HP 9000 Series 300/800 Computers

HEWLETT PACKARD

A Beginner's Guide to the X Window System

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Introduction

Welcome to the X Window System version 11 (X11). X11 is a versatile window environment designed to make your interaction with your computer easier *and* more productive. For example, you can create several windows on your screen and run a different program in each.

This guide introduces you to X11. It teaches you the basics of shaping your X11 environment. In particular, you'll learn how to do the following:

- Start and stop the X Window System.
- Control your window environment with the mouse and window manager.
- Organize and color your own personal X11 environment.
- Start and stop programs running in your X11 environment.
- Modify the selections on the X11 menus.
- Start X11 automatically when you log in.

Are You Ready?

This guide assumes that you have already done the following:

- Read *A Beginner's Guide to HP-UX* and are familiar with logging in, passwords, and using the command-line prompt.
- Read *A Beginner's Guide to Using Shells* and are familiar with the basics of shells and shell script editing.
- Read *A Beginner's Guide to Text Editing* and are familiar with `vi` or some other text editor that produces ASCII files.

Tips for Using This Guide

This guide was designed to get you "up and running" on your X Window System as quickly as possible. By the time you finish chapter 2, you'll be able to start, stop, and control your X11 environment.

You should read each chapter in one sitting—you'll probably spend between 25 and 45 minutes per chapter. But don't just read the chapter; read it *and* work through the tasks the chapter describes. You should proceed sequentially, especially if you are not yet familiar with your computer. Only when you are comfortable with the concepts in a chapter should you move to the next chapter.

Words that may be new to you are defined in the text where they first appear and are included in the glossary.

You can use the X Window System with either a two- or a three-button mouse by observing the following conventions:

Table 1-1. Mouse Buttons and Their Locations

If you see ...	On a 3-button mouse press ...	On a 2-button mouse press ...
Button 1	The left button.	The left button.
Button 2	The middle button.	Both buttons simultaneously.
Button 3	The right button.	The right button.

This guide uses the following typographical conventions:

Table 1-2. Typographical Conventions Used in This Guide

If you see ...	It means ...
colored text	You type the text exactly as shown. For example, `x11start` means that you should type exactly those characters.
`computer text`	This text is displayed by the computer, or text you type exactly as shown. For example, `login:` is a login prompt displayed by the computer.
italic text	You supply the text. For example, hpterm -fg *color* means that you type "hpterm -fg" followed by a color of your choice. Italic text is also occasionally used for emphasis.
Return	You type the corresponding key on the keyboard. For example, Shift Esc Reset means hold down the Shift key, the Esc key, and the Reset key all at the same time.
bold text	The definition for this term follows and is also included in the glossary. For example, "a **terminal window** will display on the root window. A terminal window is a window that emulates a terminal's display screen."
%	Type what follows at the command-line prompt. Don't type the %; that's the command-line prompt displayed by the computer. For example, % `x11start` Return means type "x11start" and press Return at the command prompt.

Watch Out for These "Gotchas"

If you're a new user, watch out for these "gotchas."

- HP-UX is case sensitive. Use uppercase letters where indicated and *only* where indicated. A file named `sys.xdefaults` is not the same file as `sys.Xdefaults`.
- Don't confuse the number "1" (one) with the lower case "l" (el). Although they look similar to us, the computer has no problem telling them apart. If you're changing to the `/usr/lib/X11` directory, you need to type "X one one" and not "X el el."
- Don't confuse the number "0" (zero) with the upper case "O" (oh) for the same reason.
- When typing a command, use the spacing indicated in the example. Although adding an extra space usually doesn't cause problems, omitting a space will definitely cause your command to fail.
- Watch your spelling, watch your spelling, and watch your spelling.

Checking Your Window Manager

The examples in this book use the Motif™ Window Manager (**mwm**). However, there are other window managers available, which your system administrator may have provided instead. To check which window manager you are using, type:

```
cd Return
more .x11start Return
```

If the system replies that it can't find the file, type:

```
more /usr/lib/X11/sys.x11start Return
```

Near the beginning of the file is a line that looks similar to the following

```
mwm & #Starts the mwm window manager
```

If your file looks like this, you are using the **mwm** window manager that is described in this book.

If you are using some other window manager, the **mwm** line will be replaced by one starting with **hpwm** or **uwm**.

If you are using the **hpwm** window manager, you can follow the examples in this book, replacing any references to **.mwmrc** with **.hpmwrc** and references to **Mwm**.*something* with **Hpwm**.*something*.

If you are using **uwm**, this book won't be much help to you. Check with your system administrator for information about how to use your system.

Notes

2

Getting Started: Your First Work Session

This chapter leads you through your first X11 work session. You should read and do the tasks in this chapter in one sitting and in the order in which they appear.

This chapter discusses the following topics:

- Starting X11.
- Finding the active window.
- Moving a window around on the screen.
- Changing a window's size.
- Changing a window into an icon.
- Restoring a window from an icon.
- Displaying a window menu and making selections.
- Displaying the root menu and making selections.
- Selecting the right menu.
- Raising a window without a menu.
- Stopping X11.

Starting the X Window System

Your system may be configured to start X11 as part of your login procedure. If so, skip to the next module, "Finding the Active Window." Otherwise you'll start X11 after you log in. When you see the command-line prompt, type the X Window System start command. Shortly thereafter, your screen will change color, and the pointer and a terminal window will appear on the screen.

Typing the X11 Start Command

If you have logged in correctly, you will typically see a welcome and copyright message, followed by a **command-line prompt.** A command-line prompt, as the name suggests, shows that the system is ready to accept commands. By default, the command-line prompt is either $ or %, but *it can be different* depending on how your system administrator set up your account. This guide uses % to represent the command-line prompt.

You can locate the command-line prompt by pressing the Return key several times; HP-UX displays the prompt every time you press Return.

When you see the command-line prompt, type the X11 start command:

```
% x11start Return
```

In a short time your screen will become the **root window** (you'll see it change to gray). The root window, sometimes called the "desktop" or "workspace," is the backdrop on which all other windows are positioned. When several windows overlap on the root window, they appear "stacked" one behind the other in "front" of the root window.

Next, a figure that resembles an hourglass appears in the center of the root window. This represents the **pointer,** the location of the mouse.

Then the HP Motif Window Manager starts. The **window manager** supplies a window and menu for each window and a menu for the root window.

Shortly thereafter, a **window** displays in the upper left corner of the root window. A terminal window is a window that emulates a terminal's display screen. The default window for your X11 environment is an **hpterm** window, a window that emulates an HP terminal.

When the start procedure has completed, a command prompt will appear in the terminal window, and the hourglass figure is replaced by an X.

If Problems Occur ...

If you type the X11 start command, but the start procedure doesn't result in a command prompt in the terminal window, check the following items.

Table 2-1. Possible X Window System Start Problems

If this happens ...	You should ...
The message `command not found` displays.	Check your spelling of the command. Reenter the X11 start command. If it still doesn't work, ask your system administrator to check your system's `PATH`.
The root window displays, but no pointer appears.	Press (CTRL) (Shift) (Reset) all at the same time to get your original command prompt back. Then try starting X11 again.
The root window and pointer display, but no terminal window appears.	Press *and hold* button 1 (the left mouse button). If a menu appears, open a window. Otherwise press (CTRL) (Shift) (Reset). Then try starting X11 again.
The terminal window displays, but what you type doesn't appear after the window's command prompt.	Press *and release* button 1 (the left mouse button) while the pointer is in the terminal window.

If you still have a problem, see your system administrator.

Finding the Active Window

When the pointer is in the root window, it has an × shape. However, when you move the pointer to a terminal window, the pointer changes to an arrowhead (when pointing to the window frame) or an I (when pointing to the interior of the window). When you **click** (press and release) button 1, the left button of the mouse, while the pointer is in a terminal window, you establish that window as the **active window.**

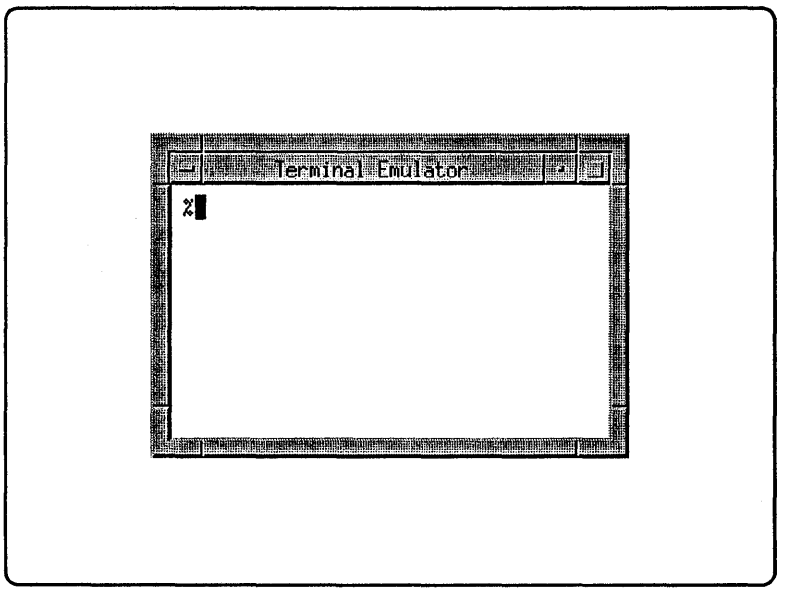

Figure 2-1.
The Default X11 Environment Is One Terminal Window

The active window is the terminal window to which the pointer has been moved *and* button 1 has been clicked.

