PC-Xware
Version 6.0

Using SSH to Secure X11 Protocol Connections

Implementation Guide

An implementation Guide to using SSH to Secure PC-Xware Connections

Introduction to SSH under PC-Xware

Using PC-Xware with SSH (Secure Shell) provides a method of securing your networked X11 Windows applications. SSH was developed by SSH Communications Security Ltd.. In the context of PC-Xware it is a program used to log into another computer over a network, to execute commands on a remote machine. It provides strong authentication and secure communications over insecure channels. SSH can be used as a replacement for telnet, rlogin, rsh, rcp, and rdist. When using SSH (instead of rlogin or telnet) the entire login session, including transmission of password, is encrypted; therefore it is almost impossible for an outsider to collect passwords. It also includes a built in X11 tunneling feature to provide security of your X Windows (PC-Xware) traffic over all LAN or WAN connections. By default most firewalls block access to the traditional ways of connecting PCX-ware to UNIX or Linux hosts using XDMCP (X11 login window), Telnet and Rlogin. However many firewalls do allow the use of SSH to connect to your Linux or UNIX hosts.

Currently PCX-ware does not include a SSH client, however you can download a free SSH clients for any Windows PCs. Putty is a free SSH client for windows PCs. For more information on Putty please see the web site: http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html.

Putty can create a secure network tunnel for UNIX or Linux applications. Plink is a companion command program that can be use with Putty to easily create desktop and menu shortcuts in the Windows PC desktop. For more information please see the Putty user manual, located at; http://www.chiark.greenend.org.uk/~sgtatham/putty/docs.html.

Using Putty (a SSH Client) you can login and create encrypted connections between PC-Xware and a UNIX or Linux host, shown in Figure 1. The UNIX environment variable "DISPLAY" is automatically set to "localhost:10.0" by the SSH users login connection. Any X11 Windows application started will use this value causing the application to be sent over the network through the Encrypted SSH X11 Tunnel to the Windows PC running PC-Xware.

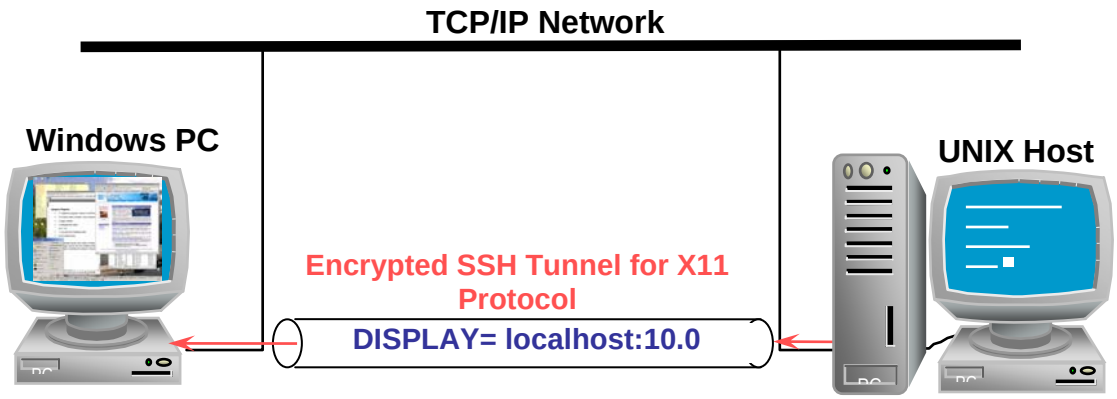


Figure 1

Download and Install Putty SSH

The installation of Putty is simple; just copy the two files to your Windows PC.

1. Open this web site, http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html
2. Locate the line "**For Windows 95, 98, ME, NT, 2000 and XP on Intel x86"** below that line you will see:

   "PuTTY putty.exe"

