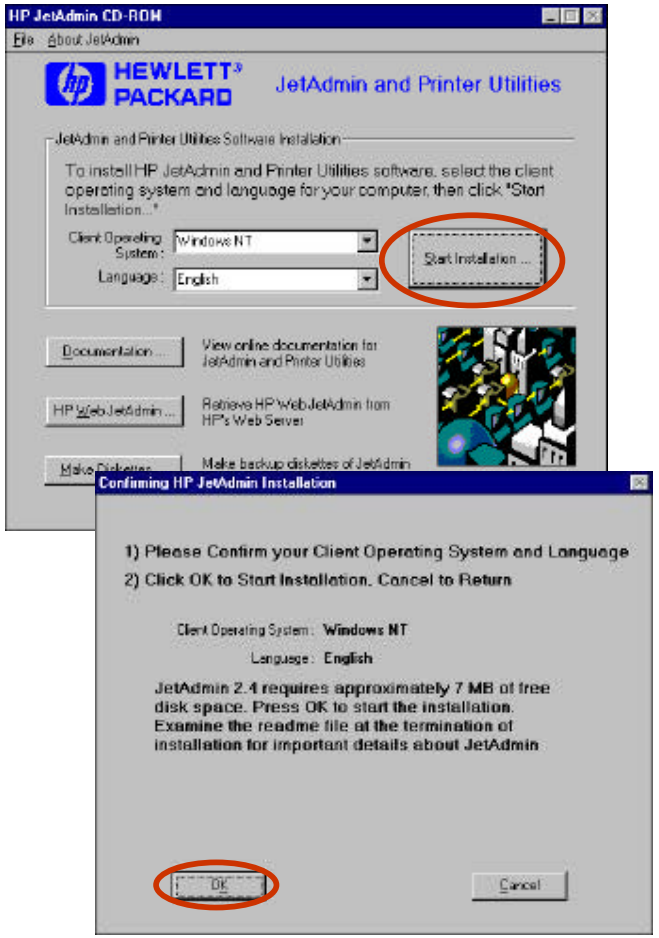




Network Access to HP Proofers

Installing TCP/IP access to a HP DesignJet Proofer unter Windows NT 4.0

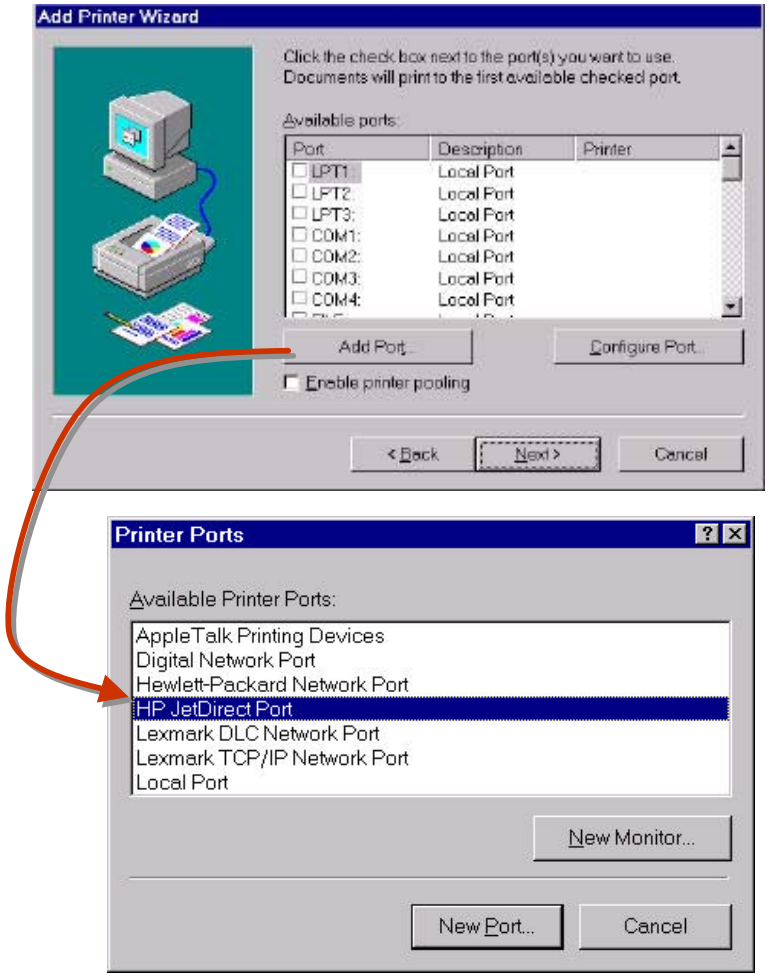
- **Installation of the „HP JetAdmin Software for JetDirect Print Servers“**
  - In order to install the HP DesignJet TCP/IP printer support under Windows NT 4.0 the „**HP JetAdmin Software**“ has to be installed first.
  - Insert the „**HP JetAdmin Software for JetDirect Print Servers**“ CD into the CD-ROM drive of your Windows NT 4.0 server
  - The installation software will be automatically started and the installation window will show up on the screen
  - Click on the „**Start Installation ...**“ button to start the software installation
  - Follow the instructions on the screen to complete the installation



