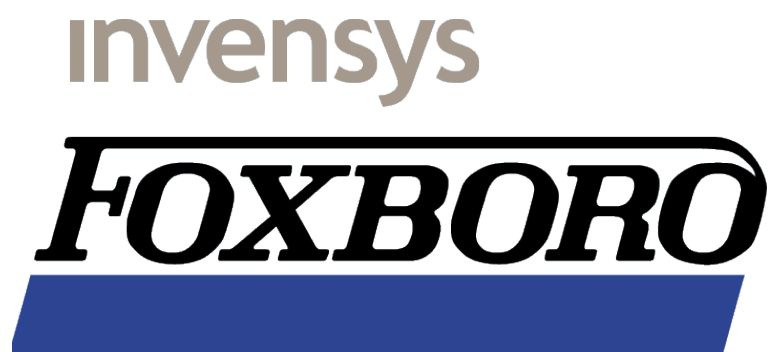




X-Terminal Installation for I/A 50 Series

Remote Display Manager and Foxview

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1 About this document.

This documentation provides installation examples for some of the X-Terminal software packages that were available during the creation of this document. (Which started back in 1994/1995).

Please note that this is NOT an Official Foxboro document. It is a personal project from the author to be of guidance when installing a PC X-terminal that will be used within the Foxboro I/A Series environment. Some choices may not be yours, some you may even find illegal! If you have any comments, tips, smart-ass remarks, wishes, demands, desires and/or problems of any kind concerning this project, the author would be very pleased if you submit these comments, tips, smart-ass remarks, wishes, demands and/or problems to the e-mail address provided on the cover page. Yes, all feedback be it pro or con is highly appreciated by the author. He would like you to want to use this documentation, that is why.

Included are the X-servers: Hummingbird Exceed, Xvision Eclipse and WRQ's Reflection X. This is by no means a replacement of the original documentation supplied with the package of your choice, neither is it the intention of this document to be the answer to all installation problems. Only standard package installation using the standard TCP/IP protocol is explained. This type of installation requires no additional software on the I/A Series platform (except for a **Display Manager/FoxView** license). When installing the software in addition to an existing network protocol, some additional information may be required which is currently not covered in this document. Please consult your network administrator in this case.

If you have any comments about this document or would like some enhancement and/or additions: please send an e-mail message to: **Ron.Deen@Invensys.com**.

The installation documentation for the **PC-NFS**, **Solarnet 1.0** and **SolarNet 1.1** packages was removed from this document. This documentation is still available but this "light" version of the document is no longer maintained! Should you need this information, send an e-mail to: **Ron.Deen@Invensys.com** and refer to "Xterm light".

As of version 9.0

1.1 To Do list.

The work is never done, this to-do list shows items which are currently NOT covered. Save you from looking through all these pages!

- Anything Linux.
- Thin client solutions (GoGlobal, GoJoe and eXceed on Demand for instance).
- WEB based solutions (see above).
- Add information for other X-terminal emulators
- Configuring UNIX X-Font server on I/A Series.
- Anything you come up with (and is a little bit related to the subject of course...).

Maybe more...

1.2 Disclaimer.

Due to the inherently complex nature of computer software and the fact that third party software is involved, Invensys does not warrant that the software described in this document or this documentation is completely error free, will operate without interruption, is compatible with all equipment and software configurations, or will otherwise meet your needs. Accordingly, this

documentation is provided as-is, and you assume all risks associated with its use. Invensys makes no warranties expressed or implied, with respect to this document. In no event will Invensys be liable for indirect, incidental or consequential damages, including, without limitation, loss of income, use, or information.

1.3 Acknowledgments.

This documentation would not be the document it is today without the inputs from the people around me and of course the feedback supplied by the readers, who supply me with some valuable information. The experiences you have shared with me have been a very valuable source of information.

There are a few I'd like to mention:

- **Rob de Groot**, who has helped me out several times with his knowledge concerning Solaris, X and the likes.
- **Bram Marsman**, who shared his efforts on getting a dual head X-Terminal running using eXceed 6.1 based on a Windows NT 4.0 Workstation.
- **Art Arruda**, who has helped me to solve some of the mysteries concerning weird behaviour of X-Terminals, eXceed software and Foxboro UNIX systems.
- **Debbie Proctor**, for helping me to figure out some of the peculiarities concerning eXceed 7.0 and 7.1 and Foxboro I/A Series.
- **Duc M. Do**, for the knowledge he shared concerning Xvision Eclipse and Foxboro Display Manager and FoxView.
- But there are many, many more.....

1.4 How this document is organized.

This has turned out to be a rather breathtaking piece of documentation. When handing over the printed version to an innocent installer, many times this person would break down in tears right after or shortly before giving up altogether. This is embarrassing enough as it is but even more: I don't think there's much reason for this, so I came up with this new paragraph.

There are over 10 chapters in here, but you do not need all of them except in the very rare cases where you would require an eXceed X-terminal to be installed for Windows 3.11 AND Windows 95 AND Windows 98 AND Windows 2000 AND you had to install Reflection for Windows 2000 as well AND had to configure a 51 style A AND a style B AND a style C AND a style D AND an E style AW and/or WP with disk mirroring installed but at the very, very least: A dual-head configuration! And all of these attempts would go terribly wrong!

Now that's not likely to happen, is it?

So, might I suggest, just going through the Table of Contents and see what you can find there. I suggest you get a quick look through the chapters where the hardware installation is covered but not unless you have to configure this sort of stuff. Have a look at TCP/IP configuration/installation if it was not already setup for you during a previous installation and next go to the chapter that matches the package you will be installing on the platform you have. I think it will not be so bad.

1.5 System requirements.

Since each package has different demands, the chapter concerning X-Terminal package

installation starts with the package's installation requirements (as found in the manufacturer's documentation). Please refer to these chapters for a detailed description on hardware and software requirements. One note about the display resolution that is required: the Display Manager window size is 960x720 pixels. This results in the demand for a minimal screen resolution 1024x786 to display a Display Manager full screen. This is, though not mandatory, the recommended configuration! The use of a display using more than 256 colors may be supported depending on the X-server of your choice. With eXceed this implies that you have version 6.1 or higher on Windows 95 or higher.

1.6 Sun X-Terminals.

The installation of Sun X-terminals is not covered in this documentation. The Sun X-terminal is a supported product which is covered in **"the Foxboro Model 51 X Terminal System Administration Guide (Solaris 2.X) (B0193UB)"**.

1.7 Read me... (Related information and documents)

Just because you have obtained this document, it does not mean you can sit back and relax. Get your teeth in some related documentation:

1.7.1 About IP configuration

[This section was extracted from a Linux HOWTO section \(NET -3-HOWTO\).](#)

Internet Protocol Addresses are composed of four bytes. The convention is to write addresses in what is called "dotted decimal notation". In this form each byte is converted to a decimal number (0-255) dropping any leading zero's unless the number is zero and written with each byte separated by a "." character. By convention each interface of a host or router has an IP address. It is legal for the same IP address to be used on each interface of a single machine in some circumstances but usually each interface will have its own address. Internet Protocol Networks are contiguous sequences of IP addresses. All addresses within a network have a number of digits within the address in common. The portion of the address that is common amongst all addresses within the network is called the 'network portion' of the address. The remaining digits are called the "host portion". The number of bits that are shared by all addresses within a network is called the netmask and it is role of the netmask to determine which addresses belong to the network it is applied to and which don't. For example, consider the following

Host Address	192.168.110.23
Network Mask	255.255.255.0
Network Portion	192.168.110.
Host portion	.23
-----	-----
Network Address	192.168.110.0
Broadcast Address	192.168.110.255

Any address that is *bitwise anded* with its netmask will reveal the address of the network it belongs to. The network address is therefore always the lowest numbered address within the range of addresses on the network and always has the host portion of the address coded all zeroes.

The broadcast address is a special address that every host on the network listens to in addition to its own unique address. This address is the one that datagrams are sent to if every host on the network is meant to receive it. Certain types of data like routing information and warning messages are transmitted to the broadcast address so that every host on the network can receive it simultaneously. There are two commonly used standards for what the broadcast address should be. The most widely accepted one is to use the highest possible address on the network as the broadcast address. In the example above this would be 192.168.110.255. For some reason other sites have adopted the convention of using the network address as the broadcast address. In practice it doesn't matter very much which you use but you must make sure that every host on the network is configured with the same broadcast address.

For administrative reasons some time early in the development of the IP protocol some arbitrary groups of addresses were formed into networks and these networks were grouped into what are called classes. These classes provide a number of standard size networks that could be allocated.

The ranges allocated are:

Network class	Netmask	Network Addresses
A	255.0.0.0	0.0.0.0 - 127.255.255.255
B	255.255.0.0	128.0.0.0 - 191.255.255.255
C	255.255.255.0	192.0.0.0 - 223.255.255.255
Multicast	240.0.0.0	224.0.0.0 - 239.255.255.255

What addresses you should use, depends on exactly what it is that you are doing. You may have to use a combination of the following activities to get all the addresses you need:

1.7.1.1 Installing a machine on an existing IP network:

If you wish to install a machine onto an existing IP network then you should contact whoever administers the network and ask them for the following information:

- Host IP Address
- IP network address
- IP broadcast address
- IP netmask
- Router address
- Domain Name Server Address

You should then configure your network device with those details. You can not make them up and expect your configuration to work.

1.7.1.2 Building a brand new network that will never connect to the Internet.

If you are building a private network and you never intend that network to be connected to the Internet then you can choose whatever addresses you like. However, for safety and consistency reasons, there have been some IP network-addresses, that have been reserved specifically for this purpose. These are specified in RFC1597 and are as follows:

RESERVED PRIVATE NETWORK ALLOCATIONS		
Network Class	Netmask	Network Addresses
A	255.0.0.0	10.0.0.0 – 10.255.255.255
B	255.255.0.0	172.16.0.0 – 172.31.255.255
C	255.255.255.0	192.168.0.0 – 192.168.255.255

You should first decide how large you want your network to be and then choose as many of the addresses as you require.

1.7.2 Foxboro Documentation.

- **50 Series X Client/Server Support.**

Foxboro partno: B0193NV

Handles the various ways to set up your X-terminal for use with remote applications (not just the Display Manager).

- **Workstation Alarm Management.**

Foxboro partno: B0193RV

The I/A Series system provides flexibility in the presentation of process alarms. This document focuses on the relationship of the Alarm Manager with respect to:

- Display Managers
- Alarm alert database
- Common Alarm Groups
- Annunciator keyboards, **FoxPanels**, and internal and external horns.
- How to use the **Display and Alarm manager configurator**.

- **System Administration Guide for 50 Series Systems (Solaris 2.X).**

Foxboro partno: B0193ND

This document provides system administration issues for 51 Series. It describes procedures for two different areas of system administration:

- System administration procedures, which contain instructions for maintaining the stations, e.g., shutdown, backup and restore procedures.
- System connectivity, which describes the procedures for connecting the optional second Ethernet port of the stations to standard networks, such as DECnet and networks running TCP/IP

The document also describes how to configure operating system parameters that support "scalable processing" for 51 Series AP's, WP's, and AW's. These configurable parameters allow optimum utilization of operating system resources to support varied application requirements in the above processors without having to be recoded for each processor.

- **Display Engineering for 50 Series**

Foxboro partno: B0193MQ

This document is intended for process and software engineers who are responsible for developing process control and application displays. It provides information needed to develop, convert and install display applications on 50 Series Workstations Processors (WPs) and Application Workstations (AW's). This document describes multi-instance Display Manager, multi-instance Alarm Manager, the display engineering tools and display databases available. The tools are utility programs that are executed from a VT100 window on the workstation.

- **SBus Card Kit Installation Procedures for 50 Series Processors.**

Foxboro partno: B0193SC

Describes the Sbus cards currently supported by Foxboro and how to configure them.

Just to keep you informed...

1.8 Conventions.

The conventions used in this document are listed below.

When you see this:	It means this:
[autoexec.bat] (typeface: ARIAL BOLD)	This typeface indicates a filename of which the contents are printed starting on the next line. This line is NOT part of the file contents.
Loadhigh doskey (typeface: courier normal)	Text printed like this is ASCII text as it appears in a file indicated with [filename] or to display a pathname or filename in normal text. When used to indicate a command, type the command on one line until <CR> which means to hit the ENTER key.
Loadhigh doskey (typeface: courier bold)	Text printed like this is ASCII text as it appears in a file indicated with [filename] and indicates a modification.
Use this data (typeface: ARIAL NORMAL)	This font is used to show a list of data to be entered in a location indicated in the text. Also used to describes a procedure.
File / Run... (typeface: Times Roman BOLD)	This is to indicate a Microsoft Windows command sequence. Here it means: select File from the menu and then select Run.
Program name (typeface: Times Roman BOLD)	In normal text BOLD means to indicate either a program name or Windows group name.
<Alt_F4> (typeface: courier normal)	This type of text means: press the keys mentioned between brackets simultaneously. In this case press the "ALT" key on your keyboard <u>together</u> with the function-key "F4"

1.9 Revision history.

Revision number:	Description:
Revision 1	First release in Dutch language for department use only.
Revision 2	Second release also in Dutch but new layout and mainly an error fix.
Revision 3	Internal use only. Not released.
Revision 4	- Layout and formatting changed. Added a table of contents and included installation for SolarNet version 1.1. - From now on also an "English" version!
Revision 5	- Added installation for eXceed 5 for Windows. - Dutch version no longer maintained Reorganized manual.
Revision 5.1	Minor changes. Typing errors fixed.
Revision 5.2 (April 3, 1996)	Login procedure made easier for eXceed package. The go_dm script has changed.
Revision 5.3 (May 8, 1996)	- Iconized windows do not redraw correctly. Changed <u>Backing Store</u> option in eXceed config from <u>When Mapped</u> to <u>Always</u>. See sections: Changing Performance Settings - An error was corrected in the client start-up section for eXceed 5 for Windows. In the display showing the Login information the Start method was displayed as <u>REXEC (TCP/IP.SPX)</u>. This should read <u>RLOGIN</u>.
Revision 5.4 (July 25, 1996)	A problem was reported concerning the <u>blink task</u>. This task may crash resulting in displaying only 16 of the 32 colors in the Display Manager. To resolve this potential problem a <u>sleep</u> of 5-10 seconds must be inserted between the "blink statement" and the "display manager start" in either the go_dm or .profile files. This does not concern all I/A versions.
Revision 6.0 (May 27, 1997)	- Added installation for eXceed 5 version 5.1.3. for Windows'95 and Windows NT 4.0 - Added hardware installation in Windows'95 and NT 4.0 environments. Reorganized several chapters.

X-Terminal Installation for I/A 50 Series

Remote Display Manager and Foxview



Revision number:	Description:
Revision 6.1 (June 1998)	- Made important changes to .profile and go_dm files to obtain a much more stable X-window operation. - Added additional information on DM and menu bar configuration. - Added a list of related documents in the Introduction section. - Added remarks for Font problems encountered with eXceed installation. (uncheck the "Automatic Font Substitution" option in the X-Config utility. - Converted all pictures to gray-scale to reduce document size. (was 27Mb reduced to less than 8Mb). - Inserted my e-mail address in the introduction section.(yes, I know it's a stupid thing to do)
Revision 7.0 (January 1999)	- Support for installing eXceed 6 for Windows'95 and Windows NT - Removed the SolarNet and NFS chapters from this document. (Available as a separate document). - Added chapter for Linux RedHat 5.1 installation.(very preliminary- feedback is welcome). - Included go_dm file layout with FoxView support. - Added AW/WP 51E support. - Added Table of Content in each chapter.
Revision 7.1 (June 1999)	- Once again modified the way you start the X-terminal session. Thanks to Art Arruda for the feedback on this. - Dual screen NT X-terminal support. Thanks Bram Marsman for his work on this subject. - eXceed 6.1 with true color display settings. - Added AW/WP 51D support. - All chapters are modified to reflect the use of a common configuration. - Included info for eXceed versions 6.1 for 95 and NT and 5.2.1 for Windows 3.x.
Revision 8.0 (April 2001)	- Swapped the "old" chapter 2 and 3. It made more sense to get to the Hardware setup first and after that configure the software. - Added new chapter 2. A "Quick Start" section. Still in the works though. - Added FAQ section. - Added installation info for eXceed 6.2 on Windows 2000 - Added installation info for WRQ 's Reflection X version 7.7 on Windows 2000. - Removed Linux section. It was too old and no time to support it and it's really quite simple to get it running. - Moved TCP/IP installation to Hardware installation chapter. - Added info about the "ia" account. (Was not in here before!!)
Revision 8.1 (July 2002)	- Some Invensys legal stuff here and there. - New e-mail address for feedback - Added eXceed 7.0/7.1 for Windows 2000 Professional. Thanks Debbie Proctor for your inputs. - Added installation tips for Xvision 2K, I would like to thank Duc M. Do for his inputs on this. - Removed the eXceed for Windows 3.11 Chapter and cleaned up some related stuff too. - Added some FAQ's
Version 9.0 (August 2004)	- Converted to OpenOffice.org version 1.1 which explains new layout - Added dynamic IP address support in this version. - Exceed on Windows XP platform documented. - Documented RealVNC Server configuration for Solaris 2.5.1

2 Quick Start

Flying start for experienced users. Run into trouble at the speed of light if you only think you are...

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2.1 Introduction.

Here is the chapter you have all been waiting for. Especially for those smart people among you that will definitely never ever need support of any kind, because they already know. Just in case you not so sure anymore, or just want to see if you did not forget anything important, this may be a nice place to look. Also, **QuickStart** is usually intended for experienced people, so you can show off to Co-workers with your assumed knowledge. Being under the assumption that since you are reading this particular part of this document you are familiar with the subject, this chapter is rather short.

2.2 The “ia” account.

This account is part of the Foxboro standard installation. The user-name is “**ia**” and the password is “**remote**”. Always use this account to set-up a X-terminal. It makes sense to change the password for this account. Consider “locking” the password (this can be done with the “**admintool**”) Locking can be a virtue when you have many X-terminals with users that can access the VT100 shell. Since all users are using the same account it can be annoying if one of them alters the password for this account. (in other words: It becomes an administrator’s nightmare). Do not contact me if you are using the “**root**” account for X-terminals. There is no need for that and most of all I don’t like it.

2.3 The “root” account.

Don’t use it for X-terminals. See the previous section.

2.4 The host.

Actions to be taken on the host:

1. Install and configure the network hardware.
2. Install and configure any additional licenses required for the Xterminal you are configuring.
3. Setup the `/usr/fox/customer/hi/dmcfg` file for the additional **DM/Foxview™**.
4. Cleanup the `.profile/go_dm` file available in `/opt/ia`. When using `go_dm`, make sure `.profile` is empty. Make the `go_dm` file executable. (`chmod 700 go_dm`)
5. Edit the `/usr/fox/wp/data/am_cmds` file to eliminate the protection class of 100. This will enable the **ack** button etc., on the Current alarm displays.

Well let’s go through these steps a little further.

2.4.1 Network hardware.

In the Foxboro host stations you can either install a PCI or a SBus card for the network communication. The type of interface, PCI or Sbus, is determined by the type of station: 51 style a, b, c, d etc. The type of network connection defines the type of PCI/SBus card that is required. Maybe you already have a network card installed but not configured because of a mirrored SCSI disk configuration, since this type of card is often a combination of SCSI and (Fast) Ethernet. Verify the proper installation. To check if the card is up and running try “**ifconfig -a**” , if not OK check the following files:

- Is the name you selected for the secondary ethernet port entered with a valid IP address in /

etc/hosts?

- Is there a file `/etc/hostname.leX` or `/etc/hostname.hmeX` that corresponds with the information gathered from the `prtconf | grep le` or `prtconf | grep hme` command?
- When all is correct, and you are using a vt100 screen on the host, can you “ping” the X-terminal, can you ping yourself?

If the command “`prtconf|grep le`” responds with a line reading something like: **le, instance #1**, you must have a file in `/etc` with the name `hostname.le1`. This file should contain the name for the second ethernet connection. (This can NOT be the same as the nodebus name.)

If the name in `hostname.le1` is `blurps`, then in the `/etc/hosts` file there must be an entry that specifies `blurps` with an IP address i.e:

```
192.168.120.10 blurps
```

This entry must not be in the same location as the standard Foxboro I/A Series IP addressess, so note the Start and End delimiters in this `/etc/hosts` file.

2.4.2 DM/FoxView™ license.

In order to use the DM/Foxview a license must be purchased/installed and this must then be added to the system configuration. This is an action under control of the **System Definition** program. Contact your Foxboro representative if you need help/DM/FV.

2.4.3 DM/Foxview™ configuration.

Things such as the initial environment, default actions to be taken at startup, is the DM resizable or not, is there an Alarm Manager configured, which X-terminal have access to this DM/FoxView, etc, are configured in the `dmcfg` file.

This file is located `/usr/fox/customer/hi/dmcfg`. The X-terminal is defined with a line like this:

NAME	BLURPS	XDM001	XTERM1	RemoteOperator
------	--------	--------	--------	----------------

This line defines:

parameter:	name
host:	BLURPS
Dmname:	XDM001
X-term name:	XTERM1
Class:	RemoteOperator

If the DM/FV is going to be dedicated, (this means limit the accessibility fot remote station to this DM/FV), the X-terminal name must also be present in the `/etc/host` file:

```
192.168.120.11 XTERM1
```

2.4.4 The “Go_dm” and “/.profile” files.

These are very important files. They setup the environment for the DM/FoxView™ to operate. The file is located in /opt/ia, which is the home directory for the user ia. When you are using eXceed's X-server: move the .profile file to a file go_dm, and make this go_dm file executable. When you are using another X-server on the PC, you may need to take similar, or completely other steps ;-)). **When you have a go_dm file, make sure .profile is no longer a copy of go_dm empty or is non-existent.**

2.4.5 Xterminal tuning.

The remotely displayed DM/FoxView™ are different from a local DM/Foxview™ in at least these ways:

- All settings of Control Processor parameters are disabled.
- Access to all configurators and most applications is disabled.
- Accessing the Alarm Display will NOT silence the annunciator horn.
- Clearing alarms function from the Alarm Display is disabled.
- Redirection of displays from the Alarm Display is disabled.
- Acknowledging alarms from the Alarm Display is disabled.
- Muting and unmuting horns from the Alarm Display is disabled.

This can be changed. I suggest you look into the related chapter in this document to come up with a good solution. If you only want the DM/FoxView to act similar to the local screens, make the following changes: In the environment files that are accessed by the X-terminal add these lines:

```
dmcmd protect all
dmcmd unprotect all
dmcmd enable omsets
```

In the am_cmds file (in /usr/fox/wp/data) insert comments in these lines:

```
# == $AM_LOCAL N amcmd protect value 100
                                # protect access to single instance applications
# == $AM_LOCAL N amcmd disable all
                                # disable clearing alarms, ACKing, and Horn Muting
                                # remote DMs by default
```

This should do the trick.

2.5 The X-terminal.

For the PC X-terminal there are some other things to look at:

- Check the network hardware. Is the card properly installed and is the type of cable corresponding with the card settings?
- Make sure that the TCP/IP protocol installed and configured.
- Is the X-Server of your choice properly configured? Check for things like **backing store**, **save unders**. Always select the maximum settings for these.
- Are the **Foxboro** fonts copied from the host and are they configured for the X-terminal?
- Is the PC VGA display set for 256 colors or, when using true color settings, is the X-server properly configured for this? To be safe, try 256 colors first and then work your way up from there.

- Use: `exec /opt/ia/go_dm` as the start command for the **DM/Foxview™**. Use **rlogin** as the preferred connection method. Use the **ia** account provided with “**remote**” as the password.
- You want to use DHCP? Read the special section on this subject.

Need more info? Read the rest of this manual

3 The Network Hardware and Software.

Get the hardware and network software on both sides properly configured.

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3.1 Introduction.

The X-terminals communicate with the I/A Series hosts through the use of a secondary Ethernet connection. How to set-up this interface in the I/A Series station and how to set-up an interface in the PC platform is covered in this chapter. To establish communication over an alternative network on a AW/WP51 an additional network interface is required since the primary (on-board) network-interface is used exclusively for communication with the I/A nodebus. This SBus/PCI type adapter has to be added to AW/WP51's and will be used in this set-up to establish the communication between the I/A series platform and the X-Terminals over this secondary network connection. Also on the PC platform a network adapter needs to be set up. If you already have the hardware properly configured on both platforms, you can skip this chapter.

3.2 Installing the SBus/PCI Ethernet card.

The Foxboro 51 Series stations are equipped with one or more expansion slots for which a large variety of cards is available. The station types AW/WP51A, AW/WP51B and AW51C have SBus slots as for the 51D and AW51E stations are built around the PCI standard. Below you can find the rear views of the different Foxboro supported processors. The numbering of the SBus and PCI slots is also found in these pictures.

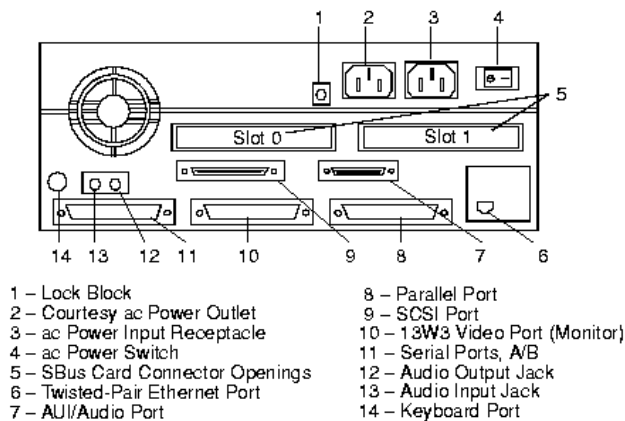


Illustration 3.1 Model 51A rear panel connections.

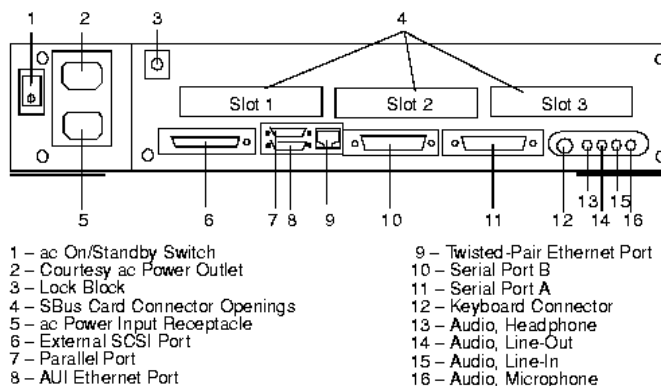


Illustration 3.2 Model 51B rear panel connections.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview

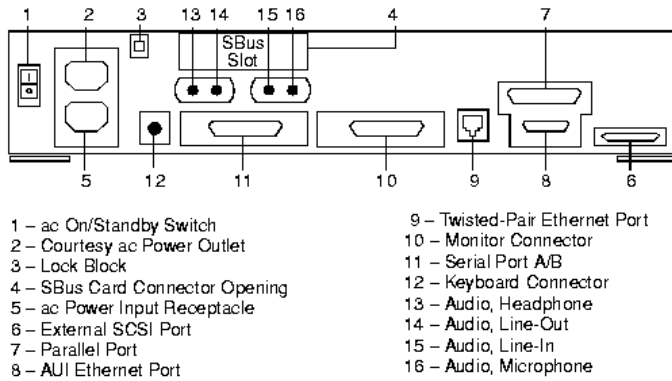


Illustration 3.3 AW51C rear panel connections

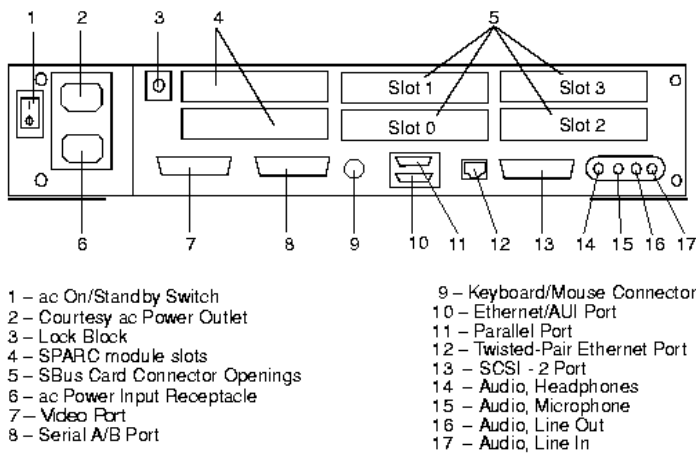


Illustration 3.4 AW51C rear panel connections

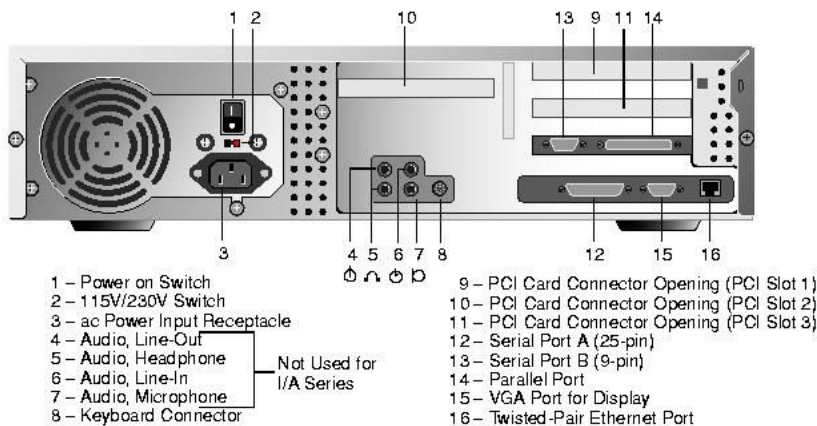
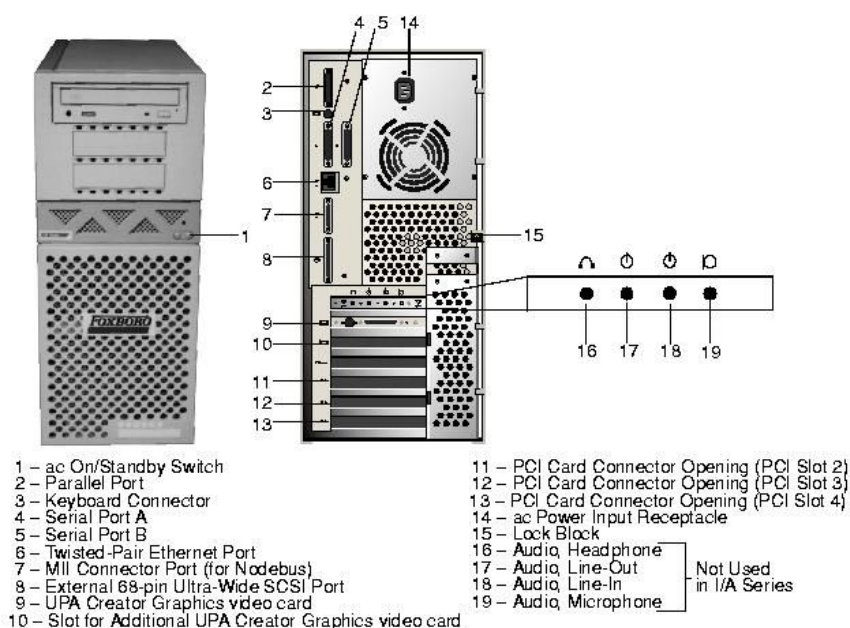


Illustration 3.5 WP51D / AW51D rear panel connections

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview



NOTE: AW51E (Style C and up) has a slightly different front panel than the one shown above.

Illustration 3.6 AW51E rear panel connections

Please be aware of some restrictions when deciding for the SBus/PCI slot position to be used for your Network card: When a combined SCSI/Network type of card will be used and Disk Mirroring is installed on your system the SBus/PCI card has to be installed in a specific slot for the mirrored disk to be bootable. When you (will) have a dual headed configuration the videocard for the second CRT also requires a specific slot for the second head to function properly, excluding this slot for the network adapter. The next table may be of use to determine your best configuration:

Station type	Disk mirroring installed:	Dual head installed:
AW51A, WP51A ¹	2 nd SCSI = Sbus slot 1	1 st Video = on-board 2 nd Video = SBus slot 0
AW51B, WP51B ¹	2 nd SCSI = Sbus slot 2	1 st Video = Sbus slot 3 2 nd Video = SBus slot 1
AW51C	2 nd SCSI = Sbus slot 3	1 st Video = Sbus slot 2 2 nd Video = SBus slot 0
AW51E	2 nd SCSI = PCI slot 4 or RAID 1/5	2 nd Video = video slot 2 ²
AW51D, WP51D ¹	RAID 1/5 SCSI card in PCI slot 1	2 nd Video = PCI slot 2

Table 1 Supported slots for LAN cards

¹ Note: Disk mirroring does not apply to WP's.

² With a 51E station the 2nd video is a special card that never installs in a PCI slot

Both the 51 model D and E allow only one additional instance of functions. This means that only one additional Ethernet card and/or additional SCSI card can be installed in the system.

3.2.1 SBus: The AUI / Ethernet card. (Foxboro partno: P0970PX).

The card we are using here is the Ethernet card featuring both ThinNet (BNC type) and ThickNet (Transceiver) connections (Foxboro partno: P0970PX). This is the default card installed when the station is ordered with a secondary Ethernet connection. On the AUI Ethernet SBus card you will find a bank of dipswitches that are used to configure the SBus card. The possible switch setting for this card are indicated below:

ThinNet	BNC	all switches on. (7 & 8 off / not relevant)
ThickNet	AUI	all switches off with an externally powered transceiver.
ThickNet	AUI	all switches off except number 7 & 8 with an internally powered transceiver.

Only one of the two types (AUI or BNC) can be set at a time.

3.2.2 SBus: Fast SCSI / UTP (10Mbps) Ethernet. (Foxboro partno: P0971BJ).

The Fast SCSI/UTP Ethernet combo card is a card, which is normally used to implement mirrored disk drives. When using this SBus card there is one jumper (J0302) related to the Ethernet section on the card. This jumper is used to configure 10Base-T Link Integrity. When the jumper is removed the Link Integrity feature is enabled. This is the default setting when the card is shipped. If for some reason there is no way to communicate between the AW/WP and the HUB it may be a good idea to check this jumper. Both the HUB and the AW/WP should have similar settings for Link Integrity testing or communication will fail. A HUB is required to connect the host and the X-terminal. When only one X-terminal is direct-connected a "NULL-HUB" (Foxboro partno: **P0971PK**) can be used.

3.2.3 SBus: Fast SCSI / UTP 10/100 Mbps Ethernet I/F Card. (Foxboro partno: P0971SD).

The Fast SCSI Plus Twisted-Pair 10/100 Mbps Ethernet I/F card operates at either 10 or 100 Mbps with both RJ-45 and an Media Independent Interface (MII) connector. The Fast SCSI Plus Twisted-Pair 10/100 Mbps Ethernet I/F card does not require any switch setting or jumper installation procedures. The card is configured at the factory. In conjunction with the installation of the Fast SCSI plus Twisted-Pair 10/100 Mbps Ethernet I/F card, there is a corresponding software package that must be installed. This software package is delivered on CD-ROM as part of the installation kit. A HUB is required to connect the host and the X-terminal. When only one X-terminal is direct-connected a "NULL-HUB" (Foxboro partno: **P0971PK**) can be used.

3.2.4 PCI: UW-SCSI / UTP 10/100 Mbps Ethernet. (Foxboro partno: P0971UC).

This card features a fast Ethernet connection as well as an Ultra-SCSI interface. When using this card for disk mirroring the card must be placed in PCI slot 4. For the second Ethernet only the card can be placed in any of the PCI slots 2, 3 and 4. **PCI slot 1 is not used with I/A Series configurations.** When configuring this card the file `/etc/hostname.hme1` must exist with the name for this station on the second Ethernet. To find out if the card is properly configured and

recognized by the system run the procedure in the next item. A HUB is required to connect the host and the X-terminal. When only one X-terminal is direct-connected a “NULL-HUB” (Foxboro partno: **P0971PK**) can be used.

3.2.4.1 Checking configuration.

To find out whether or not a second Ethernet card is in the system, power up the station and press **<Stop-A>** when the banner appears. This will present the **ok** prompt. At this prompt enter the command:

```
ok show-devs <CR>
```

This will give you the list of system devices. Two example lists are printed below, together with an explanation of the lines that indicate the presence of the network cards:

```
ok show-devs <CR>
/SUNW,ffb@1e,0
/SUNW,UltraSPARC@0,0
/pci@1f,2000
/pci@1f,4000
/counter-timer@1f,1c00
/virtual-memory
/memory@0,0
/aliases
/options
/openprom
/chosen
/packages
/pci@1f,2000/pci@2
/pci@1f,2000/pci@2/SUNW,isptwo@4
/pci@1f,2000/pci@2/SUNW,hme@0,1
/pci@1f,2000/pci@2/pci108e,1000@0
/pci@1f,2000/pci@2SUNWisptwo@4/st
/pci@1f,2000/pci@2SUNWisptwo@4/sd
/pci@1f,4000/scsi@3
/pci@1f,4000/network@1,1
/pci@1f,4000/ebus@1
```

In the list above make note of the presence of the following entries:

- **isptwo** indicates the presence of the SCSI interface on the PCI card.
- **hme** indicates the presence of the UTP 10/100 Mbps Ethernet interface on the PCI card.
- **network** indicates the presence of the onboard network interface.
- **scsi** indicates the presence of the onboard SCSI interface.

If the four items mentioned here are NOT present in the list there is a problem with the PCI interface. This requires checking the card's installation and, maybe, reinstalling the PCI card

3.2.5 PCI: UTP 10/100 Mbps Ethernet with MII Connector. (Foxboro partno: **P0971UE** or **P0971UF**).

This card provides a fast Ethernet connection featuring the **MI** connector. To check the configuration of this card in the system, follow the procedure below. **MI** is the abbreviation of **Media Independent Interface**. The P0971UF card comes with a special **MI** converter to connect

the card to the 10/100Mbps network.(Foxboro part number for this cable is: **P0971TR** and it is part of the **P0971UF** kit). A HUB is required to connect the host and the X-terminal. When only one X-terminal is direct-connected a “NULL-HUB” (Foxboro partno: **P0971PK**) can be used.

3.2.5.1 Checking configuration.

To find out whether or not a second Ethernet card is in the system, power up the station and press **<Stop-A>** when the banner appears. This will present the **ok** prompt. At this prompt enter the command:

```
ok show-devs <CR>
```

This will give you the list of system devices. Two example lists are printed below, together with an explanation of the lines that indicate the presence of the network cards:

```
ok show-devs <CR>
/SUNW,ffb@1e,0
/SUNW,UltraSPARC@0,0
/pci@1f,2000
/pci@1f,4000
/counter-timer@1f,1c00
/virtual-memory
/memory@0,0
/aliases
/options
/openprom
/chosen
/packages
/pci@1f,4000/SUNW,hme@4,1
/pci@1f,4000/pci@2
/pci@1f,4000/pci@2/pci108e,1000@4
/pci@1f,4000/scsi@3
/pci@1f,4000/network@1,1
/pci@1f,4000/ebus@1
/pci@1f,4000/scsi@3/tape
/pci@1f,4000/scsi@3/disk
```

In the list above make note of the presence of the following entries:

- **SUNW,hme** indicates the presence of the UTP 10/100 Mbps Ethernet interface on the PCI card.
- **network** indicates the presence of the onboard network interface.

If the two items mentioned here are NOT present in the list, there is a problem with the PCI interface. This requires checking the card's installation and maybe reinstalling the PCI card

3.3 Determine current configuration of the installed SBus cards.

To find out whether or not a second Ethernet card is in the system the following command can be of assistance:

```
ifconfig -a
```

Where the parameter **-a** applies this command to all interfaces in the system. Enter this command from either VT100 mode or VT100 terminal:

```
<letterbug> #ifconfig -a <CR>
```

```
lo0:flags=849<UP,LOOPBACK,RUNNING,MULTICAST> mtu 8232
    inet 127.0.0.1 netmask ff000000

le1:flags=863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST> mtu 1500
    inet 8:0:20:1e:13:92

le1:flags=863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST> mtu 1500
    inet 152.155.148.231 netmask ffff0000 broadcast 152.155.255.255
    ether 8:0:20:1e:13:92
<letterbug> #
```

All installed SBus cards are reported. As we will see later: for a new network card, a file with the name like `hostname.leX` file must exist. The value of X in the filename is dependent of the SBus slot in which the card is placed. Depending on the SBus position this filename can be `hostname.le1`, `hostname.le2`, `hostname.le3`, etc. To determine the value of X the command **prtconf** can be used. This command returns an output from which this information can be derived. Again, log on to the AW/WP51 via VT100 mode or via a VT100 terminal. Change directory to `/etc` on the AW/WP and enter the next command:

```
<letterbug> # prtconf | grep le <CR>
ledma, instance #0
le, instance #0
lebuffer, instance #0
le, instance #1
profile, instance #0
<letterbug> #
```

One line (printed BOLD) indicates that the file to be created (if it does not exist) for this just installed network card is `hostname.le1`. For the contents of the files please see section: on page .

3.4 The PC Network Interface Card.

The PC also requires an network interface of some kind. For some of the cards used at Foxboro you can find some detailed information on how to install them.