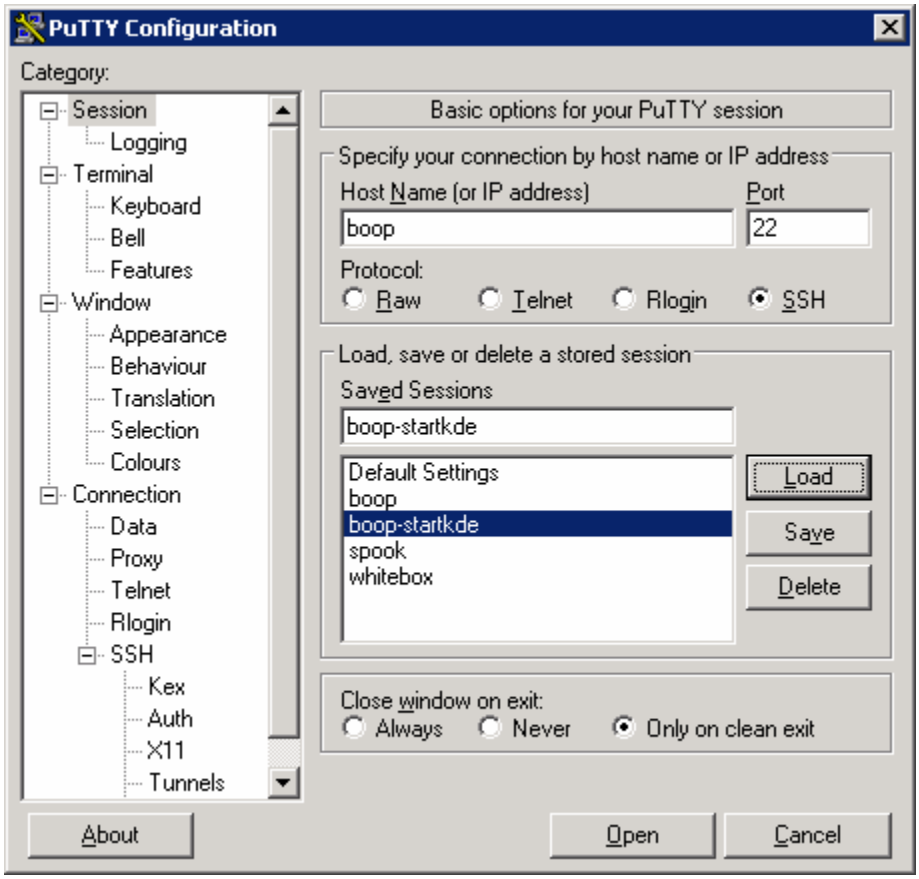
   "Plink plink.exe"
3. Double-click on "putty.exe" and plink.exe to download. Save the file Putty as a new icon on your Desktop and place the plink.exe file in the C:\Windows\system32 directory. Plink.exe should be placed in a locations where it can be used in a windows shortcut without entering the full path

Creating PC-Xware X11 Sessions Using Putty & Plink

The Putty user interface (UI) allows you to set up multiple X11 sessions to be easily started under your Windows Desktop PC with PC-Xware running. The Putty UI will also be used to test the connection and with Plink we'll use it to start the created Putty sessions from desktop shorts.

Begin Creating a new SSH Session

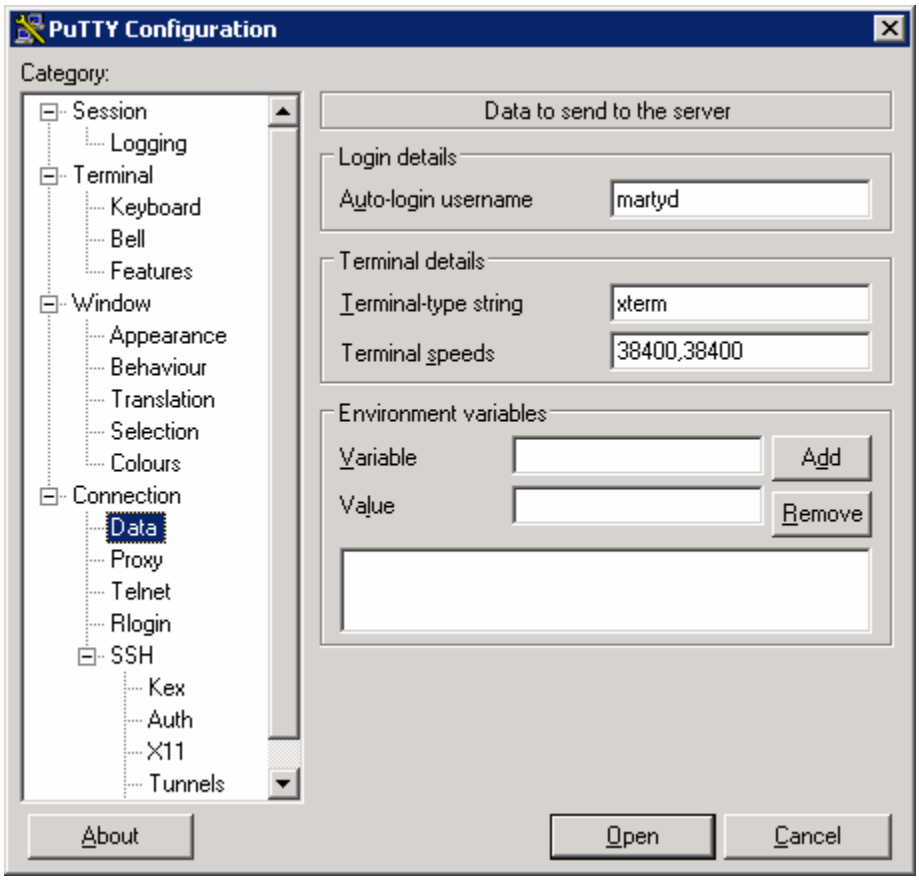
1. Open the Putty (SSH client connection window) by double-clicking on the icon "putty.exe" on your Windows Desktop.