Network Access to HP Proofers

Installing TCP/IP access to a HP DesignJet Proofer unter Windows NT 4.0

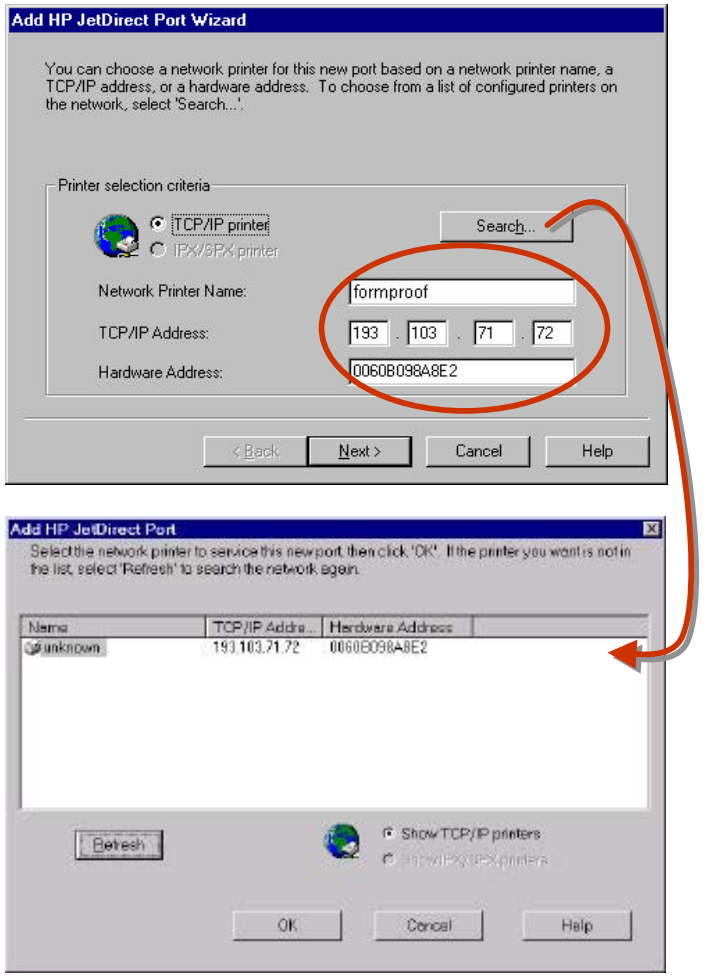
- **Install the HP DesignJet as a printer under Windows NT 4.0**
  - Choose „**Start**“-“**Settings**“-“**Printers**“ to open the Printers window
  - Doubleclick on „**Add Printer**“, select a printer on „**My Computer**“, and click on the „**Next>**“ button to continue.
  - Click on the „**Add Port...**“ button to add a HP Printer port
  - Select a „**HP JetDirect Port**“ in the „**Printer Ports**“ window and click on „**New Port**“ to create a port of that type
  - Now you have to specify the HP JetDirect printer port parameters