3.4.1 The 3Com Etherlink II.

This card is rather aged at this moment. It is however still in use in many locations and also well supported by almost every Operating System I've come across. The CPU load this card is causing is a bit higher than most modern cards and it is not one of the best performers either, but it is useful. To install this card, locate a free slot in the PC and place the card until firmly seated in the slot. The 3Com Etherlink II is an (8-bit / 16bit slot) adapter which is configured installing a number of jumpers to determine the required settings and an Etherdisk™ diskette with the driver and test software. This disk should also be supplied. (It can be obtained through the Internet)

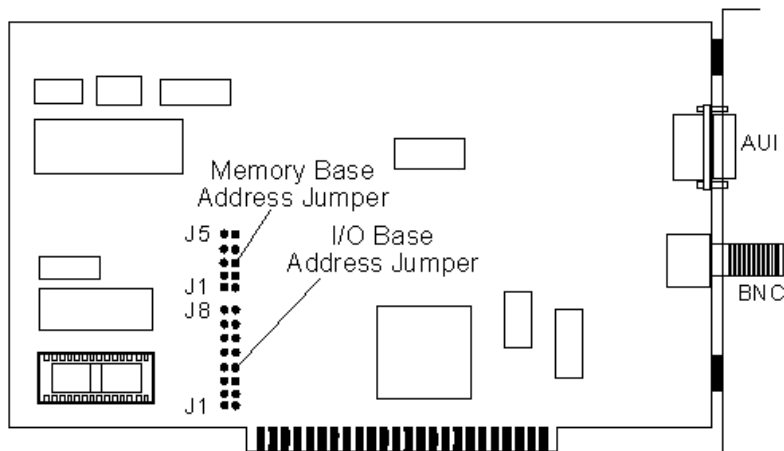


Illustration 3.7 3Com Etherlink II Typical board layout

The card settings used in this setup:

Interrupt	3
I/O address	300h
DMA ch.	1
Memory base address jumper	DISABLE
DATAMODE	16 bits (When placed in a 16bit slot)

Use the Etherdisk™ supplied with the card to determine the current settings of your card. The driver diskette used to configure the adapter should be version 3.4 or higher. It is advised to copy the contents of the floppy to your system disk so the floppy can get lost without a problem. Since the diskette contains several subdirectories a few options must be added to the “xcopy” command that is going to be used: The default directory used:

```
c:\> md \3comset <CR>
```

Place the configuration diskette in drive a: and type:

```
c:\> xcopy a: c:\3comset /s /e <CR>
```

This command copies all files and subdirectories from the diskette in the a: drive to the directory c:\3comset on the harddisk. To start the configuration utility at the DOS prompt type:

```
c:>\menu <CR>
```

This results in a screen like the one shown:

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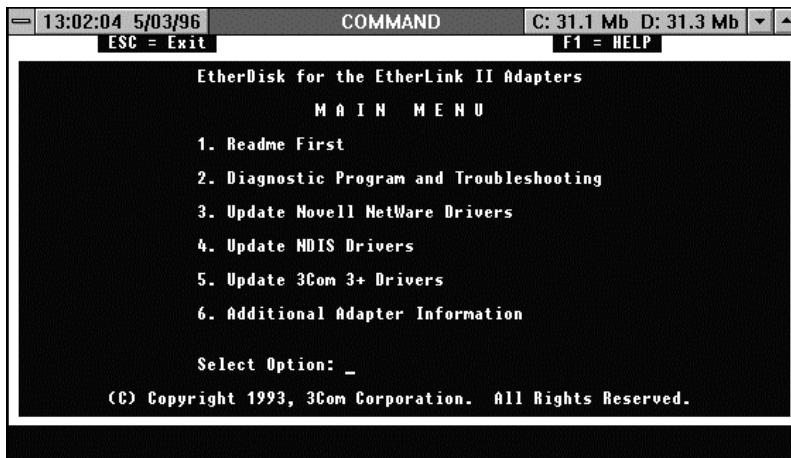


Illustration 3.8 Etherdisk Main Menu

To view the current setting of the card select option **2 Diagnostics Program and troubleshooting..**

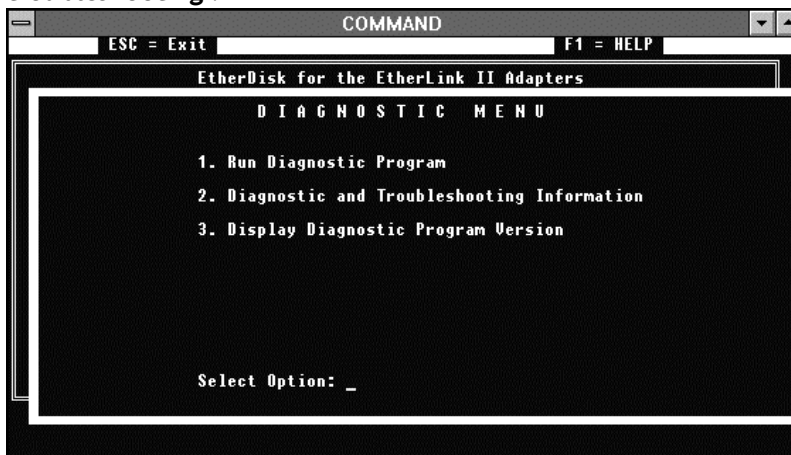


Illustration 3.9 Etherdisk Diagnostics Menu for the Etherlink II

Now select option **1 Run Diagnostic program.**



Illustration 3.10 Run diagnostics on the Etherlink II

When pressing **ENTER** here and on the next screen, you will see the current settings of this

installed card..



Illustration 3.11 Configuration overview and current settings for the Etherlink II

If the displayed settings do not match your requirements the card must be reconfigured by setting the jumpers on the card and/or by changing the software settings in your communications software (i.e. the TCP/IP configuration in Windows for Workgroups, PC-NFS, Windows 95 or Windows NT, etc).

3.4.2 The 3Com Etherlink III.

This Ethernet adapter is (or should be) supplied with an Etherdisk™ driver diskette used to configure the adapter. This card complies to the ISA PNP standard. This standard allows the operating system and PNP hardware to assign the resources required for this card. Depending of the OS that will be used the card must be configured with this Etherdisk™ disk.

3.4.2.1 With MS-Dos/Windows 3.xx/Windows NT 4.0.

It may be a good idea to copy the entire contents of the Etherdisk™ to the harddisk. This has the advantage of speeding subsequent installation routines since it is now running from harddisk, but also when in the future a new card is placed in the system it can be configured even when the diskette is lost (and it will be!). Since the diskette contains several subdirectories a few options must be added to the "xcopy" command that is going to be used:

First create a home directory for the files:

```
c:\> md \3comset <CR>
```

Place the configuration diskette in drive a: and type:

```
c:\> xcopy a: c:\3comset /s /e <CR>
```

This command copies all files and subdirectories from the diskette in the a: drive to the directory c:\3comset on the harddisk.

The next section describes the configuration procedure for the 3Com Etherlink III using the software just installed. The 3Com Etherlink III is an ISA Plug & Play network adapter. To function properly a Plug & Play operating system like Windows '95 is required, since Windows NT is NOT Plug & Play this feature must be disabled for the adapter when using it in this environment. In this case the card is configured using the DOS based Etherdisk™ menu.

Change directory to [c:\3comset](#), type "menu" and press "ENTER"

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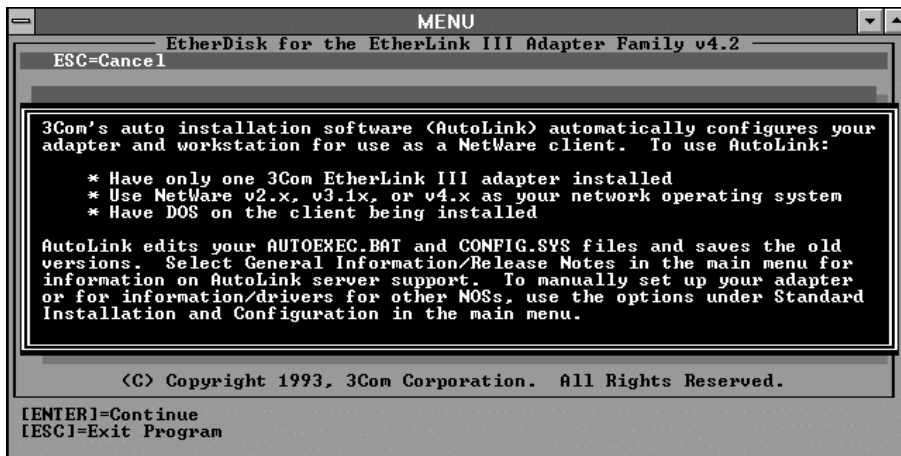


Illustration 3.12 Etherdisk Menu for the Etherlink III (ISA)

The screen as below appears where to choose option: **"Auto Configure 3Com ISA Adapter"**.

After successful completion, hit "any key" to go back to the previous menu.

Now select the menu item: **"Configuration/ Diagnostics/Troubleshooting..."**

In this menu, pick option: **"Configuration and Diagnostic Program"**. A new display appears:

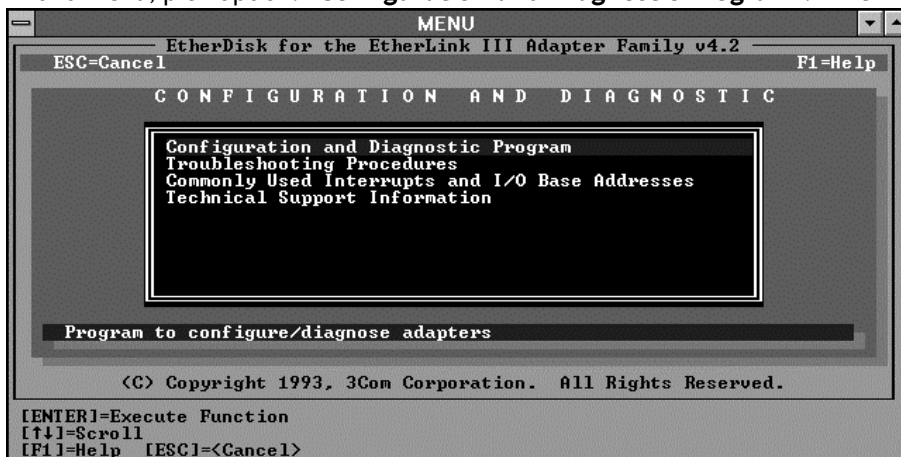


Illustration 3.13 Etherdisk Configuration and Diagnostics for the Etherlink III

In the menubar you will find an option **"Install / Configure Adapter... (F4)"** Select this option and press **ENTER**.

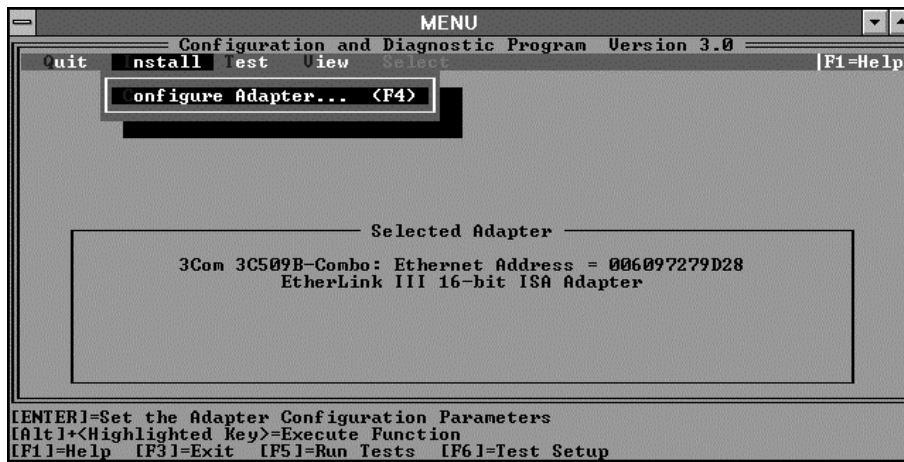


Illustration 3.14 AutoConfiguring the Etherlink III Adapter

Using the "tab" key and arrow keys, highlight the option **"Plug and Play Capability Enabled"** and press **"ENTER"**.

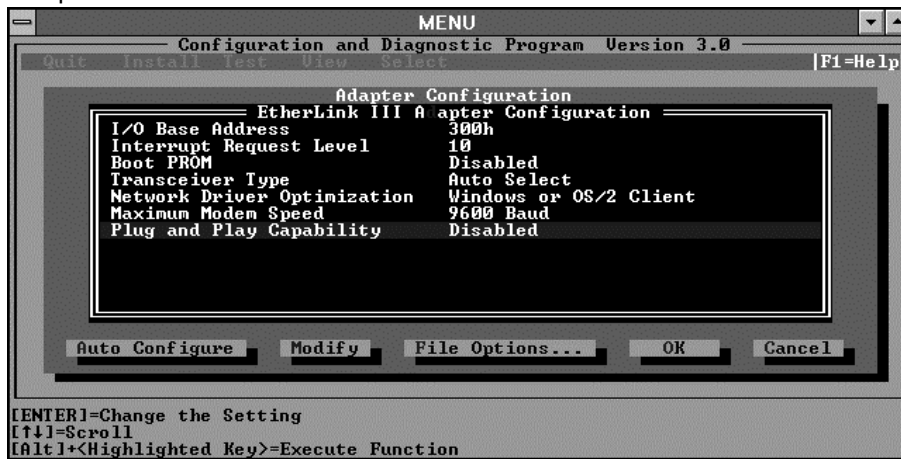


Illustration 3.15 Etherlink III Configuration information

To save the settings made so far to the card you must highlight **"OK"** and press **"ENTER"**. The program now reports that the configuration is being written to the card. To activate the configuration, the PC must be powered down and up to configure the adapter. The card is now configured to be used by your network communication software.

3.4.2.2 With Windows 95.

Since Windows 95 is a PnP operating system the card is best set to PnP capability. Follow the procedure mentioned in the previous section to establish this. Of course the last option must be set: ENABLE when Plug and Play Capability is selected.

3.4.3 The 3Com Etherlink III with Windows NT 4.0.

Although this section concerns the installation and configuration of a 3Com network interface card, the procedure is identical for most other network interfaces available.

3.4.3.1 If the card is present when installing NT.

The 3Com Etherlink III Network Adapter usually detected by the Windows NT installation, if this is not the case please refer to the previous section to **disable** the PnP setting of the card since NT is not a PnP operating system. The settings can be found in the **control panel** located on the desktop in the **My Computer** icon. Open the Control Panel by double clicking. Locate the **Network** icon



Illustration 3.16 Windows NT Control Panel (icon view)

These settings can of course vary with your configurations demands. Please check with your system administrator for a valid IP address.

3.4.3.2 Adding the network card to Windows NT.

When Windows NT is installed and the Etherlink III is later added to the system, the Network Adapter has to be added using the **Control Panel**.



Illustration 3.17 Windows NT Control Panel (icon view)

In this window an icon **Network** is found. To add adapter and/or protocol open the **Network** icon. When the Network box is displayed select the **Adapters** tab and choose add... to select the adapter installed in the system.

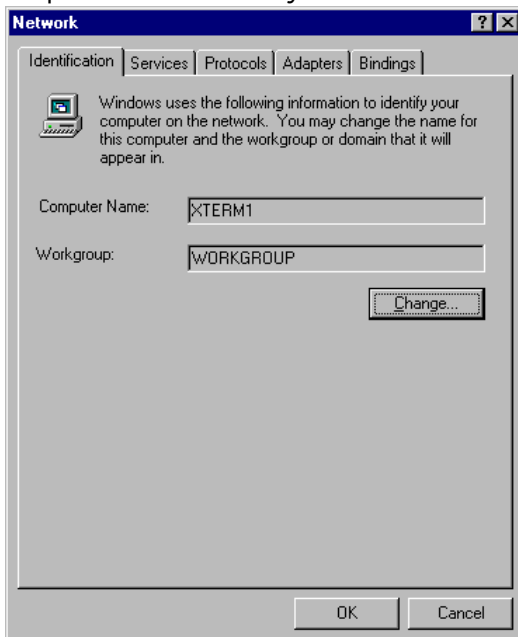


Illustration 3.18 Available tabs in Network settings

If the Adapter is not listed choose **Have Disk...** to load the manufacturers driver diskette. When the adapter is installed also install the TCP/IP protocol by selecting the **Protocols** tab. Adding a protocol is done in the same manner as adding an adapter. Make sure that the settings entered in **Protocol / Properties** are compatible with your network. Above the settings are shown as used for the Windows NT installation of **eXceed** later in this manual. Check with your system administrator for the your appropriate settings.

3.4.4 3Com Etherlink XL Combo.

Although this section deals with the installation and configuration of a 3Com NIC, the procedure is identical for most other NIC's available. The 3Com EtherLink XL is a PCI based network adapter which comes with a special driver diskette to install the card in the Windows 95 environment.

3.4.4.1 Configuring the 3Com Etherlink XL Combo for Windows 95.

This section describes the installation in case the card is identified as a **PCI Network Controller** in the **Windows Control Panel**. To find out how the adapter is installed go to the Control Panel (you can find the Control Panel via **Start / Settings / Control Panel**).



Illustration 3.19 Windows 95 System Properties tabs

Here, select the tab for the **Device Manager**. If the card is displayed with an exclamation mark it indicates that the drivers were not installed or the card is not properly configured (or both). This is due to the fact that the card registers as a PnP device demanding for driver software from either the Window 95 media or from the manufacturer's driver diskette supplied with the new hardware. In this case the card is not supported by Windows'95 standard drivers, so to install the card, select the **Properties** button and next the **Driver** tab, insert the driver diskette and

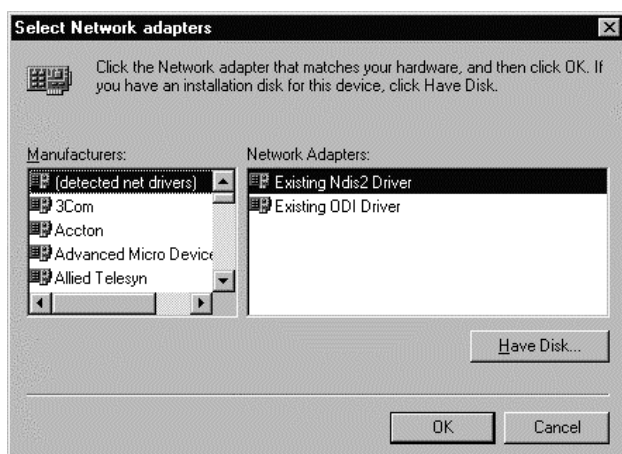


Illustration 3.20 Windows 95, Selecting an Adapter and drivers
The next screen is displayed:

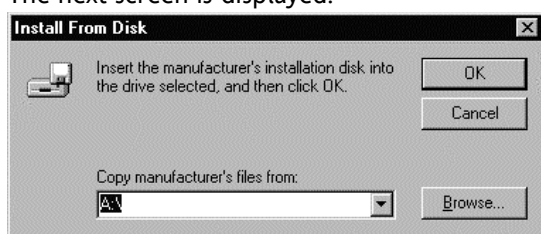


Illustration 3.21 Prompting for media...

Select **OK** to read the diskette contents.

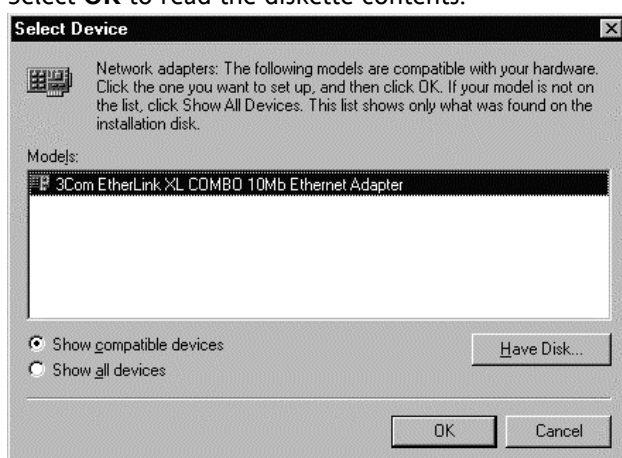


Illustration 3.22 Selecting a NIC from a (very short) list

If the adapter displayed here matches the type installed in your system click **OK**. Please insert the proper media (Windows '95 media may be required) when prompted to install all necessary software on your system. After rebooting the PC the card must appear in the section for network adapters without any remarks. This indicates that the adapter is properly configured.

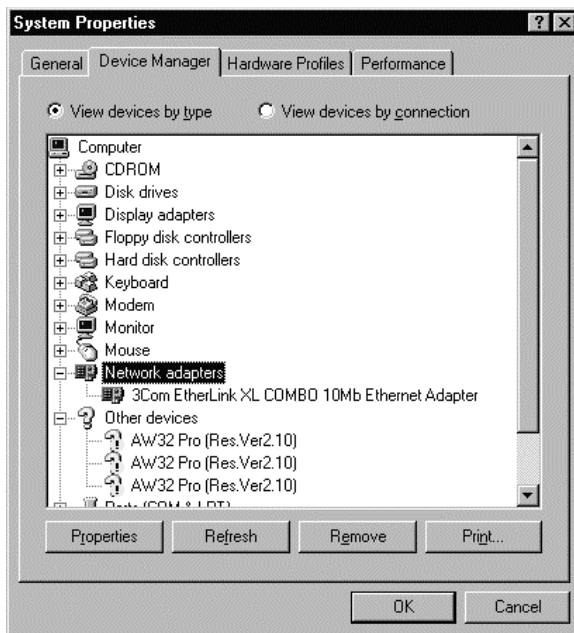


Illustration 3.23 Confirming proper installation in Windows 95 System Properties

You can now continue to install the software and / or protocols to use with this network adapter.

3.5 The TCP/IP protocol.

This TCP/IP protocol is the protocol used between the PC X-Terminal and the Foxboro I/A host. Most stable, modern and sophisticated Operating systems of today come with some sort of TCP/IP protocol. But Windows has one too. The different versions of Windows are covered here.

3.5.1 TCP/IP for Windows 95 and 98.

The Windows 95/98 operating system is supplied with a native TCP/IP protocol for network communication. For the I/A Series this TCP/IP protocol must be installed to communicate with the Solaris platform. If you already this protocol installed you can skip this section. Locate the **Control Panel** and select the **Network** icon.

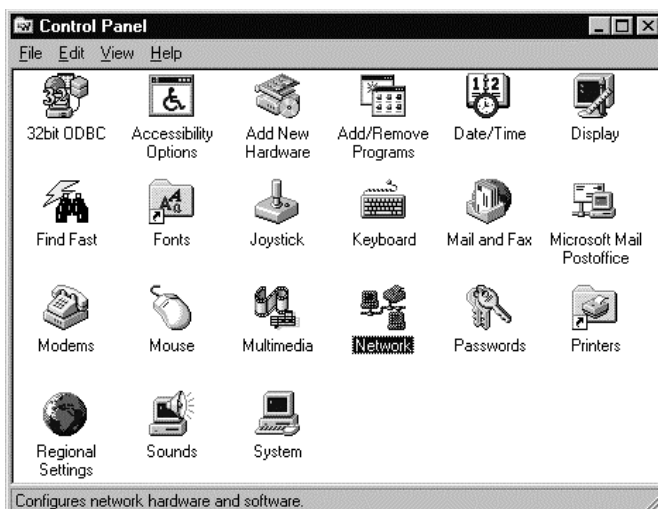


Illustration 3.24 Windows 95 Control Panel

This results in a dialog box as below:

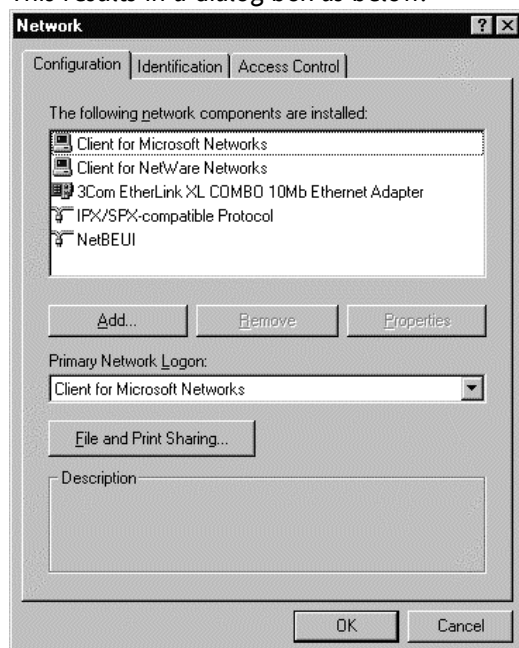


Illustration 3.25 Network settings window

Choose **Add...**.

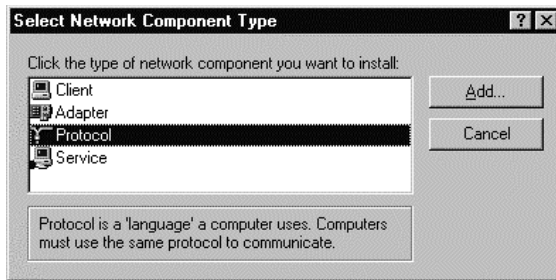


Illustration 3.26 Select Network Components: add a protocol

and select **Protocol** and **Add...** to add a protocol...The desired protocol is **Microsoft TCP/IP**...Select the this **TCP/IP** protocol and choose **Properties**. Select the **IP Address** tab and enter the appropriate IP address (here the address from the example is entered).

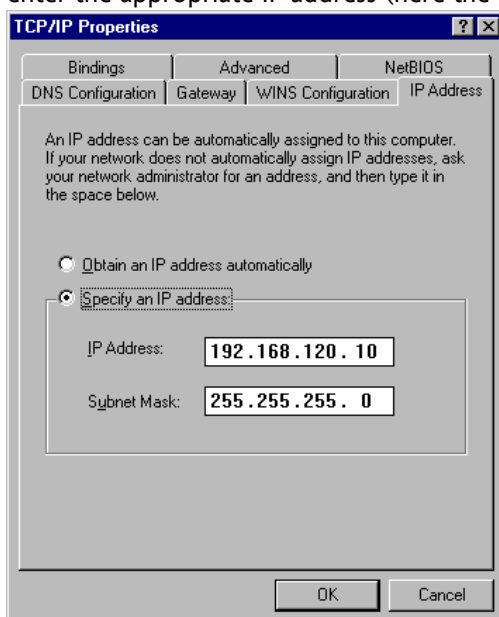


Illustration 3.27 Configure TCP/IP protocol

The Subnet Mask should be **255.255.255.0** for this class C network and this can left at the default value. Insert the media to install the software when prompted. After successful installation the systems prompts for a reboot. Select **Yes** to reboot your system and after the reboot continue with the eXceed installation.

3.5.2 TCP/IP for Windows NT 4.0.

Windows NT supplies a variety of protocols for network communication. For the I/A Series **TCP/IP** must be installed to communicate with the Solaris platform. If you already have **TCP/IP** installed you can skip this section.

To install **TCP/IP**.

Locate the **Control Panel** and select the **Network** icon. Double click to open the **Network** display



Illustration 3.28 The Control Panel

When the **Network** icon is opened you are presented a dialog which is displaying the current setting for the network. The initial screen shows the computer name you entered when installing NT.

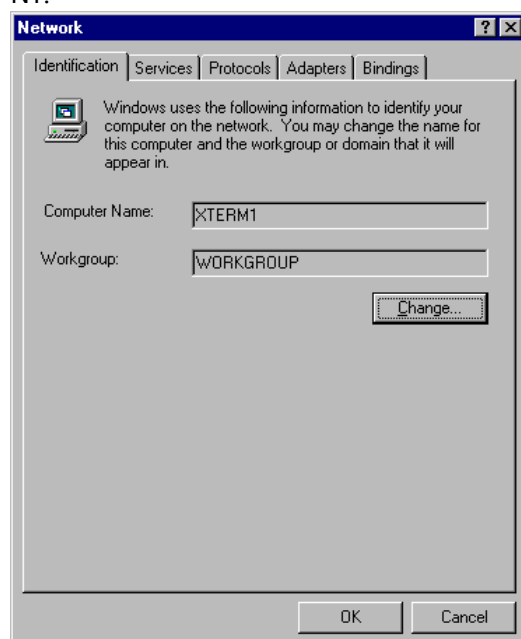


Illustration 3.29 Figure 3.2 Configure Network

Select the **Protocols** tab to add / configure the **TCP/IP** protocol. When **Add...** is selected, a list is displayed showing the available protocols. If **TCP/IP** was not installed yet, select it from the list and select **OK** to install.

Insert the media to install the software when prompted. When the installation is finished, the systems prompts for a reboot select **Yes** to reboot your system. After the reboot the TCP/IP protocol is found in the **Protocols** tab.

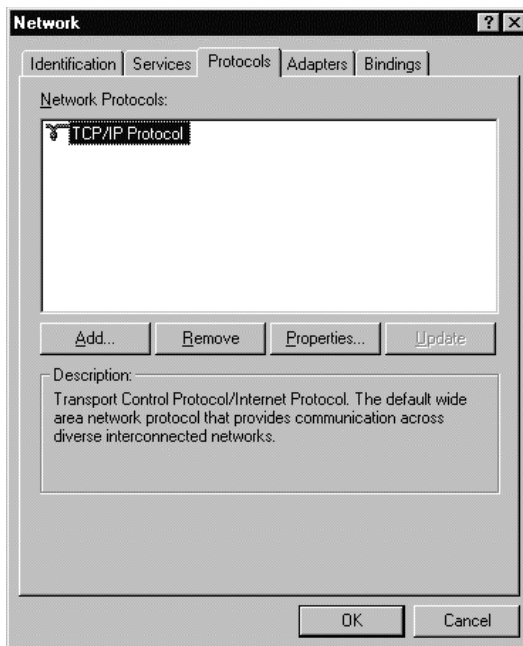


Illustration 3.30 Configuring the installed TCP/IP protocol

The next step is to configure the TCP/IP protocol. This is done by selecting the **Properties** button.

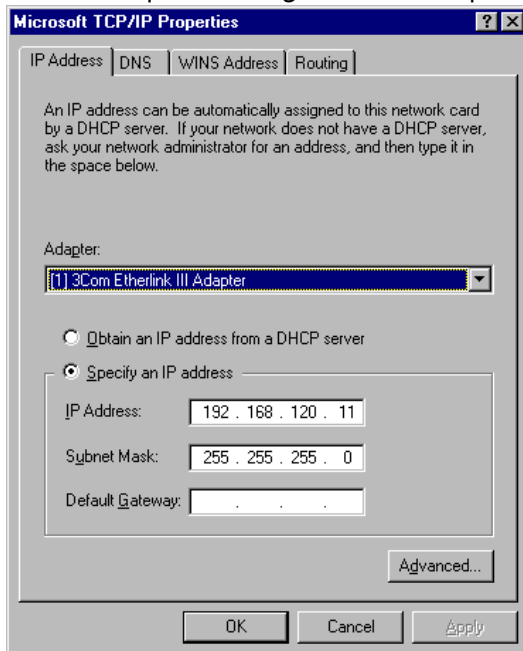


Illustration 3.31 Configuring TCP/IP

Enter the fields in this box according the specifications supplied to you by the system administrator. In this example the data as shown in the beginning of this chapter is entered. Insert the media to install the software when prompted. After successful installation the systems prompts for a reboot. Select **Yes** to reboot your system.

3.5.3 TCP/IP for Windows 2000 Professional.

Windows 2000 Professional comes with the TCP/IP protocol as standard if you choose to connect the PC to a network during Windows installation. For the I/A Series **TCP/IP** must be installed to communicate with the Solaris platform. If you already have **TCP/IP** installed you can skip this section. To install the **TCP/IP** protocol on Windows 2000: Locate the **Control Panel** and select the **Network and Dial-up Connections** icon.



Illustration 3.32 Locating the Network settings

Open the selected Icon to get the next screen:

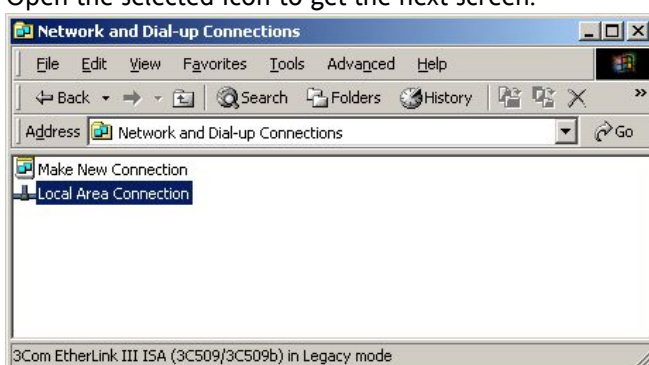


Illustration 3.33 Local Area settings

Here select: **Local Area Connection**. If the network was already running you will get a windows like the one shown here:

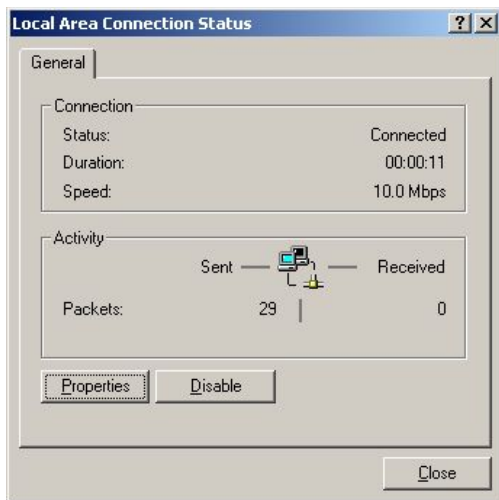


Illustration 3.34 Network is running

Here is the screen when TCP/IP was already installed.

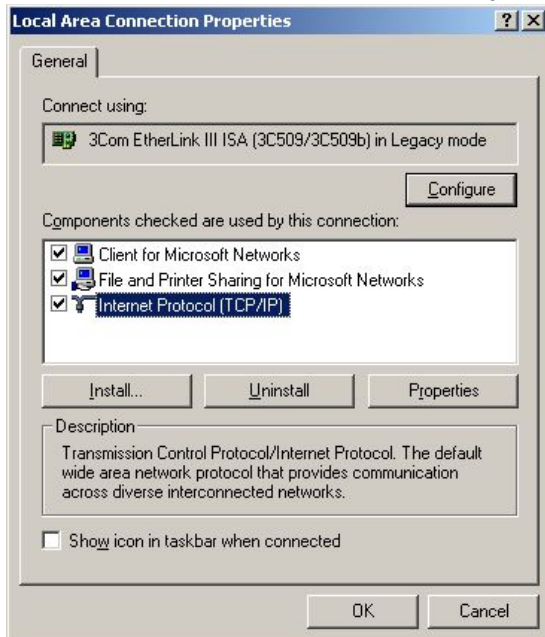


Illustration 3.35 Selected the TCP/IP protocol

When TCP/IP was not installed at this time, things look a little different:



Illustration 3.36 Oops, no TCP/IP....

Here still lies the task to install the TCP/IP protocol. Choose **I**nstall... for this. In the next dialog choose to add a protocol and click **A**dd....

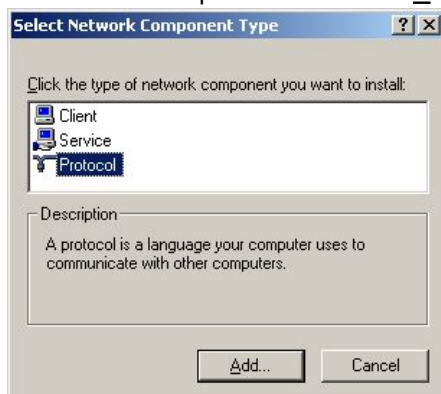


Illustration 3.37 Adding a protocol

Select the correct one...

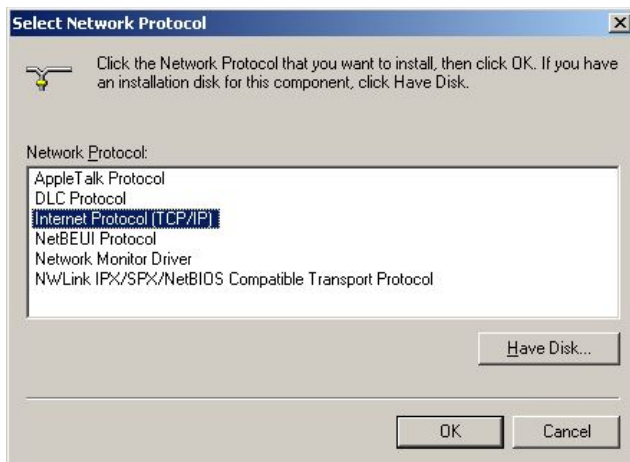


Illustration 3.38 Adding the TCP/IP protocol

And select **OK**. (Otherwise we would not be making much progress...). The disk becomes rather noisy and the system may prompt for the Windows 2000 CD and you get the next screen.

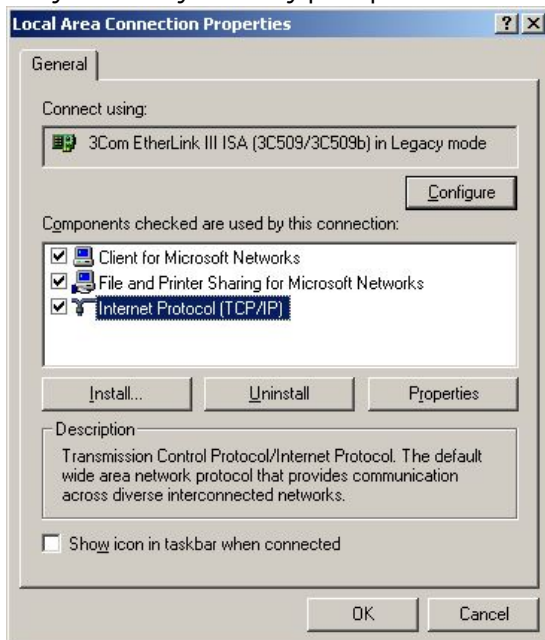


Illustration 3.39 Selected the TCP/IP protocol

Here you will see a **Properties** button. This is where the TCP/IP protocol and other network protocols and settings reside. The TCP/IP protocol, which is highlighted in the picture, again has a **Properties** button. Let's see what's in there: This next screen is where the settings for the protocol are set for the connection to the I/A host.

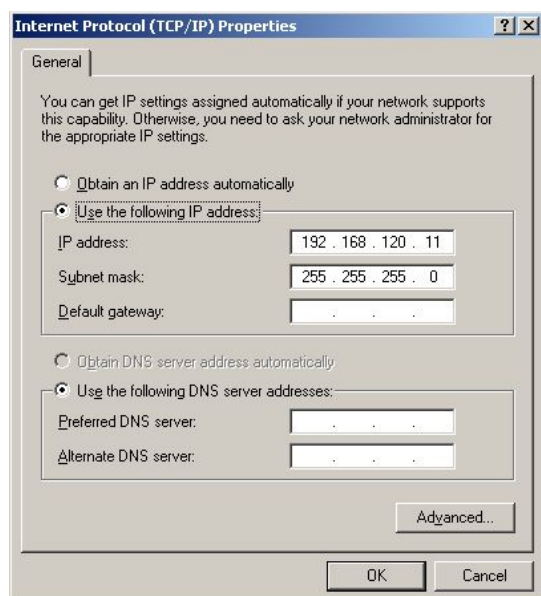


Illustration 3.40 The settings for this setup

After these steps are completed, you have configured the PC to connect to the I/A host.

3.6 Testing the setup.

It would be nice to see if the work has paid off. There is a simple way to check the communication (assuming the hardware is connected). Open a command tool and run a telnet session to the I/A host. For example:

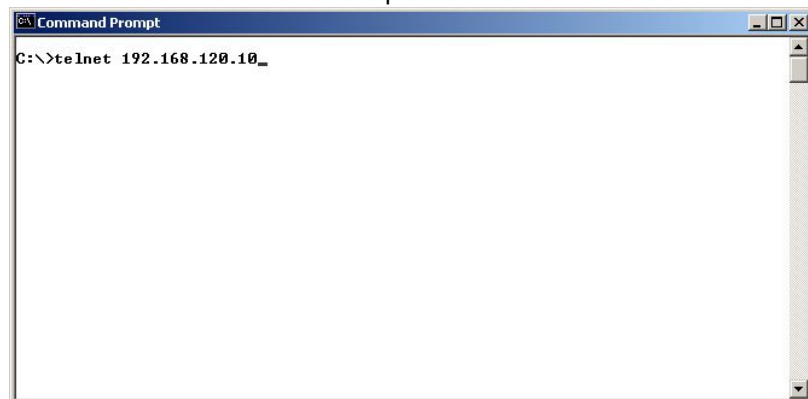


Illustration 3.41 Ready...

When pressing enter now, the telnet session to the host is started. It should be something similar to this:

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Illustration 3.42 Set...

You get a login prompt. After logging onto the host you are on the UNIX machine.

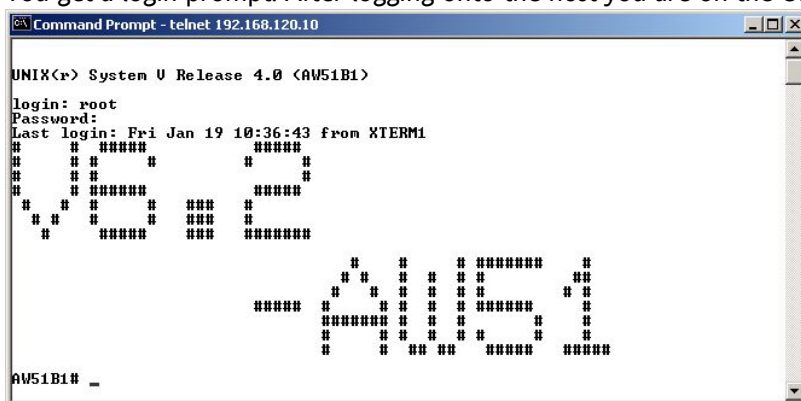


Illustration 3.43 and go!

Now that's what I find so cool! Anyway, this works. Next chapter please.
This concludes the network hardware and software installation.

4 I/A Series preparation.

What you need to know and do to get the system files right!

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4.1 Introduction

This chapter deals with the modifications that are required on the Foxboro I/A platform. Some files will have to be created and some others will have to be modified. Tailoring the X-terminal behavior is also covered in this section as far as this is achieved on the I/A Series platform. The files concerned are listed below:

- /etc/hosts/etc/hostname.leX /etc/hostname.hmeX
- /usr/fox/customer/hi/dmcfgr
- /usr/fox/sys/Change_Env (environment files for DM)
- /opt/fox/env (environment files for Foxview)
- /opt/ia/.profile and /opt/ia/go_dm
- /usr/fox/wp/data/am_cmds
- /usr/fox/wp/data/fv_cmds
- /etc/passwd

Starting with version 7.1 of this manual all installations are performed using the same TCP/IP settings and logical names. This makes it easier to relate between the different chapters. The TCP/IP settings are based on the information that can be found in the introduction section in this document. The range of IP addresses that were used are for a class C network in the “free” range “192.168.120”.

4.2 The /etc/hosts file.

This “hosts” file is used by the Foxboro system to allow normal or symbolic names instead of IP addresses to communicate between the different stations. This “hosts” file is created and maintained by the Foxboro Software Install process and for that reason it is important to make the modification at the indicated location i.e. outside the indicated Start & End delimiters.

When the Foxboro host and the X-terminals are going to be connected to your company network, please contact your system administrator for the IP addresses to use. If this network is not going to be connected to the Internet or company network, it is a good idea to use IP addresses that are reserved for this type of network. You can even use the addresses provided in this document. Please read [section Error! Reference source not found. Error! Reference source not found.](#) on page [Error! Bookmark not defined.](#) for more information on this subject.

```
[etc/hosts]
#
# Internet host table
#
127.0.0.1    localhost    loghost hw1197
#*****
# Start of I/A hosts
# created Mon Jun 21 14:16:54 GMT 1999
#*****
#
# The following host entries were created by the I/A
# Software Install sub-system. Any additional entries
# should be placed AFTER the End delimiter.
#
151.128.8.65  AWTST1
#
#*****
# End of I/A hosts
```

```
#####
#####
# Start of X-Terminal configuration info
#####
192.168.120.10 XHOST1
192.168.120.11 XTERM1
192.168.120.12 XTERM2
#####
# End of X-Terminal configuration info
#####
```

4.3 The hostname.leX / hostname.hmeX file.

On 51D and 51E type stations replace the occurrence of **leX** by **hmeX**.