When a window is active, the window frame changes color. Typing on the keyboard puts characters on the command line of the active window.

If no window is active, *what you type is lost.*

The Command-Line Prompt

The command-line prompt of an X11 terminal window is similar to other command-line prompts. When you see a command-line prompt in a window, move the pointer to that window, click button 1 (to make the window active), and begin typing commands. Remember, by default, the command-line prompt is either **$** or **%**, but it can be different. To find the prompt, press Return several times; HP-UX displays the prompt each time you press Return.

The examples in this guide use the **%** to mean the command-line prompt.

Moving a Window around the Screen

Using the pointer, you can move a terminal window to any position on the root window.

Step 1: Grabbing the Title Bar with the Pointer

Position the pointer in the **title bar** of the window. The title bar is the rectangular area across the top of the window where the words "Terminal Emulator" appear in the example. When properly positioned, the pointer is an arrowhead.

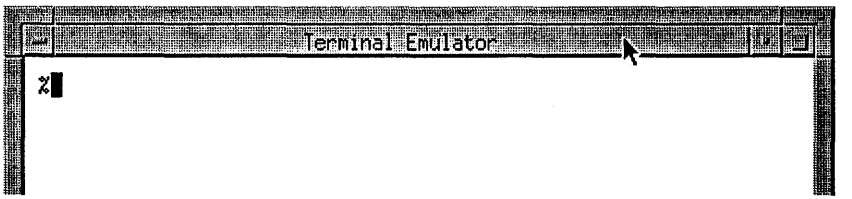

Figure 2-2. Grab the Title Bar with the Pointer

While pointing to the title bar, press *and hold* button 1, the left mouse button.

Step 2: Dragging the Window to a New Location

Still pressing button 1, slide the mouse to the right across your desktop. Now slide the mouse toward you.

As you move the mouse, the pointer on the screen drags an outline of the terminal window. The outline shows you where the window will be moved when you release the mouse button. The root window X and Y location of the window's upper left corner display in a small box in the center of the screen.

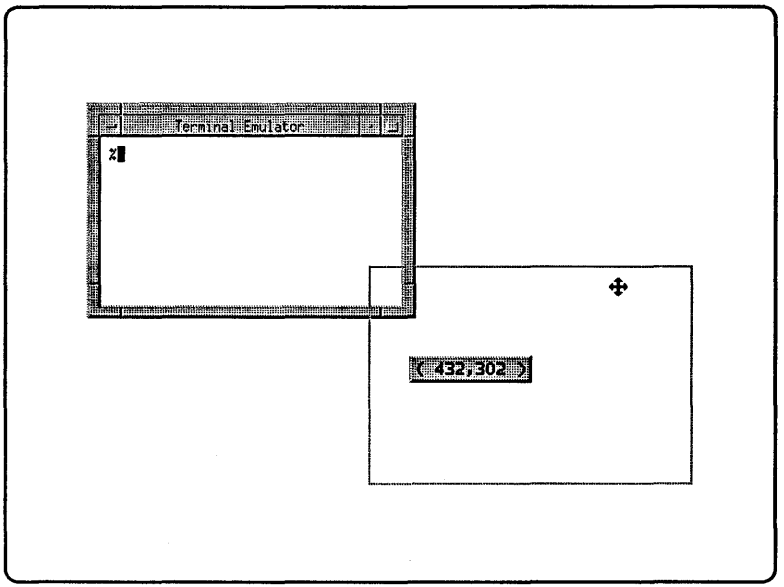

Figure 2-3. An Outline Shows Where the Window Will Reappear

Step 3: Releasing the Window

Move the outline to the center of the screen. When the outline is in the desired location, release button 1. The window reappears at the position of the outline.

Changing the Size of a Window

You can change the size of a window by grabbing an area of the window's frame with the pointer, dragging the frame to the desired size, and then releasing the frame.

Step 1: Grabbing the Frame with the Pointer

Where you grab the window's frame determines how the window will be resized.

Table 2-2. Places to Grab on the Window Frame

If you want to stretch or shrink the window ...	Position the pointer on the ...
vertically from the ...	
top	top of the frame, above the title bar
bottom	bottom of the frame
horizontally from the ...	
right	right side of the frame
left	left side of the frame
diagonally from the ...	
bottom left corner	frame's lower left corner
top left	frame's upper left corner
top right	frame's upper right corner
bottom right	frame's lower right corner

For this exercise, position the pointer in the lower right corner of the window frame. When positioned correctly, the pointer's shape changes into an arrowhead pointing into the corner of the frame. Grab the frame by pressing *and holding down* button 1.

Step 2: Enlarging or Shrinking the Window

With button 1 still pressed, slide the mouse around. As you move the mouse, the pointer on the screen drags an elastic outline of the window. The outline shows you the new size of the window.

The dimensions of the window (width × height) are shown in a small box in the center of the screen. The measurements are in characters (across) and lines (down).

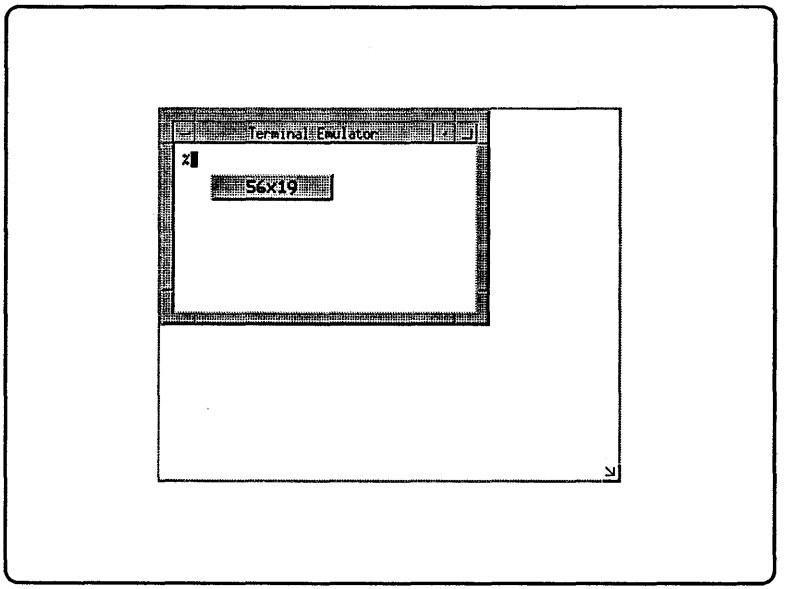

Figure 2-4. A Window and Its Elastic Outline

Now, stretch the window until it reaches the lower right corner of the root window.

Step 3: Releasing the Frame

When the elastic outline is the correct size, release button 1. The window redisplays, filling the outline.

Changing a Window into an Icon

As you work, your screen can become cluttered with windows. Changing a few of those windows into **icons** allows you to tidy up a cluttered workspace. An icon is a small graphic image that represents a window. A program executing in an iconified window continues to execute just as it would in an open window.

Step 1: Locating the Minimize Button

Slide the mouse so that you position the pointer on the "add to glossary" button, the small square to the immediate right of the title bar on the window frame.

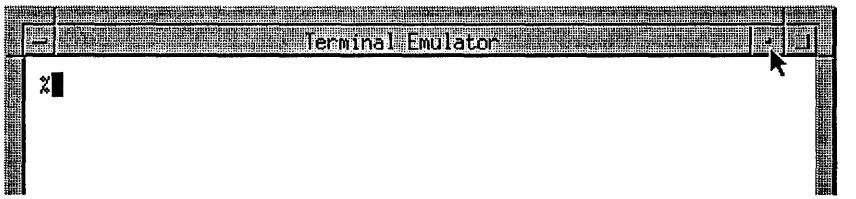

Figure 2-5. The Minimize Button Is Immediately to the Right of the Title Bar

Step 2: "Pressing" the Minimize Button

"Press" the minimize button by clicking button 1.

The window changes into an icon. Icons display in a row along the bottom of the root window starting on the left.

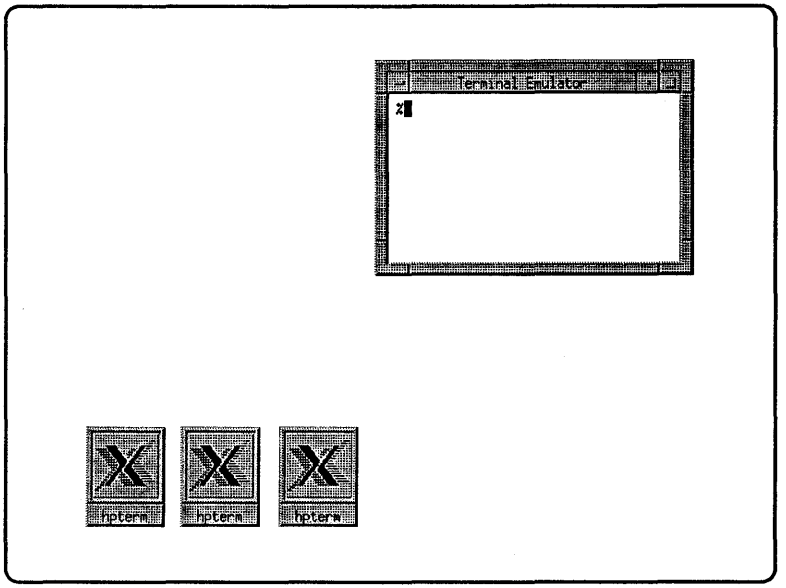

Figure 2-6.
Icons Display in a Row along the Lower Left of the Screen

Moving an Icon

To move an icon around the screen, follow these steps:

1. Point to the icon.
2. Press *and hold* button 1.
3. Still holding button 1, drag the pointer. An outline follows the pointer, showing where the icon will be repositioned.
4. To position the icon, release button 1.