2. In the left pain labeled Category, select "Session". Enter the IP address or the host name of the UNIX host. In this example "boop" is the name of a Linux host. Also select the Protocol "SSH". The Port field should change to "22".
3. To save the session, enter a descriptive name for you new SSH connection in the "Saved Sessions" entry box. Here the name "boop-startkde" is used to describe the connection to the same host.

Configure a SSH connection to send your user name

4. Select Data under the Connection tree and enter your user name in the box labeled “Auto-login username”. For this example the user name “martyd” is used. If this is left out, you will be prompted to enter a user name each time a connection is initiated.

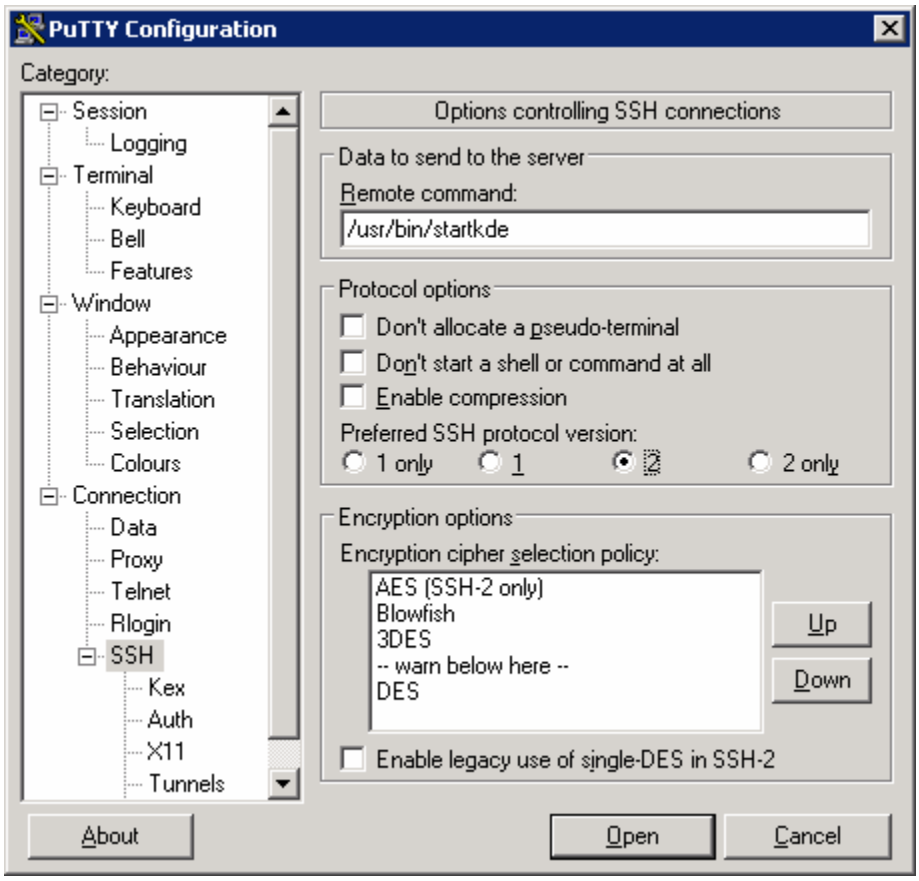


Configure the SSH connection to send a UNIX X11 client command

5. Select SSH under the tree and enter the UNIX/Linux command or X11 client applications you wish to run. For this example the command "/usr/bin/startkde" is used to start up the KDE environment on your Windows Desktop. Below are some other examples of commands you can use to start other X11 Windows enviornments.

```
#   /usr/dt/bin/dtterm          -CDE Solaris/HPUX Terminal Window
#   /usr/bin/dtsession          -Start CDE Session from Solaris/HPUX
#   /usr/bin/startkde           - Start the KDE environment under Linux
#   /usr/bin/console            - Start the KDE Terminal Window
#   /usr/bin/gnome-session          - Start the Gnome environment under Linux
```

6. Set the Preferred SSH protocol version to "2" to increase security and compatibility with current implementations of SSH.