In the directory `/etc` a file should exist with a name like `hostname.leX`. The value of `X` is dependent of the similar cards that are in the station. It represents the *instance* of the card. The network card on the system board is the first *instance* and thus is named “**hostname.le0** or **hostname.hme0**. When you install an additional card for the first time it will be addressed as **hostname.le1** or **hostname.hme1**. References of **hostname.le2** or 3 and **hostname.hme2** etc are possible. This can happen when you have had an Ethernet SBbus card in your system as **hostname.le1** in Sbus slot 1 and you replace the card with a similar card in SBbus slot 2. After booting the system finds a kernel module for the card in slot 1 and decides that an additional card is installed in slot 2. As a result this “second” card is referred to as **hostname.le2**. So the name of this file can be: `hostname.le1`, (most likely) or `hostname.le2` or 3 or `hostname.hme1` (for a 51D/E), (See section: **Error! Reference source not found. Error! Reference source not found.** on page **Error! Bookmark not defined.** for more information). If the file does not exist it must be created.

The contents of this files are:

[hostname.le1]
XHOST1

[hostname.hme1]
XHOST1

I.e.: the name this I/A host will have on the second network. This can NOT be the same name as the Node bus name!

4.4 The Display Manager Configuration (dmcfg) file

Whenever a Display Manager or Foxview is started it retrieves the initial configuration information from a file that is named `dmcfg`. This file (which is identical for both DM and Foxview™) defines the behavior of the X-Terminals in the I/A Series system. Configuration this file in the past was done in previous releases of the I/A system using a normal editor like “vi”. With the 4.2 release of the I/A Series software a graphical configurator was introduced.

4.4.1 The Display Manager Configuration with I/A Series software V4.2.x. and later

An editor like “vi” can be used to make changes to this file. Modification is required in the file `dmcfg` located in the directory `/usr/fox/customer/hi`. The changes indicate the name of the DM to be configured and the default environment they come up with. With the release of version 4.2 of I/A Series software a Motif style application is supplied to configure the Alarm- and

Display Managers. The application to create and configure these is “**DispAlarmCfg**” which can be found under the Display Manager’s **Config** menu pick. Manual modification of the `dmcfg` file is still possible and both methods are supported. However, when Alarmmanager properties are to be maintained this is the tool to use since it creates all the necessary files for proper AM and DM operation. It can also be used to maintain a system wide AM/DM configuration. More information on how to configure and maintain the Display and Alarm managers can be found in the I/A Series document: **B0193RV-D: Workstation Alarm Management** or later. The layout for the `dmcfg` file as created by the Display and Alarm Manager Configurator is printed below:

```
[dmcfg]
#-----
# "dmcfg"   Tue Jun 22 13:34:31 GMT 1999
#-----
#-----
TYPE      foxDefault      DSM      O      -
TYPE      _DEFAULT        DSM      O      Proc_Op_Env
TYPE      Operator        DSM      B      Proc_Op_Env
TYPE      AuxillaryOper    QLRSM    O      Proc_Op_Env
TYPE      RemoteOperator   DSM      O      Proc_Op_Env
TYPE      Engineer        DSM      E      Proc_Eng_Env
TYPE      View_Only        DSM      V      -
#-----
AMTYPE     foxDefault      O      -
AMTYPE     _DEFAULT        O      Proc_Op_Env
AMTYPE     Operator        B      Proc_Op_Env
AMTYPE     AuxillaryOper    O      Proc_Op_Env
AMTYPE     RemoteOperator   O      Proc_Op_Env
AMTYPE     Engineer        E      Proc_Eng_Env
AMTYPE     View_Only        V      -
#-----
NAME       AWTST1    XDM001    XTERM1      foxDefault
NAME       AWTST1    XDM002    XTERM2      foxDefault
NAME       AWTST1    AWTST1    .0          foxDefault
NAME       AWTST1    DM0001    .1          foxDefault
#-----
AMNAME     AWTST1    XDM001    XTERM1      -
AMNAME     AWTST1    XDM002    XTERM2      -
AMNAME     AWTST1    AWTST1    .0          -
#-----
DMTOAM     XDM002    XDM002
DMTOAM     AWTST1    AWTST1
```

4.5 Rebooting the stations.

When all files mentioned above have been modified and / or created as described the I/A Series station should be rebooted for the changes to take effect. When the I/A Series station is on-line again you should be able to login into the host using TELNET. This is of course only when the station attempting the login is mentioned in the `/etc/hosts` file on the I/A series hosts. However, to allow remote applications startup, another file needs to be edited. In this example the **Operator** environment was chosen for this purpose. How to do this is explained in the next section.

4.6 Setting up a working environment.

Next step is the configuration of the default X-Terminal behavior. Initially the X-Terminal startup in a read-only environment, with all menu options except a few grayed out to indicate they are not selectable. More information about this behavior can be found in section: **1.8 Limiting Access within a Display Manager or Alarm Manager** on page: 1-13. This is because the default

access levels do not allow remote users to start remote applications. To change this, there are some modifications to the environment file for the remote user, in this case the “Operator” environment.

4.6.1 With the Foxboro DM and FoxView™.

The file is normally located in /usr/fox/sys/Change_Env for DM and /opt/fox/env for FoxView on the host and has the following appearance:

Display Manager: /usr/fox/sys/Change_Env/Operator dmcmd nologscr dmcmd passwd dmcmd chng_env dmcmd button 0 Sys /usr/fox/sys dmcmd button 1 keep dmcmd button 2 keep dmcmd button 3 dmcmd button 4 Disp /usr/menus dmcmd button 5 Disp_1 /usr/menus/d1 dmcmd button 6 Disp_2 /usr/menus/d2 dmcmd button 7 Disp_3 /usr/menus/d3 dmcmd button 8 keep dmcmd button 9 keep	FoxView: /opt/fox/env/Operator.env Dmcmd nolog_script Dmcmd passwd Dmcmd chng_env \$ENV_DIR/Operator.acl \$ENV_DIR/Operator.dbr \$ENV_DIR/Operator.mbr \$ENV_DIR/Operator.dms
--	---

Three lines must be inserted in this file:

- dmcmd protect all
- dmcmd unprotect all
- dmcmd enable omsets

These lines (printed bold) must be inserted before the first line defining the buttons, so the result would be a file looking like this:

Display Manager: /usr/fox/sys/Change_Env/Operator dmcmd nologscr dmcmd passwd dmcmd chng_env dmcmd protect all dmcmd unprotect all dmcmd enable omsets dmcmd button 0 Sys /usr/fox/sys dmcmd button 1 keep dmcmd button 2 keep dmcmd button 3 dmcmd button 4 Disp /usr/menus dmcmd button 5 Disp_1 /usr/menus/d1 dmcmd button 6 Disp_2 /usr/menus/d2 dmcmd button 7 Disp_3 /usr/menus/d3 dmcmd button 8 keep dmcmd button 9 keep	FoxView: /opt/fox/env/Operator.env dmcmd nolog_script dmcmd passwd dmcmd chng_env dmcmd protect all dmcmd unprotect all dmcmd enable omsets \$ENV_DIR/Operator.acl \$ENV_DIR/Operator.dbr \$ENV_DIR/Operator.mbr \$ENV_DIR/Operator.dms
--	---

After completion a change environment must be forced to activate the above. From now on all remote applications are accessible to the remote user. This is about the least subtle use of access level usage you can think of. It is not recommended to do this for all the environments on your system.

4.6.2 The “ia” account.

This account was provided on the basic system. When starting up an X-Terminal you login as user “ia” with the default password “remote”. This account is provided to allow an easy setup for your X-terminal session. It serves well in most cases where normal DM/FoxView™ behavior meets your needs. In the case you encounter problems with program execution due to the limited privileges if

this account please make sure you read the next section which handles this subject.

In the case of the **ia** account a `.profile` file was provided to automate login sessions. The standard login home directory is `/opt/ia` on your host station and the `.profile` file is then processed. In several sections the file “`go_dm`” is mentioned but this file may not be available on your system. It is however based on the `.profile` (note the dot as the first character, indicating a hidden file) which is included in the standard IA Series installation and it is printed further on in this chapter.

Please be aware of the fact that the user **root** and the user **ia** each have different settings when connecting to the host. For instance the default shell for **root** as defined in the `/etc/passwd` file is **csh** (`/bin/csh`) as for the user **ia** this is the bourne (`/bin/sh`) shell. This will result in unstable and unpredictable behavior of X-terminals when using the **root** account. One of the symptoms are leftover `csh` processes on the host after the X-terminal is stopped or otherwise exited. Which in turn can result in a refused connection from the next X-terminal PC. The cause for all this is the fact that the **csh** started as root executes a shell script written specifically for the **bourne** shell. This caused some variables not to be set correctly. Thus forcing the **bourne** shell to allow proper execution of the `go_dm` script seems to be the solution. However this results in a leftover **csh** when the **bourne** shell is exited in the last statement of the `go_dm` script.

Since the eXceed software always requires a command to be provided when starting an X session both the `.profile` and the `go_dm` file have been rewritten. So both these files are now non-standard Foxboro files! The provided default `.profile` on the system is used as the basis for these file however!

4.6.3 The `.profile` / `go_dm` files.

In the case of the **ia** account a `.profile` file was provided to automate login sessions. The standard login home directory is `/opt/ia` on your host station and the `.profile` file is then processed. In several sections the file “`go_dm`” is mentioned but this file is not available on your (day-0) system. It is however a copy from `.profile` (note the dot as the first character indicating a hidden file) which is included in the standard I/A Series installation.

4.6.3.1 Creating the `go_dm` script.

Hummingbird eXceed requires you to enter a command to be executed whenever you login to a UNIX host. To allow for this some changes must be made to the system.

Always use the `.profile` file that comes with your system. Since this file is constantly evolving there may be new functionality and enhancements which may not be available when using a previous version of this file!!

The steps to be taken to create both files are indicated below. Please be sure to make copies of all files that you edit before you proceed!

Change directory to `/opt/ia`:

```
AW511B# cd /opt/ia <CR>
```

Then copy the (hidden) `.profile` file to a new file with the name `go_dm`.

```
AW511B# cp .profile go_dm<CR>
```

```
AW511B#
```

This file will be the script that is executed when a login session is started using the **ia** account. The contents of both files can be found later in this chapter. The `go_dm` script above must be

turned into an executable shell script. So after the `.profile` file was copied to the new file type the following commands at the prompt:

```
AW511B# chmod 777 go_dm <CR>
AW511B# l -a <CR>
total 20
drwxrwxr-x  2 root   staff   512 Mar 21 08:48 .
drwxrwxr-x 12 root   other   512 Mar 19 13:52 ..
-rw-r--r--  1 ia     other   1372 Feb 14 15:15 .profile
-rwxrwxrwx  1 root   other   1372 Mar 21 08:48 go_dm
AW511B#
```

After the `l -a` command was entered, you can see the privileges for `go_dm` are: `-rwxrwxrwx`.

```
AW511B# l -a <CR>
total 20
drwxrwxr-x  2 root   staff   512 Mar 21 08:48 .
drwxrwxr-x 12 root   other   512 Mar 19 13:52 ..
-rw-r--r--  1 ia     other   1372 Feb 14 15:15 .profile
AW511B#
```

Make sure to perform all the steps mentioned above to create the `go_dm` file. Especially the `chmod` part is important since the original file is not an executable one.

Below you will find the contents of the `.profile` and the derived `go_dm` files for the two latest releases I/A Series software.

```
[.profile]
# empty file
# DO NOT ENTER ANY COMMANDS IN HERE!!
```

Remember to always use the `.profile` in the `/opt/ia` directory that comes with your current I/A Series and/or FoxView release.

4.6.4 More than one DM on one X-terminal.

When opening more than one DM on a certain X-terminal you may get an error message (you only see this message when you have the box **show host reply** checked):

```
exec /opt/ia/go_dm
Setting DISPLAY to XTERM1:0
Blink_task: Heartbeat found on display XTERM1:0, exiting
```

In the later versions of the `/opt/ia/.profile` file an option (`-hb`) was added when starting the `blink_task`. If you require the ability to have more than one DM on a local machine you must remove this option.

The line to look for in the `.profile` is:

```
/usr/fox/wp/bin/blink_task -sig -r -hb 5 &
```

To allow more than one DM on you local machine, change the line to

```
/usr/fox/wp/bin/blink_task -sig -r &
```

i.e.: just remove the `-hb 5` string from the command and you are done. This will solve the problem.

4.6.5 Setting “root” privileges for the “ia” account.

As mentioned before, the **ia** account may limit the usability of the DM due to the fact that some programs and scripts require you to have **root** privileges. If you really require the user of the X-terminal to have these privileges (maybe because you using the X-terminal as an operator console) a modification needs to be made to one of the system files. You can change the *userid* of the **ia** account to the one **root** is having. The place to make the change is the `/etc/passwd` file. You require **root privileges** to edit this file!!

The original `passwd` file looks similar to the one printed below:

```
[/etc/passwd]
root:x:0:1:0000-Admin(0000):/bin/csh
daemon:x:1:1:0000-Admin(0000):/bin:
bin:x:2:2:0000-Admin(0000):/usr/bin:
sys:x:3:3:0000-Admin(0000):/bin:
adm:x:4:4:0000-Admin(0000):/var/adm:
lp:x:71:8:0000-lp(0000):/usr/spool/lp:
smtp:x:0:0:mail daemon user:/bin:
uucp:x:5:5:0000-uucp(0000):/usr/lib/uucp:
nuucp:x:9:9:0000-uucp(0000):/var/spool/uucppublic:/usr/lib/uucp/uucico
listen:x:37:4:Network Admin:/usr/net/nls:
nobody:x:60001:60001:uid no body:/bin:
noaccess:x:60002:60002:uid no access:/bin:
informix:x:101:101:::/bin/sh
hstorian:x:102:101:::/bin/sh
bpm:x:250:101:::/bin/sh
pm:x:251:251:::/bin/sh
pam:x:252:101:::/bin/sh
ia:x:110:1:Remote I/A User:/opt/ia:/bin/sh
```

To make the **ia** account have **root privileges** change the line which defines the **ia** account (in this case the last line in the `passwd` file) to the one printed below. Note that the number after the second colon changes from 110 to 0 which is the *userid* of **root**.

```
ia:x:0:1:Remote I/A User:/opt/ia:/bin/sh
```

This change is NOT needed nor recommended when the X-terminal will only be used for normal graphics displays. The standard “**ia**” privileges are sufficient for this use.

In addition to the previous section, changes can be made to the Terminal behavior, which is set out in the next section.

4.7 Alarm Manager Remote Access (The `am_cmds` file)

The information in this section is released as Helpful Hint # 816

When accessing the Alarm Manager remotely using eXceed or FoxRemote you must add the path statement listed below to your `/opt/ia/.profile` or `/opt/ia/go_dm` file. If you don't add this path statement you will not be able to access the Alarm Manager at 4.2 remotely.

The Alarm Manager is the first Motif application released as part of the standard set of I/A System Software. It requires access to libraries distributed with the desktop suite of software available

with Solaris 2.4. Therefore, library search paths need to include the following:

```
LD_LIBRARY_PATH=/usr/openwin/lib:/usr/dt/lib:/opt/windu/lib:/opt/windu/fox
export LD_LIBRARY_PATH
```

If you would like the buttons to be “pickable” you will also need to edit the file `/usr/fox/wp/data/am_cmds` and comment out a couple of lines. The first line to comment takes care of buttons being pickable, but if the initial environment has a “protect all” line in it you will need to comment out the second line as well. That line starts the AM in the initial environment, and nothing will be pickable. The file `am_cmds` is read when the AM starts up. You will need to comment out the following lines:

```
== $AM_LOCAL N amcmd disable all      * disables button picks
chngenv $SYSDIR/Change_Env/Init_Env  * Changes to initial env'ment
```

Also beware that if you have protection levels set up in the environment:

For the DM you must give those same commands to the AM. If in the DM's environment file it says:

```
dmcmd setacl 1 +++-+---
```

below it add:

```
dmcmd run /usr/local/pref -$GCLBUG amcmd "setacl 1 +++-+---"&
```

where GCLBUG = AM name (gclbug will affect the letterbug AM only which is your default AM) (replace gclbug with AM name if its not the default AM).

Also if configuring additional AM's be sure to backup the `dmcfg` file and then import the `dmcfg` file during the Alarm Manager configuration process. This procedure is described in the Alarm Manager documentation B0193RV Section 2.(Import dmcfg).

If you are still having trouble with your AM check the following: Change the permissions of the Display Manager to `"rwsrwxrwx"`.

```
chmod 4777 /usr/fox/wp/bin/dm_wp50
```

Change permissions on the Alarm Manager to `"rwsr-sr-x"` and link shared libraries.

```
chmod 6755 /usr/fox/wp/bin/am
link /usr/dt/lib/libXm.so.3 /usr/lib/libXm.so.3
```

If you are logging in as `"ia"` to call the remote DM, add the `"ia"` user to the root and staff groups by editing `/etc/group`.

```
root::0:root,ia
staff::10:ia
```

4.8 Limiting Access within a Display Manager or Alarm Manager.

This information can also be found in Foxboro document: B0193MQ. Display Engineering for 50 Series.

All remotely displayed Display Managers and Alarm Managers provide the following initial protections, regardless of configured TYPE:

- All settings of Control Processor parameters are disabled.
- Access to all configurators and most applications is disabled
- Accessing the Alarm Display will NOT silence the annunciator horn.
- Clearing alarms function from the Alarm Display is disabled.
- Redirection of displays from the Alarm Display is disabled.
- Acknowledging alarms from the Alarm Display is disabled.
- Muting and unmuting horns from the Alarm Display is disabled.

Each of these initial protections may be modified from within the **Display Manager/Alarm**

Manager. The recommended way to accomplish this is within password-protected environments that use the Access Lock mechanism within the Display Manager. Access locks are a standard protection feature, which can be used in display files and menu pull-down files to disable access to individual fields within displays and pull-down menus. Access lock protection is configured for display files through the Display Configurator, and for pull-down menus through the ASCII file .pulldown within the referenced subdirectory.

NOTE: Access Locks for AM command buttons and menu bars fields and pull-down menus for the Alarm Manager are configured via the Alarm/Display Manager Configurator. Refer to the Workstation Alarm Management document.

Environment files are Display Manager script files that use Display Commands. Refer to the document Display Manager Calls and to the section "Setting Environment Passwords". The following example illustrates the use of access locks, and uses the dmcfg file from the previous example.

```
#
# SCREEN <screen_variable> <monitor1> <monitor2>....
#
SCREEN    ENG      term1  .-      # terminal "term1" and either local head
#
#TYPE
<type>    <window attributes> <class>                <environment>
#
TYPE      Operator      -          B          Proc_Op_Env
TYPE      AuxillaryOper QLRSMS      O          Proc_Op_Env
TYPE      RemoteOperator -          O          Proc_Op_Env
TYPE      Engineer      -          E          Proc_Eng_Env
TYPE      View_Only     -          V          -
#
#NAME      <lbug> <dmname>      <dedicated monitor(s)> <type>
#
NAME      WP5100 WP5100      .0          Operator      # 1st local head
NAME      "      DM0001      .1          Operator      # 2nd local head
NAME      "      DM0002      .-          AuxillaryOper # either local head
NAME      "      DM0003      $ENG        Engineer      # term1 or local
NAME      "      DM0004      -          View_Only     # anyone
```

In this example, each referenced environment has been password-protected, and the initial environment, **Init_Env**, has been modified to protect (or lock) all access levels. (The initial environment, **Init_Env**, is loaded by each Display Manager before the environment optionally configured in the dmcfg file.)

In addition, this example uses the following access lock assignments:

```
120 - 129      Engineering functions
130 - 139      Operator functions
100           Standard remote Display Manager protection lock
```

These environments contain the following commands:

```
[Init_Env]
dmcmd nologscr      # delay oaj logging until after password
dmcmd passwd        # verify password, exit if invalid
dmcmd chng env      # successful password, log oaj
protect all         # Initially, protect all access locks
unprotect value 0   # Enable lock 0
disable omsets      # Disable changing Control Process variables
                  # and clearing alarms from CAD

dmcmd button 0 Sys /usr/fox/sys
dmcmd button 1 Alarm "dmcmd rcntalms"
dmcmd button 2 Help /usr/Help
dmcmd button 3
dmcmd button 4
dmcmd button 5
dmcmd button 6
dmcmd button 7
dmcmd button 8
```

```
dmcmd button 9 Select "dmcmd stddisp"
```

```
[Proc_Oper_Env]
dmcmd nologscr          # delay oaj logging until after password
dmcmd passwd            # verify password, exit if invalid
dmcmd chng_env          # successful password, log oaj
protect all             # Initially, protect all access locks
unprotect value 0,130-139 # Enable lock 0, and Oper locks
enable omsets           # Enable changing Control Process variables
dmcmd button 0 Sys      /usr/fox/sys
dmcmd button 1 keep
dmcmd button 2 keep
dmcmd button 3
dmcmd button 4 Disp     /usr/menus
dmcmd button 5 Disp_1   /usr/menus/d1
dmcmd button 6 Disp_2   /usr/menus/d2
dmcmd button 7 Disp_3   /usr/menus/d3
dmcmd button 8 keep
dmcmd button 9 keep
```

```
[Proc_Eng_Env]
dmcmd nologscr          # delay oaj logging until after password
dmcmd passwd            # verify password, exit if invalid
dmcmd chng_env          # successful password, log oaj
protect all             # Initially, protect all access locks
unprotect value 0,100,120-129,130-139
# Enable lock 0, remote lock 100, Eng and
  Op locks
enable omsets           # Enable changing Control Process variables
dmcmd button 0 Sys      /usr/fox/sys
dmcmd button 1 keep
dmcmd button 2 keep
dmcmd button 3 Config   /usr/fox/config
dmcmd button 4 Disp     /usr/menus
dmcmd button 5 Disp_1   /usr/menus/d1
dmcmd button 6 Disp_2   /usr/menus/d2
dmcmd button 7 SftMnt    /usr/fox/soft
dmcmd button 8 keep
dmcmd button 9 keep
```

These environments may be accessed from any Display Manager. For example, although the **Proc_Eng_Env** is the default environment only for **DM0004**, this environment may be accessed through any Display Manager. Since the environment is password-protected, only users knowing the Engineer's password have access to the enabled functions within this environment. In a similar manner, the **Proc_Op_Env** environment enables all operator functions that may have been disabled, and is accessible only to users knowing the Operator's password. These environments are accessible within Alarm Manager for those users with knowledge of the passwords.

If the access lock feature is to be used to disable display pick fields, these fields must be configured through the Display Configurator for the Display Manager. Refer to the document Display Configurator.

Using access locks for pull-down menu protection requires editing or creating ASCII files within the directories to be accessed by the top menu button. Refer to the section: **Pull-Down Menu Access Control** on page 1-16.

From the previous example, notice that the files found under the `/usr/fox/config` and `/usr/fox/soft` directories (buttons 3 and 7) are only accessible from the **Proc_Eng_Env** environment. These directories are not included in any other environment, and in fact, buttons 3 and 7 are either redefined or removed in the **Init_Env** and **Proc_Op_Env** environments.

Both the **Proc_Eng_Env** and **Proc_Op_Env** environments have access to the files under `/usr/menus`. However, it is possible to selectively protect individual entries within this directory

structure based on access locks.

In the following example, only the Engineer has access to the subdirectory Engineer. Both the Operator and Engineer have access to the subdirectory Boiler and the file Maintenance. All users have access to all other files.

```
[Directory Structure:]
/usr/menus
d1                subdirectory
d2                subdirectory
d3                subdirectory
d4                subdirectory
Engineer          subdirectory
Boiler            subdirectory
Overview          display file
Maintenance       display file
```

The file `/usr/menus/.pulldown` looks like this:

```
Overview
Boiler      -p 130
Engineer    -p 120
Maintenance -p 130
```

Note that the subdirectories **d1 - d4** have not been included in the `.pulldown` file. These entries will be located in the pull-down menu after the entries specifically defined in the `.pulldown` file.

Any environment that unprotects access locks and is accessible to all users should be password-protected. The utility `/usr/fox/wp/bin/tools/dmsepass` is used to add/modify environment passwords.

4.9 Pull-Down Menu Access Control

This information can also be found in Foxboro document: B0193MQ Display Engineering for 50 Series.

Some users may need to selectively disable/enable entries in Display Manager pull-down menus. To accomplish this, the Display Manager reads an optional pull-down file found within the directory being accessed by the pull-down menu. The `.pulldown` file provides the following functionality:

- Allows entries within a pull-down menu to be inactive (non-pickable) based on assigned access levels. Pull-down entries cannot be deleted, only made inactive.
- Provides blank entries and leading blanks in menu entries.
- Allows ordering of entries within the pull-down menu.
- Allows specification of menu entry colors.
- Allows specification of potential menu entries.

The `.pulldown` file can have entries that are not actually found in the directory. Entries in the pull-down menu that are not actually found in the directory are not included in the pull-down menu. The `.pulldown` file is optional. If the file is not found, Display Manager will create the pull-down menus as it currently does. All entries in the directory (up to 255) are displayed and enabled in the pull-down menu.

Foxboro provides default `.pulldown` files for each directory that is referenced in the standard environment files. These files contain access level protection for all single-instance applications, the Display Manager overview display, and all configurators. The access level used is 100.

Menu entries can be made active (pickable) or inactive (unpickable) through access levels. The Display Manager commands protect and unprotect, are used to control the access levels.

4.9.1 The .pulldown File

The .pulldown file is an ASCII file found within a directory accessed from Display Manager top menu picks. It contains a list of lines in the following format:

filename [options]

where:

- **filename**
Name of directory entry. Leading white space characters are supported, such as "filename" or "". If there is no filename, a blank non-pickable entry will be added to the pull-down menu.
- **options**
Properties of the directory entry. This field is optional. **-p level** make entry inactive if access protection "level" has been protected. **-c color** foreground color of menu entry. Default color is HI_YELLOW.
1-HI_RED
2-HI_GREEN
3-HI_YELLOW
4-BLUE
7-WHITE

4.9.2 Examples

In the following examples, the vi editor is used for editing. Editing is done on a 50 Series WP/AW workstation using the VT100 emulation mode.

4.9.2.1 Insert Space Between Pull-Down Menu Picks

To insert space between the AlarmHistory and the Change_Env pull-down picks under the Sys menu pick:

1. Enter vi /usr/fox/sys/.pulldown.
2. Insert "" (pair of double quotes) between the AlarmHistory entry and the Change_Env entry as follows:

```
AlarmHistory
""
Change_Env
```

3. Save the .pulldown file.

4.9.2.2 Indent Pull-Down Menu Picks

To indent the Display_Build and the Display_Cfg picks under the Config menu pick:

1. Enter vi /usr/fox/config/.pulldown.
2. Edit the lines for the Display_Build and the Display_Cfg as follows:
" Display_Build"
" Display_Cfg"
3. Save the .pulldown file.

4.9.2.3 Disable Pull-Down Menu Picks

To disable all Display Manager DM0001 pull-down menu picks assigned an access level of 100, run the following command:

```
pref -DM0001 dmcmd "protect value 100"
```

All disabled pull-down menu picks are cyan colored.

4.9.2.4 Enable Pull-Down Menu Picks

To enable all Display Manager ADM002 pull-down menu picks assigned an access level of 100, run the following command:

```
pref -ADM002 dmcmd "unprotect value 100"
```

You can disable or enable more than one access level at the same time. For example, to enable pull-down menu picks within a range of 100-110 for Display Manager ADM002, use the following command:

```
pref -ADM002 dmcmd "unprotect value 100-110"
```

4.9.2.5 Change the Color of Pull-Down Menu Picks

To change the color of the **Change_Env** pick to green and **Reboot_Station** pick to red:

1. Enter `vi /usr/fox/sys/.pulldown`.
2. Edit the lines for the **Change_Env** and the **Reboot_Station** entries as follows:

```
Change_Env -c 2 /* color index 2 = green */
Reboot_Station -c 1 -p 100 /* color index 1 = red; Reboot_Station is
                           assigned an access level = 100 */
```

3. Save the `.pulldown` file.

This concludes the I/A Series preparation chapter.

5 eXceed 5 on Windows NT.

Installing and configuring eXceed 5.x on Windows NT 4.0:

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5.1 Introduction.

In this chapter we will be installing and configuring the Hummingbird PC X-server eXceed. This PC X-server turns the PC platform in a workstation capable of running Unix application within the familiar Windows environment.

5.2 Hardware requirements

To successfully install eXceed 5 for Windows NT your hardware must meet the following minimum specifications:

- A 32-bit x86 processor 80386 or higher, (486 or Pentium™ recommended).[\[1\]](#)
- At least 16Mb of RAM installed. (24Mb or more recommended).
- At least 52 Mb minimum free disk space to install the software.
- One 1.44Mb floppy disk drive and /or one CD-ROM drive depending on the media supplied.
- A Windows NT compatible display (capable of at least 1024 x 768 pixels with 256 colors)
- A Windows NT compatible mouse.
- A supported networkcard.

5.3 Software requirements

The operating system requirements are:

Microsoft Windows NT Workstation version 3.51[\[2\]](#) or 4.0.

Windows NT 4.0 requires a 486 or higher processor.

The software used in this section is eXceed version 5.1.3 for Windows NT by Hummingbird communications Ltd.

The TCP/IP protocol is installed and configured.

5.4 Additional requirements and Year 2000 issues.

For some of the modifications on the I/A platform, “root” privilege is required. You may want to create a new user to use the X-Terminal. To create this new user account you must have the Administrator privileges.

For year 2000 compliance make sure you have the correct patches available. More information can be found on this subject on the Hummingbird website (<http://www.hummingbird.com/>). Below you can find a list of the year 2000 issues concerning eXceed software.

Product:	Version:	Compliance:	Notes:
Exceed	5.1.3 6.0.0 6.0.1 6.0.2	Columbus [3] is not compliant Patches required for FTP [4] & TAR	FTP Patch can be downloaded at: ftp://ftp.hummingbird.com/pub/pickup/Year2000/ftp/ and the TAR patch can be downloaded at: patch: ftp://ftp.hummingbird.com/pub/pickup/Year2000/tar/
Exceed	6.1 and up	Yes	No patches required

5.5 Configuration data.

For this installation the following applies:

- The host is: **AWTST1** and the second Ethernet IP is: **192.168.120.10**
- The I/A host used “**XHOST1**” as the name on the second Ethernet connection.
- The 1st PC has a logical name: **XTERM1** and the Ethernet IP is: **192.168.120.11**.
- The 2nd PC has a logical name: **XTERM2** and the Ethernet IP is: **192.168.120.12**.
- The PC's operating system is MS-Windows NT 4.0 Workstation SP3.
- The I/A Series AW51B was running Version 6.1 software.
- The network adapter is a 3Com EtherLink III and is properly installed.
- The installation is done via CD-ROM
- An additional DM/FoxView™ is configured on the I/A Series host.

5.6 Installing eXceed 5.

It is advised to install eXceed with **Administrator** privileges to prevent installation problems concerning write access to the Windows directory for example. The eXceed for Windows CD-ROM is a multiplatform CD which contains the eXceed versions for Windows 3.11, Windows 95 and Windows NT. Choose the **R**un command from the Windows **S**tart button, Choose the **s**etup.exe program from the directory containing the software for your platform (NT) and execute the set-up program...

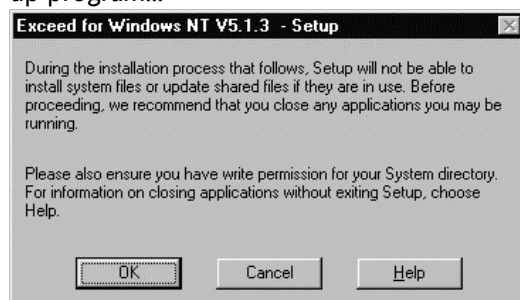


Illustration 5.1 The initial Splash screen

The first choice is the type of installation: Normally, choose **P**ersonal / **C**ustom. For the differences between the various installation possibilities, please review the documentation. The choice we make here will create a personal copy on your local harddrive. The **C**ustom setup gives you greater influence on the installation options and may give you a better idea where the application is installed. Since the defaults are usually selected the **E**xpress setup does not conflict with the installation procedure in this manual. One of the first decisions to make is the location where the eXceed files will be located.

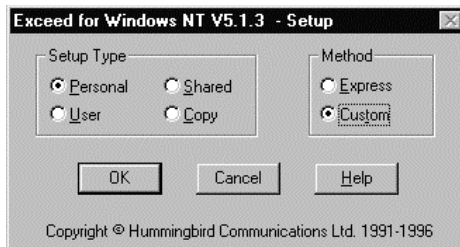


Illustration 5.2 Select the install options

If you answer no to this question only the administrator can use the programs installed. All other users are rejected. In this example Yes is entered but this may depend on your configuration

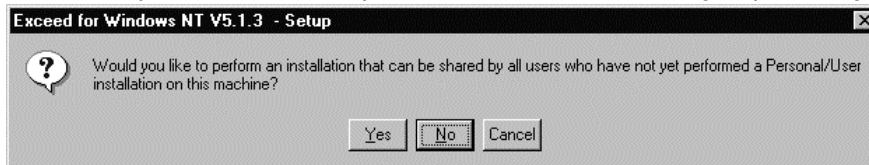


Illustration 5.3 Choose profile(s)

Accept the default directories when prompted for the file locations:

The Home directory: c:\program files\exceed.nt

The user directory: c:\program files\exceed.nt\user

For this installation all options in the next dialog are kept at the default value.

Note for FoxView:

When setting up the X-terminal for use with FoxView the fonts: **miscellaneous** and **75dpi** must be installed with eXceed.



Illustration 5.4 Resource overview

When arrived here, choose the **F**onts... button..

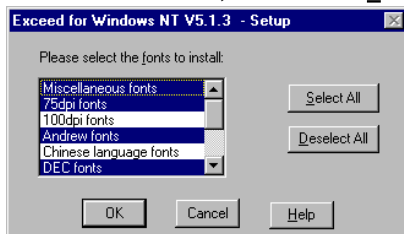


Illustration 5.5 Fonts selected for install

So **OK** to continue...

Progress and selections made so-far are displayed. If no changes are required select **S**tart.

This will bring up the next screen, where the selections until now are shown.

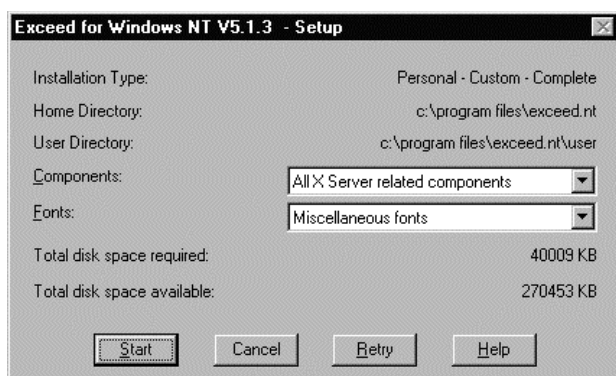


Illustration 5.6 Choices configured until now
Press **Start** to proceed with the actual installation.

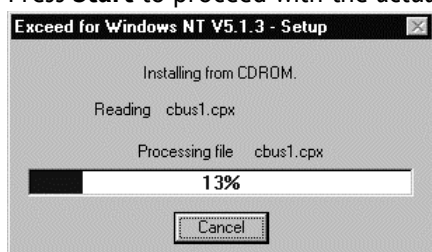


Illustration 5.7 Install progress
During the install you are prompted for some additional selections.



Illustration 5.8 US keyboard layout selected
Accept the default keyboard layout in case it matches the installed one. Next the **Xconfig** dialog appears. Here you may enter the password for eXceed configuration changes. In this example no password is used. This can be changed after installation is completed! Enter a password if required. I suggest to use this option to prevent users from tampering with the critical X configuration settings.

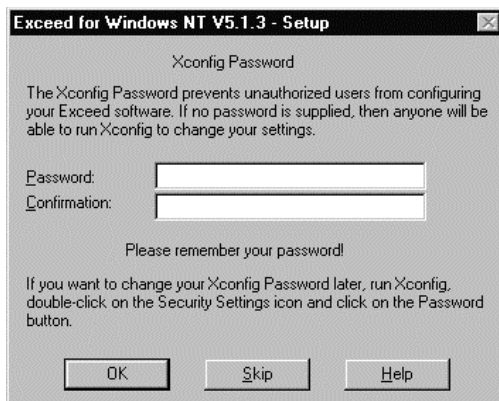


Illustration 5.9 Xconfig password entry

Enter **Yes** to create the Common group... And **Yes** again to optimize for performance. This will take some time, please wait for the performance test to complete. After successful performance testing the installation is complete! The installation software will prompt for a shutdown and reboot of your system to install certain Windows System files and/or services. Please enter **Yes** to continue. After the shutdown and reboot, the system is ready for the rest of the installation. You now have a setup that is able to connect to the host via **Telnet**. The TCP/IP layer was set-up from Windows NT and the PC-X server was installed via Hummingbird's eXceed software.

5.6.1 The eXceed hosts file

Hummingbird eXceed can use symbolic names (i.e. use a name instead of an IP address) to connect to the host station. For this, a utility is supplied which can be found in the eXceed folder in the **Start** menu on the desktop. The utility is called **Host Editor**.

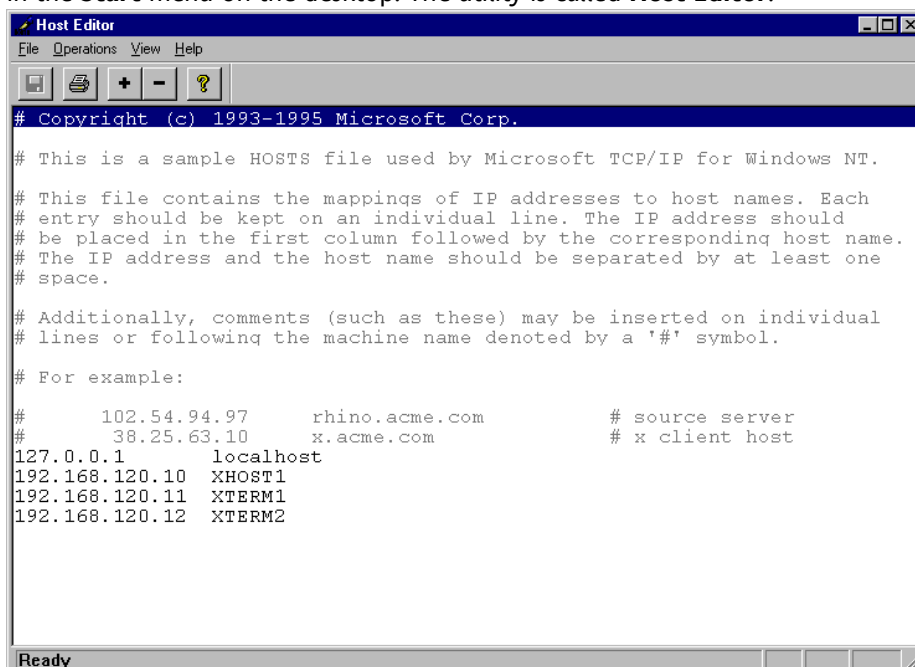


Illustration 5.10 Host table shown in "Host Editor"

In the picture above the names from the PC and the I/A host have been added. So from now on

in this chapter both the names and IP address can be used to address the stations in this file.

5.6.2 Testing the communication

At this moment all conditions are met to establish a connection between the I/A host and the PC. The network adapter is properly configured and the TCP/IP layer is installed and configured. So to be sure the communication between host and terminal is functioning try to open a **Telnet** session to **XHOST1**. The program is located in the folder **Start/Programs/Exceed/Telnet**. Click the icon to start the Telnet session. This will result in the following screen Enter the appropriate IP address or name for the host you are connecting to. (**192.168.120.10** or **XHOST1**, in this example).

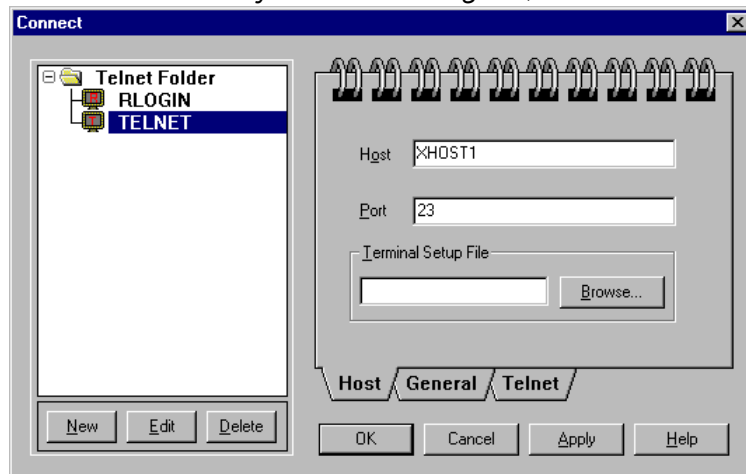


Illustration 5.11 Telnet setup

And press ENTER or click on OK to start the connection. When you receive the login prompt you must be able to login to the host.

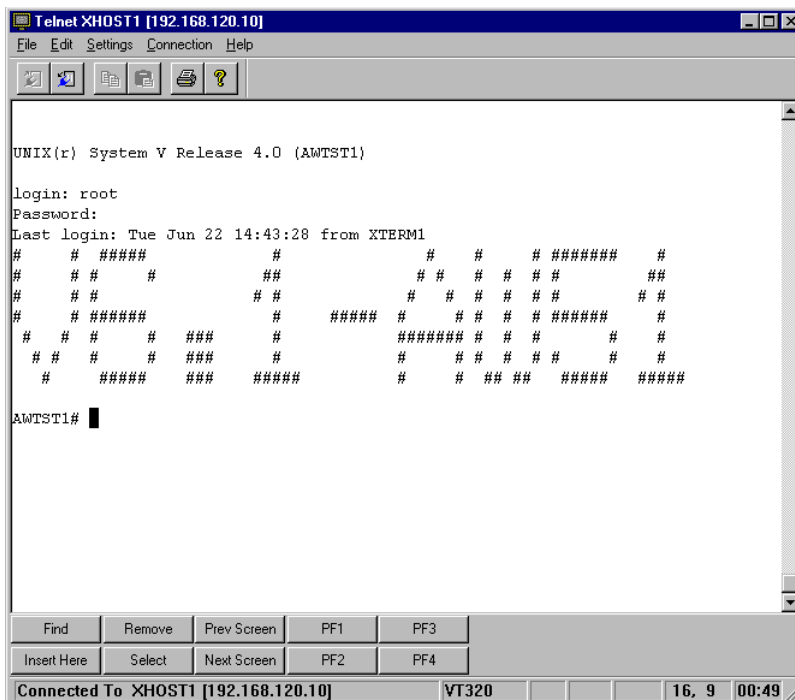


Illustration 5.12 Opened Telnet session to AWTST1

Since we can now connect to our host it is time for the next step.