Icons are positioned with no overlap on a grid, so the icon you move may jump a bit if you set it too close to the margin of the root window or too close to another icon.

Restoring a Window from an Icon

To **restore** an icon (change it back into a window), position the pointer on the icon and **double-click** the mouse button. To double-click a mouse button, press the button twice in rapid succession.

Step 1: Selecting an Icon to Restore

Slide the mouse on your desktop until the pointer is over the icon.

Step 2: Changing the Icon into a Window

Press button 1 on the mouse twice in rapid succession.

The icon changes back into the window from which it originally came. The window positions itself where it was before being iconified.

With the default program menu configuration, an "active" label appears when the icon is selected (and the menu pops up if the icon is not moved).

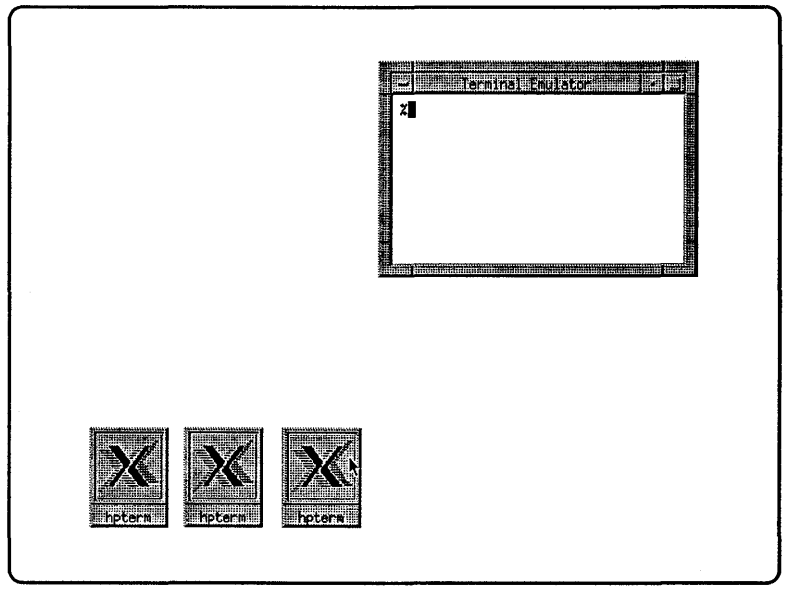

Figure 2-7. Position the Pointer on the Icon and Double-Click

Displaying a Window Menu and Making Selections

Each window has a **window menu** from which you can make selections that control the window.

Step 1: Finding the Window Menu

Slide the mouse on your desktop until you position the pointer on the window menu button, the ⊖ button in the upper left corner of the window frame.

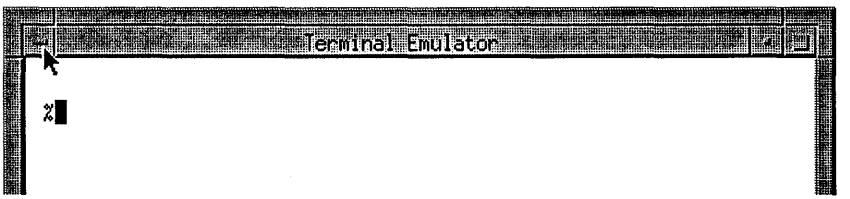

Figure 2-8.
The Window Menu Button Is in the Upper Left Corner of the Window Frame

Step 2: Displaying the Window Menu

Press *and hold* button 1 on the mouse. The window menu appears in the upper left corner of the window frame. Don't release button 1 yet.

Step 3: Making a Selection from the Menu

Drag the pointer down the menu. As the pointer moves, the "button" for each available selection highlights. Drag the pointer until you highlight the "Maximize" selection. Release button 1.

The window expands to fill the entire screen. This is called "maximizing" a window.

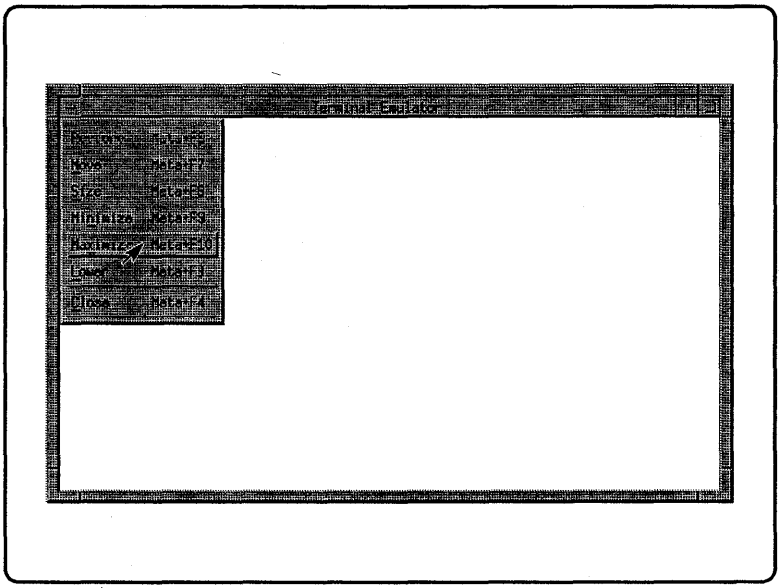

Figure 2-9.
The Window Menu Is an Easy Way to Control a Window

Step 4: Undoing Your Previous Selection

Redisplay the window menu by positioning the pointer on the window menu button in the upper left of the window. Press *and hold* button 1. Drag the pointer down the menu until you highlight the "Restore" selection. Release button 1. The window is restored to its former size and location.

For the same result, press the maximize button in the upper right corner of the window frame.

Note

If you release button 1 over the window menu button, the menu stays up until you make a selection or move the cursor off the menu and press the button.

Displaying the Root Menu and Making Selections

The root window has its own menu, the **root menu,** which contains selections that control the root window and everything currently displayed on it.

Step 1: Finding the Root Menu

Position the pointer anywhere on the root window. Remember, the root window is the "backdrop" behind your terminal window.

Note that a maximized window can cover the root window, which makes it impossible to display the root menu. Click button 1 on the maximize button to restore the window before attempting to display the root menu.

Step 2: Displaying the Root Menu

Press *and hold* button 1. The root menu appears at the position of the pointer. Don't release button 1 yet.

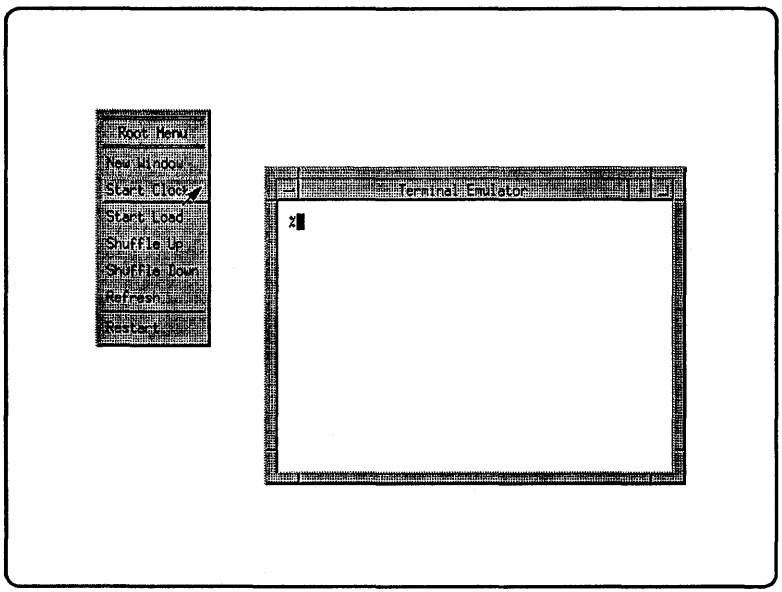

Figure 2-10. The Root Menu Controls the Root Window

Step 3: Selecting a Clock from the Menu

Drag the pointer down the menu. When the pointer highlights the "Start Clock" selection, release button 1.

In a short time, a clock displays in the upper right corner of the root window.

Step 4: Selecting a New Window from the Menu

Again redisplay the root menu. This time choose the "New Window" selection.

When you release button 1, a new terminal window appears.

