The appearance of windows on the user interface, or of screens within a screen, is created by X Windows and the fvwm2 Window Manager on the Sun Solaris machines, and Microsoft Windows or Linux/GNOME on the Dell computers. Windows are the *modus operandi* for displaying and running applications and for communicating with the operating system. Learning to manipulate windows helps you work more effectively with the programs running inside them.

**X, fvwm2, MS Windows, and GNOME**

The X Window System, Version 11, was developed at MIT and is now distributed by X.org. Also called X Windows, or X11, this software is similar to Microsoft Windows. However, when users manipulate the windows (e.g., resize and shuffle them), they are not working directly with X but with a window manager. On the campus Unix machines, the window manager is fvwm2. fvwm2 is Unix’s standard graphical user interface and is responsible for making the windows look and operate in the same way. Together, X and fvwm2 create the “look and feel” of Eos/Unity on the Unix platform.

The interface on the Dell computers is Microsoft Windows, except for some engineering labs that run Red Hat Linux and GNOME.

**Selecting a Window**

You can only write data to one window at a time. In order for a window to receive data or input, it must be “selected,” that is, it must be identified to the system as the active window. To select a window, point anywhere inside the window or on its frame and click the left mouse button. The active window then comes forward to the front of the screen.

**Grabbing and Moving a Window**

You can move a window to another location on the screen by pointing to the top of the window frame (the cursor turns into an arrow) and holding down the left mouse button. This action “grabs” the window by the frame. Slide the mouse, and the arrow on the screen drags a “ghost” or “rubber band” outline of the window until you stop and release the button to position the window in a new place.
Or, select **Move** on the window menu and use the cursor keys to position the window.

**Sizing a Window**

To change the size of a window, point into the content area of a window and slowly move the cursor toward any part of the frame until the cursor changes to an arrow similar to those in the table below. When the cursor changes to one of these arrows, press and hold the left mouse button, drag the window to the desired size, and release the button. Or select **Size** from the window menu and use the cursor keys to size.

Where you grab the window frame determines how the window will be sized when you drag the mouse. Dragging shrinks or stretches the window from that point (see following table).

<table>
<thead>
<tr>
<th>To stretch or shrink the window...</th>
<th>Point and drag from...</th>
</tr>
</thead>
<tbody>
<tr>
<td>vertically from the...</td>
<td></td>
</tr>
<tr>
<td>top</td>
<td>top of the frame, above the title bar</td>
</tr>
<tr>
<td>bottom</td>
<td>bottom of the frame</td>
</tr>
<tr>
<td>horizontally from the...</td>
<td></td>
</tr>
<tr>
<td>left</td>
<td>left side of the frame</td>
</tr>
<tr>
<td>right</td>
<td>right side of the frame</td>
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<tr>
<td>diagonally from the...</td>
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</tr>
<tr>
<td>top left</td>
<td>upper left corner of the frame</td>
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<tr>
<td>top right</td>
<td>upper right corner of the frame</td>
</tr>
<tr>
<td>bottom left corner</td>
<td>lower left corner of the frame</td>
</tr>
<tr>
<td>bottom right</td>
<td>lower right corner of the frame</td>
</tr>
</tbody>
</table>

**Iconifying (Minimizing) a Window**

Sometimes as you work, you want to shrink or move windows out of the way without closing down the application altogether. To do this, you turn the windows into **icons**. Icons (like the one in the margin) are small graphical representations of objects, applications, or windows arranged on the root window. Iconifying a window does not close the application in it; for example, an iconified program will continue to execute.

To **iconify** or **minimize** a window, point to and click the minimize button, which is one of two window buttons located in the upper right corner of the window frame (see figure below). The icon button is the left button of the two, a square with a dot or dashed line in it. When you click this icon button, the window quickly shrinks to an icon. You can also **Minimize** from the window menu.
To move the icon to another part of the screen, point to it and then press and hold the left mouse button. Drag the icon to the part of the screen where you want it, and then release the mouse button to position it there.

**Maximizing a Window**

The other button in the upper right corner, a square with a smaller square in it, is a maximize button. Clicking it will enlarge the window and its application to fill the whole screen. You can also select Maximize on the window menu brought up by right-clicking a minimized window icon.

**Restoring a Window**

To restore a maximized window to normal size, either click the maximize button again, or select the Restore option on the window menu. To restore an icon (change it back into a window), point to the icon and double-click the left mouse button.

**Scrolling a Window**

When you fill up a window with information, the contents move or scroll up and out of sight so that you have room at the bottom to add more information. Although these contents disappear from the window, they are not gone altogether. You can scroll down to bring them in view again.

On the left side of the window is a scroll bar, which allows you to control what part of the information appears in the window and to move quickly forward or back through it. The scroll bar has an arrow at each end and a white column or slider in the middle. The slider moves up and down as the information scrolls.

You can move the slider by clicking on the arrow buttons or by grabbing and dragging the slider. You can click the up or down arrow to scroll a little at a time, or hold them down for continuous scrolling. Or, you can grab the slider and drag it up or down to scroll more quickly.


**Shuffling Windows**

When several windows overlap on a screen, you can bring one of them to the front simply by clicking on it. This is how you *shuffle* windows, laying one on another as though you were shuffling cards. The selected window on top is the window that shows whatever you type. The windows behind the selected window are inactive.

**Special to Sun workstations:** You can also shuffle windows using the **Shuffle Up** or **Shuffle Down** options on the **Root Menu**, which is brought up in the gray background (root) window by holding down the right mouse button. Or, you can **lower** or send the window to the back by selecting **Lower** on the window menu, an option NOT on the Windows window menu.

**Special to Windows workstations:** Shuffling or arranging windows on the Windows interface is generally done from the **Task Bar** at the bottom of the screen. Minimized applications are arrayed there, and right-clicking in the bar’s gray background will bring up a menu that allows you to do a number of things to the positioning and layering of windows.

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**Closing a Window**

To close an application and the window in which it is running, open the window menu and drag to **Close**.

Remember that the application closes with the window! If you do not wish the application to close, iconify the window to temporarily move the window out of way.

**Special to Windows and Linux workstations:** To the right of the minimize and maximize buttons at the top of the window is a button with an X in it. Clicking this X will close the window and its application. This is much faster way to close windows than using the window menu.

Also, on Windows computers, you can close multiple windows at the same time. If you hold down the **Shift** key when you click on the **Close** button (or when you select **Close** from a menu), Windows closes the current window as well as any **My Computer** windows or “parent” windows that are open.