5.6.3 Copying the I/A Series standard fonts.

The **Foxboro Display Manager** doesn't show the correct fonts and markers when the X-Terminal is started at this moment. This is due to the fact that the fonts in use on the I/A platform are currently not yet available on the PC. So they should be copied to the PC and this is done using the FTP utility located in **Start/Programs/Exceed/FTP**.

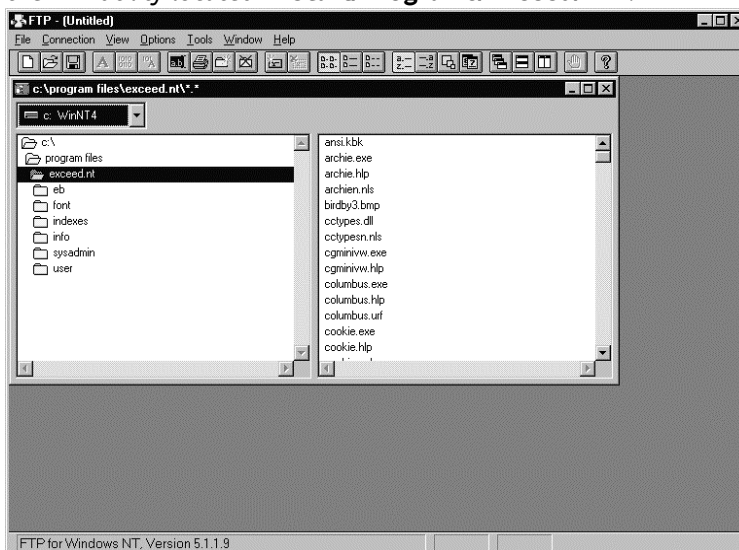


Illustration 5.13 The FTP application

The next screen shows the result after displaying the windows tiled horizontally:

The source directory is: `\usr\fox\wp\fonts\*.bdf`

The destination directory is: `c:\program files\exceed\font\ia`

The IA subdirectory can be created with the FTP program using the **File/ Create Directory** menu option. Select only the `*.bdf` files via **View/By file type...** option and enter `*.bdf`. This results in the following display:

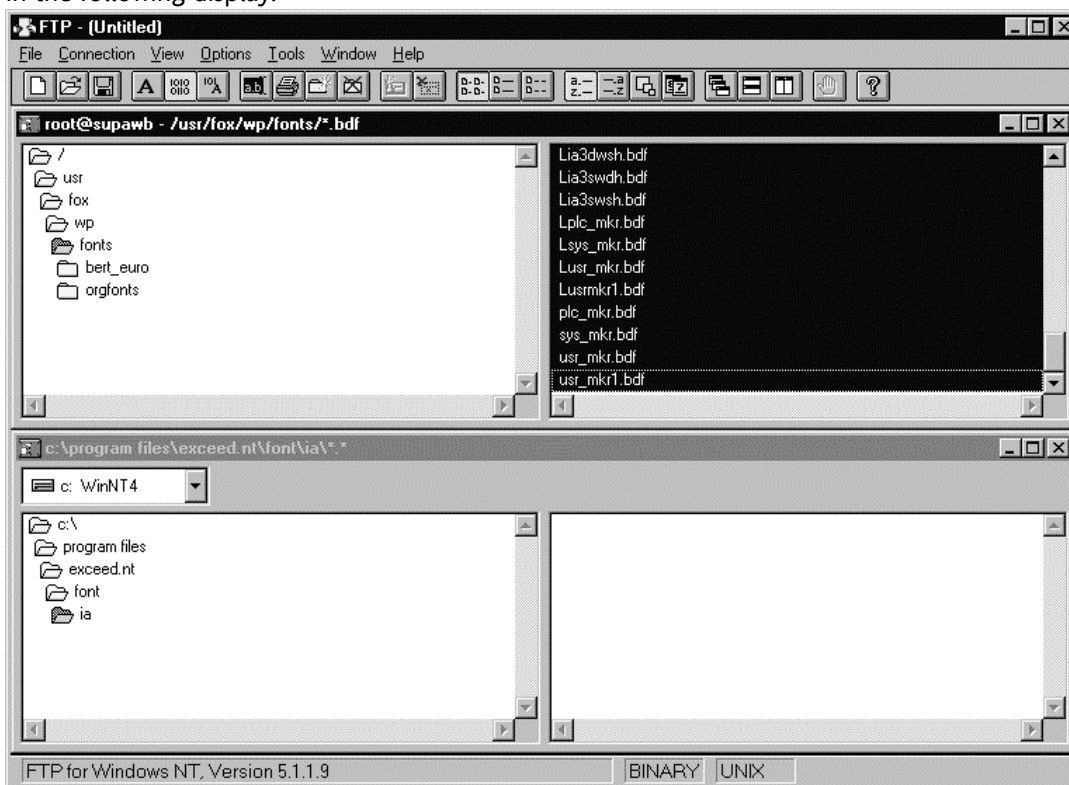


Illustration 5.14 FTP connection opened to AWTST1

Using Drag & Drop copy the selected files to the local drive. When all fonts have successfully been copied, exit the application.

5.6.4 Converting the I/A Series fonts on the X-Terminal PC.

To use the I/A fonts just copied, they must be converted to be used in the Windows environment. For this start the **Xconfig** program in the eXceed folder.

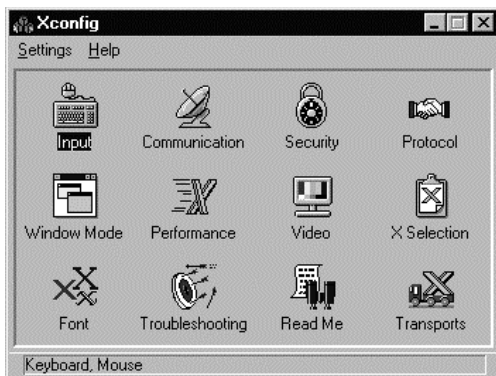


Illustration 5.15 The Exceed Xconfig application

Double click **Font** icon...

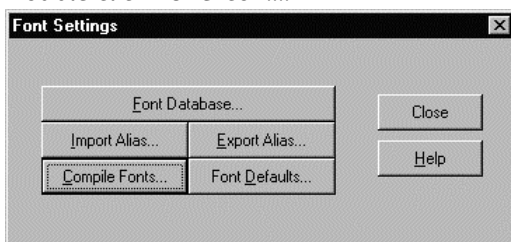


Illustration 5.16 Font settings window

... and choose the button **Compile Fonts...** Change directory to `c:\program files\exceed\fonts\ia` and make sure the output directory is the same as the source!

Select All and choose **Compile**

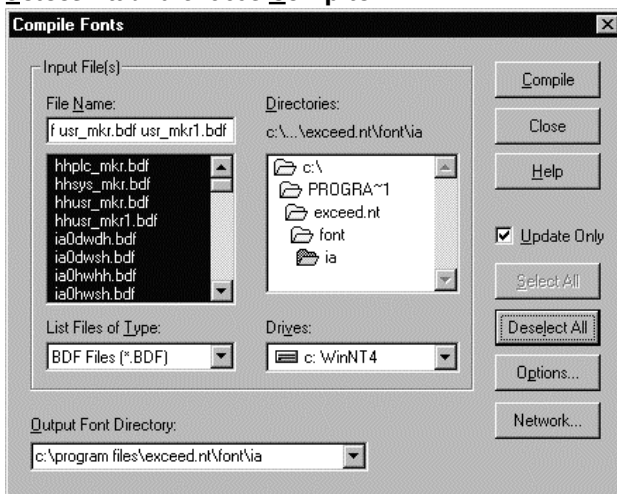


Illustration 5.17 Compiling fonts

Choose **Yes** to add the font directory to the font database...



Illustration 5.18 Add font directory

Exit the **Font** utility. You are returned to the **Xconfig** utility. One final step required for the font installation. For this, select the **Fonts** button in the **Xconfig** window. This will result in the following window:



Illustration 5.19 Font settings window

Next select the **Font Database** button. In the next window you will find **Automatic Font Substitution** with a check box on the left of it. This box is by default checked in certain versions of the eXceed distributions. In this case **uncheck** the box so it looks like the picture below.

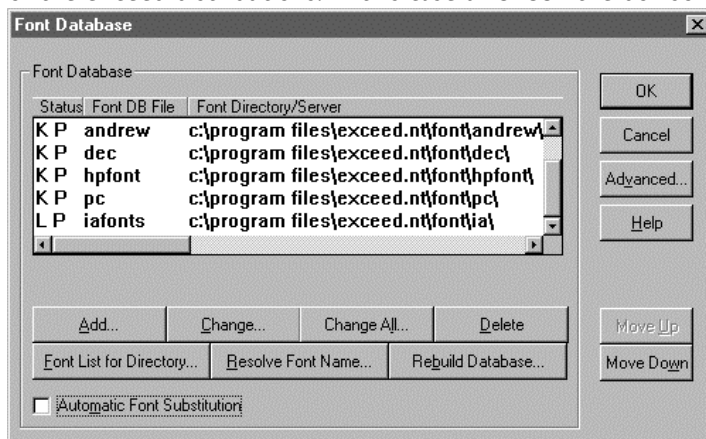


Illustration 5.20 The font database overview

When this is omitted the fonts may not display correct on the Foxboro DM or FoxView™.

Note for FoxView:

When setting up the X-terminal for use with FoxView™ the fonts: **miscellaneous** and **75dpi** must be installed with eXceed.

5.6.5 Optimizing the Performance settings

The default performance setting for eXceed are not optimal for some of the Foxboro applications. The main issue is the redrawing of the X-windows whenever a portion or the full screen was covered by another window or when the application was minimized. When this happens the “covered” or minimized windows will not be redrawn correctly when they are “revealed”. To change this a modification has to be made in the **Xconfig** screen found in the **eXceed** folder.

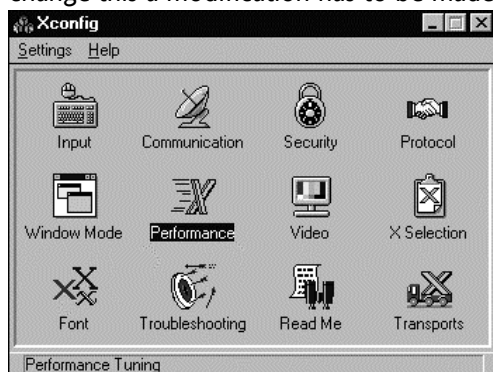


Illustration 5.21 Exceed Xconfig

In this group select the icon **Performance** and change the settings in the dialogue screen to the ones shown in the screen below.

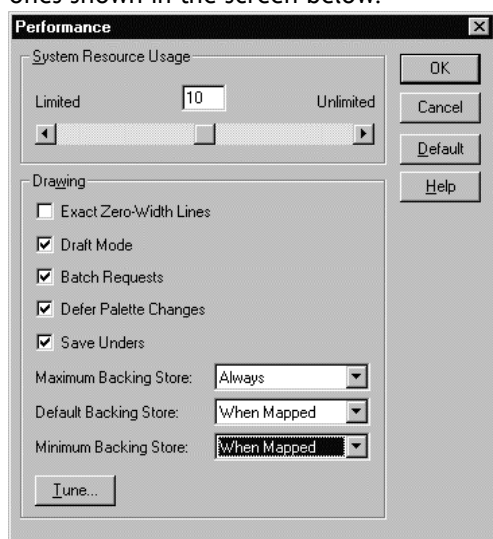


Illustration 5.22 Optimizing Server performance for Foxboro usage

After completion the screen redraws should work without problems.

5.6.6 Starting the X-Terminal

Now it's time to start an X- terminal session. Locate the **X-Start (Start/Programs/Exceed/Xstart)** application and start. Starting the X Start application will produce the box shown here (the password for the ia account is “remote”):

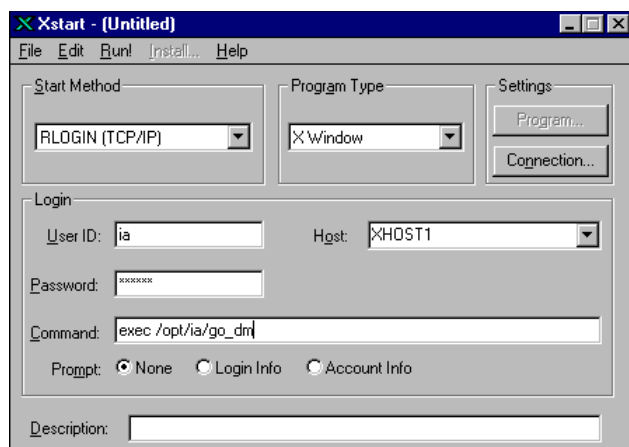


Illustration 5.23 Configuring the X-start session

Please note that the **User ID:** must be **ia** and **NOT** the **root** account. Complete this screen as shown. After entering this screen select the button **Connection...** Set the **Close (sec):** timeout to -1 (minus one - this means no timeout) and check the box next to **Show progress**. There are two boxes that can be checked here. They may be left unchecked but the information they can provide may be of help when debugging possible communication problems.

You can save the settings if you like. Next choose **Run!** to start the X-Terminal. As a result the Foxboro Display Manager or FoxView™ (whatever is the default) appears.

So it is either this:



Illustration 5.24 The Display Manager on Windows

Or this....

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview



Illustration 5.25 FoxView on Windows

This completes the installation of eXceed 5 for Windows NT.

6 Multiple heads with eXceed on Windows NT 4.0

Setting up a dual head X-terminal. This section sort of describes how to do that. Could be translated into something more recent.

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6.1 Introduction

This is a special section concerning multi-screen configurations with Windows NT and eXceed software. I.e.: a multi screen X-Terminal for displaying more than one Display Manager / FoxView™ each on a separate screen. In this setup the Windows NT machine is equipped with a special videocard with two or more video connectors or with two or more video cards. This setup was tested with an NT box with a dual connector video card. This chapter is based on the chapter concerning eXceed 6 for Windows 95 and NT 4.0. Only the additional information, required to configure a multihead NT X-terminal, is provided.

6.2 Hardware requirements

To successfully install eXceed 6.x for Windows 95/NT, your hardware must meet the following minimum specifications:

- A 486 or higher processor (Pentium recommended).
- At least 16Mb of RAM installed (32Mb or more recommended).
- Approx. 52 Mb free disk space to install the software.
- One 1.44Mb floppy disk drive or one CD-ROM drive depending on the media supplied.
- A Windows NT compatible multi head display card (capable of 1024 x 768 with 256 colours on multiple displays).
- A Windows compatible mouse.
- A supported network adapter.

6.3 Software requirements

The operating system must be Microsoft Windows NT4.0 SP3 or higher.

The eXceed software used in this section is eXceed version 6.1 for Windows 95/NT by Hummingbird communications Ltd. The manufacturers drivers for the video adapter are to be used.

6.4 Windows NT considerations

Windows NT requires at least service pack 3 to support some PCI and ALL AGP cards.

6.5 Other considerations

At this moment, it is NOT possible to have a dedicated **DM/FoxView™** for a multi Head NT station. The message “No DM configured for this screen” appears and the DM does not start. Exceed has a maximum “limit” of 4 screens at this moment.

6.6 Configuring eXceed for multi-head support

In the X Window environment it is common to address the CRT's attached to your workstation as “screens”. So when addressing a certain application to a particular screen you must provide some extra information to the application on where it should display.

For instance: if your PC (MY_OWN_PC) runs eXceed and has two screens you can display the **xclock** from a UNIX server on the first screen by running (on the server) :

```
# xclock -display MY_OWN_PC:0
```

or:

```
# xclock -display MY_OWN_PC:0.0
```

This will display the **xclock** program on the (default) first screen on the PC. However to display the same application on the SECOND screen you must supply some extra information:

```
# xclock -display MY_OWN_PC:0.1 (Note the .1 at the end of the command)
```

More specific: this syntax will display on screen 1 on server 0. So, if you want to have the Display Managers to display on the different screens you must add (a) screen(s) to the eXceed configuration. Start the **Xconfig** tool for this (**Programs/eXceed/Xconfig**) and select

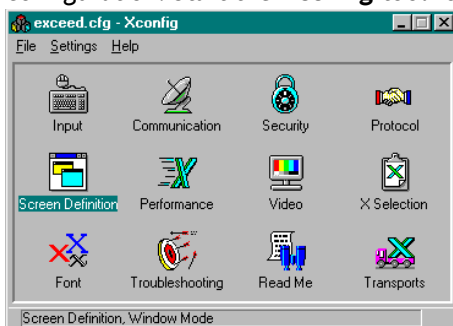


Illustration 6.1 Exceed Configuration tool (Xconfig)

Screen Definition... this will bring you the next screen:

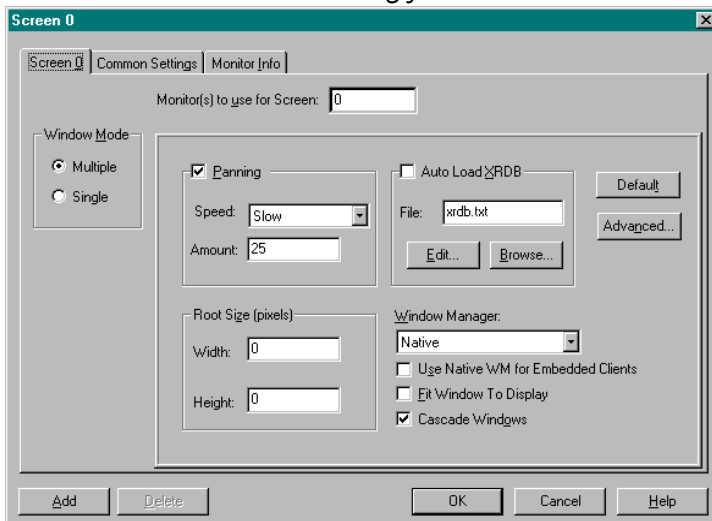


Illustration 6.2 Screen definitions window

Here, the default (**Screen 0**) is present. Choose **Add** to create an extra tab for **Screen 1**.

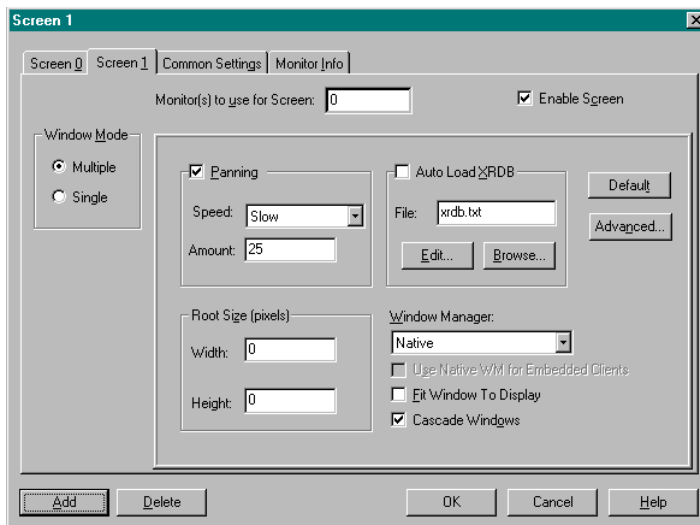


Illustration 6.3 Added an additional screen (screen 1)

Select the tab **Monitor Info**:

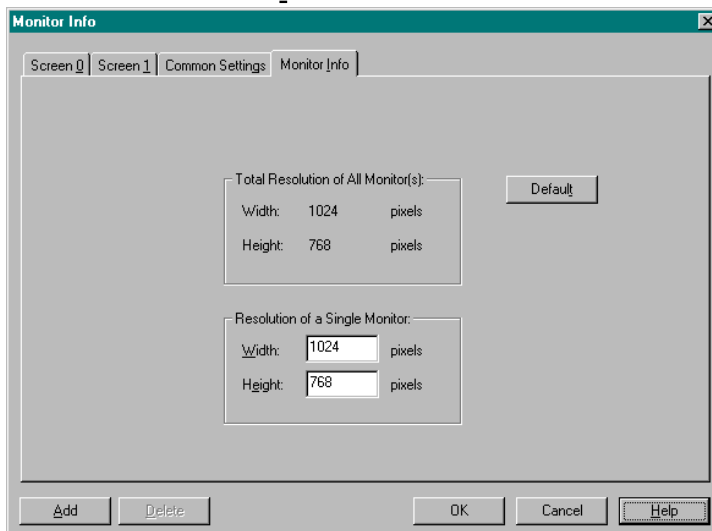


Illustration 6.4 Monitor Information

Xconfig automatically detects the total resolution of all monitors and displays it on this tab for your convenience. For example, if you have one physical monitor set at 1024x768 resolution, then your total resolution is 1024x768; but if you have two physical monitors set at 1024x768, then your total resolution is 2048x768.

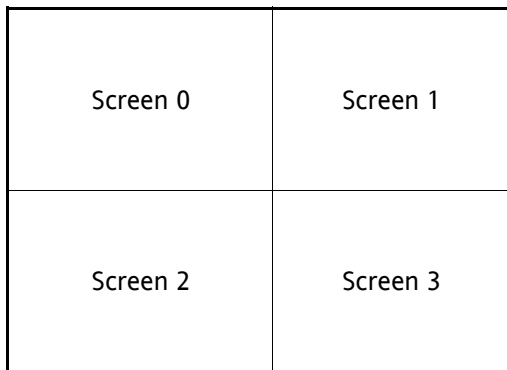


Illustration 6.5 Virtual screen locations in eXceed

Multiple physical monitors **MUST** all be set at the same resolution, both size and colors. If one monitor is at 1024x768 with 256 colors, then all the physical monitors must be set the same. The Resolution of a Single Monitor setting determines the number of screens needed to fill a physical monitor, and their orientation within that monitor. Regardless of configuration, there can only be a maximum of 4 Screens. Screen number assignments are made left to right then top to bottom, as shown above.

This only allocates the screen space, though. To actually add screens, you must use the **Add** button at the bottom of the **Screen Definition Settings** dialog box. You can also have a screen that spans more than one monitor.

6.7 The modified go_dm script

In order to allow for a DM to go to a specific screen on the X-terminal PC we must be able to pass this information to the X display manager. The standard `.profile/go_dm` file does not allow for additional parameters to be passed. Because of this the `go_dm` file was modified.

Below you find the modified `go_dm`.

The variable `REM_SCREEN` is introduced and it is made part of the `DISPLAY` variable. (notice the **BOLD** print in the file

[go_dm] I/A version 4.3 (with FoxView™ and DUAL screen support)

```
PATH=/bin:/usr/bin:/usr/sbin:/etc:/usr/ucb:/usr/local:/usr/ccs/bin:./usr/opt/SUNWm
d/sbin:/optgms/bin:/usr/fox/wp/bin/tools
export PATH
# Need to set up library path for jettool (needs libview.so.x)
LD_LIBRARY_PATH=/usr/openwin/lib ; export LD_LIBRARY_PATH
l () ls -l $*
lc () ls -CF $*

REM_STATION=`who am i | awk '{print $6}' | tr -d "()"`
LOC_STATION=`uname -n`
REM_SCREEN=$1

DISPLAY=$REM_STATION:0.$REM_SCREEN ; export DISPLAY
echo Setting DISPLAY to $DISPLAY
.
```

```
the rest of the file
.
.
.
exit
```

This concludes the section for dual head support.

7 eXceed 6.2 on Windows 2000 Professional.

Windows 2000 is something different altogether again. This time it was eXceed 6.2 on this platform.

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7.1 Introduction

In this chapter we will be installing and configuring the Hummingbird PC X-server eXceed version 6.2. This X-server enables the PC platform to run Unix platform applications within the familiar Windows environment. This X-server functionality is required to run the Foxboro DM and FoxView™ with their accompanying applications.

7.2 Hardware requirements

To successfully install eXceed 6.x on Windows 2000, your hardware must meet the following minimum specifications:

- An Pentium™ processor.
- At least 64Mb of RAM installed (more recommended).
- Approx. 52 Mb free disk space to install the software.
- One 1.44Mb floppy disk drive and one CD-ROM drive depending on the media supplied.
- A Windows compatible display (capable of at least 1024 x 768 pixels with 256 colours).
- A Windows compatible mouse.
- A supported networkcard.

7.3 Software requirements

The operating system must be Microsoft Windows 2000 Professional.

The eXceed software used in this section is eXceed version 6.2 for Windows 95/98/NT by Hummingbird communications Ltd.

The TCP/IP protocol is installed and configured.

7.4 Additional requirements and Yaer 2000 issues

For some of the modifications on the I/A UNIX platform, “root” privilege is required. You may want to create a new user in NT to use the X-Terminal. To create this new user account you must have the **Administrator** privileges on the NT system.

In the case you do not have these permissions you must contact your system administrator for assistance.

7.5 True Color support

The restriction of having a display driven with a maximum of 256 colors can be eliminated when you are using eXceed version 6.1 or higher. This is the first version that allows the reliable use of the “**pseudo color**” setting found in eXceed. The problem in the past was that the blinktask would not initialize and as a result, would not show blinking colors. For the true color mode to work some steps need to be taken.

- Set the display to **true color** mode (sometimes referred to as 16777261 colors, 24 bit or 32 bit colormode). (No, not high color or 65536 colors!)

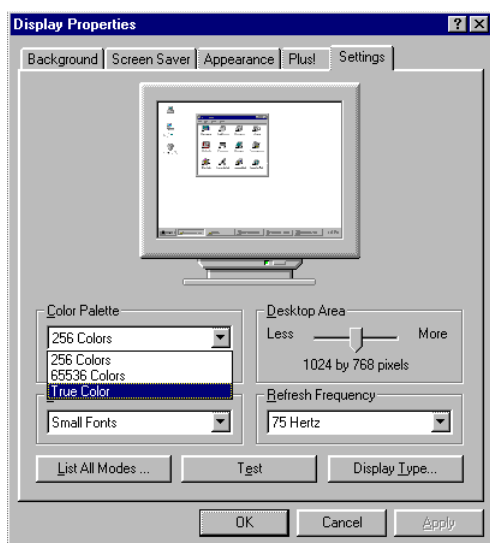


Illustration 7.1 Display properties for true color

- In the **Xconfigurator** utility open the **video** icon and set the **Server Visual** to **PseudoColor**:

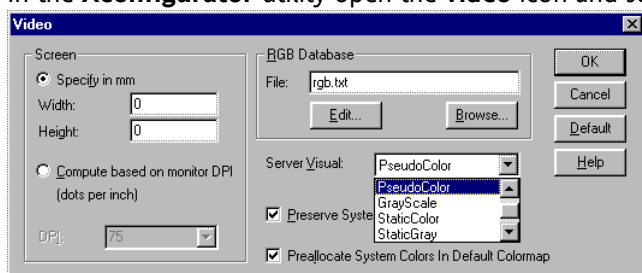


Illustration 7.2 Video settings in Xconfig to support true color

This should be sufficient to allow the use of true color mode with the Foxboro Display Manager or **FoxView™**.

7.6 Configuration information

For this installation the following applies:

- The host is: **AWTST1** and the second Ethernet IP is: **192.168.120.10**.
- The I/A host used "**XHOST1**" as the name on the second Ethernet connection.
- The PC1 has a logical name: **XTERM1** and the Ethernet IP is: **192.168.120.11**.
- The PC2 has a logical name: **XTERM2** and the Ethernet IP is: **192.168.120.12**.
- The I/A Series AW51B was running Version 6.1 software.
- The PC was running Windows 2000 Professional SP1.
- The network adapter is a 3Com EtherLink III.
- The installation is done from CD-ROM.
- Both `CONFIG.SYS` and `AUTOEXEC.BAT` are empty or non-existent.
- A DM is configured on the I/A Series host according Foxboro release notes V4.2 appendix D.

In this chapter both the **Foxboro DM** and **FoxView™** are supported. However when the installation proceeds only the abbreviation DM is used. When specific tasks are required for FoxView this is denoted in the text.

When applicable relevant information for the Windows 95 platform is included.

7.7 eXceed 6 installation

This chapter was written using Windows 2000.

The eXceed CD-ROM supports the **autorun** feature found in Windows 2000. All that's required is load the eXceed CD and wait for the install screen to appear. In the event that this does not appear (this may be because the autorun feature is disabled in Windows), just browse the CD and run the **MSETUP.EXE** program in the root of the CD. This will have the same result as "autorun".

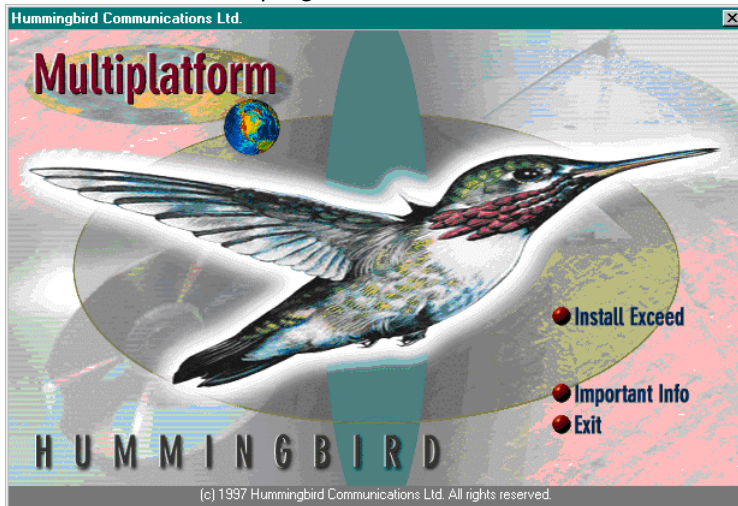


Illustration 7.3 Exceed splash screen

Choose **Install Exceed** to continue.

After passing the information screen that follows the next dialog is displayed:



Illustration 7.4 Select the correct installation type

The first choice here is the type of installation: Normally choose **Typical** or **Custom**. For the differences between the various installation possibilities please review the screen information and the documentation. The choice we make here will perform a **Custom** installation on your local harddrive. This will result in a installation similar to choosing **Typical**, but this installation option will give more information on what is happening to the system. So, choosing **Typical** will not show all the dialogs in the documentation, but will result in an identical setup. The **Workstation** and **Administrative** options speak for themselves and are meant specifically for network installations. We will not go into these at this time. The InstallShield will present you with the first

screen. Choose **N**ext to continue.

(NT Administrator only) We're going to do a "common" installation and we will choose the option to allow all users of this machine to use the eXceed programs. This dialog is not displayed when running as another user than Administrator on the PC where you are installing eXceed. In that case you will install for the current user only.

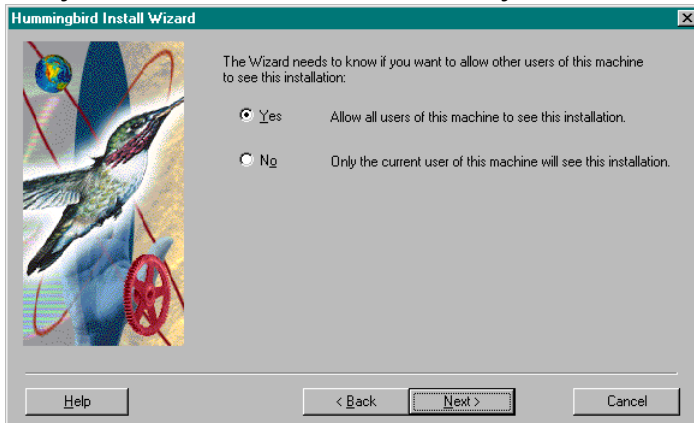


Illustration 7.5 Different installation options for "this user" or "all users".

Accept the default directories when prompted for the file locations:

The Home directory: `c:\program files\exceed.NT`

The user directory: `c:\program files\exceed.NT\user`

You will be presented on overview of all the eXceed parts that will be installed. A lot of this is not needed but we'll leave it at the default selection as it is.

Press **N**ext to show the **F**onts screen:

Note for FoxView:

When setting up the X-terminal for use with FoxView the fonts: **miscellaneous** and **75dpi** must be installed with eXceed. These fonts are part of the default selection by eXceed, but please verify that these fonts are selected for installation.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview

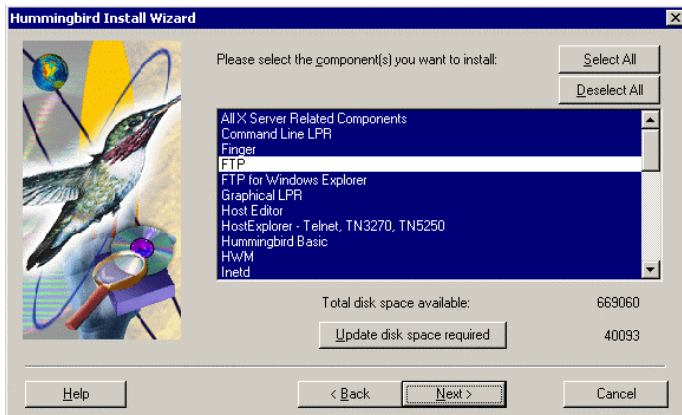


Illustration 7.6 The eXceed parts to be installed

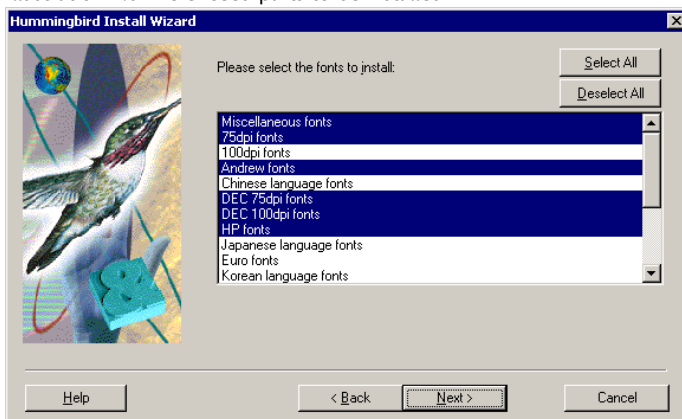


Illustration 7.7 Window showing fonts selected for installation

Again leave the selection as is and press **Next** again to continue the installation.

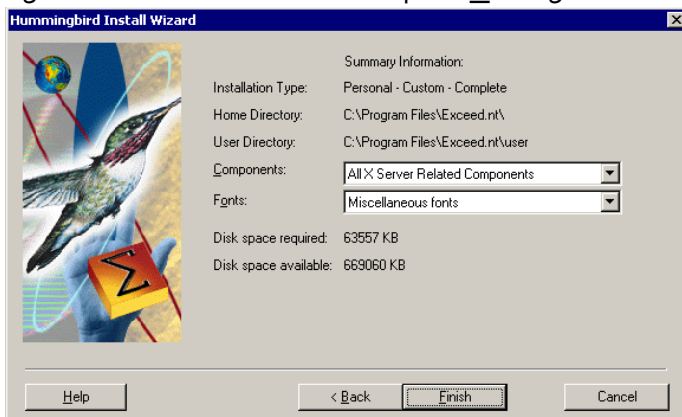


Illustration 7.8 Overview of current selections

Now a screen is displayed showing the selections made this far. The amount of disk space is shown and this must be less than the available disk space. (I guess...).

Installation begins...

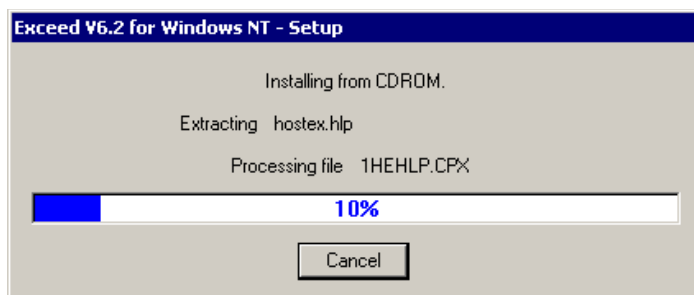


Illustration 7.9 Installation progress

You can apply for Technical Support from Hummingbird you should enter the next screen, but in this case I will choose **Skip**.

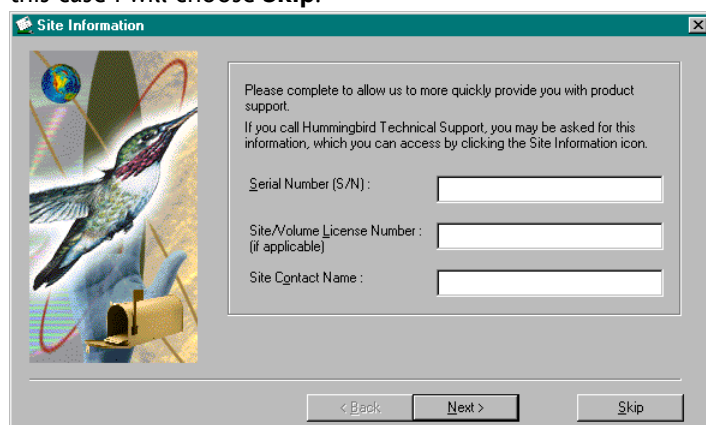


Illustration 7.10 Dialog to register and enter serial number

If you regret skipping at a later time, you can run the Online Registration Application when the installation is completed.

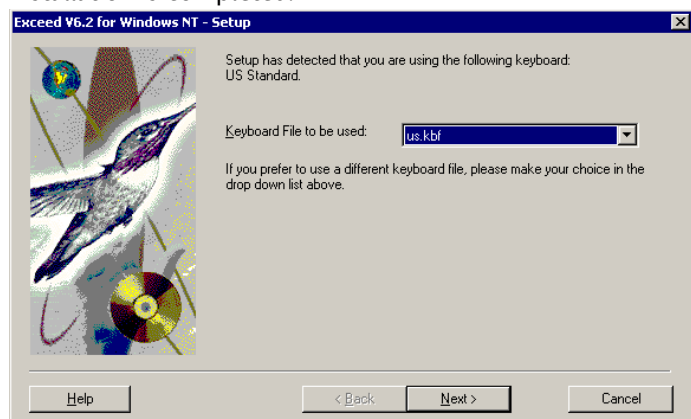


Illustration 7.11 Here the US keyboard layout was selected

Accept the default keyboard layout in case it matches the installed one (us.kbf when a standard US layout is used). After this you are prompted for a password for the configuration settings in eXceed. It is wise to configure eXceed with password protection when you will be giving these Terminals to others or you might end up being much more of an Administrator than you may like.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview

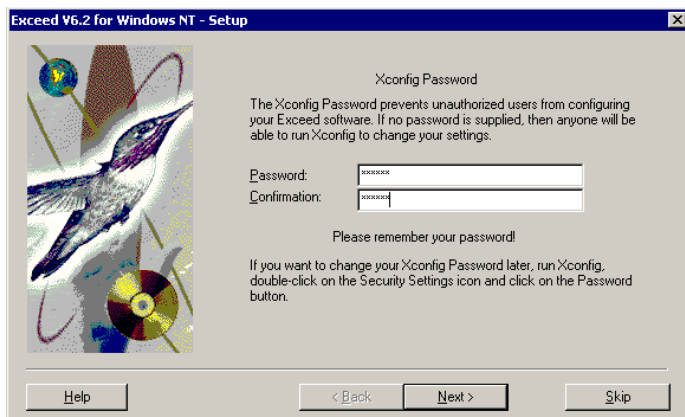


Illustration 7.12 Setting security: the password for Xconfig

When you want to enter **Xconfig** utility later, a dialogue appears where must enter the password provided here for eXceed configuration changes.

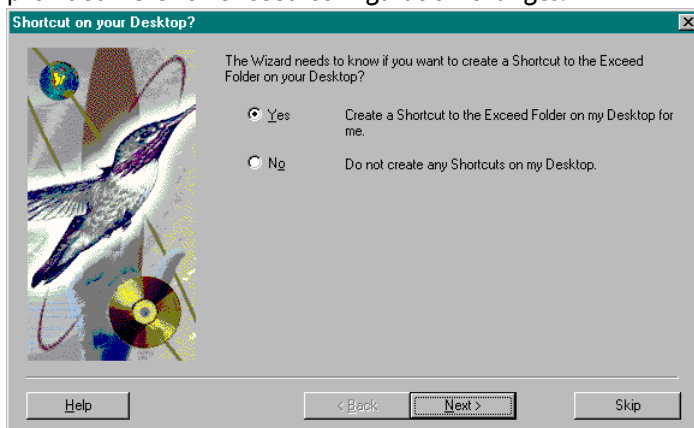


Illustration 7.13 Add a shortcut on the Desktop?

Select **Yes** to create the shortcut if you prefer. Now you are prompted to allow **eXceed** to do some performance testing in order to tune the X-server.

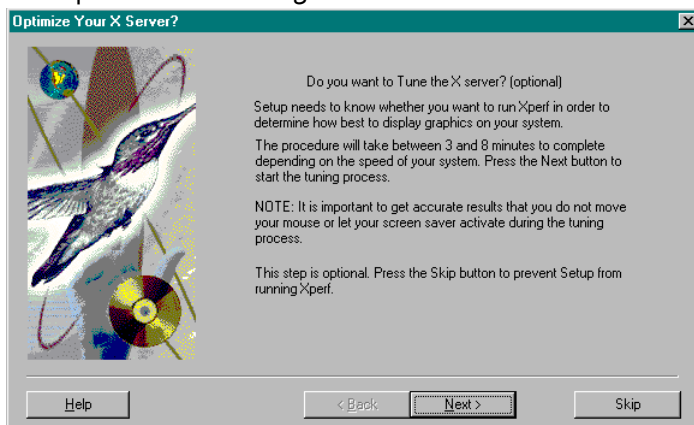


Illustration 7.14 Optionally tune the X-server

Choose **Next** to start these tests. As you can read in the information on the screen it will allow you for an 8 minute break (since: of course your PC meets the lowest specs you can get away with). When the tests are completed you are prompted that installation (hopefully) was successful

and that a reboot is in order to activate the changes made to the system.

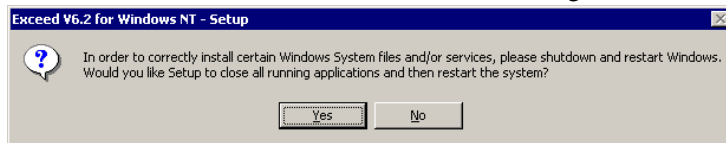


Illustration 7.15 Reboot message

After system rebooted, the system is ready for the rest of the installation. You now have a setup that is able to connect to the host (using Telnet, for example). The TCP/IP layer was set-up from Windows NT/95 and the X-tools and the X-server were installed via Hummingbird's eXceed software.