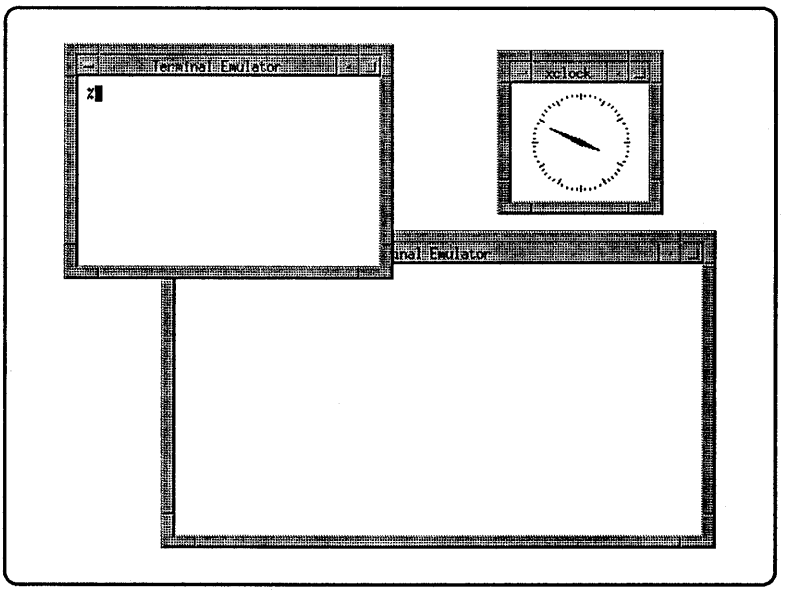

Figure 2-11. Select a Clock and a New Terminal Window

Step 5: Undoing a Previous Selection

Position the pointer on the window menu button of the clock. Press *and hold* button 1.

Now drag the pointer down the menu to the "Close" selection. Release button 1. The clock disappears.

Choosing the Right Menu Selection

The window menu selections enable you to perform the following functions:

Table 2-3. The Window Menu Selections

To do this ...	Select ...
Restore a window from an icon or after maximizing.	Restore
Change the location of the window.	Move
Change the size of the window.	Size
Shrink the window to its icon representation.	Minimize
Enlarge the window to cover the entire root window.	Maximize
Send a window to the back or bottom of the window stack, the position closest to the root window.	Lower
Immediately stop the window and make it disappear.	Close

The root menu includes the following selections:

Table 2-4. The Root Menu Selections

To do this ...	Select ...
Create a new terminal window.	New Window
Make a clock with the current time appear.	Start Clock
Make a system load histogram appear.	Start Load
Bring the most concealed window to the front of the root window.	Shuffle Up
Lower the least concealed window to the back of the root window.	Shuffle Down
Blank the screen and redisplay its contents.	Refresh
Blank the screen and restart the window manager.	Restart

If you display a menu, but decide against making a selection, move the pointer off the menu in any direction before you release button 1.

If you make a selection by mistake, you can usually recover by making another selection.

Table 2-5. How to Recover from Menu Mistakes

If you did this by mistake ...	You should ...
Changed the location of a window.	Grab the window's title bar (press *and hold* button 1 on the title bar), move the window to where it belongs, and release button 1.
Changed the size of a window.	Grab the window's frame (press *and hold* button 1 on the frame), drag the pointer to the correct size, then release button 1.
Minimized a window (turned it into an icon).	Double-click button 1 on the icon.
Maximized a window (enlarged it to cover the entire screen).	Select "Restore" from the window's menu, or click the Maximize button in the upper right corner of the window frame.
Closed a terminal window.	Select "New Window" from the root menu.
Created a new window.	Select "Close" from the appropriate object's window menu.

Raising a Window without a Menu

To bring a partially concealed window to the front of the root window without selecting from a menu, click on the window.

Step 1: Positioning the Pointer

Position the pointer on any visible portion of the concealed window. (If you don't have any partially concealed windows, move or create a window that overlaps another window.)

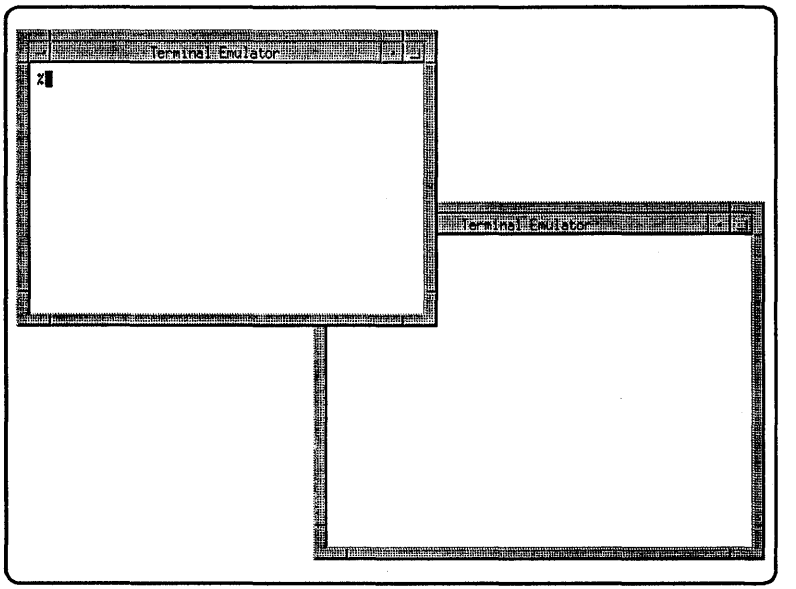

Figure 2-12. A Partially Concealed Window

Step 2: Pressing Mouse Button 1

Click button 1.

The partially concealed window moves to the front of the root window.

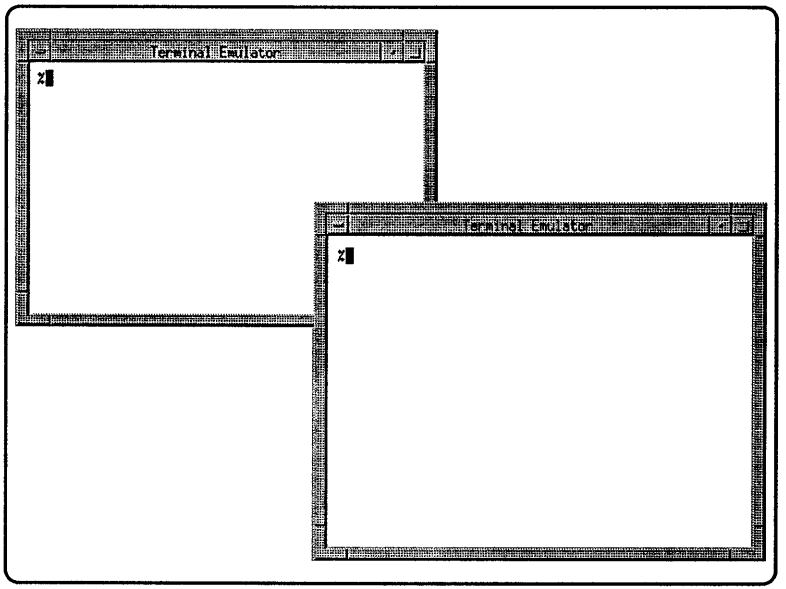

Figure 2-13. The Window Is No Longer Concealed

Exiting X11

Before exiting the window environment, follow the recommended procedure to exit any application programs and stop any commands that may be running in terminal windows. When you have a command prompt in each terminal window, press the X11 exit key-sequence.

Step 1: Preparing to Exit

First, exit any application programs running in terminal windows. This avoids the possible loss of data due to improperly stopping the program.

Follow the exit sequence recommended for each program that is running.

When you exit a program, the command-line prompt returns to the terminal window, or the window disappears entirely. (However, if you started the program automatically or from a menu, exiting will also remove the terminal window. This is proper behavior.)

The "Close" selection on the window menu immediately stops the window and *any program running in the window.* This may not be an appropriate method to stop some programs. For example, if you were running a word processor in the window, you could lose data. However, you can close the clock, the load histogram, or an "empty" terminal window (one showing a command prompt) with no ill effect.

Step 2: Pressing the X11 Exit Keys

When you have exited all programs, press the following keys simultaneously:

CTRL Shift Reset

This removes from the screen all terminal windows (as well as the windows for clocks, load histograms, and similar windowed programs). The root window then disappears.

Shortly thereafter, a command-line prompt displays on the screen.

You have now exited the X Window System, but you are still logged into your computer. On some displays, you must press CTRL Delete Char to view text on the screen.

3

Coloring Your X Environment

The `sys.Xdefaults` file specifies the colors of the X Window System environment. You can copy the file to your **home directory,** the directory in which you are placed at login. Once there, you can edit the file just like any other text file to make your own custom-colored X environment.

Copying the file to your home directory before editing has two benefits:

- You can customize *your* environment without interfering with the environments of other users.
- You can have a backup copy of the file as a safety precaution in case your editing doesn't work.

The colors that are in `sys.Xdefaults` are ones that show well on both color and monochrome monitors.

- If you have a color monitor, you can change the colors by following the directions in "Coloring Your Enviroment's Window Frames".
- If you have a monochrome monitor, you can use a special set of entries in the `.Xdefaults` file to improve the look of windows by following the directions in "Using the 'mwm_bw' Resources".

Coloring Your Environment's Window Frames

The following example changes the frame color of the objects displayed in your X environment (terminal windows, clocks, load histograms) to "SteelBlue." When a window is active, the frame changes color to "VioletRed."

Copying sys.Xdefaults to Your Home Directory

If you aren't already there, change to your home directory. If you are unsure which directory you are in, type:

```
% cd Return    This changes your location to your home directory.
```

Type the following command at the command-line prompt:

```
% cp  /usr/lib/X11/sys.Xdefaults .Xdefaults Return
% chmod  u+w  .Xdefaults  Return
```

This copies `sys.Xdefaults` to your home directory, giving it the name `.Xdefaults`, and changes the permissions on the file to permit editing the file.