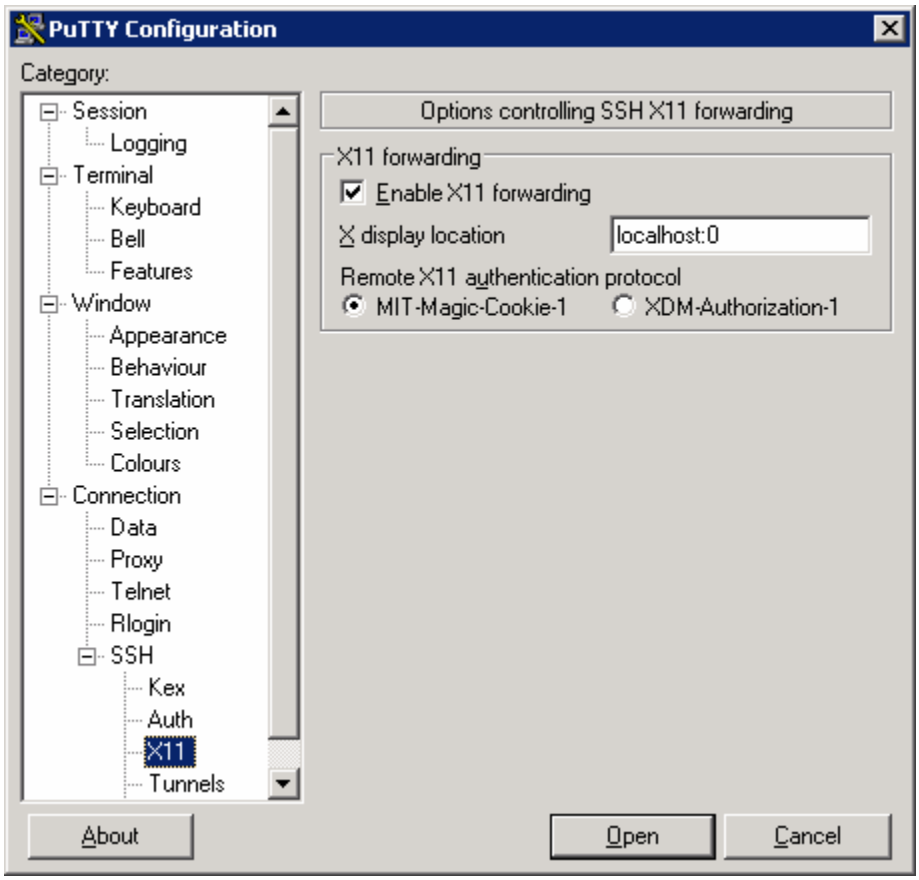
Configure the SSH connection to use an X11 tunnel

7. In the left pane labeled Category, select “SSH/X11”. Check the box “Enable X11 forwarding”. The “X display location” should read “localhost:0”.

This feature will cause the DISPLAY environment variable on the remote server to be set to the remote UNIX/Linux host:10. By default it is set to “localhost:10”. The value Localhost:10 (not shown) refers to the remote server side of the X11 tunnel. This is a sub process of the SSH server running at the remote server listening on TCP Port 6010.