7.8 Copying the I/A Series fonts.

At this time a DM can be started on the PC using the methods described later in this document. However...the **Foxboro Display Manager and FoxView™** do not show the correct fonts and markers when the X-Terminal is started at this moment. This is due to the fact that the fonts in use on the I/A Series platform are currently unknown/available to the eXceed PC. So they should be copied to the PC and this is done with **FTP**.

The paths for the Foxboro fonts on both platforms:

The I/A host \usr\fox\wp\fonts*.bdf

The PC : c:\program files\exceed.nt\font\ia

Create the PC directory before you proceed.

Open a command session (**Start/Programs/Accessories/Command Prompt**) and open the ftp program to the host.

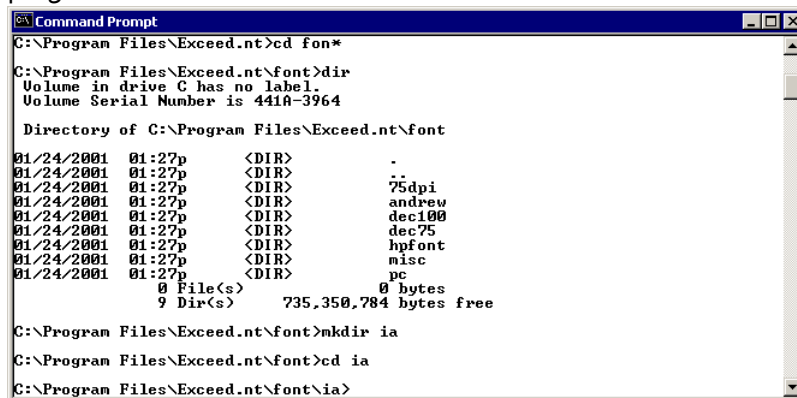


Illustration 7.16 Opened Command Prompt and create ia directory for the fonts

To get all the BDF fonts over enter the ftp commands printed in bold as in the example below:

```
C:\Program Files\Exceed.nt\font\ia>ftp XHOST1<cr>
Connected to XHOST1.
220 AW51B1 FTP server (UNIX(r) System V Release 4.0) ready.
User (XHOST1:(none)): root<cr>
331 Password required for root.
Password:password for root<cr>
230 User root logged in.
ftp> cd /usr/fox/wp/fonts<cr>
250 CWD command successful.
ftp> bin<cr>
```

```
200 Type set to I.
ftp> prompt<cr>
Interactive mode Off .
ftp> lcd<cr>
Local directory now C:\Program Files\Exceed.nt\font\ia.
ftp> mget *.bdf<cr>
200 Type set to I.
200 PORT command successful.
150 Binary data connection for Lia0dwdh.bdf (192.168.120.11,1030) (87461 bytes).

226 Binary Transfer complete.
ftp: 87461 bytes received in 0.24Seconds 362.91Kbytes/sec.
200 PORT command successful.
150 Binary data connection for Lia0dwsh.bdf (192.168.120.11,1031) (49315 bytes).

etc...
```

```
200 PORT command successful.
150 Binary data connection for usr_mkr1.bdf (192.168.120.11,1085) (749 bytes).
226 Binary Transfer complete.
ftp: 749 bytes received in 0.01Seconds 74.90Kbytes/sec.
ftp> bye<cr>
221 Goodbye.
C:\Program Files\Exceed.nt\font\ia>exit<cr>
```

Now all the fonts are available on the PC and we have to tell eXceed about it...

7.9 Converting the I/A Series fonts on the PC

To use the I/A fonts just copied, they must be converted to be used in the Windows environment. To accomplish this, open the **Xconfig (Start / Exceed / Xconfig)** application. (depending on the choices at installatin time, a password may be requested).



Illustration 7.17 The Exceed Xconfig Utility

Double click **Font** icon, as indicated above, and choose the button **C Compile Fonts...**

Change directory to `c:\program files\exceed.nt\fonts\ia` and make sure the output directory is the same as the source!!

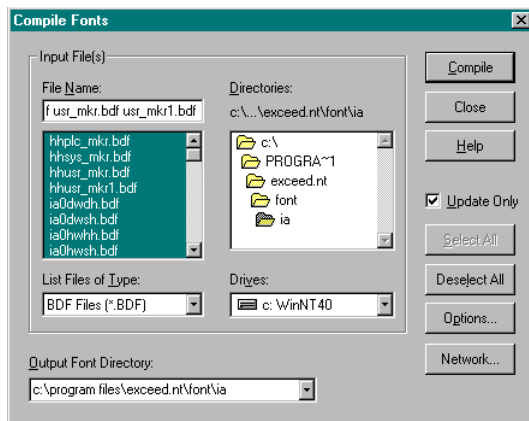


Illustration 7.18 The selected fonts will be compiled

Select All and choose **Compile**.

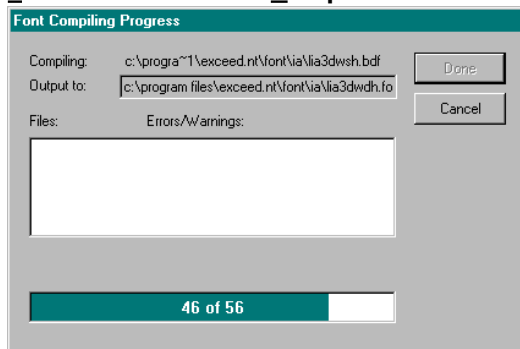


Illustration 7.19 Compilation progress, watch for errors

Enter **Yes** to the question to add the new fonts to the font database and enter a name...lets say **ia.fdb**.

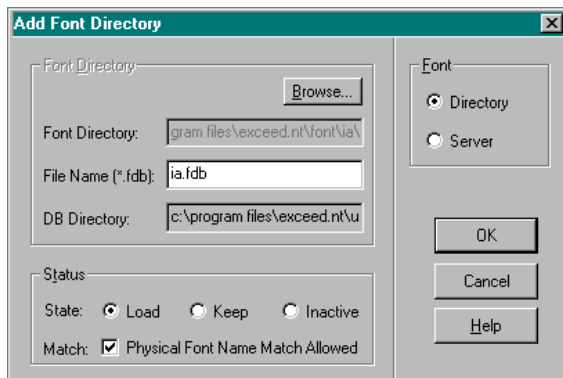


Illustration 7.20 Adding a font directory

You are returned to the **Font** utility. One final step required for the font installation.

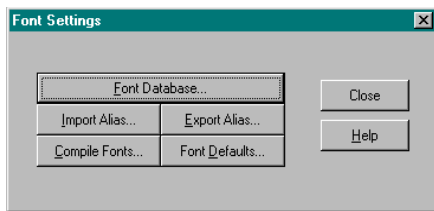


Illustration 7.21 Font utility dialog

Next select the **Font Database** button. In the next window you will find **Automatic Font Substitution** with a check box on the left. This box is by default checked and should be **unchecked** so it looks like the picture below.

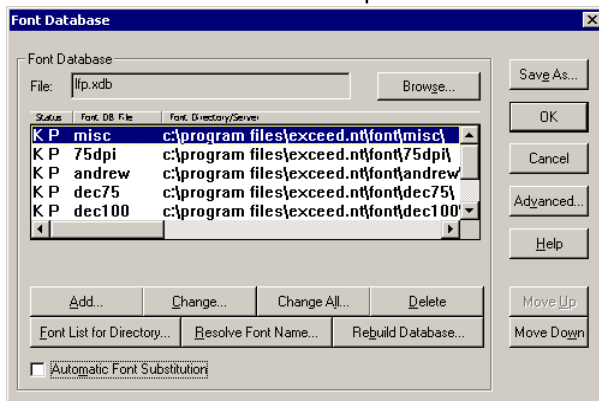


Illustration 7.22 Currently available font databases

When this is omitted the fonts will not display correct on either Foxboro DM or FoxView. For DM it appears that the fonts on the initial display are too small as for FoxView they appear to be too large. After making the proper selections, exit the Font Database dialog with **OK**.

7.10 Optimizing performance settings

The default performance settings for **eXceed** are not optimal for some of the Foxboro applications. The main issue is the redrawing of the X-windows whenever a portion or the full screen was covered by another window or when the application was minimised. When this happens, these “covered” or “minimised” windows will not be redrawn correctly when brought to the front or restored to their original size (dynamic fields are left empty until updated). To change this a modification has to be made in the **Xconfig** screen found in the **eXceed** group.



Illustration 7.23 Exceed Xconfig window

In this group select the icon **Performance** and change the settings in the dialogue screen to the ones shown in the screen below.

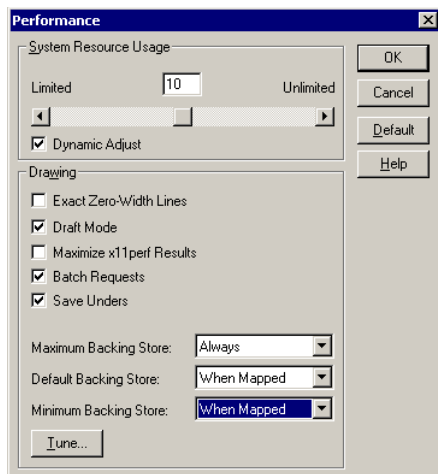


Illustration 7.24 Optimized performance settings for Foxboro

After completion exit the **Performance** window with **OK**. The screen redraws should work without problems.

7.11 Starting the X-Terminal

At this moment it is assumed you have a `go_dm` file for exceed 6 present on the I/A host and it's time to start an X-terminal session. Locate the **X-Start (Start / Programs / Exceed / Xstart)** application and start. In the window enter the data as indicated below (The password for the **ia** account is "**remote**"):

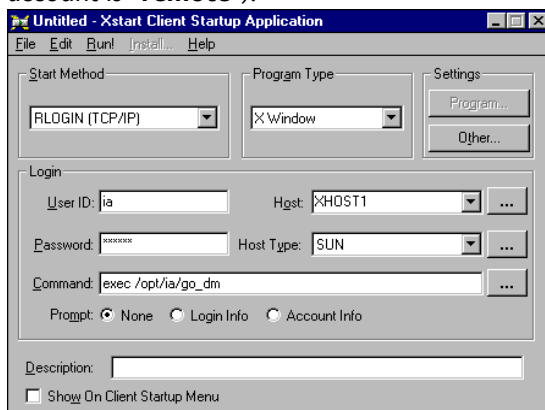


Illustration 7.25 Setting up the X start session

Please note that the **User ID**: must be **ia** and **NOT** the **root** account.

This has resulted in a stable environment, which does not trash the host with all sorts of left-over shells. Refer to section **4.6 Setting up a working environment**. for more information on this subject. Enter the rest of the fields in this dialog box as described. After entering this screen select the button **Other...**. Set the **Close (sec):** timeout to **-1** (minus one - this means no time-out) and check the box next to **Show progress**. This last box may be omitted but it will present you with some feedback on what is going on.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview

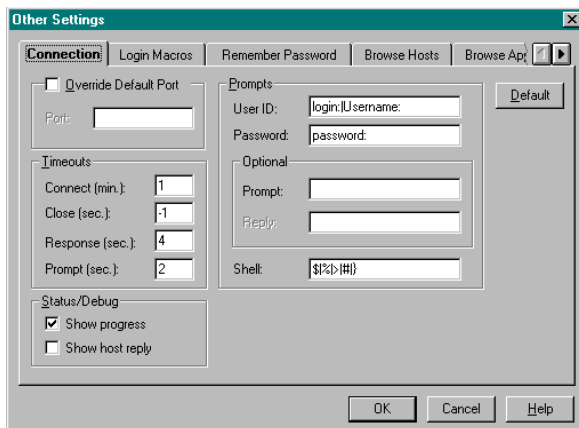


Illustration 7.26 Connection parameters

After completion of the previous screen press **OK** to return to the Client Startup Screen and with **File/Save as...**, save the settings in the default location:

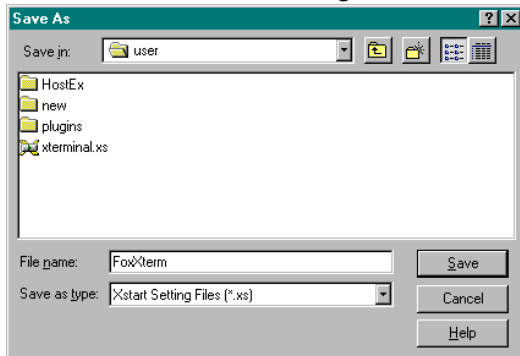


Illustration 7.27 Saving the current X session

You can create a **shortcut** on the desktop to this file. This will allow an easy way to start the session next time.

Choose **Run!** from the menu bar and the DM appears. (When I'm right).



Illustration 7.28 The Display Manager on Windows

As you can see I was right...I also had a version of FoxView™ available so it's here as well:



Illustration 7.29 FoxView on Windows

Depending on the installation.

This completes the installation of eXceed 6.2 for Windows 2000 Professional.

8 eXceed 7.0 on Windows 2000 Professional.

Installing and configuring eXceed 7.0 for Windows 2000 Professional.

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8.1 Introduction.

This chapter covers the installation and configuration of the Hummingbird PC X-server eXceed version 7.0. This X-server enables the PC platform to run Unix platform applications within the familiar Windows environment. This X-server functionality is required to run the Foxboro DM and FoxView™ with their accompanying applications.

8.2 Hardware requirements

To successfully install eXceed 7.0 for Windows 2000, your hardware must meet the following minimum specifications:

- A Pentium™ processor.
- At least 64Mb of RAM installed (128 Mb or more recommended).
- Approx. 52 Mb free disk space to install the software.
- One 1.44Mb floppy disk drive and one CD-ROM drive depending on the media supplied.
- A Windows compatible display (capable of at least 1024 x 768 pixels with 256 colours).
- A Windows compatible mouse.
- A supported networkcard.

8.3 Software requirements

The operating system used, is Microsoft Windows 2000 Professional.

The eXceed software used in this section is eXceed version 7.0 for Windows 95/98/NT/2000 by Hummingbird communications Ltd.

The TCP/IP protocol was previously installed and configured.

8.4 Additional requirements.

For some of the modifications on the I/A UNIX platform, “root” privilege is required. You may want to create a new user in NT to use the X-Terminal. To create this new user account you must have the **Administrator** privileges on the NT system.

In the case you do not have these permissions you must contact your system administrator for assistance.

8.5 True Color support.

The restriction of having a display driven with a maximum of 256 colors can be eliminated when you are using eXceed version 6.1 or higher. This was the first version that allowed the reliable use of the “**pseudo color**” setting found in eXceed. The problem in the past was that the blinktask would not initialize and as a result, would not show blinking colors. For the true color mode to work some steps need to be taken.

- Set the display to **true color** mode (sometimes referred to as 16777261 colors, 24 bit or 32 bit colormode or even “millions of colors”). (No, not high color or 65536 colors!)

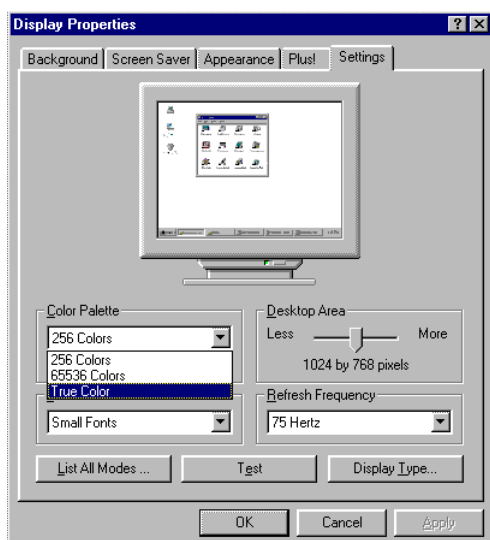


Illustration 8.1 Display properties for true color.

- In the Xconfigurator utility open the **video** icon and set the **Server Visual** to **PseudoColor**:

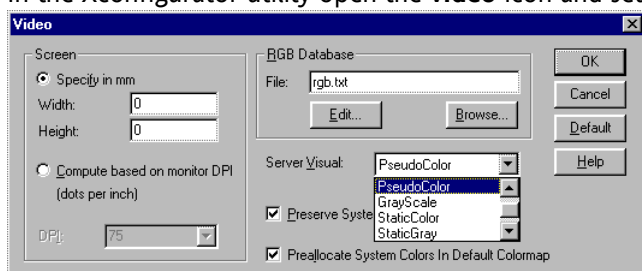


Illustration 8.2 Video settings in Xconfig to support true color.

This should be sufficient to allow the use of true color mode with the Foxboro Display Manager or FoxView™.

Configuration information.

For this installation the following applies:

- The host is: **AWTST1** and the second Ethernet IP is: **192.168.120.10**.
- The I/A host used "**XHOST1**" as the name on the second Ethernet connection.
- The PC1 has a logical name: **XTERM1** and the Ethernet IP is: **192.168.120.11**.
- The PC2 has a logical name: **XTERM2** and the Ethernet IP is: **192.168.120.12**.
- The I/A Series AW51B was running Version 6.2 software.
- The PC was running Windows 2000 Professional SP1.
- The network adapter is a 3Com EtherLink III.
- The installation is done from CD-ROM.
- Both `CONFIG.SYS` and `AUTOEXEC.BAT` are empty or non-existent.
- A DM is configured on the I/A Series host according to Foxboro release notes V4.2 appendix D or later.
- A new user "Operator" was created which has install privileges.

In this chapter both the **Foxboro DM** and **FoxView™** are supported. However when the installation proceeds only the abbreviation DM is used. When specific tasks are required for

FoxView this is denoted in the text.

8.6 eXceed 7.0 installation.

This chapter was written using a Windows 2000 configuration.

The eXceed CD-ROM supports the **autorun** feature found in Windows 2000. All that's required is load the eXceed CD and wait for the install screen to appear. In the event that this does not appear (this may be because the autorun feature is disabled in Windows), just browse the CD and run the **MSETUP.EXE** program in the root of the CD. This will have the same result as "autorun".

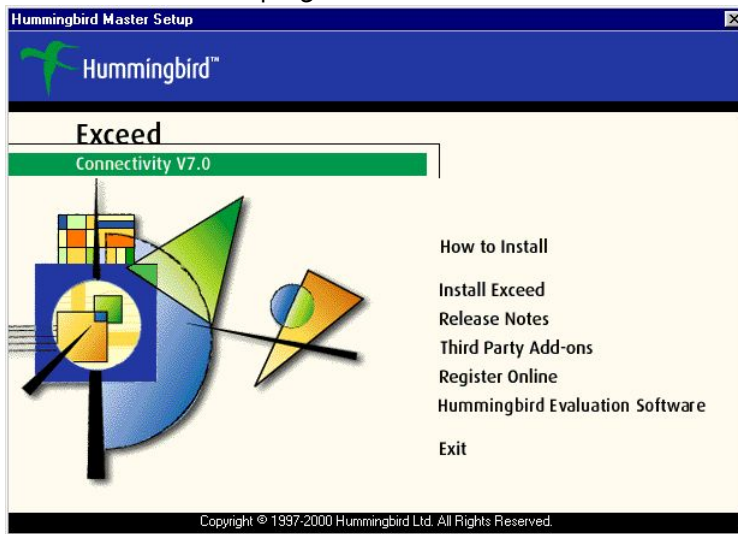


Illustration 8.3 Exceed initial setup screen.

Choose **Install Exceed** to start the installation wizard.

After passing the information screen that follows the next dialog is displayed:

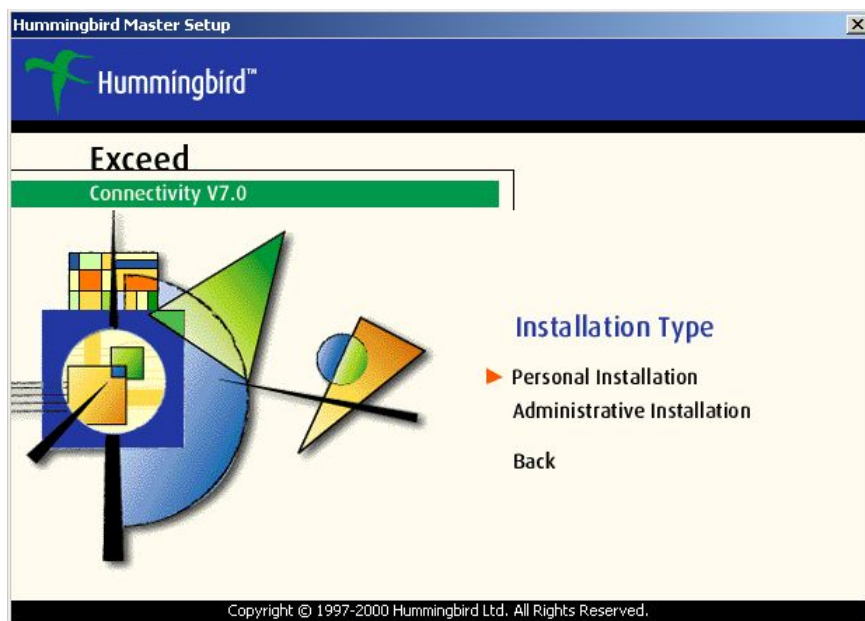


Illustration 8.4 Choose the Personal Installation

The first choice here is the type of installation: Choose the **Personal Installation** option. For the differences between the various installation possibilities please review the screen information and the documentation. The InstallShield will present you with the first screen. The next screen will prompt for the language to use:



Illustration 8.5 Select your language

After making the choice of language, you are presented the screen above. Press **Next** to continue. The next screen informs you eXceed will be installed on your computer.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview



Illustration 8.6 Hummingbird will be installed.

You are prompted to accept or decline the license agreement. If we want to get anywhere, it is better to accept them (after you have read them carefully AND understood every part of it of course).

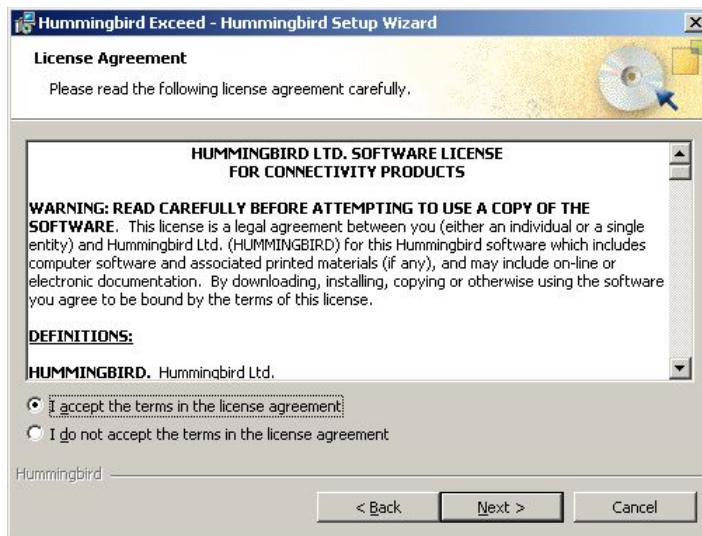


Illustration 8.7 Just accept the License agreement or else...



Illustration 8.8 Enter your name and organization info.

Hummingbird suggests a location where to install the program. This is fine, make changes if you have to.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview

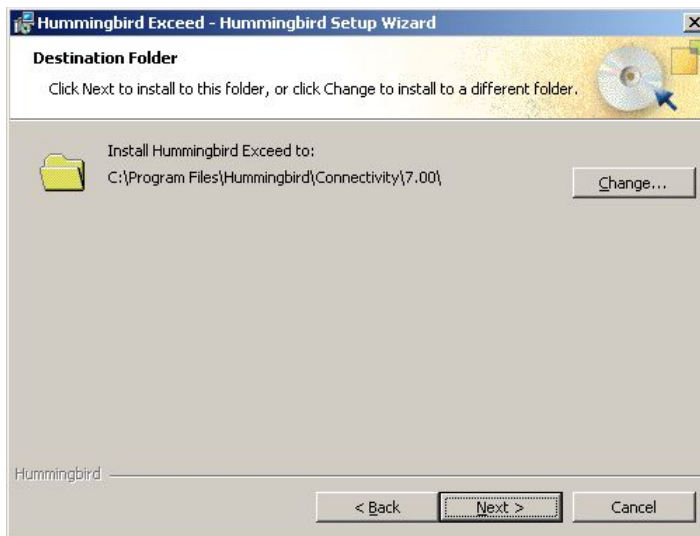


Illustration 8.9 The default installation folder.

Choose a typical installation since this covers all we need to get our work done.



Illustration 8.10 The installation type is "typical"

After which the installation can proceed.

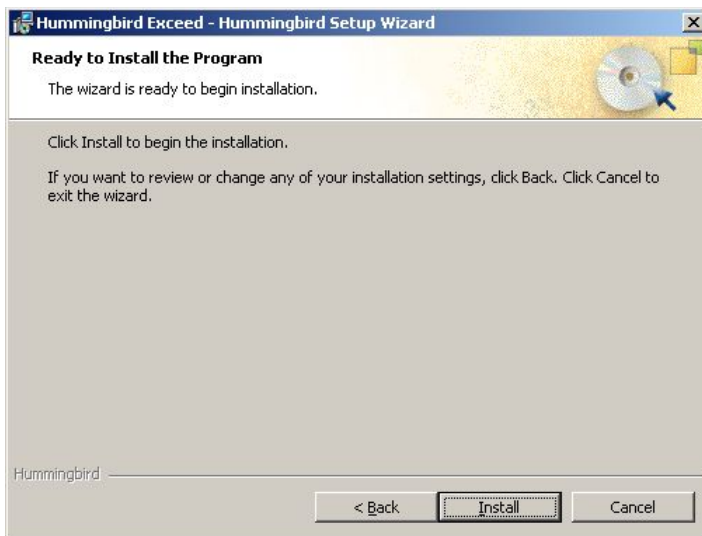


Illustration 8.11 To make progress, press Install

After some time you must provide information about you keyboard layout. The US international keyboard layout is assumed here. If this matches the actual situation accept the default.



Illustration 8.12 The keyboard layout is

Next you are prompted to enter a password for the Xconfig program. Keeps other from playing around with your X-server settings.



Illustration 8.13 XConfig password dialog

Next the performance of your system will be tested:

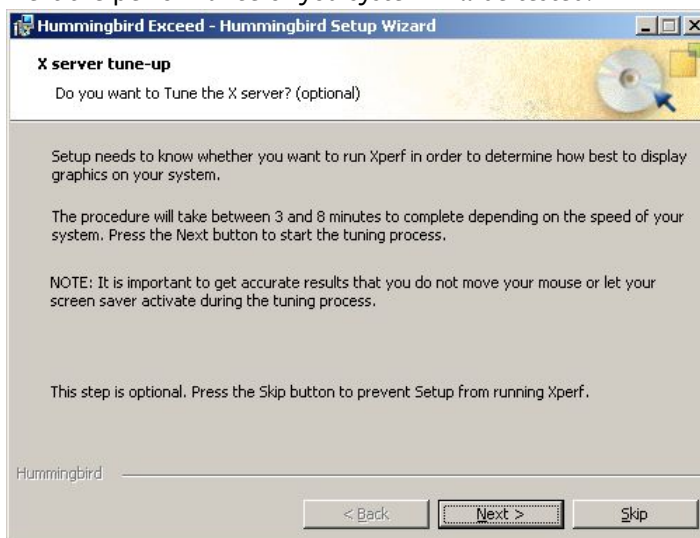


Illustration 8.14 Optionally tune the X-server

It's up to you if you want to do this. Some tuning parameters will be modified later on. It does not hurt to run the test however and as a bonus it allows for a break. (coffee time!). After some time you get the screen below which indicates a completed setup.



Illustration 8.15 Setup completed

The systems must be rebooted (of course) for some reason.

8.7 Copying the I/A fonts.

At this time a DM can be started on the PC using the methods described later in this document. However the **Foxboro Display Manager and FoxView™** do not show the correct fonts and markers when the X-Terminal is started at this moment. This is due to the fact that the fonts in use on the I/A Series platform are currently unknown/available to the eXceed PC. So they should be copied to the PC and this is done with **FTP**.

The paths for the Foxboro fonts on both platforms:

The I/A host: \usr\fox\wp\fonts*.bdf

The PC: C:\Program Files\Hummingbird\Connectivity\7.00\Exceed\Font\ia

Create the PC directory before you proceed.

Open a command session (**Start/Programs/Accessories/Command Prompt**) and open the ftp program to the host. To get all the BDF fonts over enter the ftp commands printed in bold as in the example below:

```
C:\Program Files\Hummingbird\Connectivity\7.00\Exceed\Font\ia>ftp XHOST1<cr>
Connected to XHOST1.
220 AW51B1 FTP server (UNIX(r) System V Release 4.0) ready.
User (XHOST1:(none)): root<cr>
331 Password required for root.
Password:password for root<cr>
230 User root logged in.
ftp> cd /usr/fox/wp/fonts<cr>
250 CWD command successful.
ftp> bin<cr>
200 Type set to I.
ftp> prompt<cr>
Interactive mode Off .
ftp> lcd<cr>
Local directory now C:\Program Files\Exceed.nt\font\ia.
```

```
ftp> mget *.bdf<cr>
200 Type set to I.
200 PORT command successful.
150 Binary data connection for Lia0dwdh.bdf (192.168.120.11,1030) (87461 bytes).

226 Binary Transfer complete.
ftp: 87461 bytes received in 0.24Seconds 362.91Kbytes/sec.
200 PORT command successful.
150 Binary data connection for Lia0dwsh.bdf (192.168.120.11,1031) (49315 bytes).

etc...
```

```
200 PORT command successful.
150 Binary data connection for usr_mkr1.bdf (192.168.120.11,1085) (749 bytes).
226 Binary Transfer complete.
ftp: 749 bytes received in 0.01Seconds 74.90Kbytes/sec.
ftp> bye<cr>
221 Goodbye.
C:\Program Files\Hummingbird\Connectivity\7.00\Exceed\Font\ia>exit<cr>
```

Now all the fonts are available on the PC and we have to tell eXceed about it...

8.7.1 Converting the I/A Fonts on the PC.

To use the I/A fonts just copied, they must be converted to be used in the Windows environment. To accomplish this, open the **Xconfig (Start / Exceed / Xconfig)** application. (depending on the choices at installatin time, a password may be requested).



Illustration 8.16 The Exceed X-Configuration utility (Xconfig)

Double click **Font** icon, as indicated above, and choose the button **Compile Fonts...**

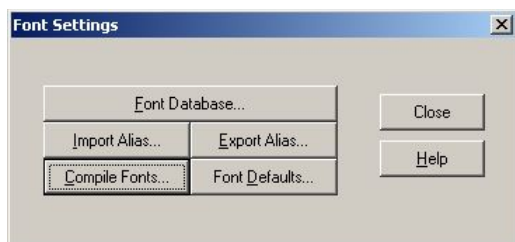


Illustration 8.17 The Font settings dialog

Make the folder where you have copied you Foxboro fonts the current folder and select all fonts. Make sure that the output directory is the same as the source.

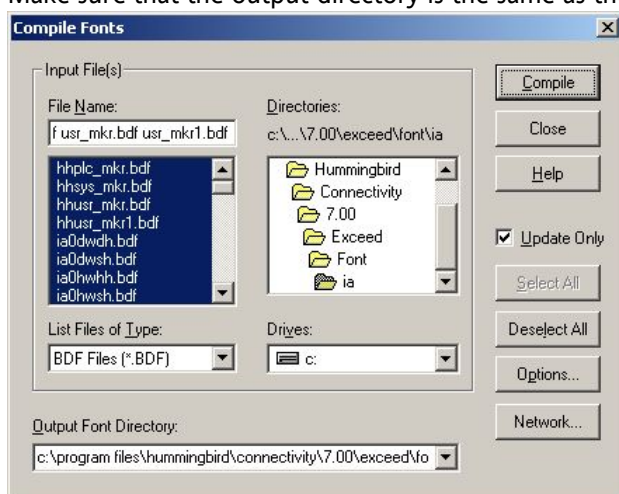


Illustration 8.18 The selected fonts will be compiled

Select All and choose **Compile**.

As a result you should get the next screen without any errors.

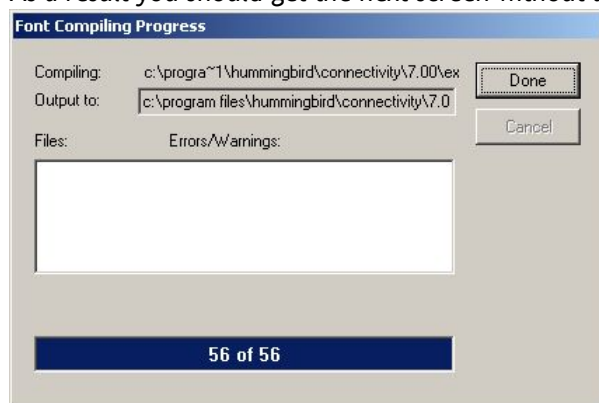


Illustration 8.19 All 56 fonts compiled OK

The fonts must be defined in a font database entry so that is what the next dialog is all about:

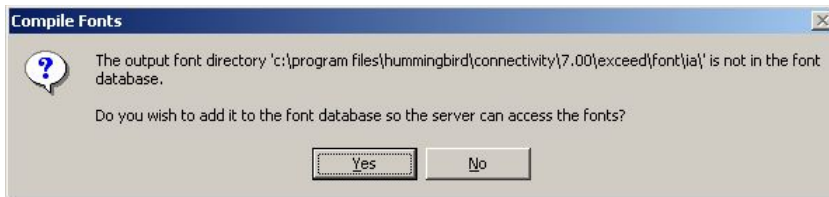


Illustration 8.20 Add the fonts to the database?

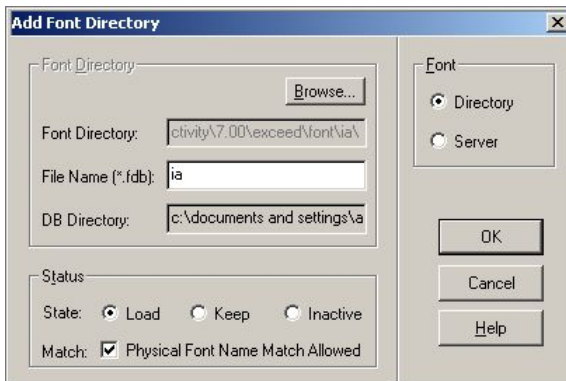


Illustration 8.21 Enter the font database name: example (ia)

This will add the fonts to the database. In the **Compile Fonts** dialogue choose **Close** to return to the Font settings screen. Select the button **Font Database** and deselect the option at the bottom of the dialog that reads "**Automatic Font Substitution**"

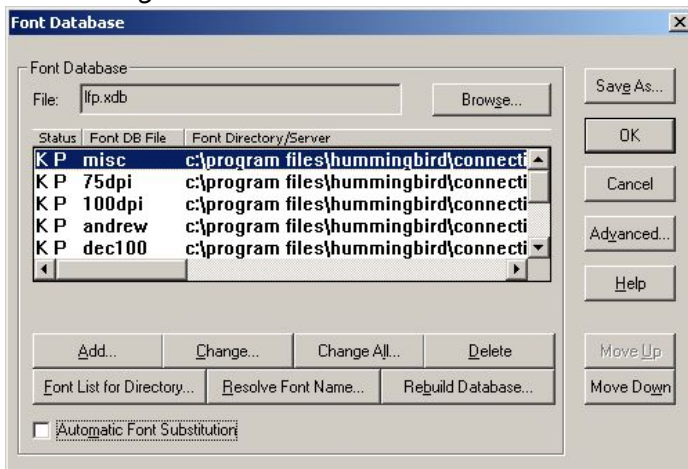


Illustration 8.22 De-select "Automatic font substitution

When this is omitted, the fonts will not display correct on either Foxboro DM or FoxView. For DM it appears that the fonts on the initial display are too small as for FoxView they appear to be too large. After making the proper selections, exit the Font Database dialog with **OK**.

8.7.2 Additional steps when using FoxView.

When you will be using FoxView, you may notice font problems. The problem surfaces when you have the "Show host reply" function enabled in the Xstart program. The fonts in FoxView do not scale correctly. This problem has been addressed by Foxboro and Hummingbird and has resulted in the release of a QuickFix with number QF1001457. This QF supplies two Font database files to be copied into the proper location to resolve the font problem. The fonts concerned are 75dpi

and 100dpi. The QF can be retrieved from <http://www.ips.csc.invensys.com/> and requires you to have an account on that site. Consult your local service representative if you need assistance. When you have followed this manual (and since you are reading this I assume that you have), there is one minor change you must take into account: The two files must NOT be copied to the location specified (the “all-users” section), but to the location the user the program was installed for, i.e. “**Operator**” in this example.

8.8 Changing Performance settings

The default performance settings for **eXceed** are not optimal for some of the Foxboro applications. The main issue is the redrawing of the X-windows whenever a portion or the full screen was covered by another window or when the application was minimised. When this happens, these “covered” and/or “minimised” windows will not be redrawn correctly when brought to the front or restored to their original size (dynamic fields are left empty until updated). To change this a modification has to be made in the **Xconfig** screen found in the **eXceed** group.



Illustration 8.23 The Xconfigurator window

In this group select the icon **Performance** and change the settings in the dialogue screen to the ones shown in the screen below.

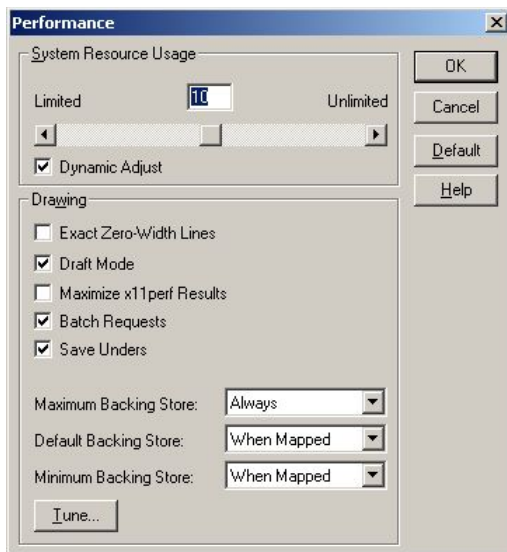


Illustration 8.24 Changing the performance settings

After completion exit the **Performance** window with **OK**. The screen redraws should work without problems.

8.9 Starting the X-terminal.

At this moment it is assumed you have a `go_dm` file present on the **I/A** host!!!

Now it's time to start an X-terminal session. Locate the **X-Start (Start / Programs / Exceed / Xstart)** application and start. In the window enter the data as indicated below (The password for the **ia** account is "**remote**"):

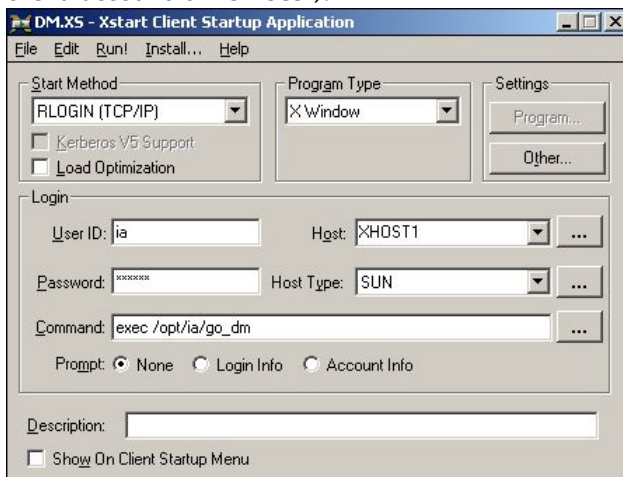


Illustration 8.25 Setting up the X start session

Please note that the **User ID**: must be **ia** and **NOT** the **root** account.

This has resulted in a stable environment, which does not trash the host with all sorts of left-over shells. Refer to section 4.6 Setting up a working environment. for more information on this subject. Enter the rest of the fields in this dialogue box as described. After entering this screen select the button **Other...**. Set the **Close (sec):** timeout to **-1** (minus one - this means no time-out) and check the box next to **Show progress**. This last box may be omitted but it will present

you with some feedback on what is going on.

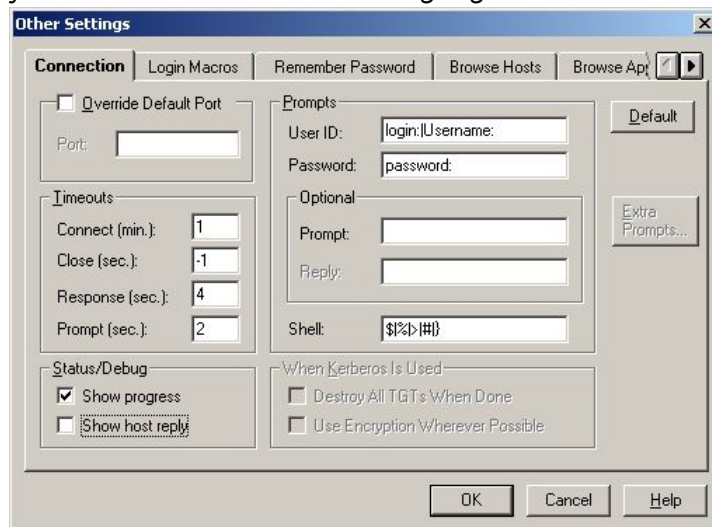


Illustration 8.26 Connection parameters

Return to the previous screen by pressing **OK** and save the session (**File/Save As...**) and save the settings in the default location:

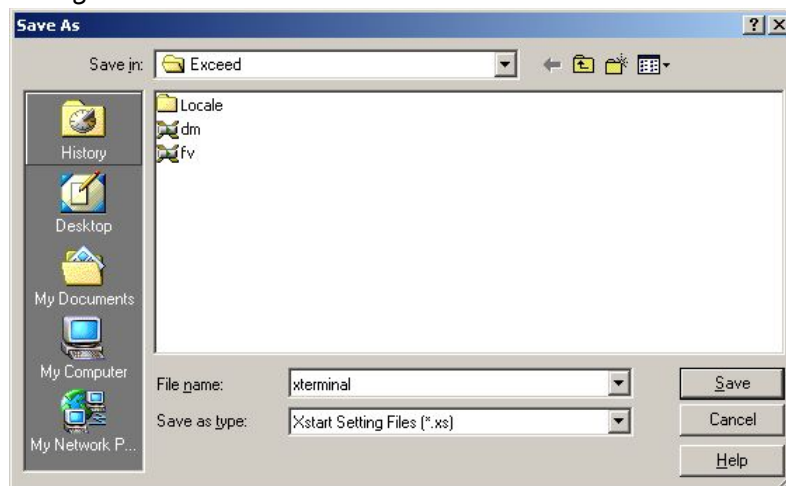


Illustration 8.27 Save the settings

You can create a shortcut on the desktop to this file to make it easier to start the session next time. After you have saved the session, you are returned to the previous screen. Choose **Run!** from the menu bar and the DM appears. (When I'm right).