Changing the Color of the Window Frames

Follow these steps to change the window frame to SteelBlue:

1. Start your text editor and open the file `.Xdefaults`.
2. Scroll down or search for the line that reads as follows:

   ```
   ! Mwm*background: <color>
   ```

3. Delete the `!` and the space from the left margin to activate the line.
4. Replace `<color>` at the end of the line with `SteelBlue`. Don't exit from your editor program yet!

Making the Active Window a Different Color

Follow these steps to change the framework of the active window to VioletRed:

1. Move the cursor to the line that reads as follows:

   ```
   ! Mwm*activeBackground: <color>
   ```

2. Delete the ! and the space from the left margin to activate the line.
3. Replace <color> at the end of the line with VioletRed.

Checking and Saving Your Work

After performing the above steps, you should have made the changes to .Xdefaults that are listed in the following table:

Table 3-1. The Before and After of Editing .Xdefaults

Before the line read ...	Now the line reads ...
! Mwm*background: <color>	Mwm*background: SteelBlue
! Mwm*activeBackground: <color>	Mwm*activeBackground: VioletRed

If the changes in your .Xdefaults file match the changes listed in the table, save the file, and exit from your text editor.

Viewing the Results

To view the results of your edit:

1. Restart the window manager.
2. Display the root menu (press *and hold* button 1 while the pointer is in the root window).
3. Choose the "Restart" selection (highlight the selection and release button 1). A confirmation dialog box is displayed.
4. Click button 1 on the OK button. All displayed windows momentarily disappear. When the window manager starts, the windows reappear, using the new border colors.

Using the 'mwm_bw' Resources

There are a special set of entries in the `.Xdefaults` file that start with `mwm_bw`. These entries provide more attractive window shading than the default entries do for monochrome monitors.

To use the `mwm_bw` entries:

1. Copy the `sys.x11start` file to your home directory (if you haven't already done so) by typing:

   ```
   % cd Return
   % cp /usr/lib/sys.x11start .x11start Return
   % chmod u+w .x11start Return
   ```

2. Start your text editor and open the file `.x11start`.

3. Scroll down or search for a line similar to:

   ```
   mwm & #Starts the mwm window manager
   ```

4. Edit this line to read:

   ```
   mwm -name mwm_bw & #Starts the mwm window manager
   ```

5. Press CTRL Shift Reset simultaneously to exit the X Window System.

6. Type `x11start` Return to restart X11 with the new monochrome window shading.

4

Controlling Your X Environment

The `sys.x11start` configuration file determines which **clients** appear when you start the X Window System. A client is a program written specifically for use with the X Window System. You are already familiar with four clients: the window manager, the `hpterm` terminal window, the clock, and the load histogram. Other clients exist that provide still more functions. One example is `xterm`, a window that emulates DEC and Tektronix terminals.

Editing the `.x11start` file, made by copying `sys.x11start` to your home directory, enables you to customize your X environment without interfering with the environments of other users.

The `.x11start` file is an ordinary ASCII text file, and you can edit it using any ASCII text editor.

This chapter guides you through editing the `.x11start` file, so you can do the following:

- Start client programs automatically.
- Create a window that automatically runs an application.

Starting Clients Automatically

You can edit your `.x11start` file to automatically start clients when you start X11, such as another terminal window, a clock, and a load histogram.

Copying sys.x11start to Your Home Directory

Copy `sys.x11start` to your home directory by typing the following command line (you should still be in your home directory):

```
% cd Return
% cp /usr/lib/X11/sys.x11start .x11start Return
% chmod u+w .x11start Return
```

Adding Another Window, a Clock, and a Load Histogram

Follow these steps to add three clients to your X11 environment:

1. If your editor is closed, start the editor and open `.x11start`.
2. Scroll down or search for two lines similar to the following:

```
### Add client commands below, one command per line.
### End each command line with an ampersand (&).
```

3. Beginning on the line below these, insert the following command lines:

```
hpterm -geometry 80x24+260+260 &  (adds "hpterm" window)
xclock -analog -update 1 -geometry 100x90-1+1 &  (adds analog clock)
xload -geometry 150x90-130+1 &.  (adds load histogram)
```

Note that all three lines end with an ampersand (&), which tells the computer to start the client as a **background process**; this doesn't require the total attention of the computer, allowing you to run several tasks at once. If you omit the ampersand, subsequent commands are deferred until the process ends. Use CTRL C to terminate the process, then re-invoke the command with the ampersand to run the process in background.

Checking and Saving Your Work

Editing that section of your `.x11start` file should produce the following:

```
### Add client commands below, one command per line.
### End each command line with an ampersand (&).

hpterm -geometry 80x24+260+260 &
xclock -analog -update 1 -geometry 100x90-1+1 &
xload -geometry 150x90-130+1 &
```

If your edited `.x11start` file matches the above listing, save the file. You can exit your text editor, if you choose to take a break, or continue with the next lesson module, "Starting Non-Clients Automatically."

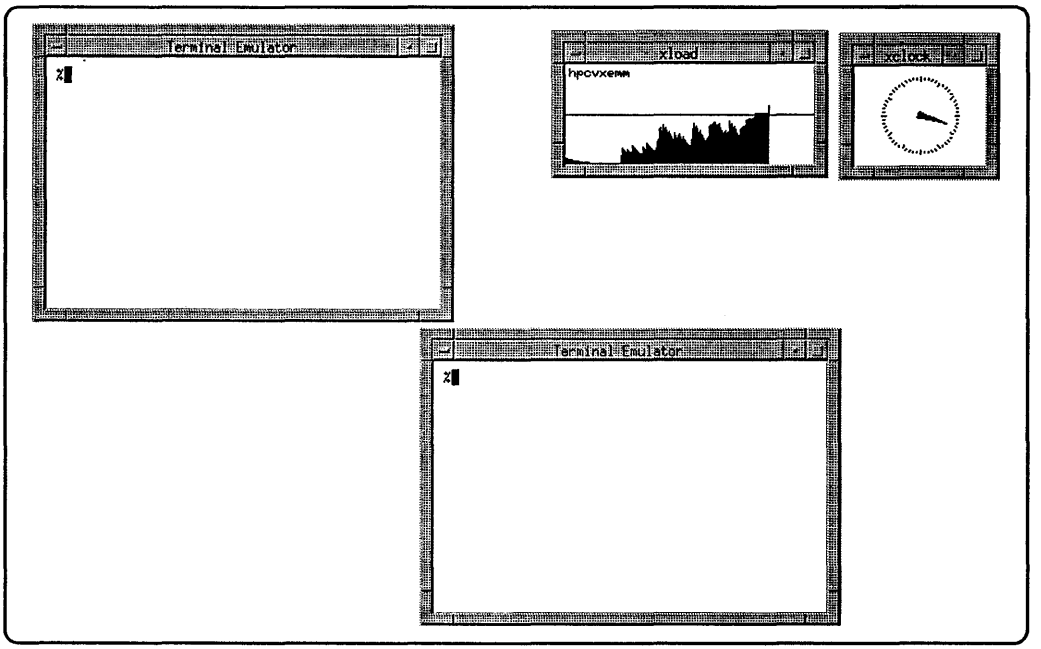

Figure 4-1. The Result of Editing the '.x11start' File

Starting Non-Clients Automatically

You can modify your `.x11start` file to start a **non-client** program each time you start X11. A non-client is a program that is not written specifically to run in the X environment. To start a non-client this way, create a terminal window in which the non-client can run.

The following example creates an editing window, a window that runs a text editor automatically. Although the example uses `vi`, you can substitute a different non-client program by replacing `vi` with the desired program name.

Creating an Editing Window

Follow these steps to create an editing window:

1. If you didn't exit your text editor at the end of the last lesson module, continue with step 2. If you did exit, start the editor and open `.x11start`.
2. Scroll down or search for the line that reads as follows:

```
xload -geometry 150x90-130+1 &
```

3. On the line below (it should be blank), insert the following command line:

```
hpterm -geometry 80x24-1-1 -e vi &
```

This line creates an `hpterm` window 80 characters wide and 24 lines high. The window is located on the bottom right corner of the screen. The window appears when you start X11 and automatically runs `vi` (or whatever program you name instead of `vi`). When you exit `vi` (or the program you substituted), the window disappears.

Checking and Saving Your Work

After performing the above editing, that section of your **.x11start** file should look like the following:

```
### Add client commands below, one command per line.
### End each command line with an ampersand (&).

hpterm -geometry 80x24+260+260 &
xclock -analog -update 1 -geometry 100x90-1+1 &
xload -geometry 150x90-130+1 &
hpterm -geometry 80x24-1-1 -e vi &
```

The option to start a program *must be the last option* on the line and come *just before* the **&**. If your edited **.x11start** file matches the above listing, save the file and exit your text editor.

Viewing the Result of Your Edit

To view the result, exit the X Window System by pressing CTRL Shift Reset simultaneously. Type **x11start** Return to restart X11.

Discovering Your Options

Each X11 client has options that affect its appearance and behavior. The following table lists some of the common options available for four popular X11 clients.

Table 4-1. Color Options for Popular X11 Clients

Option Descriptions		X11 Clients			
To change this ...	**Use this option ...**	**hpterm**	**xterm**	**xclock**	**xload**
Foreground color.	`-fg` *color*	√	√	√	√
Background color.	`-bg` *color*	√	√	√	√
Cursor color.	`-cr` *color*	√	√		
Pointer color.	`-ms` *color*	√	√		
Font selection.	`-fn` *font*	√	√	√	√
Update interval.	`-update` *number*			√	√
Clock hands color.	`-hd` *color*			√	
Hand edge color.	`-hl` *color*			√	
Analog clock.	`-analog`			√	

Table 4-2. Other Options for Popular X11 Clients

Option Descriptions		X11 Clients			
To change this ...	**Use this option ...**	**hpterm**	**xterm**	**xclock**	**xload**
Set location.	`-geometry` $W \times H \pm col \pm row$	√	√	√	√
Start a program.	`-e` *command*	√	√		
Name an icon.	`-n` *name*	√	√	√	√
Name a window.	`-title` *name*	√	√	√	√

Using Command-Line Options

Where you specify an option determines the effect that option has.