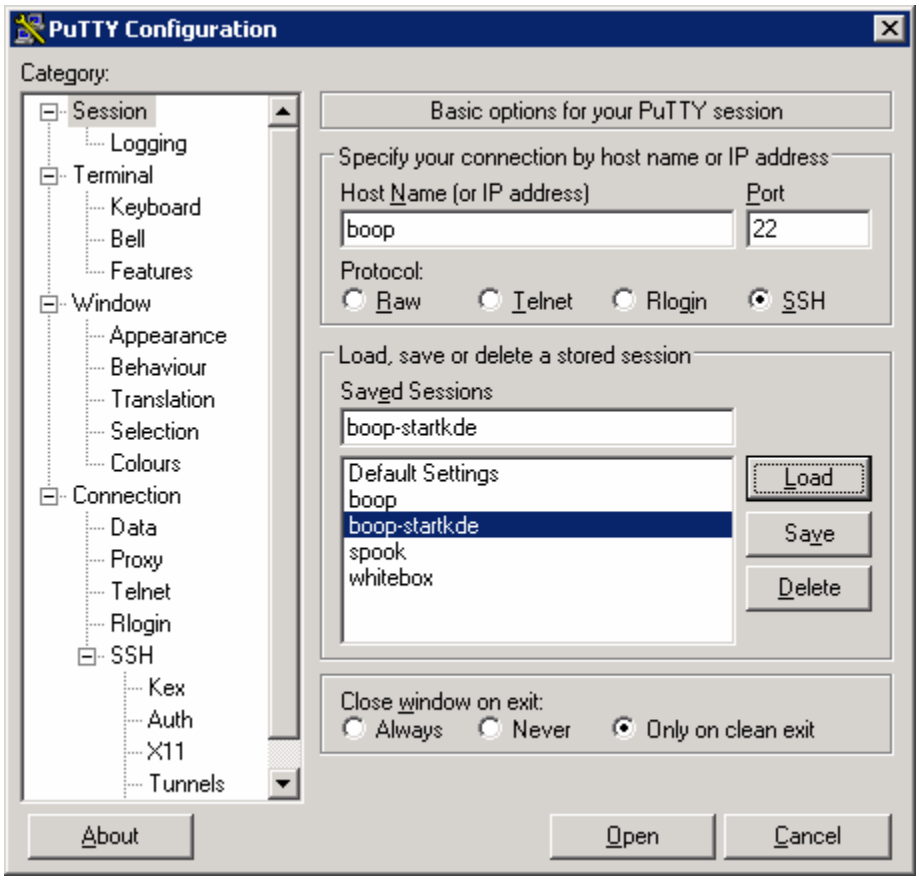
The value localhost:0 below refers to the PC running PC-Xware. The “:0” portion refers to the local PC side of the X11 tunnel which will cause the X11 traffic to be directed to PC-Xware on TCP port 6000. The value could be changed to direct the X11 to another host and TCP port. The PC-Xware X11 server listens on TCP ports 6000-6127 for X11 protocol.

X11 applications will use the DISPLAY variable to determine where to direct the X11 windows applications to. Setting DISPLAY to localhost:10 will force the X11 protocol through the encrypted SSH tunnel.



Saving the SSH Connection Session Name

8. To save these changes, in the left pain labeled Category, select “Session” and press the “Save” button. Each time you open the Putty window just select the Saved Session name and click on the “Load” button and you will be ready to connect via SSH.



Testing the SSH Connection Session Name

9. To test session name Click on the “Open” button to open a secure connection to your UNIX/Linux host. Note, if it’s the first time you will be prompted to enter (Yes or No) to establish your unique SSH connection, just answer “Yes”.

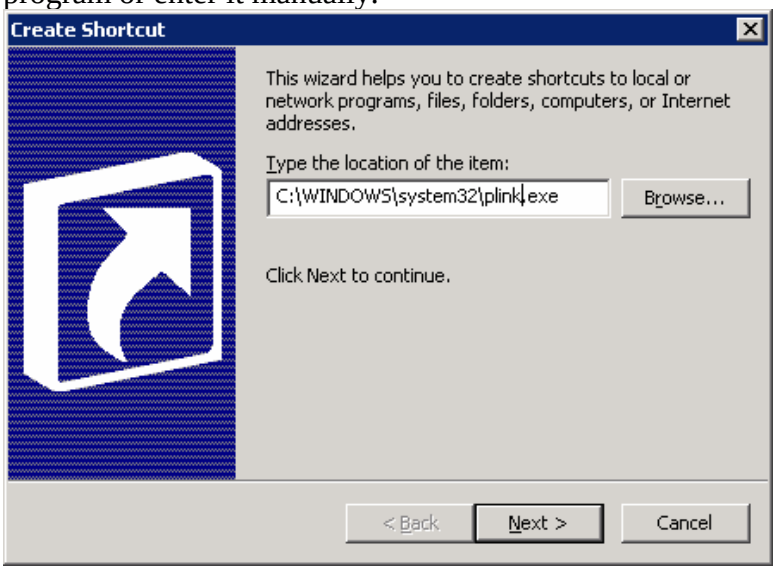
   Login in as normal on your UNIX/Linux host. The DISPLAY environment variable will automatically be set to the “localhost:10.0”. If you entered a Remote command (step 5 above) then you should see the window(s) appear. Please note, the PC-Xware server must be running. See the section below on starting the PC-Xware server.