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Illustration 8.28 The Display Manager

As you can see I was right..., I also had a version of FoxView™ available so it's here as well:

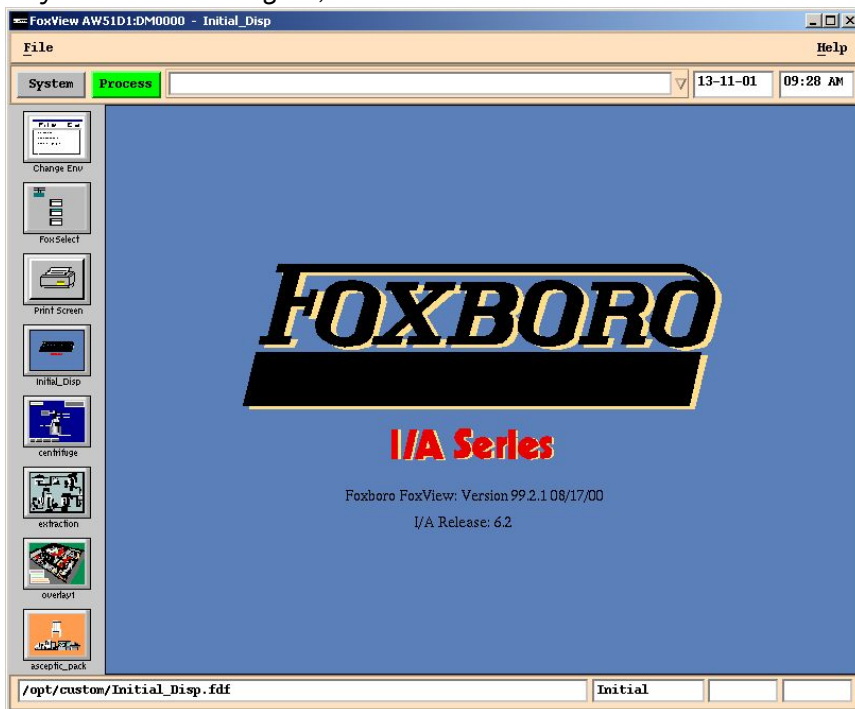


Illustration 8.29 Foxview has arrived

Depending on the installation, you will get either DM or FoxView. The rule of thumb is that you get the same type as you have on the local Foxboro machine.

This completes the installation of eXceed 7.0 for Windows 2000 Professional.

9 Reflection X 7.7 for Windows 2000 Professional.

Reflection is used by some out there. This may be of help to get things working right.

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9.1 Introduction.

In this chapter you will find some instructions on how to install WRQ's ReflectionX PC X-server. This X-server will allow access to your X clients on the PC Windows platform.

9.1.1 Hardware requirements

To successfully install this software, your hardware must meet the following minimum specifications:

- A Pentium™ or higher processor.
- At least 64Mb of RAM installed.
- Approx. 25 Mb free disk space to install the software.
- A CD-ROM drive to install the software.
- A Windows compatible display (capable of at least 1024 x 768 pixels with 256 colors).
- A Windows compatible mouse.
- A Windows compatible network card.

9.1.2 Software requirements

The operating system must be either Microsoft Windows 95/98, Microsoft Windows NT4.0 or Windows 2000.

The TCP/IP protocol is installed and configured.

9.1.3 Additional requirements

For some of the modifications on the I/A platform, "root" privilege is required. You may need "Administrator" privileges for some of the settings on the NT/2000 platform.

9.1.4 Configuration information

The software described in this section is WRQ's Reflection X 7.7 on Windows 2000 Professional. This software is supplied on CD-ROM. For this installation the following applies:

- The I/A host logical name is: **AWTST1**.
- The I/A host used "**XHOST1**" as the name on the second Ethernet connection with IP: **192.168.120.10**.
- The 1st PC has a logical name: **XTERM1** and the Ethernet IP is: **192.168.120.11**.
- The 2nd PC has a logical name: **XTERM2** and the Ethernet IP is: **192.168.120.12**.
- The I/A Series AW51B was running Version 6.2 software.
- The PC network adapter is a 3Com EtherLink III.
- Both **CONFIG.SYS** and **AUTOEXEC.BAT** are empty or non-existent.
- A DM is configured on the I/A Series host according Foxboro release notes V4.2 appendix D.

9.2 Installing Reflection X

To start the installation of Reflection X, insert the CD in the drive and wait for the setup screen (run **install.exe** if autorun is disabled).

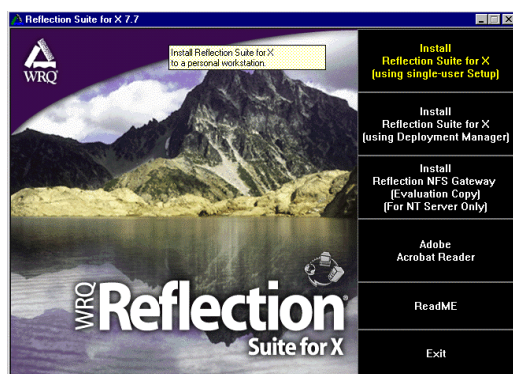


Illustration 9.1 Reflection startup screen

Choose the Single user setup (the top choice). After some screens about licensing etc, you end up with the Wellcome screen:



Illustration 9.2 Wellcome, wellcome, wellcome

Choose the locations for the Program files and the user files. You can de-select the IBM Host Applications checkbox if you like to save some space.

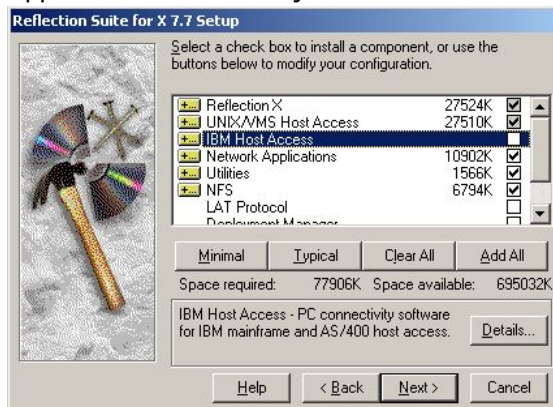


Illustration 9.3 Installation options

Enter the Program Group where the shortcuts will be placed.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview



Illustration 9.4 Name the folder for Reflection
Accept the default association for the applications



Illustration 9.5 Telnet defaults to Reflection
To have the passwords remembered automatically, accept this default setting.



Illustration 9.6 Save passwords is nice
After some time you are prompted for a restart:

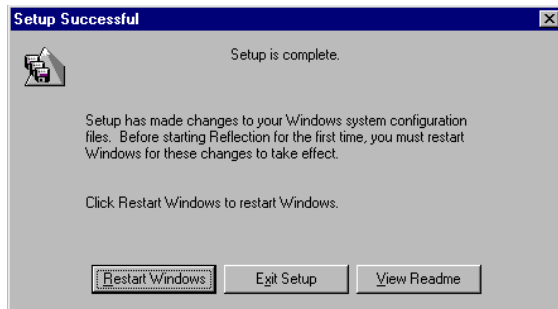


Illustration 9.7 The inevitable “Restart Windows” message

9.3 Making the I/A Series fonts available on the X-Terminal

The Foxboro fonts need to be made available to the X-terminal. This will allow the DM and FoxView™ to properly display the fonts in use on the I/A Series platform. Before we can add these fonts to the Reflection server fonts database we need to have the fonts available on the local machine. This implies (in this setup) to copy the fonts the local system and convert them to a Windows format.

9.3.1 Copying the fonts to the X-Terminal

In order to have the Foxboro fonts available on the PC -X terminal we must copy these fonts to the PC. For this **Reflection** supplies an FTP client application. (**Start/Programs/Reflection/FTP Client**). When this client is started you are presented with a connection wizzard. Select **New...** for the connection to the Foxboro host.



Illustration 9.8 The FTP Client window

In the screen above, we can add the connections to the XHOST1 Foxboro machine with the **New...** button



Illustration 9.9 Adding the XHOST server

Enter the Host name (XHOST1) or the IP address for the host (192.168.120.10 in this setup) and press **Enter/Next>**. In the next dialog select the **User** option and again press **Enter**.



Illustration 9.10 Connect with an account (root)

In the next dialog enter the user (root) and optionally "**Save my password**".



Illustration 9.11 Connect with the "root" account

You are now prompted if you wish to connect to the selected host. Let's do so.

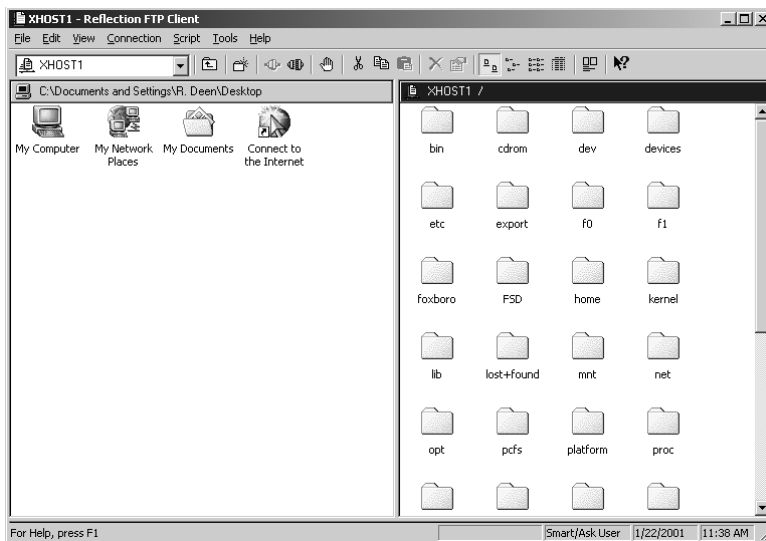


Illustration 9.12 FTP Connection opened

Make a directory in `c:\Program Files\Reflection\fonts` named **ia**. On the Unix platform, the Foxboro fonts are located in `/usr/fox/wp/fonts`. Under the FTP Client select **Binary** transfers. (**T**ools/**T**ransfer Method/**B**inary). When “right-clicked” on the Unix part of the screen there is an option “**W**ildcard...”. Select ***.bdf** here and drag the result to the **ia** directory on the PC platform. This copies the Foxboro fonts to the PC platform.

9.3.2 Compiling the I/A Series fonts

To convert a font for use with the Windows environment, it must be converted. This is usually referred to as “compiling” the fonts. A special program was provided with Reflexion for this task.

Open the X –Font compiler (it is found under **Start/Programs/Reflexion/Utilities**)

In the screen below, the selected directory was set to the **ia** fonts directory created earlier. This is also the output directory for the Windows formatted fonts.

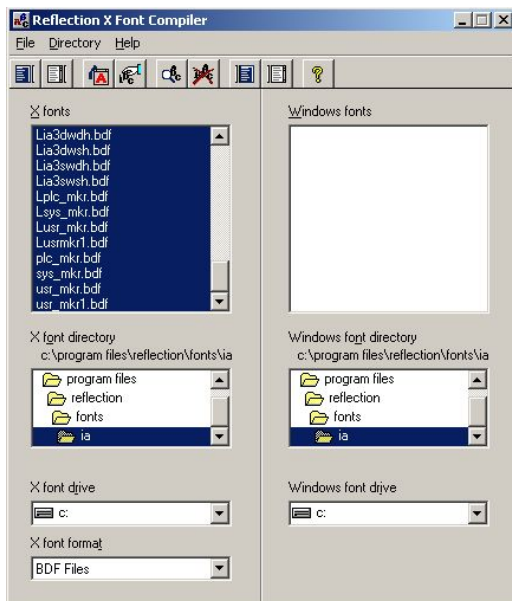


Illustration 9.13 The X Font Compiler

Compile the fonts with the **File/Convert** command



Illustration 9.14 I'm having a good day

This would be a normal response to this command...

To create the infamous `fonts.dir` file choose **Directory/Build fonts.dir** from the menu. This will create the information file for the fonts installed in the **ia** directory.

9.3.3 Creating a font alias file (fonts.ali)

There is one more very important thing that needs to be done. This has to do the way fonts are treated with Reflection. These fonts are not available to the Display Manager or FoxView because the names that are currently requested are not known to Reflection. This is because the `fonts.dir` does not contain the names as the X-server on the PC expects them. So we must create an *alias* file for them. This file will do the translation for us. In the directory for the **ia** fonts you will find the `fonts.dir` file it has a layout similar to shown in this example:

The `fonts.dir` file:

```
56
hhplc_mkr.fon -foxboro-plc_mkr-bold-r-marker--12-120-75-75----
hhsys_mkr.fon -foxboro-sys_mkr-bold-r-marker--24-240-75-75----
hhusr_mkr.fon -foxboro-usr_mkr-bold-r-marker--24-240-75-75----
hhusr_mkr1.fon -foxboro-usr_mkr1-bold-r-marker--24-240-75-75----
ia0dwdh.fon   -foxboro-ia0swsh-bold-r-normal--54-540-75-75----
ia0dwsh.fon   -foxboro-ia0dwsh-bold-r-normal--27-270-75-75----
```

```
ia0hwhh.fon -foxboro-ia0swsh-bold-r-normal--14-140-75-75----
ia0hwsh.fon -foxboro-ia0swdh-bold-r-normal--27-270-75-75----
ia0swdh.fon -foxboro-ia0swdh-bold-r-normal--54-540-75-75----
ia0swhh.fon -foxboro-ia0dwsh-bold-r-normal--14-140-75-75----
ia0swsh.fon -foxboro-ia0swsh-bold-r-normal--27-270-75-75----
ialdwdh.fon -foxboro-ialswsh-bold-r-normal--54-540-75-75----
ialdwsh.fon -foxboro-ialdwsh-bold-r-normal--27-270-75-75----
```

Make an exact copy of this file with the name **fonts.ali** and replace the first line as shown in the example below:

The **fonts.ali** file:

```
FILE_NAMES_ALIASES
hhplc_mkr.fon -foxboro-plc_mkr-bold-r-marker--12-120-75-75----
hhsys_mkr.fon -foxboro-sys_mkr-bold-r-marker--24-240-75-75----
hhusr_mkr.fon -foxboro-usr_mkr-bold-r-marker--24-240-75-75----
hhusr_mkr1.fon -foxboro-usr_mkr1-bold-r-marker--24-240-75-75----
ia0dwdh.fon -foxboro-ia0swsh-bold-r-normal--54-540-75-75----
ia0dwsh.fon -foxboro-ia0dwsh-bold-r-normal--27-270-75-75----
ia0hwhh.fon -foxboro-ia0swsh-bold-r-normal--14-140-75-75----
ia0hwsh.fon -foxboro-ia0swdh-bold-r-normal--27-270-75-75----
ia0swdh.fon -foxboro-ia0swdh-bold-r-normal--54-540-75-75----
ia0swhh.fon -foxboro-ia0dwsh-bold-r-normal--14-140-75-75----
ia0swsh.fon -foxboro-ia0swsh-bold-r-normal--27-270-75-75----
ialdwdh.fon -foxboro-ialswsh-bold-r-normal--54-540-75-75----
ialdwsh.fon -foxboro-ialdwsh-bold-r-normal--27-270-75-75----
ialhwhh.fon -foxboro-ialswsh-bold-r-normal--14-140-75-75----
ialhwsh.fon -foxboro-ialswdh-bold-r-normal--27-270-75-75----
ialswdh.fon -foxboro-ialswdh-bold-r-normal--54-540-75-75----
```

Please note the line containing “56” was replaced with the line “**FILE_NAMES_ALIASES**”.

9.4 X-Server configuration settings

For use with the **Foxboro Display Manager** and **Foxview** we need to make some modifications to the server.

9.4.1 Backing store / Save unders

One of the concerns is screen updates and redraws when restoring a previously minimized application and how a, previously covered, application behaves when uncovered. Generally this is referred to “backing store” and “save unders”. To change these settings for Reflection start the “X Client Manager” application. (**Start/Programs/Reflection/Reflection X**). This will bring up the **Reflection X Client Manager**:

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview

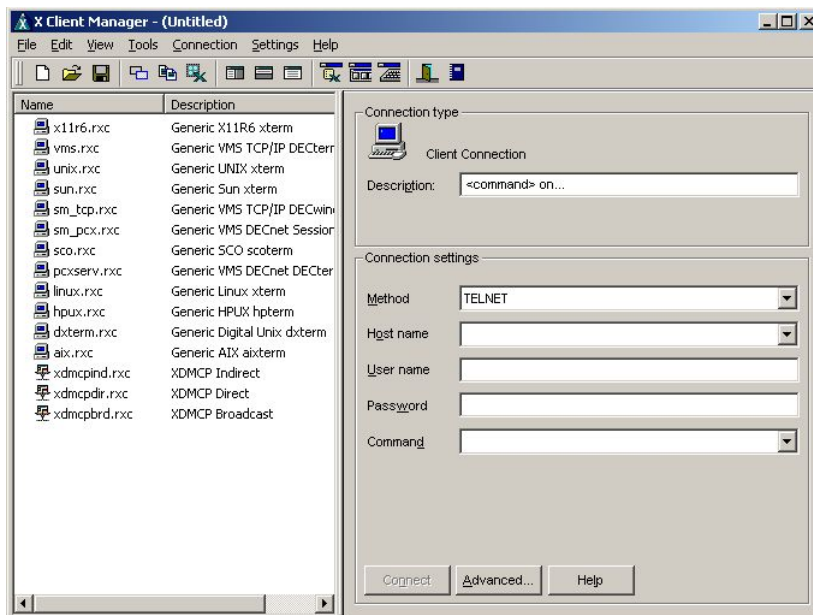


Illustration 9.15 The Reflection X Client Manager

Under the Menu bar option **Settings** you will find the option: **Server...**: change the setting for **Backing store** and **Save unders** to **When Mapped** and check the box **Save unders** like shown. This should prevent invisible items on the screen for Foxboro applications.

9.4.2 The I/A Series fonts

In the same **X Client Manager**, under **Settings** locate the **Fonts...** entry. Modify the setting as shown:

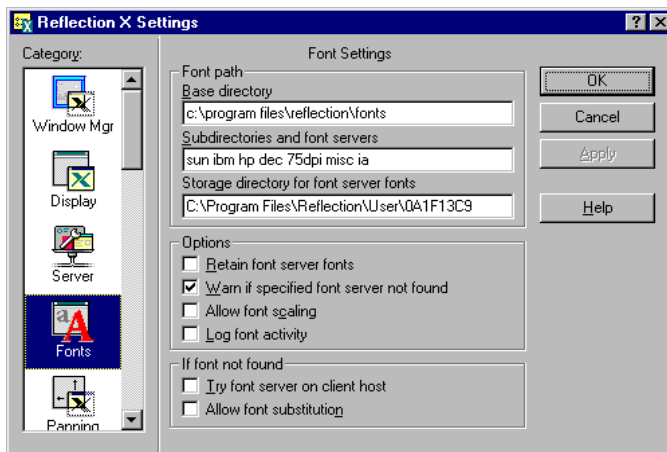


Illustration 9.16 The Font settings

Make sure to add the ia fonts on the section: **Subdirectories and font servers**. Disable the options: **Try font server on client host** and **Allow font substitution**.

9.5 Configuring your X-Terminal session

In this section, the X-terminal is configured for use. It deals with some modifications to the actual server (running on the PC) and the procedure to create a session to the host.

9.6 Making the connection

The tool for this would be Reflection X. (**Start/Programs/Reflection/Reflection X**)

Yes, this is the same one as used before. To connect to the host for **Foxview** or **Display Manager** fill in the blanks as indicated:

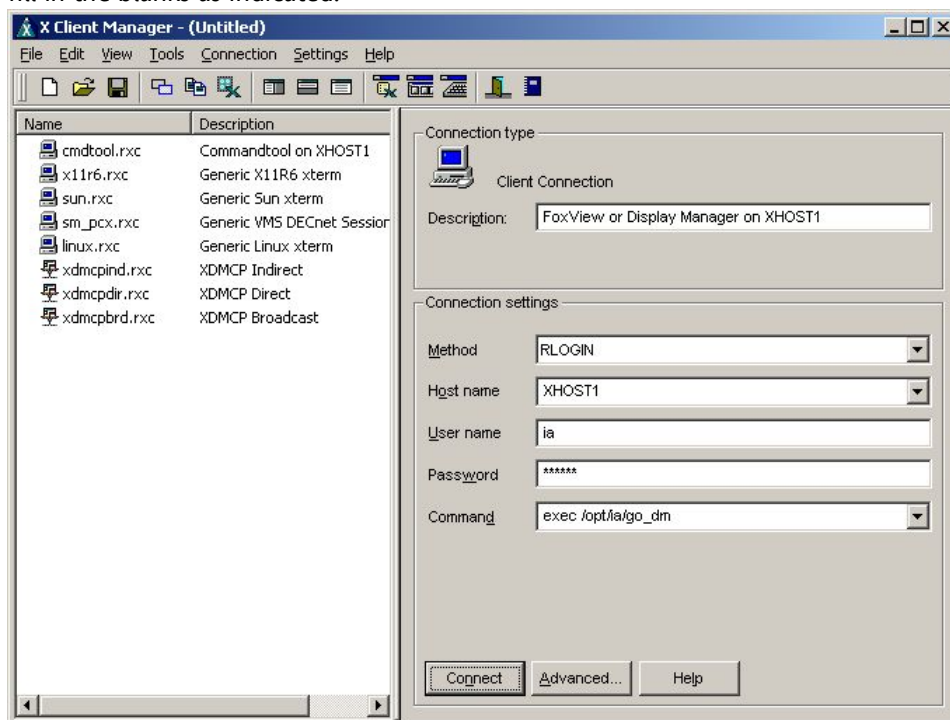


Illustration 9.17 Parameters for a standard FoxView or Display Manager

Have a look at what is under the **Advanced...** button too.

X-Terminal Installation for I/A 50 Series Remote Display Manager and Foxview

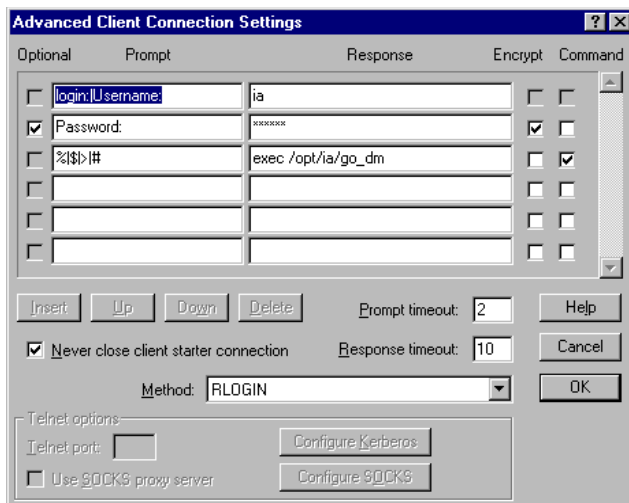


Illustration 9.18 Advanced settings

Select the check box to **Never close client starter connection**.

Press **OK** to go back to the previous screen and try **Connect** for a connection!

If all goes well you will be getting this if Foxview is installed on your system:



Illustration 9.19 Now this is something: FoxView

and this if you are running The Foxboro Display Manager:



Illustration 9.20 But so is this.: The Display Manager..

This completes the installation of Reflection X 7.7 on Windows 2000 Professional.

10 I/A 50 Series and X-Terminals with Dynamic IP Addresses

If you need DHCP for all PC hardware including X-Terminals, this may be of some use.

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10.1 Introduction.

This manual attempts to explain how to setup **I/A 50 Series** hosts in combination with **MS-Windows** based X-Terminals having dynamic IP addresses for the Windows platform. This manual is a first attempt to setup and configure the **DNS** and **DHCP** services to work in this specific environment. This **DNS** and **DHCP** functionality is established on the "**Corporate Network**" side to which the **I/A 50 Series** system is connected through the secondary Ethernet™ interface only. We do appreciate any feedback regarding this subject. Sent your comments and remarks to the e-mail addresses provided on the cover page. Thanks in advance.

10.1.1 Dynamic IP Addressing and X-Terminals

Setting up X-Terminals together with I/A 50 Series in combination with dedicated Display Managers or FoxViews, would traditionally involve a simple administration based on a "*hosts*" file. In that file, every PC and UNIX host would get a fixed IP address and the configuration of the Display Manager or FoxView behavior would be reasonably simple. The DM or Foxview would lookup the name for the corresponding IP address in the `/etc/hosts` file and take that name to lookup the dedicated DM or Foxview to use for that screen in the `/usr/fox/customer/hi/dmcfg` file. This type of administration is, in a larger network, difficult to maintain. A new **host** in the network would require all the separate "*hosts*" files be edited to reflect this change. However, there is a way to solve this issue and that is to make use of **DHCP** (Dynamic Host Configuration Protocol). This protocol allows hosts to get all required network parameters like the default gateway, default route, available **DNS** servers, domain name prefix etc. from one centrally maintained server making network maintenance a snap.

On a few occasions some of our customers have at one time or another, expressed the wish to have all PC's in their network receive their IP addresses assigned from a **DHCP** server. This seems like the end of all problems but there is a catch: The Solaris 2.5.1 version used on Foxboro I/A 50 Series hosts does not support the use of **DHCP**.

Some ways to get around this problem:

1. Assign a fixed IP address to the Foxboro X-Terminals in the **DHCP** configuration.
2. Set the leasetime to a very long period that would, under normal conditions, never expire.
3. Setup an Domain Name System Server that interacts with a **DHCP** Server on the IT network, which will allow **I/A 50 Series** to resolve the IP address to a hostname.

We could waste your time and dive into the pro's and con's of all three options but this manual deals with option **3** as you may have guessed from the title :-)

Since one of the major problems is the **Solaris** version used in all **I/A 50 Series** which does not support **DHCP**. We must therefore take another approach to get things working. We had to find a way to make the **DHCP** information available to the **I/A 50 Series** host which at best can get info from a **DNS** server. The goal was to make configuring X-terminals and UNIX hosts as easy as possible preserving all the dedicated DM/Foxview functionality as we go along.

The solution we opted for was to configure the Windows platform to get an IP address and additional configuration data from a **DHCP** server and make the **I/A 50 Series** UNIX host **DNS** aware.

This manual describes a solution that will allow you to have dynamic IP (and other) configuration settings, providing the information required by the host for normal operation. For the **DHCP** and

DNS functions we opted for an open source solution based on **Mandrake Linux version 9.1 Download Edition** at the time of writing this manual.

10.1.2 Reference documents

Some of the paperwork you could get in to, trying to accomplish this:

- **X-Terminal Installation for Remote Display Manager and FoxView™**
By Ron Deen, not partnumbered.
Available from The Cassandra Project <http://thecassandraproject.org/archive.html> to name one or <http://home.hccnet.nl/r.deen/Docs> to name another.
- **The DNS Howto – HOWTO become a totally small time DNS admin.**
from Nicolai Langfeld, Jamie Norrish and others.
Available from <ftp://ftp.ibiblio.org/bub/Linux/docs/HOWTO/DNS-HOWTO>
A valuable HOWTO about maybe becoming something you don't want.
- **DNS and Bind 4th edition**
ISBN: 0-596-00158-4.
By Paul Albitz and Cricket Liu and available from O'Reilly & Associates Inc.
The latest book covering BIND 9 and DNS Admin in general.

10.1.3 General requirements

To support dynamic IP addresses for the X-Terminals this manual assumes the following:

- The **I/A 50 Series** stations ALL have fixed IP addresses and must be running I/A Series version 4.3 or higher. I/A Series based on Solaris 8 was not a part of the test but may be working just fine.
- The **Windows XP Professional** based X-terminal obtains a valid IP address from a **DHCP** Server.
- A properly installed and configured **DHCP** Server is available on the secondary network.
- A properly installed and configured **DNS** Server is available on the secondary network and this **DNS** Server must be configured to be updated from **DHCP** automatically (it is a Dynamic DNS server).

For reference purposes we have included all the required files from the Linux based **DHCP** and **DNS** Server in this manual should you want to take this route.

10.1.4 The LAB Setup

In order to test our plans we used a small system containing an I/A 50 Series host, a Linux machine providing the DHCP and DNS servers we require for the test and a Windows PC for the X-Terminal. This section of the manual was tested and verified using out LAB in the office. We used this equipment to write this:

- **I/A 50 Series platform:**
a SPARCstation 5, 64Mb RAM, 2.1 Gb disk with I/A Series 4.3. (**Solaris 2.5.1**)
- **The Windows platform:**
a HP VL PC Pentium II 266, 160Mb Ram, on-board NIC, **Windows XP professional**.
- **The Linux Server platform:**

a Zenith Z-Station Pentium II 350MHz, 256Mb Ram, on-board NIC and additional NIC, running **Mandrake Linux 9.1 Download Edition** a 3CD package. Available at <http://www.mandrakelinux.com/en> in the download area.

- The **DNS** we used was BIND 9.2.2 which is maintained by the Internet Software Consortium. We installed it from the Mandrake CD's.
 - The **DHCP** server is too maintained by the Internet Software Consortium and was also installed from the Mandrake CD's. The version on de CD was version 3.0-2pl2
- Both the DNS and DHCP Servers are covered under the BSD license.

10.1.5 System modifications per platform

In order to make everything work as intended, the three different platforms must be properly configured. This manual deals with all three of them.

1. Preparing the **Windows XP Professional** platform to be used as an X-Terminal. (section 4 on page 13)
2. Setting up the **I/A 50 Series** platform which will be the host for the X-Terminals. (section 5 on page 21)
3. The **Linux Mandrake** platform:
 - Installing and Configuring the **DHCP** Server. (section 6 on page 25)
 - Installing and Configuring the **DNS** Server. (section 7 on page 31)

Have a look at the sections relevant to the task. You can skip the sections dealing with **DNS** and **DHCP** in total if you are sure that these services are setup correct.

10.2 Preparing the Windows XP Platform

The Windows platform must be configured to obtain an IP address from a **DHCP** Server. How this is configured you will find here. Other settings that are important to this platform like the default gateway, netmask, the **DNS** Server address, etc will be provided by the **DHCP** Server, so we don't worry about these things here. Although this may be very straightforward stuff for you (of course you have performed this trick at least a dozen times for Windows NT and 95) we have provided the screenshots for XP since I remember beeing utterly lost on this platform when I wanted to do exactly the same things I had done before...

10.2.1 Setting the Windows XP machine hostname.

One of the things to do is identify the PC's *hostname*. Dedicated Foxview and DM's are related to the PC name to check whether you are a valid user or not. To find out and/or set this machine name we should have a look under the hood and that would be: Choose the **Control Panel** from the **Start** menu... (**Start/Control Panel**)

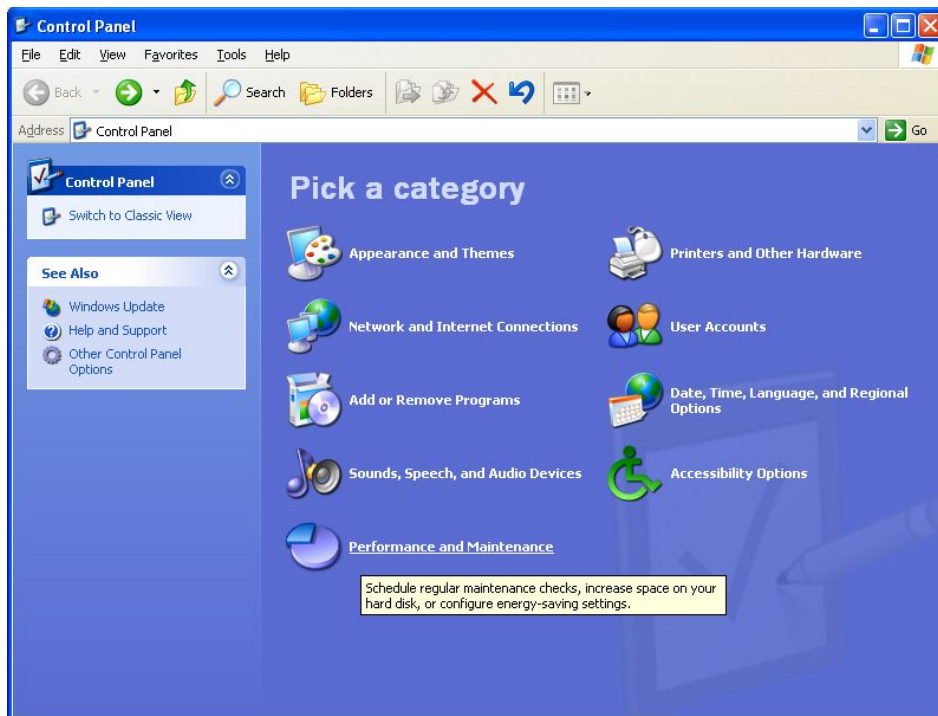


Illustration 10.1 The Control Panel (Performance and Maintenance)

Choose the **Performance and Maintenance** category as shown above and click on that. The next screen will show you the options you have here.

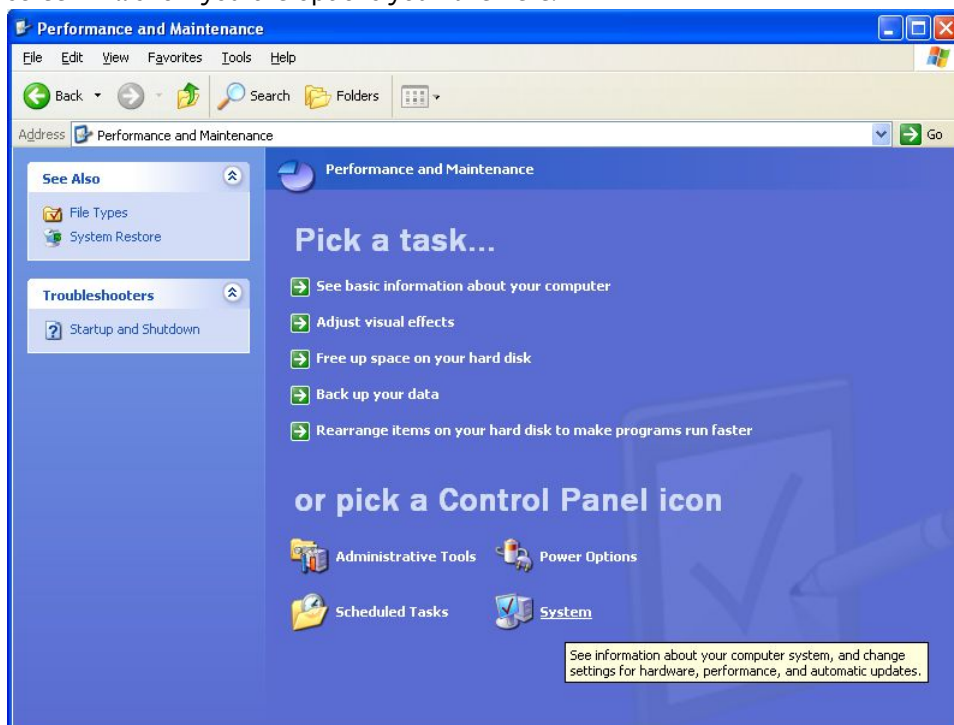


Illustration 10.2 Control Panel > Performance and Maintenance > System

We want to have a peek in one of the **Control Panel** icons. For our task we need to select

the **System** icon which brings you this:



Illustration 10.3 System Properties (General tab selected)

Activate the tab that reads **Computer Name** to proceed...

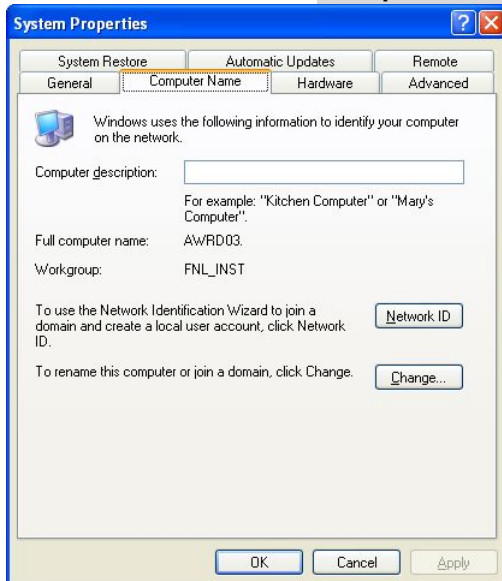


Illustration 10.4 System Properties (Computer Name tab selected)

Here you can set the PC name on the network (i.e: the *hostname*). Please note that it is this name that will be used to identify your PC on the I/A 50 Series hosts. On these hosts, the file `/usr/fox/customer/hi/dmcf` is used to map a dedicated Display Manager or FoxView to a specific machine name. The **Computer Name** should match the one in the `dmcf` file.

Choose the **Change** button to make the modifications you desire: In this example we used the name **AWRD03** because we had a dedicated DM mapped to that name.



Illustration 10.5 Changing the Computer name

Follow the **More...** button to make one more additional change:

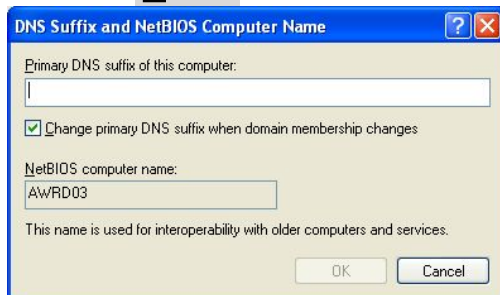


Illustration 10.6 DNS Suffix and NetBIOS Computer name

Check the box next to **Change primary DNS suffix when domain membership changes**.

10.2.2 The TCP/IP related settings

To set the TCP/IP protocol and **DNS** settings correct for this setup again pick the **Control Panel**. From the **Control Panel** select the **Network and Internet Connections** category.

X-Terminal Installation for I/A 50 Series

Remote Display Manager and Foxview

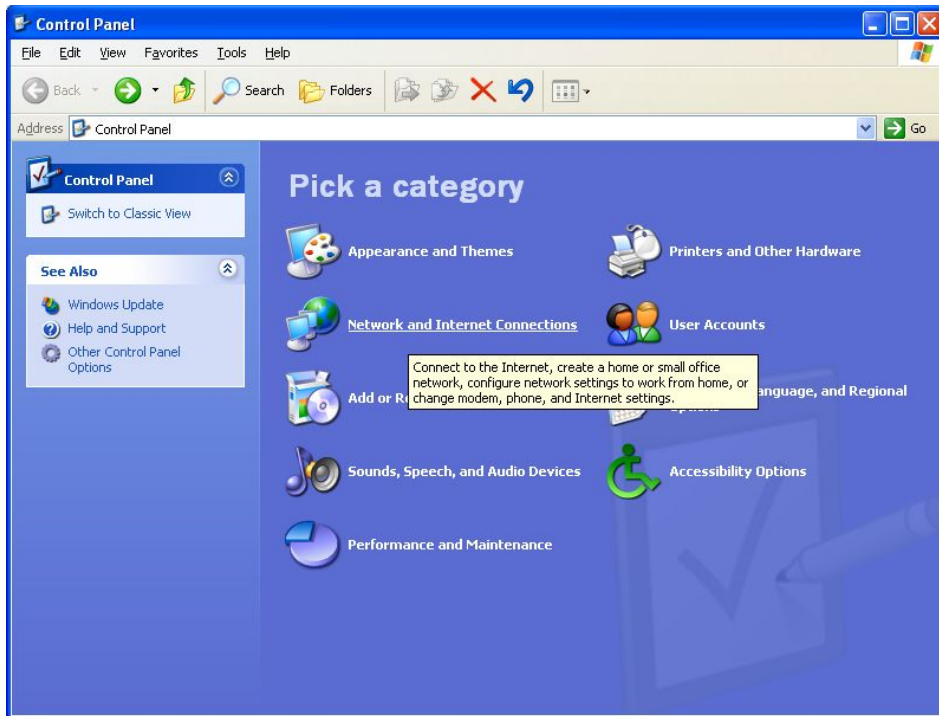


Illustration 10.7 Control Panel (Network and Internet Connections)

When the screen as below appears, select the icon **Network Connections**.