For example, to give *all* automatically starting **hpterm** windows the same background color, edit the **HPterm*background:** option of **.Xdefaults**. But to give *a particular* window a different background color (regardless of the color specified in **.Xdefaults**), add the **-bg** option to the command line in the **.x11start** file that starts the window.

The following line, included in your **.x11start** file, creates an 80×40 **hpterm** window in the upper left corner of the screen. The window starts **vi** automatically and has the title *Text Editor* in the title bar.

```
hpterm -title "Text Editor" -geometry 80x40+1+1 -e vi &
```

The following line in your **.x11start** file creates an 80×24 **hpterm** window with a slightly larger font size (9x15), a white foreground, and a maroon background. The window automatically runs **emacs** as a text editor when it starts.

```
hpterm -fg White -bg Maroon -fn 9x15 -geometry 80x24+1+1 -e emacs &
```

Viewing Error Messages

Error messages generated when you start X11 are written to a file called **.x11startlog** in you home directory.

If you start X11 and your environment displays as expected, no error messages are generated and **.x11startlog** will be empty.

However, at some point you may start X11 and your environment does *not* display as expected. For example, maybe one of your terminal windows doesn't display. To view any error messages that occurred, type the following at the command-line prompt in your home directory:

```
more .x11startlog Return
```

Placing Clients in Your Environment

Each client you add to your `.x11start` file is located at a certain position on the root window. You may want to change a location given in the above examples, especially if the resolution of your screen doesn't match the 1280×1024 resolution that the examples assume. You may also wish to change the size of a window: Maybe you'd like a bigger clock or an editing window with 40 lines.

The `-geometry` *Width*×*Height*±*X*±*Y* option specifies the size and location of a new window. The size, *Width*×*Height*, is in characters by lines for terminal windows, and in pixels for clocks and load histograms. The location, ±*X*±*Y*, is in pixels and depends on the resolution of your screen. Plus values (+) start at the upper left corner and proceed down and to the right. Minus values (−) start at the lower right corner and proceed up and to the left.

The following table lists some typical locations for a 1280×1024 high-resolution display.

Table 4-3.
Example Locations for an 80×24 X11 Terminal Window

To position a window here ...	Use this location ...
The upper left corner of the root window.	+1+1
The lower left corner of the root window.	+1−1
The upper right corner of the root window.	−1+1
The lower right corner of the root window.	−1−1
The left side at mid-window.	+1+512
The right side at mid-window.	−1+512
The top of the root window and right of center.	+635+1
Centered at left.	+1+330
Centered at right.	−1+330
Centered in the root window.	+320+330

5

Managing Your Window Manager

The `system.mwmrc` configuration file is a text file that controls the menus and other operations of the window manager. You can copy the file into your home directory and edit it, just like any other text file.

For example, you may want the convenience of a window that starts a program automatically, but not want the added workspace clutter of having it start when you start X11. The solution is to edit the `.mwmrc` file in your home directory and add a selection to your root menu.

Also, if you've completed each of the preceding modules, you have a clock and a load histogram that start when you start X11. You also have selections on the root menu that do the same thing. The solution for such redundancy is to edit your `.mwmrc` file and delete the redundant selections.

This chapter guides you through the following tasks:

- Copying the `system.mwmrc` file to your home directory.
- Adding selections to menus.
- Deleting selections from menus.

Adding and Deleting Menu Selections

You can add and delete selections to both the system and the root menu. However, to preserve consistent behavior, you should make changes only to your root menu.

Copying system.mwmrc to Your Home Directory

If you aren't already there, change to your home directory and type the following at the command-line prompt:

```
% cp /usr/lib/X11/system.mwmrc .mwmrc (Return)
% chmod u+w .mwmrc (Return)
```

This copies `system.mwmrc` to your home directory, giving it the name `.mwmrc`.

Adding a Selection to Your Root Menu

Follow these steps to add an electronic mail selection to your root menu:

1. Start your text editor and open the file `.mwmrc`.
2. Scroll down or search for the line that reads as follows:

```
"Start Load" f.exec "xload -geometry 150x90-130+1 &"
```

3. On the line below this, insert a line that reads as follows:

```
"Read/Send Mail" f.exec "hpterm -geometry 80x24+320+330 -e mailx &"
```

This menu selection creates a window and starts the `mailx` electronic mail program in it. The window is 80 characters wide, 24 lines long, and roughly centered in the root window (for screen resolutions of 1280×1024).

Deleting a Selection from Your Root Menu

Follow these steps only if you want to delete the clock and the load histogram selections from the root menu:

1. Scroll up until the cursor is at the beginning of the following line:

```
"Start Clock" f.exec "xclock -geometry 100x90-1+1 &"
```

2. Delete the entire line.
3. Position the cursor on the line that reads as follows:

```
"Start Load"  f.exec "xload -geometry 150x90-130+1 &"
```

4. Delete this line also.

Checking and Saving Your Work

After performing the above editing, that section of your `.mwmrc` file should look similar to the following:

```
Menu RootMenu
{
 "Root Menu"        f.title
 "New Window"       f.exec "hpterm &"
 "Read/Send Mail"   f.exec "hpterm -geometry 80x24+320+330 -e mailx &"
 "Shuffle Up"       f.circle_up
 "Shuffle Down"     f.circle_down
 "Refresh"          f.refresh
 no-label           f.separator
 "Restart ... "     f.restart
}
```

If your edited `.mwmrc` file matches the above listing, save the file, and then exit your text editor.

Viewing the Result of Your Edit

To view the result of your edit, display the root menu (press *and hold* button 1 while the pointer is over the root window). Drag the pointer down the menu until you highlight the "Restart" selection. Then release button 1. When the dialog box appears, select OK.

When the window manager is completely restarted, you can display the root menu, and your changes will be apparent.

Notes

6

Starting X11 Automatically at Login

If your system isn't already configured to start X11 at login, you may want to configure it that way. By editing your `.login` or `.profile` file, you can include a command line that starts X11 as part of your login process.

This chapter discusses the following tasks:

- Selecting the correct file to edit.
- Editing that file to start X11 automatically.

Editing .login or .profile to Start X11 Automatically

Which file you should edit depends on which shell command interpreter you use. If you use the C shell (csh), you will edit `.login`. If you use the Bourne (sh) or Korn (ksh) shell, you will edit `.profile`.

Finding Out Which Shell You Use

If you are not familiar with which shell you use, type:

```
% env (Return)
```

This command lists your environment variables. Look for the one named `SHELL`.

Table 6-1. Shells and Their Login Files

If you see ...	Edit ...
`SHELL=/bin/csh`	.login
`SHELL=/bin/sh`	.profile
`SHELL=/bin/ksh`	.profile

Editing .login

Follow these steps to edit the `.login` file for the C shell.

1. Start your text editor and open `.login`.
2. Scroll down to the bottom of the file.
3. Insert the following as the last line of the file:

```
if ["`who am i | grep console`" != ""] then
    exec /usr/bin/x11start
endif
```

4. Save your edited file and exit the text editor.

Editing .profile

Follow these steps to edit the `.profile` file for the Bourne or Korn shells.

1. Start your text editor and open `.profile`.
2. Scroll down to the bottom of the file.
3. Insert the following as the last line of the file:

```
if [ "`who am i | grep console`" != "" ]
then
    /usr/bin/x11start
fi
```

4. Save your edited file and exit the text editor.

Viewing the Result of Your Edit

To view the result of your edit, exit the X Window System by pressing CTRL Shift Reset.

When the command-line prompt returns to the screen you can either log out and then log back in, or type:

`source .login`	*if you use the C shell*
`.profile`	*if you use the Bourne shell*
`. .profile`	*if you use the Korn shell*

Notes

A

Adding More Colors to Your Environment

Changing the color of an element listed in `.Xdefaults` changes the color for *every* occurrence of that element in your environment. For example, if you change `HPterm*background:` to Coral, every `hpterm` terminal window that does not have a command option of `-bg` specified will have a Coral background.

If you have a monochrome monitor, you can still change "colors" as explained in chapter 3. The system tries to convert the color into a shade on your monitor. If two or more colors that you select translate into the same shade, you can have odd-looking results.

Determining Which Elements to Color

To establish the general colors of your X11 environment, scroll through your `.Xdefaults` file. The following tables list the colorable elements of your environment by client.