Network Access to HP Proofers

Installing TCP/IP access to a HP DesignJet Proofer unter Windows NT 4.0

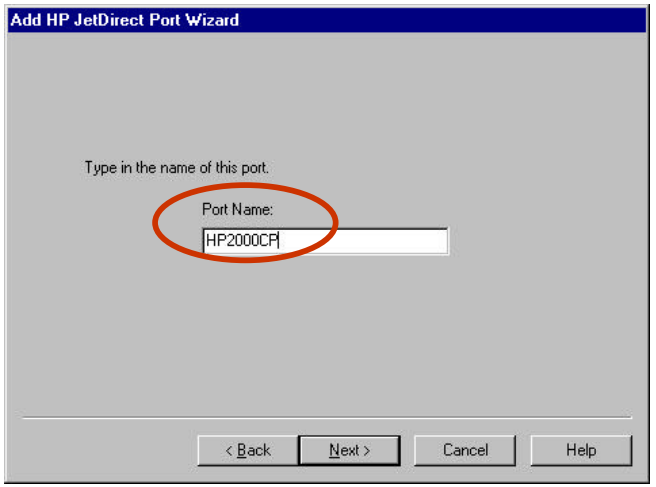
- **HP DesignJet printer installation under Windows NT 4.0 (continued)**
  - Specify at least one of the following parameters in the „**Add HP JetDirect Port Wizard**“ window to identify the printer:
    - the „**Network Printer Name:**“ which was assigned to the HP DesignJet printer
    - the „**TCP/IP“ Address**“ of the printer
    - the „**Hardware Address**“ of the printer which is the MAC address of the printer‘s network interface
  - You may search on the network for HP DesignJet printers by clicking on the „**Search**“ button
  - When you have specified the printer then click on the „**Next>**“ button to continue

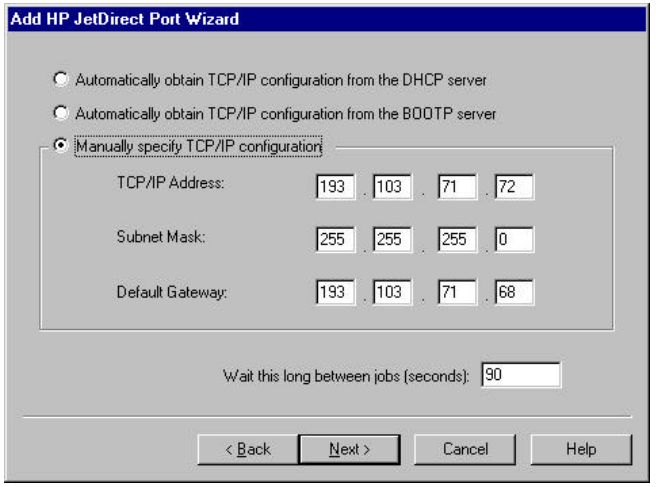


Network Access to HP Proofers

Installing TCP/IP access to a HP DesignJet Proofer under Windows NT 4.0

- **HP DesignJet printer installation under Windows NT 4.0 (continued)**
  - Now you will be asked to specify the „**Port Name:**“ of the new printer port. Enter an appropriate name and click on the „**Next>**“button to continue
  - The „**Add HP JetDirect Port Wizard**“ starts to search for the printer on the network and opens a window showing the TCP/IP configuration of the printer as soon as it gets a response from the remote device
  - If you do not want to reconfigure your printer then leave this information unchanged and click on the „**Next>**“ button to continue