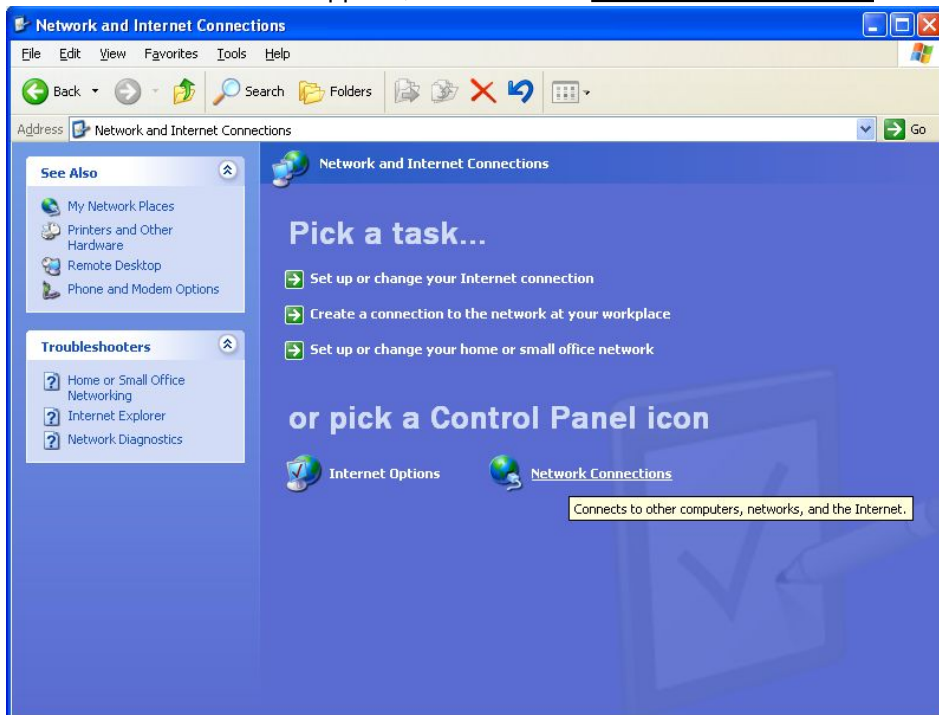


Illustration 10.8 Control Panel > Network Connections

When you have done that, you get the screen similar to the one below:

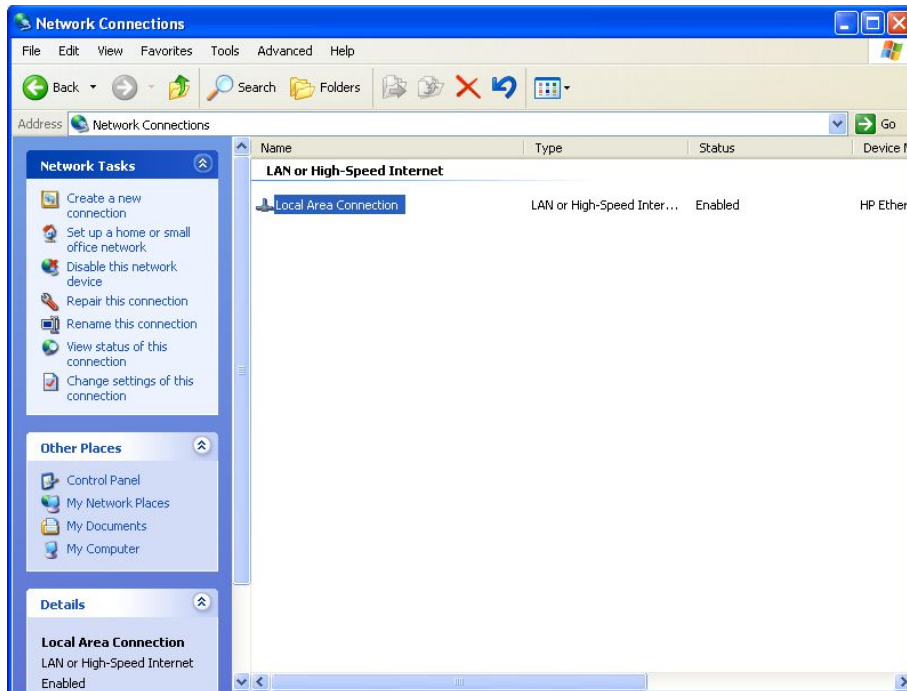


Illustration 10.9 Network Connections, Local Area Connection selected

Next, select the **Local Area Connection** , “right click” on that line and choose **Properties**, you get a screen similar to the one shown here:

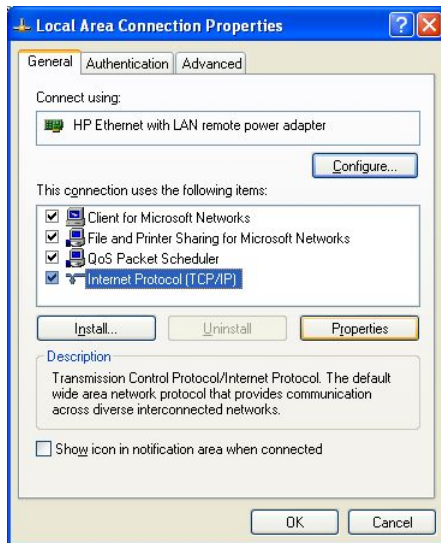


Illustration 10.10 Local Area Connection Properties

Again select the **Internet Protocol (TCP/IP)** line and click on the **Properties** button. On the **General** TAB some modifications are required:

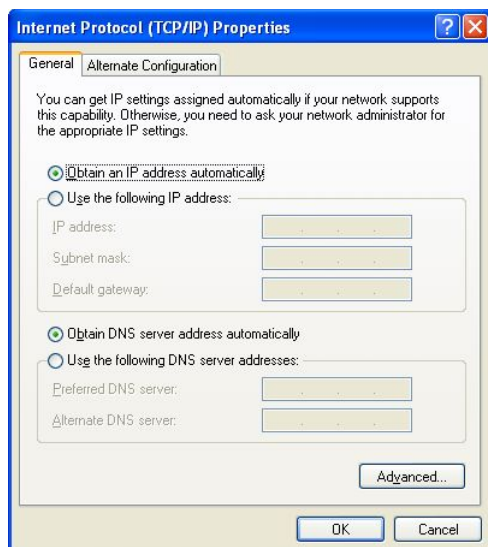


Illustration 10.11 Internet Protocol (TCP/IP) Properties

Make sure that the selections are matching those in the example on screen i.e.:

- **Obtain an IP address automatically** (this will enable **DHCP** for this Windows client) and
- **Obtain DNS server address automatically** (unless you get other info from your System administrator).

and when this is done, pick the **Advanced...** button.

In the next screen the **DNS** tab was chosen. Make the changes as shown, i.e: check the boxes that read:

- **Append primary and connection specific DNS suffixes**
- **Append parent suffixes of the primary DNS suffix** and
- **Register this connection's addresses in DNS** (on by default)

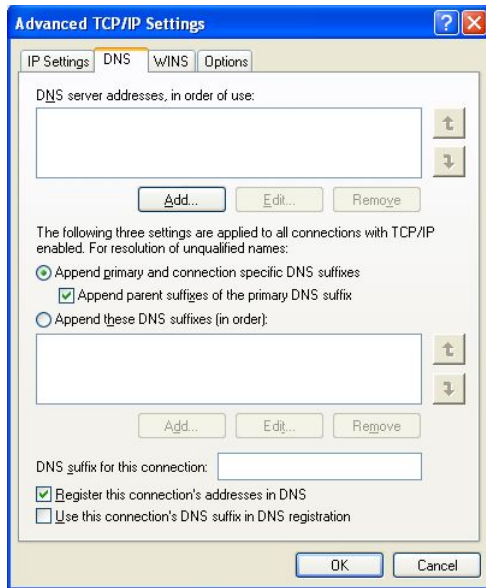


Illustration 10.12 advanced TCP/IP Settings (DNS tab selected)

This concludes the modifications required on the **Windows XP Professional** platform. The **I/A 50 Series** platform comes next.

10.3 Setting up the I/A 50 Series platform

The modifications on the **I/A 50 Series** platform are fairly minimal. We must make sure that the UNIX host knows that there is a **DNS** server available on the network and the host should place its **DNS** queries there in case the request can't be resolved locally. This implies making modifications to the `/etc/hosts` file, the `/etc/nsswitch` file and the `/etc/resolv.conf` file on the UNIX host. In this section you can also find some information about the Display Manager Configuration file: `/usr/fox/customer/hi/dmcfg` on the X-Terminal host.

10.3.1 The `/etc/hosts` table

The `/etc/hosts` file would normally hold all IP address and name data for the X-terminals and other hosts in your system. This file could be almost identical on all hosts and should be maintained properly. Since we now will have a centralized place where this information is stored we can get away with a much simpler `/etc/hosts` file. For starters, any references to your PC X-Terminal based hardware can be removed from this file on your UNIX hosts. This means that the *host file* can almost be the one that is created by the **System Definitions** program. An example from our LAB test setup, note that only the second Ethernet port is declared in here:

```
[AW51RD /etc/hosts]
#
# Internet host table
#
127.0.0.1      localhost      loghost hwl197
192.168.1.2    AW51P2
*****
# Start of I/A hosts
# created Mon Jul 7 10:27:30 GMT 2003
#*****
#
# The following host entries were created by the I/A
# Software Install sub-system. Any additional entries
# should be placed AFTER the End delimiter.
#
151.128.16.65  AW51RD
#
#*****
# End of I/A hosts
#*****
AW51RD#
```

Illustration 10.13 The /etc/hosts file on the I/A host

After we have cleaned up the `hosts` file there is one other file to edit. This is the Name Service Switch configuration file and that's coming next...

10.3.2 The `/etc/nsswitch.conf` file

In order to make the UNIX host look further than the default `hosts` file (which won't tell us too much anymore) we must make a small change to the file that takes care of this for us. The file for this is located in the `/etc` directory and is named `nsswitch.conf`. This configuration file takes care of the **Name Service Switch**. (Who says that program-names in UNIX don't make sense?). In this file, the place to look for is the line that starts with "`hosts:`", usually this is followed by the word "`files`" indicating that for `hosts` resolving only the `hosts` file will be used. We want to make sure that if that fails (and it will) the system should try to find the **DNS** server and get the required information there. For this the word "**`dns`**" must be added to the line after "`file`" as shown in the example.

```
[/etc/nsswitch.conf]
:::::::::::::
nsswitch.conf
:::::::::::::
#
# /etc/nsswitch.files:
#
# An example file that could be copied over to /etc/nsswitch.conf; it
# does not use any naming service.
#
# "hosts:" and "services:" in this file are used only if the
# /etc/netconfig file has a "-" for nametoaddr_libs of "inet" transports.

passwd:      files
group:       files
hosts:       files  dns
networks:    files
protocols:   files
rpc:         files
ethers:      files
netmasks:   files
bootparams:  files
publickey:   files
# At present there isn't a 'files' backend for netgroup; the system will#
# figure it out pretty quickly, and won't use netgroups at all.
netgroup:    files
automount:   files
aliases:     files
services:    files
sendmailvars: files
```

Illustration 10.14 On I/A 50 Series: /etc/nsswitch.conf example.

10.3.3 The /etc/resolv.conf file

The changes we have made until now prepare the UNIX host to query a DNS server for name lookups. However, the system still does not know where to find such a DNS Server. Therefore one last change is required and that is the file `/etc/resolv.conf`. This file is not found on standard **I/A 50 Series** stations and must be added. The function of this file is to make the **I/A 50 Series** station do its resolving starting in the local *domain* and when that fails, consult the *nameserver(s)* found in this file to see if the IP/hostname resolving can be accomplished there. This file contains the *domain name* we are part of and the *IP address* for the **DNS** server to be consulted.

```
[AW51RD /etc/resolv.conf]
domain      domain.org
nameserver  192.168.1.1
```

Illustration 10.15 On I/A 50 Series: the /etc/resolv.conf file example

When you will do an `nslookup hostname` using the example `resolv.conf` file above, because of the *domain* entry here, the *hostname* will be appended by the *domain* given here. I.e.: `hostname` will become `hostname.domain.org` in this example. When however you enter: `hostname.pookie.net` the name will remain unchanged since you did provide domain information.

10.3.4 The `dmcfg` file

This file is used to configure the **Display Manager/FoxView** defaults. Here you define which (if any) DM will be assigned to which X-Terminal. In a little example file we will explain the setup for

this where we define one DM to one specific DM and one DM to a group of X-Terminals where only the first two will get one. As you may know already, the `dmcfg` file is found in the directory `/usr/fox/customer/hi` on your host AW of WP and the example shown is derived from one that was created by the **Display and Alarm Manager Configurator**:

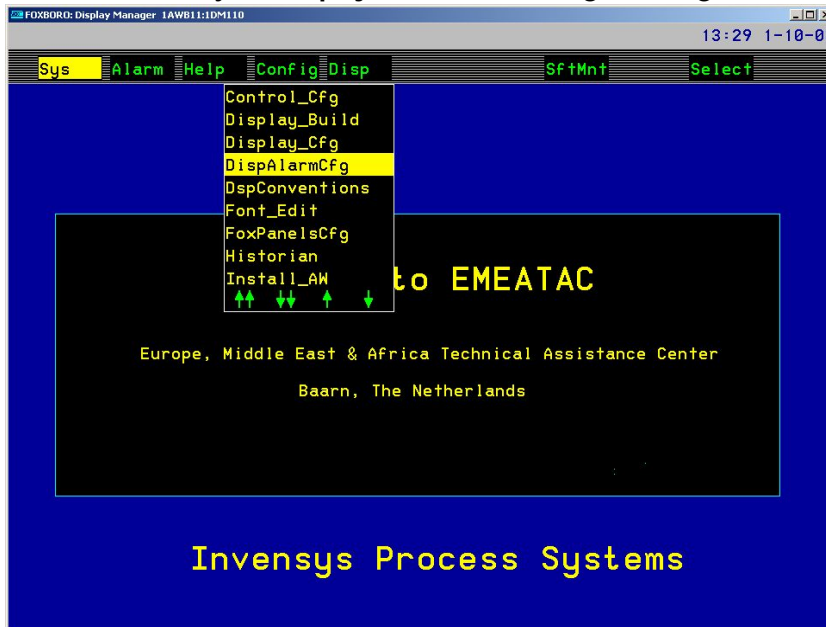


Illustration 10.16 Invoking the GUI Display and Alarm Manager Configurator

Although we won't be using the **Display and Alarm Manager Configurator** here, the example we start off with is one that was created with this configurator. The biggest advantage of using a `dmcfg` that was created this way lies in the fact that it is much easier to read because all comments are stripped from it and it contains only relevant data. Here is the example:

```
#-----
# "dmcfg" Tue Sep 23 09:44:50 GMT 2003
#-----
SCREEN SUPPORT pc-1-supt pc-2-supt pc-3-supt
SCREEN SERVICE pc-1-serv pc-2-serv pc-3-serv pc-3-serv pc-4-serv pc-5-serv pc-
6-serv pc-7-serv
SCREEN OPERATION pc-1-ccr pc-2-ccr pc-3-ccr pc-4-ccr pc-5-ccr pc-6-ccr pc-7-ccr
pc-8-ccr pc-9-ccr
#-----
TYPE foxDefault DSM O -
TYPE VIEW_ONLY DSM V Init_Env
TYPE _DEFAULT DSM O Proc_Op_Env
#-----
AMTYPE foxDefault O -
AMTYPE foxFullScreen O -
AMTYPE foxFullSq O -
AMTYPE foxGrids O -
AMTYPE foxOldCAD O -
AMTYPE foxQuarter O -
AMTYPE foxStrips O -
```

AMTYPE	_DEFAULT	O	Proc_Op_Env
#-----			
NAME	OMAW02 DM0000	\$SUPPORT	foxDefault
NAME	OMAW02 DM0001	\$OPERATION	VIEW_ONLY
NAME	OMAW02 DM0002	\$SERVICE	VIEW_ONLY
NAME	OMAW02 DM0003	\$SERVICE	VIEW_ONLY
NAME	OMAW02 DM0004	\$SERVICE	VIEW_ONLY
NAME	OMAW02 DM0005	\$SUPPORT	foxDefault
NAME	OMAW02 DM0006	AWRD03	foxDefault
#-----			
AMNAME	OMAW02 AM0000	-	foxDefault
#-----			

In the example shown above:

Two DM's are dedicated to the PC's from the support group, and for that reason a **SCREEN** variable was declared containing the PC names from the Support group that should have access to one of the two DM's.

For the Service group too, a **SCREEN** variable was created with the PC names from their systems. This group shares three DM's.

The Operators share one DM license among them. (I just hope they have some WP's in addition to this).

One additional DM was created that is dedicated to one specific X-Terminal, one DM is assigned to the PC X-Terminal with name **AWRD03**.

10.3.5 Some additional notes

Some thing to keep in mind when editing the `dmcfg` file:

- PC names as shown in the `dmcfg` file are *case sensitive*. E.g. when you add a PC with name **xterm1** and the `dmcfg` file shows **XTERM1**, the message: **No DM configured for this screen** will appear with the obvious consequence you will not get one.
- Adding PC's to a **SCREEN** list can not be done from the GUI configurator. You must make the changes to the actual `dmcfg` file using a textg editor like *vi*.
- When you start an X-Terminal session, the `go_dm/.profile` file will attempt to set the **DISPLAY** variable. This variable will contain the **Fully Qualified Domain Name** for your PC. It is exactly this name that should be set in the `dmcfg` file. So, to find out what the **DNS** has in store for you try to do an **nslookup <pcname>** from the prompt and see what the response is:

```
# nslookup xterm1<cr>
Name:      xterm1.domain.org
Address:   10.31.16.116
```

When you get a result similar to the one above and the DM does not work, try to add PC name for the X-Terminal as displayed in the response, i.e.: **xterm1.domain.org** so you will get as line that looks something like:

```
NAME OMAW02 DM0005 xterm1.domain.org FoxDefault
```

10.3.6 Filtering the hostname from your FQDN

When you have the scenario where you must always enter the FQDN (the abbreviation for **Fully Qualified Domain Name**) the in the `dmcfg` file **and** this is not as desired because your domain changes regularly, it may be an idea to strip everything away from the FQDN and leave the host portion only. This can be achieved by making a small modification to the `.profile/go_dm` file located in the `/opt/ia` directory. Below you will find a little part of that file with **(in bold and red print)** the changes suggested:

```
SIGUSR1=`grep SIGUSR1 $SIG_PATH | awk '{ printf ( "%s", $3 ) }'`

REM_STATION=`who am i | awk '{print $6}' | tr -d "()" | awk -F. '{print $1}'`
LOC_STATION=`uname -n`

DISPLAY=$REM_STATION:0 ; export DISPLAY
echo Setting DISPLAY to $DISPLAY
```

Without the modification the **DISPLAY** variable is filled with `HOSTNAME.domain.org:0` (i.e.:the FQDN) while the modified file will produce the **DISPLAY** variable with only `HOSTNAME:0`. These are all the changes required on the **I/A 50 Series** platform.

10.4 Setting up the DHCP Server

In order for our setup to work, we have some special requirements regarding the **DHCP/DNS** combo. The most important requirement is that **DNS** is updated automatically by the **DHCP** server regarding information that is handed out to clients. Because the IP addresses are provided to PC clients on the network by **DHCP**, it would be a requirement that this information was propagated to the **DNS** server since we are using an `nslookup` to the **DNS** server to get a name that matches an IP address. The latest versions of **DHCP** and **DNS** do support this functionality but finding the information on how to achieve this was another story.

Nevertheless, if your plant already has a **DHCP/DNS** combination that meets this requirement, you already have completed the setup.

In this chapter we will configure a **DHCP** Server that meets our requirements.

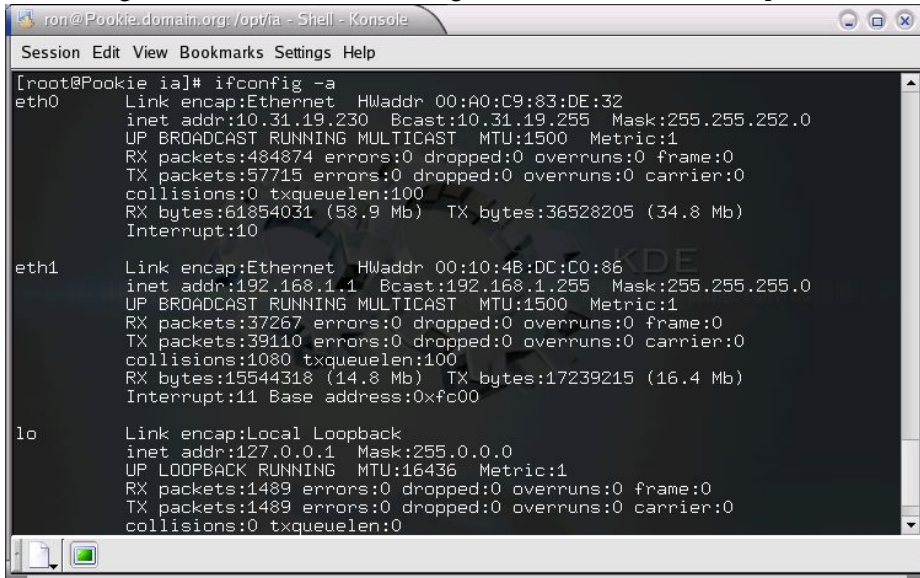
This setup was tested using a PC with Mandrake Linux version 9.1 download edition. Additionally we added the **DHCP** server to this configuration. Although there is no need to use Mandrake or any other Open Source initiative or this purpose, this section hopefully will provide some information about the requirements for the **DHCP** server we used. As mentioned here, Linux is used for this setup. The reason being it comes without any licensing hassle and is well documented and supported.

10.4.1 The Server configuration

Before we start, a few things are assumed to be in working order:

- You have the desired network interface (eth1 in this case) configured and up and running.
- A ping from from the "outside" to that interface will be successful.
- The output from `ifconfig` will something similar to the example below.
- You can *telnet* and *ping* the server via the *localhost* name.

Let's have a look at the hardware we started with, more specific the network interfaces installed. The Server was equipped with two network interfaces: one on-board and one added as a PCI card. The settings used can be obtained using the command "`ifconfig -a`" from a terminal window:



```
[root@Pookie ia]# ifconfig -a
eth0      Link encap:Ethernet  HWaddr 00:A0:C9:83:DE:32
          inet addr:10.31.19.230  Bcast:10.31.19.255  Mask:255.255.252.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:484874 errors:0 dropped:0 overruns:0 frame:0
          TX packets:57715 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:61854031 (58.9 Mb)  TX bytes:36528205 (34.8 Mb)
          Interrupt:10

eth1      Link encap:Ethernet  HWaddr 00:10:4B:DC:C0:86
          inet addr:192.168.1.1  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:37267 errors:0 dropped:0 overruns:0 frame:0
          TX packets:39110 errors:0 dropped:0 overruns:0 carrier:0
          collisions:1080 txqueuelen:100
          RX bytes:15544318 (14.8 Mb)  TX bytes:17239215 (16.4 Mb)
          Interrupt:11 Base address:0xfc00

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:1489 errors:0 dropped:0 overruns:0 frame:0
          TX packets:1489 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
```

Illustration 10.17 On the Linux box: results from "`ifconfig -a`" command

As we can see (we are primarily interested in the **eth1** card), the network is configured with IP address **192.168.1.1/255.255.255.0**. (Note the hardware address as we will use that in the `dhcpd.conf` file to force that IP address to this interface). The **eth0** network interface was, in our configuration, connected to the office network. We used that to obtain data from the outside world. It is of no real importance to our task here.

10.4.2 Installing DHCP with the Mandrake Control Center

The place to install your software is the **Mandrake Control Center**. It is usually selectable from the bar at the bottom of the screen or by invoking the command "**drakconf**" from a terminal:



Illustration 10.18 The Mandrake Control Center

We will be needing the **Software Management** entry from this screen to install the **DHCP** Server (if not already installed that is).

You will get a screen as below where you click on the **RpmDrake** icon to install the software we need:

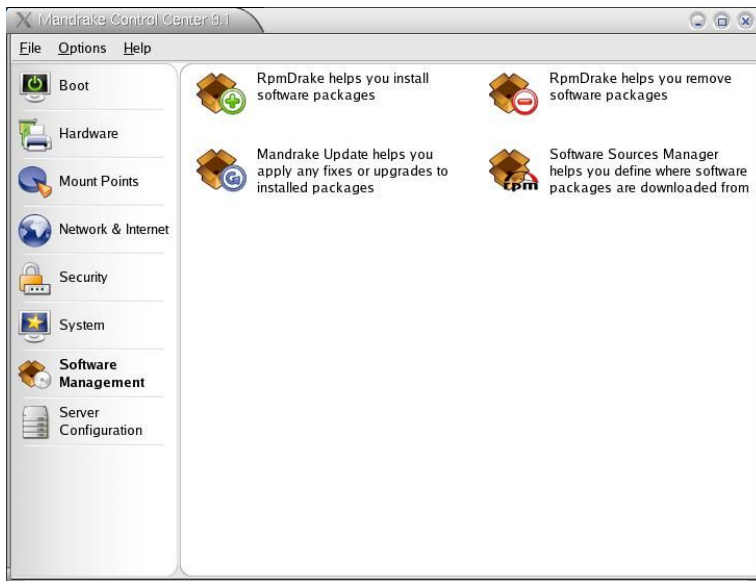


Illustration 10.19 Mandrake Software Management screen

You now have a display as shown below which will allow you to enter a search item and present you with the options. In our example we want to install the **DHCP** server, so let's search for that:

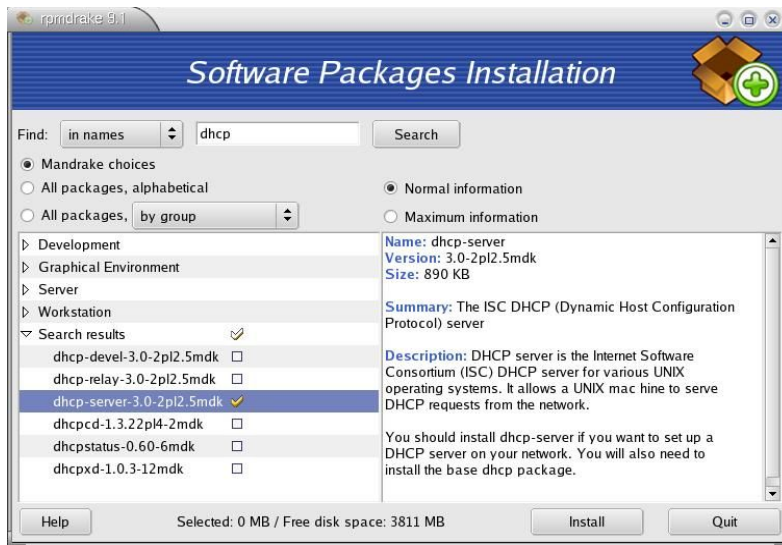


Illustration 10.20 The dhcp search results (selection made)

As we can see, the search resulted in several hits where we selected the `dhcp-server-3.0-2pl2.5mdk` package. This package is all we need from the listed options.

When we click the **Install** button now, you are prompted to insert the **Installation CD 2**. Follow the directions on screen to complete the installation and you are done. You should have **CD 2** at hand of course:

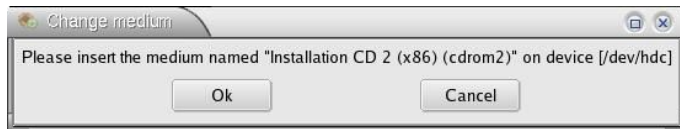


Illustration 10.21 Insert the correct CD for the job

10.4.3 The DHCP Server configuration

After we have installed the **DHCP** server, we can continue with the configuration. The **DHCP** configuration file is quite simple. The file is printed here and we will try to explain the options used. The **DHCP** configuration file is usually found in the `/etc` directory and is named `"dhcpd.conf"`. The contents for our configuration file are printed below:

```
[/etc/dhcpd.conf]
ddns-update-style interim;
subnet 192.168.1.0 netmask 255.255.255.0 {
    # default gateway
    option routers 192.168.1.1;
    option subnet-mask 255.255.255.0;
    option broadcast-address 192.168.1.255;
    option domain-name-servers 192.168.1.1;
    option domain-name "domain.org";

    range dynamic-bootp 192.168.1.12 192.168.1.25;
    default-lease-time 3600;
    max-lease-time 7200;
```

```
# we want the nameserver to appear at a fixed address
host ns {
    next-server pookie.domain.org;
    hardware ethernet 00:10:4B:DC:C0:86;
    fixed-address 192.168.1.1;
}
}
```

This file, once you get used to it, is reasonably straightforward. (Yes, strange things happen to you when look at weird things long enough...) Some of the options and what they mean:

- **ddns-update-style interim**
Allows for dynamic updates for the **DNS** Server.
- **subnet**
Defines the subnet mask for the global network
- **option routers**
Sets the default router for the clients
- **option subnet-mask**
Tells the clients to use this subnet mask
- **option broadcast-address**
Sets the broadcast address to this value for all clients
- **option domain-name-servers**
Informs the clients about their **DNS** server IP
- **option domain-name**
Contains the domain name for the clients
- **range dynamic-bootp**
Specifies the IP range to be handed out to requesting clients
- **default-lease-time**
If a client makes no special request, specifies the lease time after which the IP address expires.
- **max-lease-time**
If a clients request a specific lease time, sets the max to this value.
- **host ns**
The host *name server* gets some options too. In this case it gets a fixed ip address from **DHCP**.
The required configuration work for the **DHCP** Server is now completed.

10.4.4 Starting the DHCP server

DHCP will not start just by force of will. On a Mandrake system, the Mandrake Control Center is the way to configure the Server startup. After selecting the **System** button on the left, choose the icon next to **DrakXServices**:

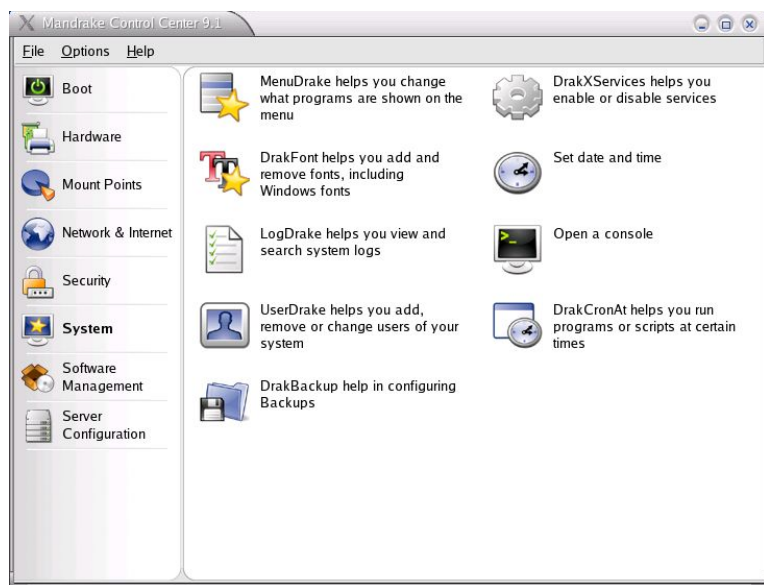


Illustration 10.22 Finding the Services to start via DraxServices

You then get a list of available services on your system. They are listed in alphabetical order. Scroll down until you see the "*dhcpcd*" program and select the "**On boot**" button and try to start the server. The picture below shows the "*dhcpcd*" (the **DHCP** daemon) is running and the "**On boot**" button is checked.

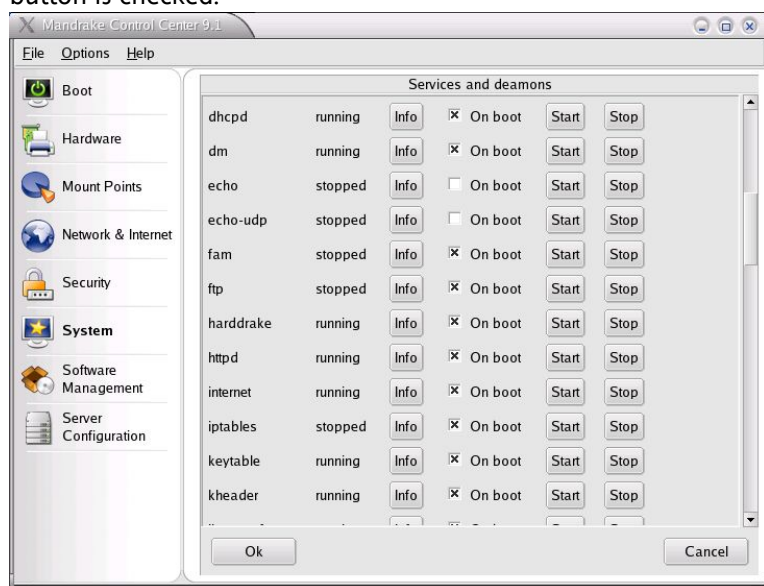
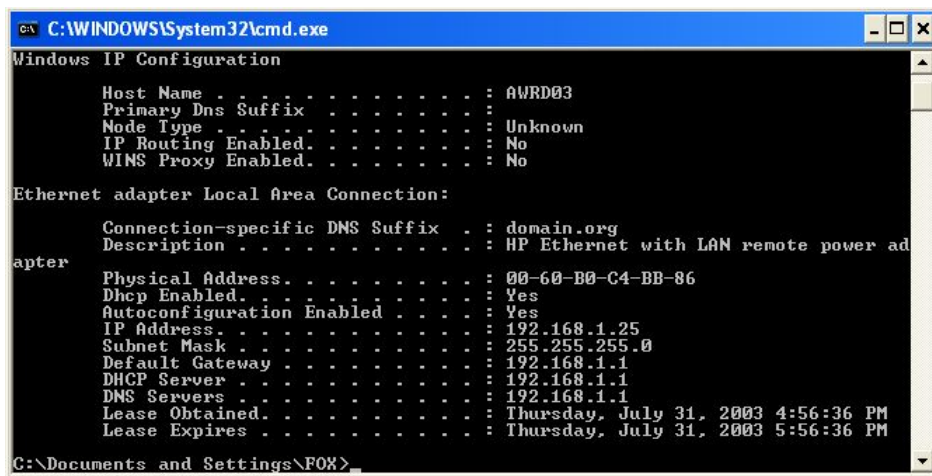


Illustration 10.23 Verifying if the DHCP daemon is running and startup configured correctly.

When the server is started, a client requesting an IP address should receive the settings as set in the `/etc/dhcpd.conf` file we configured earlier. This can be checked after the **Windows XP** client was booted by issuing the command "`ipconfig /all`" from any **cmd** command box. The response must be similar to the one shown here:



```
C:\WINDOWS\System32\cmd.exe
Windows IP Configuration

Host Name . . . . . : AWRD03
Primary Dns Suffix . . . . . :
Node Type . . . . . : Unknown
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : domain.org
    Description . . . . . : HP Ethernet with LAN remote power ad
    Physical Address. . . . . : 00-60-B0-C4-BB-86
    Dhcp Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    IP Address. . . . . : 192.168.1.25
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1
    DHCP Server . . . . . : 192.168.1.1
    DNS Servers . . . . . : 192.168.1.1
    Lease Obtained. . . . . : Thursday, July 31, 2003 4:56:36 PM
    Lease Expires . . . . . : Thursday, July 31, 2003 5:56:36 PM

C:\Documents and Settings\FOX\>
```

Illustration 10.24 Windows XP: output from "ifconfig /all" command.

If you get a similar response, we are ready to proceed with the next step: Setting up your **DNS**.

10.5 Setting up the DNS Server

A successful **DNS** Server setup can be a little harder to accomplish. If this is what you have to do, you may dig into some related documentation as mentioned in the beginning of this manual, consult the Internet or find someone else to do it ;-). **DNS**, which is the abbreviation for **Domain Name System**, is a system that provides the mapping between IP addresses to names and vice versa. This can be used to look up an IP address corresponding to a name, or find a name to an IP address. The latter part is our main interest here since we know an IP address (the X-Terminal received that from the **DHCP** Server) and want to know the name that goes with it.

10.5.1 Confusing: BIND?, DNS?, named?

One of the first things we may need to clear out is the different names you will find in this section. We are going to setup a **DNS Server**. This requires a package called **BIND9** (or BIND8 which is a little older). This package contains the actual "program" that will do the work for you, but this program is called **named** (for **name daemon**). **BIND** (Berkely Internet Name Domain Software) is one of the most common implementations of **DNS** which implicates that **BIND** is **DNS** but **DNS** is not limited to **BIND**, there are others. In this setup we will restrict ourselves to the Berkely implementation

So **BIND** is the **DNS** Server implementation we use here and that starts a daemon that's called **named**, OK? All three names are used in the related documentation. We installed the **BIND9** package from the **Mandrake 9.1 Download Edition** CD-Roms on our Linux machine, (it is on one the three download CD's so there should be no problem getting that part done. After the installation we can have a look at what we have.

10.5.2 Installing BIND (DNS) with the Mandrake Control Center

The place to install your software is the **Mandrake Control Center**. It is usually selectable from the bar at the bottom of the screen or by invoking the command "**drakconf**" from a terminal:



Illustration 10.25 The Mandrake Control Center again.

You can use **Software Management** entry from this screen to install the **DNS** Server (if not already installed that is). You will get a screen as below where you click on the **RpmDrake** icon to install the software we need:

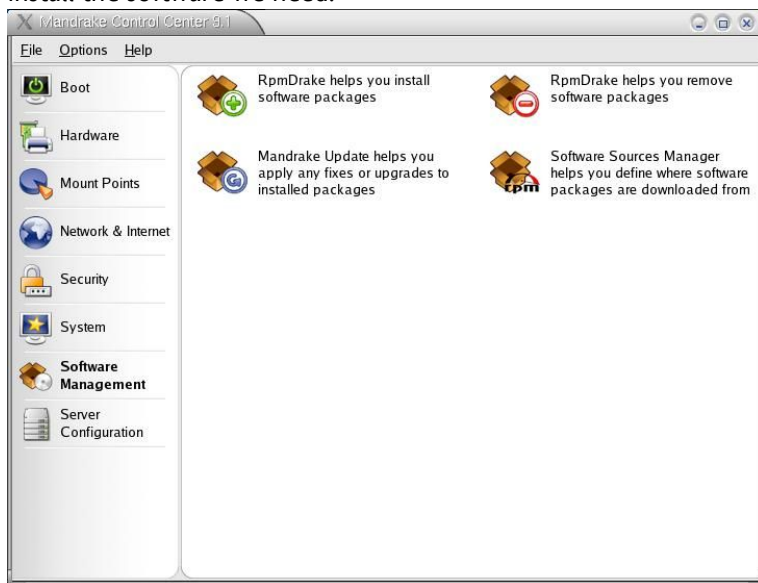


Illustration 10.26 Choose to install software here

As with the **DHCP** server earlier, we search for **BIND** (not **DNS**) in this case, which (after you have pressed the **Search** button) gives you these results:

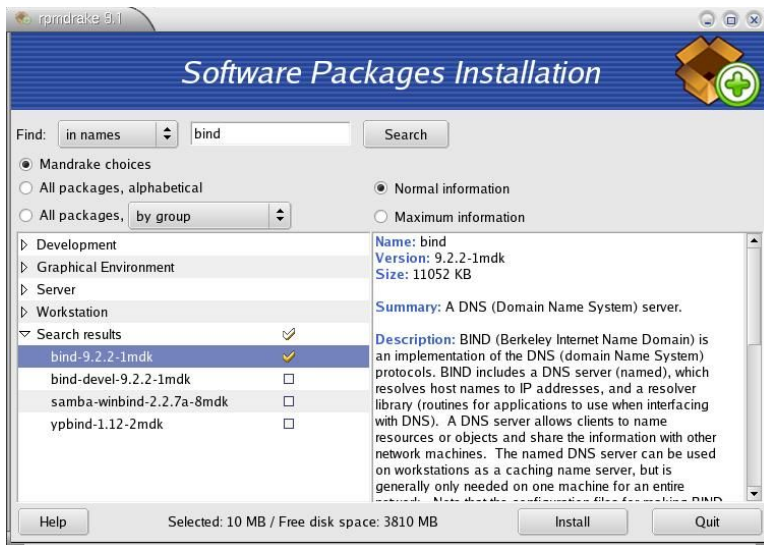


Illustration 10.27 The search results for the bind search string

As you can see, we already selected the only option required to install DNS services on our system: `bind-9.2.2-1mdk`. Click the **Install** button and you will be prompted to insert **Installation CD 1** from the Download set and again follow the instruction on screen to proceed.

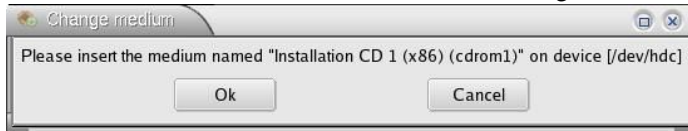


Illustration 10.28 Load Installation CD 1 for BIND

10.5.2.1 Where did everything go?

The **BIND9** package provided with the Mandrake distribution follows the standard where file locations are concerned. The basic configuration file: `named.conf` is by default located in the directory `/etc` and the `zone` files are by default under the `/var/named` directory. This `/var/named` directory is specified in the `named.conf` file as we will see later.

10.5.3 The main configuration file `named.conf`

This `named.conf` file is the main configuration file for **BIND**. The file lists, apart for some global settings, the `zones` for which this **DNS** server has some information to spare. Below you will find the `named.conf` file we used in our lab setup. The files mentioned for the `zones` have a "syntax" that is similar to the one found in the O' Reilly handbook "**DNS and BIND 4th Edition**" i.e. we use `db.zone-name` as the file name for the `zones` used. This is not mandatory but it helps to stick to some sort of standard:

```
[/etc/named.conf]
options {
    directory "/var/named";
    pid-file "/var/named/named.pid";
};

# name to address
```

```
zone "domain.org"{
    type master;
    file "db.private";
    allow-update { 192.168.1.1; };
};

# address to name
zone "1.168.192.in-addr.arpa"{
    type master;
    file "db.192.168.1";
    allow-update { 192.168.1.1; };
};

# localhost to 127.0.0.1
zone "localhost"{
    type master;
    file "db.localhost";
};# 127.0.0.1 to localhost
};

# 127.0.0.1 to localhost
zone "0.0.127.in-addr.arpa"{
    type master;
    file "db.127.0.0";
};

# dummy zones
zone "0.in-addr.arpa"{
    type master;
    file "db.dummy";
};

zone "255.in-addr.arpa"{
    type master;
    file "db.dummy";
};

zone "." {
    type hint;
    file "named.root";
};
```

A little explanation should go with this file (I guess):

The first lines define some global options, one of them is defining the "root" of the *named* configuration files. This option indicates that the *zone* files can be found under the directory /var/named, and as a result you should find the *zones* specified in this file under the /var/named directory. For example there is a *zone* defined with db.localhost as the name. There should be a file called /var/named/db.localhost for that matter.

Also note that for the db.private and db.192.168.1 files a statement was added to allow updates from our **DHCP** server.

As you can see, named.conf is only just the start, it defines the *zones* and these can be a real

pain to setup. The examples can be used as a starting point for your specific setup. We will go (a little) deeper into these *zone* files next.

10.5.4 The zone files

Zone files are quite important to **DNS** as they will specify to **DNS** what to do with request received from clients. Some special *zone* files should always be part of your **DNS** configuration and you can use the ones listed here in the example, other are specific to your specific situation and must be tinkered with. Some things just can't be helped... Let's have a look at the *zone* files we created in our lab setup.

Since **DNS** is used to resolve names to valid IP addresses, there must be some information on how to achieve this. This is done via the *zone* files. A *zone* can have a function to map IP addresses to names while another *zone* can have the opposite function (a *reverse zone* as it is called). So one would expect to find for each *zone* two files that handle requests for that *zone*.

10.5.4.1 Some specific "overhead" zones

As mentioned, some *zones* should always be part of your **DNS** server configuration. There are sort of standard overhead but you need them to take care of some standard stuff. Amongst these are *zones* that deal with the "*localhost*", the network name, the broadcast address and of course the big bad world outside (the "*root*" *zone*) .