Table A-1. You Can Color These Terminal Window Elements

To color this element ...	Uncomment and add a color to this line ...
`hpterm` window text	! HPterm*foreground:
`hpterm` window background	! HPterm*background:
`hpterm` window text cursor	! HPterm*cursorColor:
`hpterm` window mouse pointer	! HPterm*pointerColor:
`hpterm` scrollbar foreground	! HPterm*scrollBar*foreground:
`hpterm` scrollbar background	! HPterm*scrollBar*background:
`hpterm` softkey foreground	! HPterm*softkey*foreground:
`hpterm` softkey background	! HPterm*softkey*background:
`xterm` window text	! XTerm*foreground:
`xterm` window background	! XTerm*background:
`xterm` window text cursor	! XTerm*cursorColor:
`xterm` window mouse pointer	! XTerm*pointerColor:

Table A-2. You Can Color These Load Histogram Elements

To color this element ...	Uncomment and add a color to this line ...
system load histogram foreground	! XLoad*foreground:
system load histogram background	! XLoad*background:

Table A-3. You Can Color These Clock Elements

To color this element ...	Uncomment and add a color to this line ...
analog clock tick marks	! XClock*foreground:
digital clock text	! XClock*foreground:
clock background	! XClock*background:
clock hands	! XClock*hands:
edges of clock hands	! XClock*highlight:

Table A-4. You Can Color These Window Frame Elements

To color this element ...	Uncomment and add a color to this line ...
window frame text	! Mwm*foreground:
window frame background	! Mwm*background:
top and left window frame bevel	! Mwm*topShadowColor:
bottom and right window frame bevel	! Mwm*bottomShadowColor:
active window frame text	! Mwm*activeForeground:
active window frame background	! Mwm*activeBackground:
top and left active window beveling	! Mwm*activetopShadowColor:
bottom and right active window beveling	! Mwm*activebottomShadowColor:

Where to Color Your Environment

The usual place to specify colors is in the `.Xdefaults` file in your home directory. However, you can change the color of a particular instance of an element (such as the foreground color of a particular window) by specifying that color on the command line that starts the client. If you start the client when you start X11, the command line would be in the `.x11start` file. If you start the client from a menu, the command line would be in the `.mwmrc` file.

For example, if you wanted your `vi` editor to have a DarkSlateGrey background and White foreground, you could specify these colors on the command line you used to start the editor.

Coloring Windows That Start Automatically

The following line in your `.x11start` file would override any background and foreground colors specified in the `.Xdefaults` file and create *this particular* `hpterm` window with a DarkSlateGrey backgound and White foreground.

```
hpterm -bg DarkSlateGrey -fg White -e vi &
```

Coloring Windows That Start from Menus

The following line in your `.mwmrc` file would override any background and foreground colors specified in the `.Xdefaults` file and, when the "Editor Window" selection was chosen from the menu, would create an `hpterm` window that ran `vi` and that had a DarkSlateGrey background and White foreground.

```
"Editor Window" f.exec "hpterm -bg DarkSlateGrey -fg White -e vi &"
```

What Colors Are Available

You can color your X11 environment by specifying any of the color names listed in the following table. Type the color name exactly as it appears below. This list is contained in the file `/usr/lib/X11/rgb.txt` on your computer.

Table A-5. X Window System Color Table

Available Colors			
Aquamarine	Black	Blue	BlueViolet
Brown	CadetBlue	Coral	CornflowerBlue
Cyan	DarkGreen	DarkOliveGreen	DarkOrchid
DarkSlateBlue	DarkSlateGray	DarkSlateGrey	DarkTurquoise
DimGray	DimGrey	Firebrick	ForestGreen
Gold	Goldenrod	Gray	Green
GreenYellow	Grey	IndianRed	Khaki
LightBlue	LightGray	LightGrey	LightSteelBlue
LimeGreen	Magenta	Maroon	MediumAquamarine
MediumBlue	MediumForestGreen	MediumGoldenrod	MediumOrchid
MediumSeaGreen	MediumSlateBlue	MediumTurquoise	MediumVioletRed
MidnightBlue	Navy	NavyBlue	Orange
OrangeRed	Orchid	PaleGreen	Pink
Plum	Red	Salmon	SeaGreen
Sienna	SkyBlue	SlateBlue	SpringGreen
SteelBlue	Tan	Thistle	Transparent
Turquoise	Violet	VioletRed	Wheat
White	Yellow	YellowGreen	

Notes

B

A Sample X11 Environment

The `.x11start` file in your home directory starts the clients and other programs that make up the environment that displays on your screen when you start the X Window System.

The sample environment illustrated here includes the following features:

Table B-1. Sample Environment Features

Feature	Size	Screen Location
`vi` editor	80×40	left side
system window	80×24	lower right corner
analog clock	100×90	upper right corner
load histogram	150×90	upper right

The Client Section of .x11start before Modification

Before modification, the default `.x11start` file you copied to your home directory from `/usr/lib/X11/sys.x11start` contained a client section similar to the following:

```
hpterm -C -geometry 80x24+1+1 $@ &

### Add client commands below, one command per line.
### End each command line with an ampersand (&).
```

The top line sets the characteristics for a single `hpterm` terminal window and starts the window. In this case, the window is 80 characters wide, 24 lines deep, and is located in the upper left corner of the root window.

The Client Section of .x11start after Modification

The `.x11start` file modified for the sample environment contains the following client section:

```
### Add client commands below, one command per line.
### End each command line with an ampersand (&).

hpterm -n vi -title Editor -geometry 80x40+1+1 -e vi &
hpterm -n System -title "System Window" -geometry 80x24-1-1 $@ &
xclock -update 1 -geometry 100x90-1+1 &
xload -geometry 150x90-130+1 &
```

The above lines modify the original `hpterm` window, making it 40 lines long. When it starts, it automatically calls the `vi` editor. The title *Editor* appears in the title bar, while *vi* appears as the label of the icon. Another `hpterm` window, titled *System Window* and with an icon labeled *System,* appears in the lower right corner of the root window and is 80 characters wide and 24 lines long. A clock and a load histogram also start. These are located in the upper right corner of the root window.

Notes

C

A Sample Root Menu

The `.mwmrc` file in your home directory controls the selections that appear on the root menu.

The sample `.mwmrc` file illustrated in this appendix is designed for use with the sample `.x11start` illustrated in the last section. The `.mwmrc` file has been modified to eliminate root menu selections for the load histogram and clock since these are now started automatically in `.x11start`. Selections have been added to the menu to allow for logging into a remote computer and using a mail program called `elm`.

The Root Menu Section of .mwmrc before Modification

Before modification, the default `.mwmrc` file copied to your home directory from `/usr/lib/X11/system.mwmrc` contained the following root menu section:

```
# Root Menu Description
Menu RootMenu
{
 "Root Menu"              f.title
 "New Window"             f.exec "hpterm &"
 "Start Clock"            f.exec "xclock -geometry 100x90-1+1 &"
 "Start Load"             f.exec "xload -geometry 150x90-130+1 &"
 "Shuffle Up"             f.circle_up
 "Shuffle Down"           f.circle_down
 "Refresh"                f.refresh
 no-label                 f.separator
 "Restart ... "           f.restart
}
```

The default root menu has selections for starting a new `hpterm` window, a clock, and a load histogram. Selections also enable you to shuffle windows, refresh the screen, and restart the window manager.

The Root Menu Section of .mwmrc after Modification

After modification, the new `.mwmrc` file contains the following root menu section:

```
# Root Menu Description
Menu RootMenu
{
 "Root Menu"            f.title
 "New Window"           f.exec "hpterm &"
 "Remote Login"         f.exec "hpterm -e rlogin hostname &"
 "Mail"                 f.exec "hpterm -e elm &"
 "Shuffle Up"           f.circle_up
 "Shuffle Down"         f.circle_down
 "Refresh"              f.refresh
 no-label               f.separator
 "Restart ... "         f.restart
}
```

The modified root menu listed above still has a selection for starting a new window, but the selections for the clock and load histogram have been replaced with selections for logging into a remote host and for an electronic mail program. The other selections have remained the same.

Notes

D

Fonts Are Changeable Too!

As with colors, you have a variety of **fonts** to choose from. A font is a type style; that is, a style in which text characters are printed. For example, the text of most newspapers is printed in the Times Roman font, while the headlines are usually printed in Helvetica.

Choosing a Font to Specify

Fonts were loaded into directories within the `/usr/lib/X11/fonts` directory when X11 was loaded onto your computer. For example, the HP Roman 8 fonts are in the `/usr/lib/X11/fonts/hp_roman8/75dpi` directory.

Each font directory contains a variety of type styles (such as Helvetica, Roman, Italic, or bold), and type sizes (such as 8-point). The `hp_roman8` subdirectory contains fonts for English and other European languages. There are other font directories for non-European languages.

Usually, fonts are referred to by an "alias", which is the font file name without the .scf or .snf extension. If there is a `fonts.alias` file in the directory containing the font you want to use, and there is a line in that file that reads `FILE_NAMES ALIASES`, then you can use the filename alias. (If not, specifying fonts is beyond the scope of this document. Consult your system administrator for help.)

Note

Mwm fonts are specified with the `fontList` resource; for example, `Mwm*fontList:courR10`.

Choosing Where to Specify a Font

Usually, you specify fonts in the `.Xdefaults` file in your home directory. However, you can specify the font of an individual client (such as the text of a particular window) in the command line that starts the client. If you start the client when you start X11, the command line will be in the `.x11start` file. If you start the client from a menu, the command line will be in the `.mwmrc` file.

You could use any of the following lines to specify the font of a window as courR10.