The 9 steps above can be repeated to create session names for each of the UNIX or Linux X11 applications your use. If the sessions are similar for example the “Remote Command” is different, just load the similar session name, make the changes and save it as a different session name. In the next section these session names will be used to create Windows Start Menu shortcuts.

Creating Windows Shortcuts for your PC-Xware Putty Connections

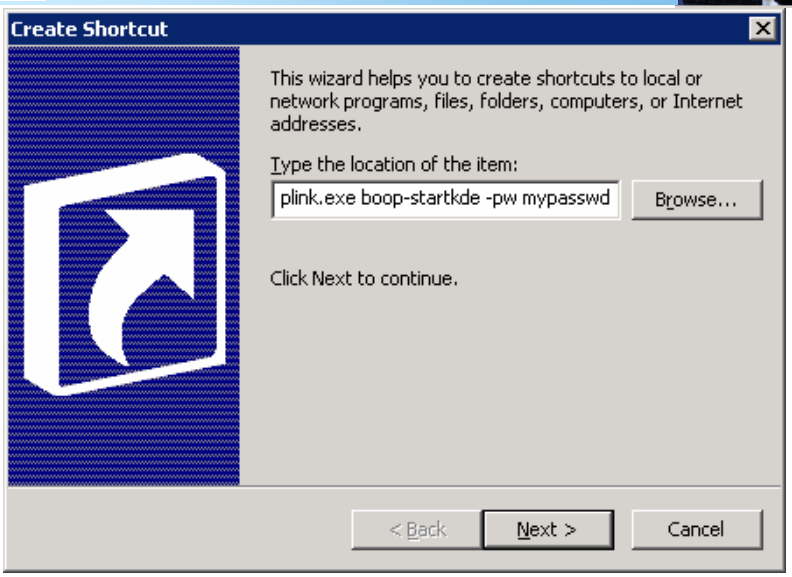
The PC-Xware V6.0 Connection Wizard now adds connection to the Start menu under PC-Xware Connections. So all connection can be accessed from the same start menu location, the sessions created using the Putty UI should also be added here.

1. Right Click on the Start Menu and select Explore.
2. Under the Start menu tree for your user account select “Programs, then select PC-Xware Connections.
3. In the right pain, right click and select New > Shortcut. Browse to the plink.exe program or enter it manually.



4. Next the plink command above needs the session name and any command line arguments added. Add the session name and the “–pw mypassword” to the end of the command.

    C:\Windows\system32\plink.exe boop-startkde –pw mypasswd



5. Select “Next” and enter the name you want to use for the shortcut that will be used in the menu under PC-Xware Connections. Select Finish to create the new PC-Xware Connection menu item.
6. From the start menu, select the new PC-Xware Connection just created to start your X11 Windows Application. Please note, the PC-Xware server must be running. See the section below on starting the PC-Xware server

Starting the PC-Xware Server

When using putty or plink to start X applications, the PCXware X server needs to be already running. If the program Xncd.exe is a running program under the Windows Task Manager then the PC-Xware Server is running.

Starting PC-Xware server manually

The PC-Xware server will start if you initiate a PC-Xware connection that was created using the PC-Xware Connection Wizard. Just by initiating one of these connections is all that is required. For example starting a simple PC-Xware telnet connection, even thought you may not login in to the UNIX host is enough to cause the PC-Xware server to start.

PC-Xware starting automatically at boot time

To have PCXware start up at startup/bootup add and entry to the “Run List” in the registry.

1. Open the registry editor under Windows by selecting “START/RUN”, enter “regedit”, and press Enter.

2. In the registry editor, select the location: [HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run].

3. With “Run” high-lighted, Select menu item “Edit/New/String Value”. Type in the name box “PC-Xware” and press enter.

4. Double click on the new PC-Xware entry and in the “Edit String” window add this value to the “Value data” entry box and select OK. C:\Program Files\ThinPATH\PC-Xware 6\pcxsvc32.exe

This path may be different based on where PC-Xware was installed. Please change the path above for pcxsvc32.exe to the path where it is located on your system.

5. When completed the new entry should look like…. “PC-Xware”=”C:\Program Files\ThinPATH\PCXware 6\psvc32.exe”

6. Close the Registry editor. The next time your PC is rebooted, PC-Xware will now automatically start displaying the “Terminal icon with an X” in the Windows Sys-tray.