10.5.4.2 The "localhost" and the (reverse lookup) "0.0.127.in-addr-arpa" zone

These *zones* for instance, will cover the *loopback* name resolving. In the example configuration we used the *zone* was named "*db.localhost*" while the *reverse lookup* was handled by a files that was named "*db.127.0.0*". These files are a must to allow lookups to the *loopback* or *localhost* address and vice versa. No **DNS** should be without these two. First as a little refresh, the references to these files in `/etc/named.conf`:

```
[/etc/named.conf (part)]
# localhost to 127.0.0.1
zone "localhost"{
    type master;
    file "db.localhost";
};# 127.0.0.1 to localhost
};

zone "0.0.127.in-addr.arpa"{
    type master;
    file "db.127.0.0";
};
```

The contents of the *db.localhost* and *db.127.0.0* files are listed here. We start with the *db.localhost* file:

```
[/var/named/db.localhost]
$TTL 259200
@ IN SOA pookie.domain.org. hostmaster.domain.org. (
2003071002 ;serial YYYYMMDDxx set by DNS admin (you!!)
```

```
86400      ;refresh once a day same 1d
3600       ;retry once per hour same as 1h
604800     ;expire after one week same as 1w
259200)    ;minumum lifespan three days same as 3d
;
          IN NS pookie.domain.org.
localhost. IN A 127.0.0.1
```

Here is the *reverse lookup file* for "localhost" which is db.127.0.0:

```
[/var/named/db.127.0.0]
$TTL 259200
@      IN      SOA      pookie.domain.org. hostmaster.domain.org. (
2003071002 ;serial YYYYMMDDxx set by DNS admin (you!!)
86400     ;refresh once a day same 1d
3600      ;retry once per hour same as 1h
604800    ;expire after one week same as 1w
259200)   ;minumum lifespan three days same as 3d
;
0.0.127.in-addr.arpa. IN NS  pookie.domain.org.
1.0.0.127.in-addr.arpa.      IN PTR      localhost.
```

10.5.4.3 The "root" zone

This is also a very important *zone* if your DNS takes care of connections to the outside world. This *zone* which out of your control will help you to resolve named like www.invensys.com to a valid IP adress. These "root" *zones* are served by the internet "root" name servers. A list of these servers is available on the internet and should be updated regularly. You can get the latest version through the location: "ftp.internic.net" under the directory /domain, the file to look for is "named.root". The file we used is of course located in the /var/named and (in our example setup) has a filename named.root. It is referenced in the /etc/named.conf file:

```
[/etc/named.conf (part)]
zone "." {
    type hint;
    file "named.root";    };

```

Note that this *zone* is of type "*hint*" as we do not know if **DNS** will find the answer you are looking for in that zone, it is indeed no more than just a hint for **DNS** to have a look there. The file "named.root" contains these hints (the "root name servers") and it is listed here:

```
[/var/named/named.root]
;      This file holds the information on root name servers needed to
;      initialize cache of Internet domain name servers
;      (e.g. reference this file in the "cache . <file>"
;      configuration file of BIND domain name servers).
;
;      This file is made available by InterNIC
;      under anonymous FTP as
;          file                /domain/named.root
;          on server           FTP.INTERNIC.NET
;
```

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Remote Display Manager and Foxview



```
;      last update:      Nov 5, 2002
;      related version of root zone:  2002110501
;
;
; formerly NS.INTERNIC.NET
;
.      3600000      IN      NS      A.ROOT-SERVERS.NET.
A.ROOT-SERVERS.NET.      3600000      A      198.41.0.4
;
; formerly NS1.ISI.EDU
;
.      3600000      NS      B.ROOT-SERVERS.NET.
B.ROOT-SERVERS.NET.      3600000      A      128.9.0.107
;
; formerly C.PSI.NET
;
.      3600000      NS      C.ROOT-SERVERS.NET.
C.ROOT-SERVERS.NET.      3600000      A      192.33.4.12
;
; formerly TERP.UMD.EDU
;
.      3600000      NS      D.ROOT-SERVERS.NET.
D.ROOT-SERVERS.NET.      3600000      A      128.8.10.90
;
; formerly NS.NASA.GOV
;
.      3600000      NS      E.ROOT-SERVERS.NET.
E.ROOT-SERVERS.NET.      3600000      A      192.203.230.10
;
; formerly NS.ISC.ORG
;
.      3600000      NS      F.ROOT-SERVERS.NET.
F.ROOT-SERVERS.NET.      3600000      A      192.5.5.241
;
; formerly NS.NIC.DDN.MIL
;
.      3600000      NS      G.ROOT-SERVERS.NET.
G.ROOT-SERVERS.NET.      3600000      A      192.112.36.4
;
; formerly AOS.ARL.ARMY.MIL
;
.      3600000      NS      H.ROOT-SERVERS.NET.
H.ROOT-SERVERS.NET.      3600000      A      128.63.2.53
;
; formerly NIC.NORDU.NET
;
.      3600000      NS      I.ROOT-SERVERS.NET.
I.ROOT-SERVERS.NET.      3600000      A      192.36.148.17
;
; operated by VeriSign, Inc.
```

```
;
.           3600000      NS      J.ROOT-SERVERS.NET.
J.ROOT-SERVERS.NET.  3600000      A      192.58.128.30
;
; housed in LINX, operated by RIPE NCC
;
.           3600000      NS      K.ROOT-SERVERS.NET.
K.ROOT-SERVERS.NET.  3600000      A      193.0.14.129
;
; operated by IANA
;
.           3600000      NS      L.ROOT-SERVERS.NET.
L.ROOT-SERVERS.NET.  3600000      A      198.32.64.12
;
; housed in Japan, operated by WIDE
;
.           3600000      NS      M.ROOT-SERVERS.NET.
M.ROOT-SERVERS.NET.  3600000      A      202.12.27.33
; End of File
```

10.5.4.4 The "dummy" zone

This *zone* is required to handle request to the network or broadcast address. As we are used to, it is referenced in the `/etc/named.conf` file:

```
[/etc/named.conf (part)]
# dummy zones
zone "0.in-addr.arpa"{
    type master;
    file "db.dummy";
};

zone "255.in-addr.arpa"{
    type master;
    file "db.dummy";
};
```

It does not contain anything usefull and therefore all requests will result in a simple "not found". The content of `/var/named/db.dummy`:

```
[/var/named/db.dummy]
$TTL 259200
@ IN SOA pookie.domain.org. hostmaster.domain.org. (
2003071002 ;serial YYYYMMDDxx set by DNS admin (you!!)
86400      ;refresh once a day same 1d
3600       ;retry once per hour same as 1h
604800     ;exipire after one week same as 1w
259200)    ;minumum lifespan three days same as 3d
;
      NS pookie.domain.org.
```

```
PTR localhost.
```

10.5.4.5 The zones that matter :-)

After dealing with the overhead stuff, we can get down to the real thing. We need some *zones* for the work we are trying to do here. These *zones* are for dealing with our domain **domain.org** and should handle requests for that *zone*. One zone we have is titled `domain.org` and, as we are used to by now,(?) there is also a reverse lookup file and that is zone `1.168.192.in-addr-arpa`. These *zones* we need to setup too and since we did that already for you let's have a look: First see what the files are in `/etc/named/conf`:

```
[/etc/named.conf (part)]
zone "domain.org"{
    type master;
    file "db.private";
    allow-update { 192.168.1.1; };
};

# address to name
zone "1.168.192.in-addr.arpa"{
    type master;
    file "db.192.168.1";
    allow-update { 192.168.1.1; };
};
```

This **DNS** Server considers itself a *master* for these *zones* and the names for the files where **DNS** can find info about this *zone* are `db.private`. and `db.192.168.1`. Ergo, these files must exist in the directory `/var/named` (remember that this was declared the "root" for *named* in the `named.conf` file. Note the lines that read "`allow-update { 192.168.1.1; } ;`" in the `/etc/named.conf` file for these two *zones* which are the lines that will make **DNS** allow updates of these zones from your **DHCP** server.

The "`db.private`" zone file we used:

```
[/var/named/db.private]
$TTL 259200
@      IN      SOA      pookie.domain.org. hostmaster.domain.org. (
2003071003 ;serial YYYYMMDDxx set by DNS admin (you!!)
86400      ;refresh once a day same as 1d
3600       ;retry once per hour same as 1h
604800     ;expire after one week same as 1w
259200)    ;minumum lifespan three days same as 3d
;
;          NS       pookie.domain.org.
;
pookie IN  A        192.168.1.1
AW51B IN  A        192.168.1.2
; aliases
mozart IN  CNAME    pookie
print IN   CNAME    pookie
```

As we can see, the names "**pookie**" and "**AW51B**" both have fixed IP addresses in this

configuration. Please note that there is no mentioning of anything related to the X-Terminals. Of course we also need the *reverse lookup* file for this network and that would be the file "db.192.168.1" which is exactly what we used:

```
[/var/named/db.192.168.1]
$TTL 259200 ; 3 days
@      IN SOA pookie.domain.org. hostmaster.domain.org. (
                                2003071007 ; serial
                                86400      ; refresh (1 day)
                                3600       ; retry (1 hour)
                                604800     ; expire (1 week)
                                259200     ; minimum (3 days)
                                )
      NS  pookie.domain.org.
1      PTR localhost.
2      PTR AW51B.
```

10.5.5 The initial zone files

Before we start the **DNS** services, we take a look at the `/var/named` directory to see what we have so far. We should at least have these files:

```
[The contents of the /var/named directory before running DNS/DHCP]
db.127.0.0
db.192.168.1
db.dummy
db.localhost
db.private
named.root
```

There is a reason why we do this of course. These files are supposed to change if everything goes well and we did the configuration work correctly. Remember we need DNS to dynamic? Well at this point no dynamics are required (nothing is running) but as soon as a client will request an IP address, the DHCP Server will attempt to update the DNS server of this a the zone files which are open for updates will reflect this change.

10.5.6 Starting DNS (named)

When all configuration work is done, we can try to start the service. Again similar to the **DHCP** service, **DNS** can be started from the **Mandrake Control Center**. Select the **System** Icon and after selecting the **DrakXServices** icon, scroll down until you get the **named** program. The same as with **dhcpcd** applies: run at boot and try to start the service now.

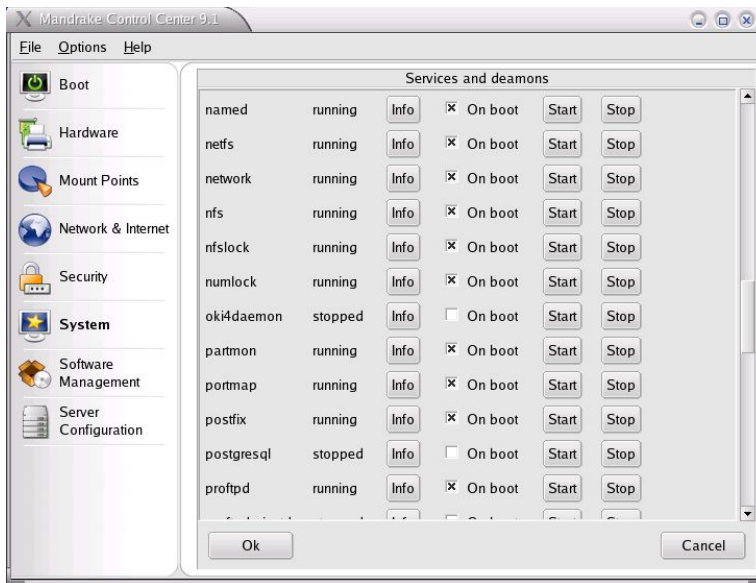


Illustration 10.29 DrakXServices view in Mandrake Control Center- on top the "named" configuration

10.5.7 Verifying proper operation

To see whether we were successful in our setup it is time to check this out. We assume the following situation:

- The **I/A 50 Series** host is up and running
- The **DNS** and **DHCP** servers are both on-line

To see how things are going in may be a nice idea to have a `tail -f` on the `/var/log/messages` file on the Linux machine.

It is time to boot up the **Windows XP** X-Terminal PC...

10.5.8 The zone files after running DHCP and DNS and client request

When the **Windows XP** machine is on-line, you should see that the IP address is handed out by the **DHCP** Server and also you should see that **DHCP** is attempting to update the **DNS** files related to the `db.private` and `db.192.168.1` zones in `/var/named` and **DNS** should respond in favor of these attempts.

Another change you may observe is some additional files in `/var/named` directory showed up on the Linux box:

[The contents of the `/var/named` directory after booting the XP machine]

```
db.127.0.0
db.192.168.1
db.192.168.1.jnl
db.dummy
db.localhost
db.private
db.private.jnl
named.pid
```

```
named.root
```

As we can see, there are some extra files which are the direct result from the interaction between **DHCP** and **DNS** on this system. The files with the extension `.jnl` are the journal files that are used by **DNS** to maintain the (now dynamic) **DNS** server files.

Don't be surprised to see these `db.private.jnl` and `db.192.168.1.jnl` files on your system since they are proof of your success. More important: do not just delete them.

10.5.9 The db.private zone after a dynamic update

One of the *zones* we have that will be updated by **DHCP** is the `db.private zone`. Once the **Windows XP** PC is on-line and has received an IP address, there should a change to the `db.private zone` file in addition to the `db.private.jnl` file: Note that the `db.private.jnl` file is binary and is not user readable. The journal file is used to maintain periodic updates of the *zone* files in **DNS**.

10.5.10 Messages in /var/log/messages

After starting the DHCP Server, your `/var/log/messages` file should contain some lines similar to this:

```
[/var/log/messages snippet]
Aug 20 08:46:00 Pookie dhcpd: dhcpd shutdown failed
Aug 20 08:46:00 Pookie dhcpd: Wrote 0 deleted host decls to leases file.
Aug 20 08:46:00 Pookie dhcpd: Wrote 0 new dynamic host decls to leases file.
Aug 20 08:46:00 Pookie dhcpd: Wrote 0 leases to leases file.
Aug 20 08:46:00 Pookie dhcpd:
Aug 20 08:46:00 Pookie dhcpd: No subnet declaration for eth0 (10.31.19.230).
Aug 20 08:46:00 Pookie dhcpd: ** Ignoring requests on eth0. If this is not what
Aug 20 08:46:00 Pookie dhcpd:     you want, please write a subnet declaration
Aug 20 08:46:00 Pookie dhcpd:     in your dhcpd.conf file for the network segment
Aug 20 08:46:00 Pookie dhcpd:     to which interface eth0 is attached. **
Aug 20 08:46:00 Pookie dhcpd:
Aug 20 08:46:00 Pookie dhcpd: dhcpd startup succeeded
```

When you run the **DNS** Server next, some extra lines should appear in this file:

```
[/var/log/messages snippet]
Aug 20 08:48:48 Pookie named: named shutdown failed
Aug 20 08:48:48 Pookie named[8253]: starting BIND 9.2.2 -u named
Aug 20 08:48:48 Pookie named[8253]: using 1 CPU
Aug 20 08:48:48 Pookie named: named startup succeeded
Aug 20 08:48:49 Pookie named[8255]: loading configuration from '/etc/named.conf'
Aug 20 08:48:49 Pookie named[8255]: no IPv6 interfaces found
Aug 20 08:48:49 Pookie named[8255]: listening on IPv4 interface lo, 127.0.0.1#53
Aug 20 08:48:49 Pookie named[8255]: listening on IPv4 interface eth0, 10.31.19.3
Aug 20 08:48:49 Pookie named[8255]: listening on IPv4 interface eth1, 192.168.13
Aug 20 08:48:49 Pookie named[8255]: zone 'domain.org' allows updates by IP addre
Aug 20 08:48:49 Pookie named[8255]: zone '1.168.192.in-addr.arpa' allows updatee
Aug 20 08:48:49 Pookie named[8255]: couldn't add command channel 127.0.0.1#953:d
```

```
Aug 20 08:48:49 Pookie named[8255]: zone 0.in-addr.arpa/IN: loaded serial 200302
Aug 20 08:48:49 Pookie named[8255]: zone 0.0.127.in-addr.arpa/IN: loaded serial 2
Aug 20 08:48:49 Pookie named[8255]: dns_master_load: db.192.168.1:9: 1.168.192.e
Aug 20 08:48:49 Pookie named[8255]: zone 1.168.192.in-addr.arpa/IN: loading mase
Aug 20 08:48:49 Pookie named[8255]: zone 255.in-addr.arpa/IN: loaded serial 2002
Aug 20 08:48:49 Pookie named[8255]: zone localhost/IN: loaded serial 2003071002
Aug 20 08:48:49 Pookie named[8255]: dns_master_load: db.private:10: domain.org.e
Aug 20 08:48:49 Pookie named[8255]: zone domain.org/IN: loading master file db.e
Aug 20 08:48:49 Pookie named[8255]: running
```

So far so good... Now boot the Windows XP PC and see what happens:

When **Windows XP** boots it will request an IP adress and some work needs to be done by **DHCP** and **DNS**:

[/var/log/messages when XP boots]

```
Aug 20 11:58:05 Pookie dhcpd: DHCPDISCOVER from 00:60:b0:c4:bb:86 (AWRD03) via
eth1
Aug 20 11:58:06 Pookie dhcpd: DHCPOFFER on 192.168.1.25 to 00:60:b0:c4:bb:86
(AWRD03) via eth1
Aug 20 11:58:06 Pookie named[1227]: client 192.168.1.1#32781: updating zone
'domain.org/IN': adding an RR
Aug 20 11:58:06 Pookie named[1227]: client 192.168.1.1#32781: updating zone
'domain.org/IN': adding an RR
Aug 20 11:58:06 Pookie dhcpd: if IN A AWRD03.domain.org domain doesn't exist add
150 IN A AWRD03.domain.org 192.168.1.25 add 150 IN TXT AWRD03.domain.org
"3193fe5d3a8fa5d6a29ab668812c969fae": success.
Aug 20 11:58:06 Pookie named[1227]: client 192.168.1.1#32781: updating zone
'1.168.192.in-addr.arpa/IN': deleting an rrset
Aug 20 11:58:06 Pookie named[1227]: client 192.168.1.1#32781: updating zone
'1.168.192.in-addr.arpa/IN': adding an RR
Aug 20 11:58:06 Pookie dhcpd: delete IN PTR 25.1.168.192.in-addr.arpa. add 150 IN
PTR 25.1.168.192.in-addr.arpa. AWRD03.domain.org: success.
Aug 20 11:58:06 Pookie dhcpd: DHCPREQUEST for 192.168.1.25 (192.168.1.1) from
00:60:b0:c4:bb:86 (AWRD03) via eth1
Aug 20 11:58:06 Pookie dhcpd: DHCPACK on 192.168.1.25 to 00:60:b0:c4:bb:86
(AWRD03) via eth1
```

You can (after some time that is) have a look at the `db.private` and `db.192.168.1` files. Note that these files lag behind the real world because **DNS** does not update these files immediately after every change. (this would cause a lot of stress on the disk when a lot of clients are requesting IP addresses). **DNS** keeps track of the IP adresse/name mapping in cache and updates the *zone* file every hour or so. So, after some time the files may look something like this: Before:

/var/named/db.private before dynamic update

```
$TTL 259200      ; 3 days
domain.org      IN SOA  pookie.domain.org. hostmaster.domain.org. (
                                2003071010 ; serial
                                86400      ; refresh (1 day)
                                3600       ; retry (1 hour)
```

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Remote Display Manager and Foxview

```

                                604800      ; expire (1 week)
                                259200      ; minimum (3 days)
                                )
;
                                NS      pookie.domain.org.
;
pookie      IN      A      192.168.1.1
AW51B      IN      A      192.168.1.2
; aliases
mozart      IN      CNAME  pookie
print      IN      CNAME  pookie

```

and after:

```

/var/named.db.private after dynamic update:
domain.org      IN SOA  pookie.domain.org. hostmaster.domain.org. (
                                2003071047 ; serial
                                86400      ; refresh (1 day)
                                3600      ; retry (1 hour)
                                604800      ; expire (1 week)
                                259200      ; minimum (3 days)
                                )
                                NS      pookie.domain.org.
$ORIGIN domain.org.
AW51B      A      192.168.1.2
$TTL 30 ; 30 seconds
AWRD03      A      192.168.1.25
            TXT      "3193fe5d3a8fa5d6a29ab668812c969fae"
$TTL 259200      ; 3 days
mozart      CNAME  pookie
pookie      A      192.168.1.1
print      CNAME  pookie

```

Similar updates are expected for the “reverse lookup” files

That's it for now. RdG/RD

11 VNC on Solaris 2.5.1 based systems.

VNC is an Open Source application that provides a thin client solution in the area of remote display management etc.
It is different from eXceed like approaches and this is how we did it.

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11.1 About VNC

As stated on their web site: <http://www.realvnc.com>:

RealVNC is a UK company founded in 2002 by a team from the world-leading AT&T Laboratories in Cambridge. The company was established to commercially develop, enhance and promote VNC, the innovative remote access software with a widespread international user base. VNC (Virtual Network Computing) software makes it possible to view and fully-interact with one computer from any other computer or mobile device anywhere on the Internet. VNC software is cross-platform, allowing remote control between different types of computer. For ultimate simplicity, there is even a Java viewer, so that any desktop can be controlled remotely from within a browser without having to install software.

VNC has a wide range of applications including system administration, IT support and helpdesks. It can also be used to support the mobile user, both for hot desking within the enterprise and also to provide remote access at home, or on the road. The system allows several connections to the same desktop, providing an invaluable tool for collaborative or shared working in the workplace or classroom. Computer support within the geographically spread family is an ever popular use.

The open source version of VNC has been freely available since 1998, and more than 20 million copies of the software have been downloaded. The software has also appeared on numerous magazine cover disks, and for several years all popular versions of Linux have included VNC. It is in active use by many millions in industry, commerce, education and at home. Virtually all Fortune 500 companies use VNC, and installations of VNC across thousands of workstations are commonplace.

Today, the RealVNC team has re-designed and re-implemented the VNC system. Compatible with the original protocols, the system is now an extremely flexible, modular and scaleable platform for vertical development, integration and licensing.

12 Troubleshooting.

Just some of the problems you can run in to. Hope you don't have to read this. Apologies in case you do.

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12.1 Introduction

When all of the documentation has been read and you have double-checked everything four times, the impossible happened: You ran into trouble. I have collected some of the installation questions that have reached me in the past and put them in here. I even managed to answer most of them! If you have answered any other frequently asked question, let me know. Maybe it will be of some use to others. (Yes! You will get the credits!).

12.2 Frequently Answered Questions

Well, here they are then.... Please note that most of the FAQ are eXceed related. Feedback and experience on/with other packages (Linux, SCO XVision, WRQ's Reflection X and others is appreciated.

12.3 Ping <hostname> responds with: "unknown host <hostname>"

The ping utility can be used to check for the presence of hosts on your network.

```
AW512A# ping pong<cr>
ping: unknown host pong
AW512A#
```

When you get this response the name "**pong**" may not be in the "hosts" table of the I/A station from where you are trying to ping.

Try ping <ip address of pong>. If this DOES work, the name pong is not in the hosts table but the host "pong" is available. Edit the "/etc/hosts" file so it has the entry for "pong".

When this doesn't work you may have another problem. Could be hardware. Check the following:

- Can you ping yourself? (If you are sitting behind the VT100 screen of "pong" can you "ping" pong?)? When you can "ping" yourself this indicates a properly set-up TCP/IP layer. If you can also do a "ping <ip-address>" the station is OK.

On your Foxboro host: try `ifconfig -a<cr>`, Does the response show your interface (hme1, le1 etc) AND does it appear to be configured properly?. A valid response (taken from our LAB system) looks like this:

```
AW511B# ifconfig -a
lo0: flags=849<UP,LOOPBACK,RUNNING,MULTICAST> mtu 8232
    inet 127.0.0.1 netmask ff000000
le0: flags=863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST> mtu 1500
    inet 151.128.16.66 netmask ffff0000 broadcast 151.128.255.255
    ether 8:0:20:71:62:2b
le1: flags=863<UP,BROADCAST,NOTRAILERS,RUNNING,MULTICAST> mtu 1500
    inet 192.131.120.232 netmask ffffffff broadcast 192.131.120.255
    ether 8:0:20:71:62:2b
AW511B#
```

It shows valid information for the *inet*, *netmask* and *broadcast* portion of the interface "le1".

- On the PC: Check the media that 's used. For instance a 3Com Etherlink III Combo can have three types of connection: AUI, UTP and BNC. Check for the one that is used!
- Maybe you have a bad cable. Are you using cross-cables with a HUB where you should have the normal patch cables?
- Are both ends of the Coax cable properly terminated? Check the terminators.

12.4 The Display Manager comes up but has wrong colors

Symptoms are: a black screen with a dark menubar for the DM. Or any other strange color combination. This is common when you have the display settings for your X-terminal wrong. X-window requires a *palletized* driver for the screen. Switch the desktop to display 256 colors or when you are using eXceed 6.1 or higher, you can switch to true color mode with pseudo color settings. This usually fixes the problem. With other X-servers you may or may not be lucky. Give it a try. Look for similar conventions.

12.5 No blinking colors.

Usually a problem with the color depth of the X-terminal. Try to switch the desktop to 256 colors. You can have true-color depth when you have eXceed 6.1 or higher. Look in the relevant chapter for more on this. Basically the same issue as FAQ 12.2.2. When the palette was modified, have a look at FAQ **12.2.20 Modifying the colors to display on an X-terminal.** on how to fix this.

12.6 When the DM/FV window is active the background flickers.

This is caused by the fact that the DM has allocated some colors on the desktop to be blinking colors. Change the background image into a 16 color image (or none at all). If the problem persists you can (with eXceed 6.1 and up) try to use a true color setting for your display. Read the documentation on this.

12.7 Fonts are shown incorrect.

When a DM or FV starts, you get the wrong fonts. There are two possible causes:

- The fonts are not copied and/or converted to the X-terminal. See the appropriate sections in the eXceed installation chapters.
- The option "**Automatic Font Substitution**" option is checked. This should be unchecked. You can find this option in the eXceed **Xconfig** application. It is under the "**font**" icon in the "**Font Database**" dialog box.

12.8 After resizing the markers disappear.

Happens when you are using Window 3.11. Sorry, no fix. Please upgrade to Windows 95 or Windows NT or higher.

12.9 Minimized/covered application windows do not restore properly.

There may be something wrong with the Xconfiguration. Check that all the setting for the "performance" settings are correct:

For eXceed:

Maximum Backing store: ALWAYS

Default backing store: WHEN MAPPED

Minimum backing store: WHEN MAPPED

This should fix the problem. For other packages there should be a similar setting. (The **Graphon** package "**Go Global**" does not support this function, this may limit the usability for this package).

12.10 Display Manager/FoxView comes up OK, but disappears after a few seconds.

Check the setting in the eXceed's Xstart session. The timeouts section defaults to 10 seconds for the "close" parameter. (Found under the **Other** button). This must be changed to "-1" (minus one), this means NO TIMEOUT.

12.11 Some or all characters do not work in VT100 mode.

Particularly the characters s, u and x (sux hmm....) appear to be favorites. This is the result of an incompatibility between eXceed and the printscreen application (jettool). There are several possible workarounds or solutions:

- In the /opt/ia/.profile or /opt/ia/go_dm file locate the following line:

```
/usr/fox/wp/bin/jettool -Wi -f &
```

and change this to:

```
/usr/fox/wp/bin/jettool -grabkey 23 -Wi -f &
```

Sometimes another number instead of 23 may be required. If "23" does not work you can try "0" or "1000" or something in between. (This should keep you busy for some time) After this the keyboard problems should be resolved.

- remove the jettool statement in the go_dm script: look for the line:

```
/usr/fox/wp/bin/jettool -Wi -f &
```

and comment it out. You will not be able to perform a printscreen from any of the Xterminals that are hosted from this station. You can however use the Windows printscreen function (**Alt_PrintScr**n key combination on the keyboard, this will copy the contents of the ACTIVE window to the Windows Clipboard).

- Close the application in the task bar in Window NT/95 that is titled "**Foxboro: Printscreen**". This will solve the problem for this session but after you restart the X-session you will be able to perform a printscreen.

12.12 Cannot enter anything in the password space.

See FAQ:12.2.9.

12.13 Keyboard stops functioning when entering data.

See FAQ:12.2.9.

12.14 Scripts do not work when started from the X-terminal.

Usually this indicates a privilege issue. Verify that the scripts do function from the local DM/FV. If this does work, you may have to change the user id for the **ia** account from the default (mostly

110) to 0 (zero) which is the user id of “root”. You change this in the `/etc/passwd` file. **Root** privilege is required to edit this file! **Changing the userid of the “ia” account is not recommended!!!** Please be aware of the security issues involved: the user on the corporate network has access to the IA system with **root / administrator** privileges and the password for the environments are your only line of defense!!

12.15 No Display Manager Available.

Check the `dmcfg` file (located in `/usr/fox/customer/hi`). A reference must exist to your X-terminal on the host for this X-terminal.

12.16 The message: “No License Available” appears.

There is no license available for the DM you are requesting. This requires a change in the system configuration (System Definition). Contact your local Wizard for this one or you could try Foxboro of course.

If a license is available to your knowledge, have a look at the `dmcfg` file located in `/usr/fox/customer/hi` and make sure that the primary DM for the host is FIRST in the list of configured DM's.

12.17 Host reply shows: “Cannot execute”.

When attempting to start the DM (with the host reply checkbox checked) the message:

```
exec /opt/ia/go_dm
/opt/ia/go_dm: cannot execute
```

is displayed.

Check the owner rights for the `go_dm` file.

Typical would be:

```
-rwxrwxrwx  1 root    other      3396 Aug 19 11:40 go_dm
```

It should be executable for the user who accesses the file. If yours looks like:

```
-rw-rw-rw-  1 root    other      3396 Aug 19 11:40 go_dm
```

Try the command: “`chmod 777 go_dm`” and try again.

12.18 Made changes to the “go_dm” file, but nothing changes.

Maybe you forgot to clean up the original `/opt/ia/.profile` file. This `.profile` must be empty when you are starting the DM/FoxView™ using eXceed with the “`/opt/ia/go_dm`” script file.

This can also be caused by an update of FoxView, which copies a new `.profile` to `/opt/ia` for you. Have a look at FAQ There appears to be some relation...

12.19 Can not have more than one DM/FV active on my PC.

The option “**Show host reply**” in the Xstart session should be enabled to see the error reported by the Foxboro host. Typically, after you try to open a **second** DM/FV, you get a message like:

```
exec /opt/ia/go_dm
Setting DISPLAY to XTERM1:0
Blink_task: Heartbeat found on display XTERM1:0, exiting
```

There may be a setting in the `.profile/go_dm` file that is causing the problem.

Locate the line where the *blinktask* is started in `/opt/ia/go_dm`. This looks like:

```
/usr/fox/wp/bin/blink_task -sig -r -hb 5 &
```

If the option `-hb 5` is in the line, you can safely remove it. This option checks for the heartbeat on the X-terminal's *blinktask* and when found decides, not to start another DM.

```
/usr/fox/wp/bin/blink_task -sig -r &
```

After changing the line you should be able to start more than one DM/FV on the PC/X-terminal.

12.20 After several successful logins, connections are refused.

Have a look at your Foxboro host station. When you login there (on the local screen or something like that), run a `ps -ef|more`. Can you see a lot of `-sh` processes there? If this is the case the problem may arise from the fact that your login command (in Xstart) is not preceded with the `exec` statement. If this statement is not there, insert it!

So it 's not: `"/opt/ia/go_dm"` but `"exec /opt/ia/go_dm"`.

This "exec" is standard UNIX and tells the current shell to replace itself with the command given. The script `go_dm` properly exits at the end (when you leave the DM/FV or when you shut down the X-terminal) and since the `go_dm` script is the only program running, no shell is left behind. If you omit the "exec" part, the script exits and then returns to the shell from which it was started. This shell is never exited and thus stays behind on the system consuming resources. A protection mechanism prevent this from running out of control and when too many shell are open, another startup of such a shell is denied resulting in the symptom as described.

12.21 After installing/upgrading FoxView™ my X-terminals do not behave as before.

With the installation of a new version of FoxView/FoxDraw you get a new copy of the `.profile` in the `/opt/ia` directory. This means that, when you login as user `ia` this `.profile` will be processed and a DM/FV will be started after which the `go_dm` file will be processed. This does the same thing, so one of them will have to go. However, it is a wise decision to use the `.profile` as a basis for the new `go_dm`. (The version you get with FoxView/FoxDraw may contain fixes or changes that may be required to run this application on an X-terminal).

12.22 Modifying the colors to display on an X-terminal.

When changing the color palette on the WP/AW you may end up with the old style palette on your X-Terminals. There is a way to "force" the new modified palette to the Xterminals.

There is a bug in V4.3 with "blinktask" in relation with remote DM's on X-terminals of Exceed PC's.

In V4.3 and later you can explicitly define which "WP color" file you are planning to use i.e. `"/opt/fox/wp/data/sys_pal.wp50"` for example.

You should alter the coding as follows in your startup script (`/opt/ia/.profile` or `/opt/fox/go_dm`):

In your startup script locate the line:

```
/usr/fox/wp/bin/blink_task -sig -r -hb 5 &
```

and modify it to:

```
/usr/fox/wp/bin/blink_task -f -b -r -hb 5 -sig /usr/fox/wp/data/sys_pal.wp50 &
```

Notice that you have to explicitly declare "/usr/fox/wp/data/sys_pal.wp50"

12.23 How to install Exceed V6.1 on Windows Terminal Server (Citrix)

(Source: <http://www.hummingbird.com/support/nc/exceed/ex60035.html>)

This procedure applies when installing Exceed on a WTS that has the CITRIX METAFRAME Software installed. The installation of Exceed will require at least one Reboot of the WTS Machine in order to update the registry and install Exceed properly. Make sure that no users are connected to the WTS during the installation of Exceed and that no applications are running. It is recommended that the individual who is performing the installation of Exceed on the WTS Machine be logged in at the WTS Console as the Local Administrator. (As supposed to the Domain Administrator or as a User).

Here are the steps for installing Exceed version 6.1 on WTS:

1. At the Terminal Server click on **add/remove programs** from the Control Panel, click on the **install** button, on the following window click on next, browse to the directory or drive where the Exceed installation files are located and select **Setup.exe**.
2. Once the installation wizard is up and running go to the select type of installation window, select Administrative click next and select **custom**.
3. Choose the Path and directory where you would like to install Exceed or click next to select the default Path; Drive:\Program Files\Exceed.nt
4. From the components list window Select the Exceed components you would like to install.
5. From the font selection window make sure that **100dpi & 75dpi** are selected along with any other fonts you may require, click next. Some users may require either 100dpi or 75dpi fonts to display X applications depending on the resolution they choose to Display their WT Session. If the user selects a resolution higher than 1024x768, the 100dpi font will be the best suited for that resolution, If the resolution is equal or lower than 1024x768 the 75dpi font would be the one to use.
6. The next window is the Summary Information window that will tell you the following information: Installation Type: which should be **Administrative - Custom - Complete**.
Shared Dir: the path you've specified or Exceed's default path for the Exceed directory.
Components: All the components you have selected.
Fonts: The fonts you have selected.
Disk Space required: Depends on the components and fonts you've selected.
Disk Space available: The space available on the Drive where Exceed is being installed.
Note: Make sure that you have enough disk space to install Exceed.
Click on the **Finish** button to proceed with the installation.
7. Once the setup program has finish installing and copying all the necessary files to the Exceed directory, open explorer, find the Exceed directory and edit the **install.ini** and **install.ins** files. The install.ins will be located within the **userins** directory:
On both files **.ini** & **.ins** under [setup] change the value of the **bSysDllToSysDir=0** to **1** to enable it and also create the next two entries (still under [setup]), **UniqueDisplayForUsers=1** and **UniqueDisplayReadOnly=1**. Both files will end up looking like this:

[setup]

```
bSysDllToSysDir=1 ;copies HCL's dll files to System32
UniqueDisplayForUsers=1 ;Increments the Display # in the
```

Xconfig > Communications
UniqueDisplayReadOnly=1 ;Makes the Display # read only
Save both files.

8. Close all windows, go to the start button click on run and browse to the userins directory within Exceed. Find the **setup.exe** and double click it, click on the OK button, this will run the setup program for the user installation.
9. Once the wizard is up and running one of the questions it will ask you will be the location of the Home Directory, the path shown to you as default should be the path you specified in step 3 of this document. The wizard will also ask you for the path of the user directory (where each individual's user files will be located). The default path looks something like this...
Drive:\Path\Exceed.nt\user
Change the name of the user directory to reflect the name of the individual that is running the userins setup, since the first userins setup you must run has to be as the local Administrator of the WTS, the name of the user directory could be...Drive:\Path\Exceed.nt\Admin
or Drive:\Profiles\Administrator's Directory\Admin.
The other choices a user will have to make when running the userins setup are entirely up to the user, (Giving a password for Xconfig, Tuning the X server etc.).
10. When the setup has finished installing the user files to the user directory it will ask you if you want to reboot the WTS machine, it is recommended that you say yes and reboot the WTS in order to install Exceed properly, (this will be the only time you are required to reboot the WTS). Once the machine reboots and you are presented with the logon window, log in again as the Administrator so that the setup program can finish updating your System's registry.

12.24 Cannot ack alarms, mute the horn, etc. on an X-terminal.

When the Foxboro Access levels are not configured, the default protection level for X-terminals is 100. This will not allow alarms to be acknowledged or the horn to be muted.

Modify the `am_cmds` file in such a way that the default protection level is NOT set to 100.

Insert a comment (#) in this line in `/usr/fox/wp/data/am_cmds`:

```
amcmd script                # magic number
= AMCMD ""                  # clear previous messages
#
# == $AM_LOCAL N amcmd protect value 100
#                               # protect access to single instance applications
# == $AM_LOCAL N amcmd disable all
#                               # disable clearing alarms, ACKing, and Horn Muti
ng
#                               # remote DMs by default

== $AM_LOCAL N setenv CADDD "" # clear CAD redirection variables
== $AM_LOCAL N setenv CADTP "" #   when running on remote
== $AM_LOCAL N setenv CADUS "" #   terminal
#
disable monitor             # Don't set Om monitoring variables
```

12.25 Foxview shows a pretty pink/yellow menu background.

This appears to be normal on PC-Xterminals. It does not conflict with normal operations, unless

you are allergic to pink/yellow of course. It is even documented (well anyway, it is now!). It has to do with FoxView demanding a color that is unknown to the server, which in turn replaces it with the nearest one. And be honest: yellowish pink is very close to grey, wouldn't you agree?

12.26 Cannot start remote applications.

This is similar on eXceed and Reflection. It shows as application that will not function when they are remote. I.e.: System Monitor is OK but Control Configurator is NOT.

A PC -Xterminal with Reflection may hang after attempting to start a remote application and Display Manager may not even start at all! To solve this issue with eXceed: all version as far as I know, have a look at this setting found under **Xconfig/fonts**.

Select the ia fontdatabase (see picture):

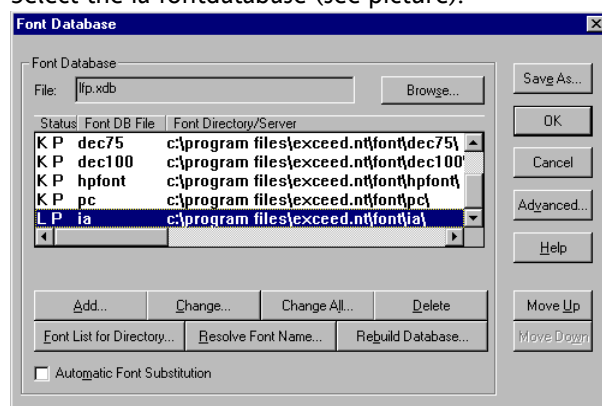


Figure 50 Font database

And open it with the **C**hange... button:

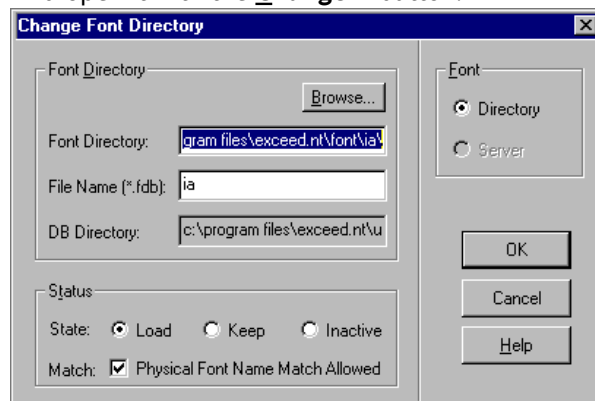


Figure 50 Font directory specifics

Make sure that the check box **Physical Font Name Match Allowed** is checked.

With Reflection 7.7

With Reflection things are not as nice. Reflection is NOT very forgiving when a font is not available. The PC can be locked up in this case. (Seen with NT4 and Windows 2000).

To allow Reflection to find the fonts:

In the directory where your **ia** fonts are located, find the **fonts.dir** file and make a copy of this file with the name **fonts.ali** in the same directory.

Change the contents of this file: Replace the first line (containing 56) by the text:
FILE_NAMES_ALIASES

So, this:

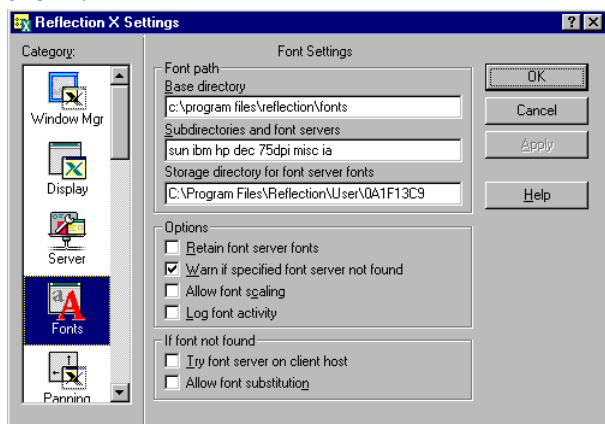
```
56
hhplc_mkr.fon -foxboro-plc_mkr-bold-r-marker--12-120-75-75----
hhsys_mkr.fon -foxboro-sys_mkr-bold-r-marker--24-240-75-75----
...
...
...
..
etc
```

must be turned into this:

```
FILE_NAMES_ALIASES
hhplc_mkr.fon -foxboro-plc_mkr-bold-r-marker--12-120-75-75----
hhsys_mkr.fon -foxboro-sys_mkr-bold-r-marker--24-240-75-75----
...
...
...
..
etc
```

In addition to this check the settings in the X-server fonts configuration:

In the same **X Client Manager**, under **Settings** locate the **Fonts...** entry. Modify the setting as shown:



Make sure to add the ia fonts on the section: **Subdirectories and font servers**. Disable the options: **Try font server on client host**, and **Allow font substitution**

12.27 No yellow box on the Password area on screen.

With DM the password screen does not show an entry box for the password.

The box is just invisible, but still allows the password to be entered. Usually this is related to the Display settings in Windows and the Server settings from the X server you are using. (eXceed, Xvision, Reflexion, etc). Just a little inconvenient I guess. Usually selecting a 256 colormap will fix this but then you Niagara Falls wallpaper looks like s##t.

12.28 Some programs will not work from the X-terminal.

The thing to watch is: the programs all work fine when invoked from the local DM/FoxView but fail to start (properly) when they are run from the X-Terminal. This is true for programs like the **Alarm and Display Manager configurator**, the **FoxPanel configurator** but there may be others. The most common cause for this behaviour is the lack of privileges on behalf of the X-Terminal. The biggest chance of solving this is to change the *userid* for the user **ia**. This is done in the `/etc/passwd` file. Check out page **4-33** section **Setting “root” privileges for the “ia” account**.

12.29 Cannot compile sequence from the X-terminal.

This comes down to a privilege problem in the **ia** account. Check out page **4-33** section **Setting “root” privileges for the “ia” account**. for a way around this.

12.30 Foxview crashes when I start it.

When you run a Xstart session from eXceed to run FoxView it appears briefly but then crashes with a **sgml_ident** error.

This usually indicates a font problem. With exceed 7.x it appears that the **Latin1** font must be deleted from the Font database.

That's all for now, but I'm sure there's more trouble to come....