Making All Windows Have the Same Font

The following line in your `.Xdefaults` file would change the font of *every* `hpterm` window to courR10.

```
HPterm*Font: courR10
```

Specifying the Font of a Window that Starts Automatically

The following line in your `.x11start` file would override any font specification in the `.Xdefaults` file and create *this particular* `hpterm` window with an courR10 font.

```
hpterm -fn courR10
```

Specifying the Font of a Window that Starts from a Menu

The following line in your `.mwmrc` file would override any font specified in the `.Xdefaults` file and, when the "New Window" selection was chosen from the menu, would create an `hpterm` window with a font of courR10.

```
"New Window"  f.exec "hpterm -fn courR10 &"
```

Notes

Glossary

active window
The terminal window in which what you type appears. If there is no active window, what you type is lost. Only one terminal window can be active at a time.

background process
A process that doesn't require the total attention of the computer for operation. Background processing enables the operating system to execute more than one program or command at a time. As a general rule, all clients should run as background processes.

click
To press *and release* a mouse button. The term comes from the fact that pressing and releasing the buttons of most mice makes a clicking sound.

client
A program written specifically for the X Window System.

command-line prompt
Shows that the computer is ready to accept your commands. Each terminal emulation window has a command-line prompt that acts just like the command-line prompt you see on the screen immediately after login (before starting X11). Usually the command-line prompt is either a **$** (for Bourne and Korn shells) or a **%** (for C shells). You can find the command-line prompt by pressing Return several times. Every time you press Return, HP-UX prints the prompt.

double-click
To press *and release* a mouse button twice in rapid succession.

drag
To press *and hold down* a mouse button while moving the mouse on the desktop (and the pointer on the screen). Typically, dragging is used with menu selecting, and window moving and resizing.

fonts
A font is a style of printed text characters. Times Roman is the font typically used for most newspaper text; Helvetica is the font used for newspaper headlines.

home directory
The directory in which you are placed after you login. Typically, this is `/users/`*username*, where *username* is your login name. The home directory is where you keep all "your" files. Type `cd` Return to change to your home directory. Type `echo $HOME` Return to view the path and name of your home directory.

hpterm
A type of window that provides an HP-compatible terminal emulation, complete with softkeys. The `hpterm` window is the default window for your X environment.

icon
A small, graphic representation of an object on the root window (typically a terminal window). Objects can be "minimized" or "iconified" (turned into icons) to clear a cluttered workspace and "restored" (returned to their original appearance) as needed. Processes executing in an object continue to execute when the object is iconified.

non-client
A program that is written to run on a terminal and so must be supported by a terminal emulation window to run in the window environment.

pointer
Sometimes called the "mouse cursor," the pointer shows the location of the mouse. The pointer's shape depends on its location. In the root window, the pointer is an `X`. On a window frame, the pointer is an arrowhead. Inside the frame, the pointer can be an arrowhead (as when it is inside a clock or load histogram frame) or an `I`-beam (as when it is inside a terminal

window). When a menu is displayed, the pointer is a diagonally oriented arrow.

restore
To change an icon back into its "normal" (original) appearance.

root menu
The menu associated with the root window. The root menu enables you to control the behavior of your environment.

root window
The root window is what the "screen" (the flat viewing surface of the terminal) becomes when you start X. To a certain extent, you can think of the root as the screen. The root window is the backdrop of your X environment. Although you can hide the root window under terminal windows or other graphic objects, you can never position anything behind the root window. All windows and graphic objects appear "stacked" on the root window.

terminal type
The type of terminal attached to your computer. HP-UX uses the terminal type to set the `TERM` environment variable so that it can communicate with the terminal correctly. The terminal type is usually set at login.

terminal window
A terminal window is a window that emulates a complete display terminal. Terminal windows are typically used to support non-client programs. When not running programs or executing operating system commands, terminal windows display the command-line prompt. Two terminal windows are supplied with X11, `hpterm`, which emulates HP terminals, and `xterm`, which emulates DEC and Tektronix terminals.

title bar
The title bar is the rectangular area between the top of the window and the window frame. The title bar contains the title of the window object, usually "Terminal Emulator" for `hpterm` windows, "xclock" for clocks, and "xload" for load histograms.

window
A portion of the screen that is set aside for a particular application. A window can be resized and relocated anywhere on the screen. A wide variety of windows of different size, shape, and color can be displayed simultaneously.

window manager
The window manager controls the size, placement, and operation of windows on the root window. The window manager includes the functional window frames that surround each window object as well as a menu for the root window. The window manager comes with the X Window System as a client program.

window menu
The menu that displays when you press the system menu button on a window frame.

xclock
An X11 client program that displays the time, either analog (hands and dial) or digital (text readout).

xload
An X11 client program that displays the work load of the system as a histogram.

xterm
An X11 client program that displays a terminal window that emulates DEC and Tektronix terminals.

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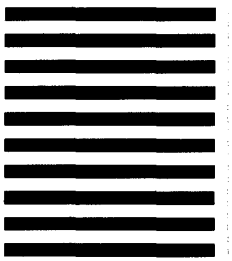

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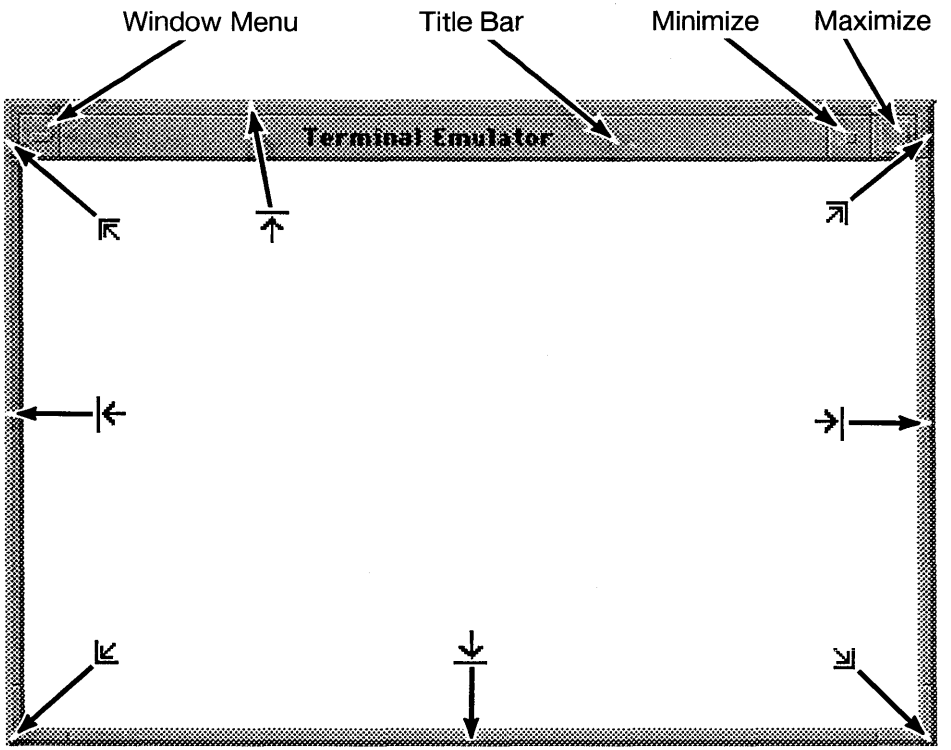
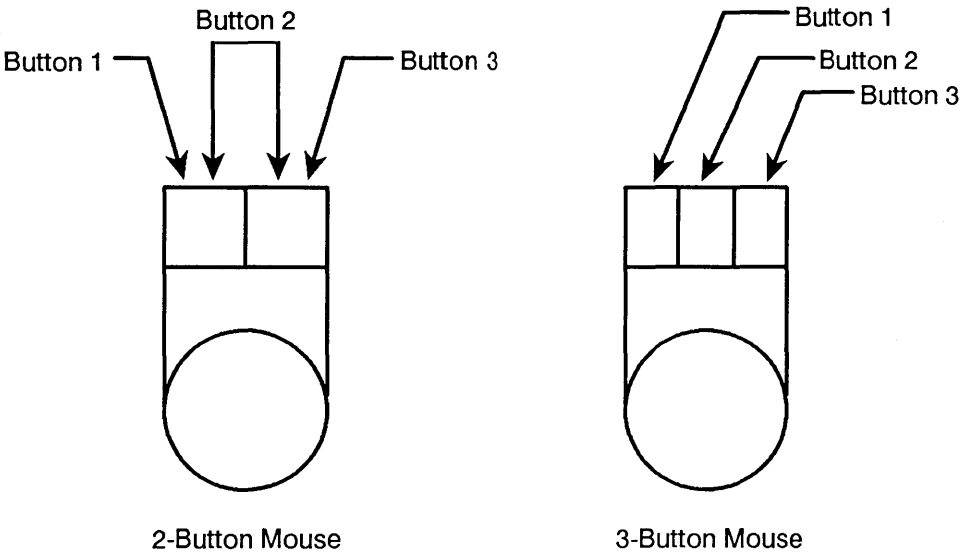


The Elements of the HP Window Manager Window Frame

This pointer symbol ...	Means this ...
	The pointer location inside a window or window frame.
	The pointer location inside a `hpterm` or `xterm` terminal emulation window.
	The pointer location in the root window.
	The pointer has "grabbed" the window and is ready to move it.
	The pointer has "grabbed" the window fame and is ready to stretch or shrink the window in or against the direction of the arrow.
	The pointer has "grabbed" a corner of the window frame and is ready to stretch or shrink the window in or against the direction of the arrows.



Mouse Buttons and Their Locations

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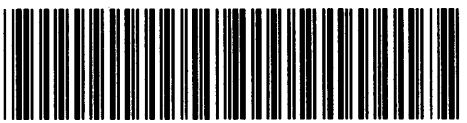

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