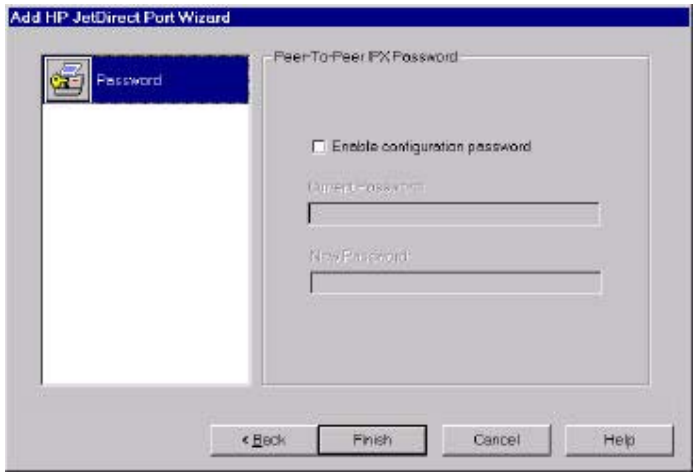


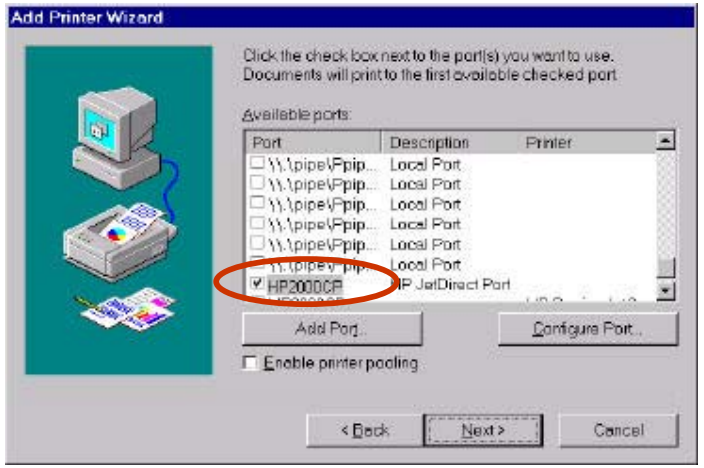


Network Access to HP Proofers

Installing TCP/IP access to a HP DesignJet Proofer unter Windows NT 4.0

- **HP DesignJet printer installation under Windows NT 4.0 (continued)**
  - In the next „**Add HP JetDirect Port Wizard**“ window just click on the „**Finish**“ button to complete the port setup
  - Now the new HP JetDirect printer port will show up in the list of available printer ports
  - Click on the „**Next>**“button to continue
  - In the next window click on the „**Have Disk**“ button and insert the HP Windows NT 4.0 driver disk delivered with the printer into the floppy disk drive of your Windows NT server
  - Select the appropriate driver (e.g. HP DesignJet 2000CP by HP) and click on „**Next>**“ To install the driver
  - Follow the instructions on the screen to complete the installation

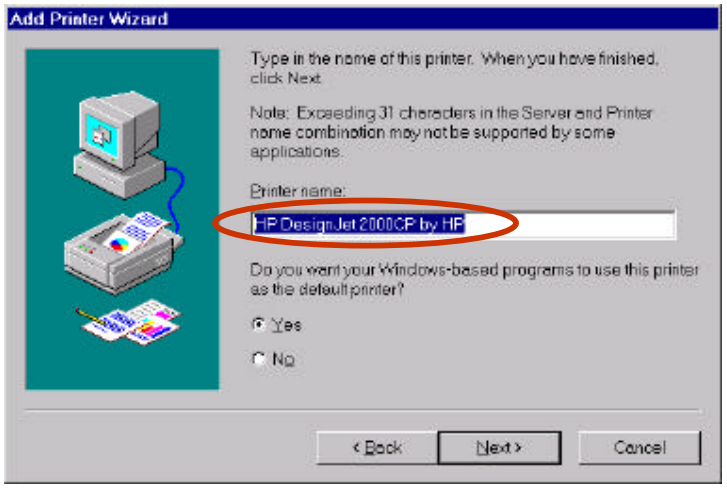


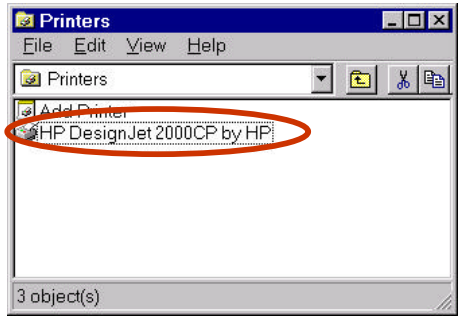


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End of the Training Course on CWR Connectivity