Introduction [1]

The X Window System is a portable, network-transparent window system originally developed at the Massachusetts Institute of Technology (MIT) and now an industry standard under control of the X Consortium. The X Window System, also known simply as X, allows separate applications (known as *clients*) that run on one or more hosts to be displayed on the same workstation screen in separate windows. The workstation does this by running an X server. To run X, the workstation must provide a bit-mapped display with a keyboard and pointing device (such as a mouse). If clients will run on a Cray Research system, TCP/IP access must be available between the workstation and Cray Research systems.

Because X is portable, it can be used on a wide variety of workstation hardware (for example, Sun, DEC, IBM, RT, Apollo, HP, Sony, and Apple). An important byproduct of this portability is a standardized method of writing graphics programs independent of hardware or operating system constraints. The low-level C language programming interface to X, called *Xlib*, and the high-level interface, called *Toolkit* (`Xt` library) and the *Athena Widgets* (`Xaw` library), are also standardized.

X achieves network transparency because it uses its own protocol to communicate between the client and the display server. Most Xlib functions generate some type of protocol requests. The X protocol requires a reliable end-to-end byte stream, which TCP/IP currently provides as the underlying network protocol.

This manual describes aspects of version 11, release 5 (X11R5) of the X Window System that are related specifically to Cray Research applications. Servers with earlier versions of X11 might still work with Cray Research X clients, but it cannot be guaranteed.

"Getting Started," page 3, provides information that enables users to get started using X on a Cray Research system. The rest of the manual provides programming information. "Writing Your Own Clients," page 7, offers programming techniques to

ensure efficient use of the system. “Fortran and X,” page 19, describes the process for mixing Fortran and C functions in one binary file. “Cray Research Clients,” page 25, provides a list of the clients that were written to run on Cray Research systems.