HEWLETT PACKARD

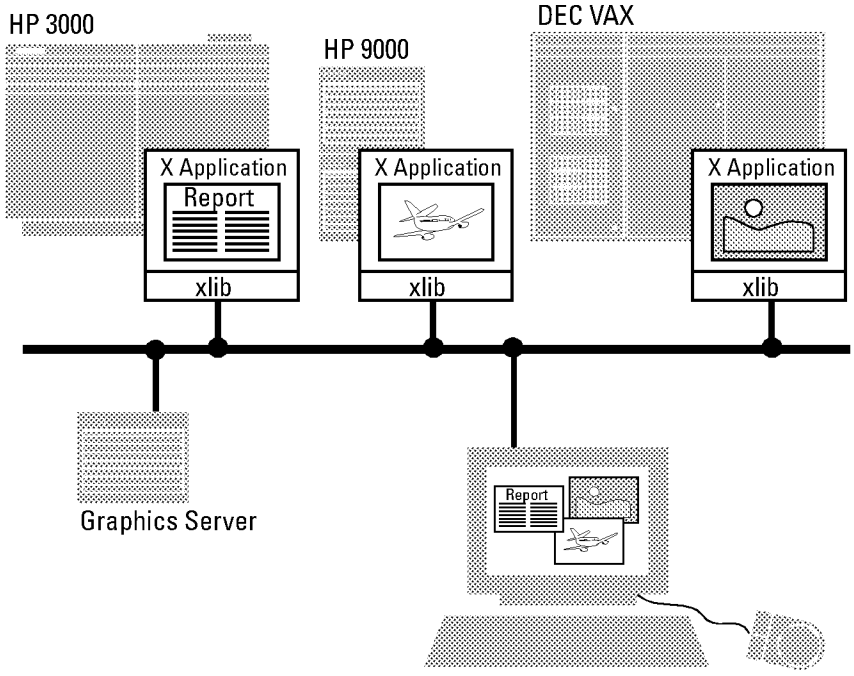
HP Motif™ XL

Technical Data

HP 3000 Computer Systems

The X Window System from M.I.T is an industry-standard windowing protocol providing interaction among applications that are executed on systems from different vendors from different locations on a network. With the X Window System, users can access multiple distributed applications from a single display screen. The OSF/Motif user environment offers a high resolution 3D "look and feel" which is consistent across systems. HP Motif XL provides HP 3000 developers a set of programmatic libraries to create X Windows based OSF/Motif applications.

Multi-vendor interoperability means more effective decision making



Features and benefits

- OSF/Motif provides an industry standard graphical user interface for a consistent look and feel
- HP plays an important role in X11 industry standards assuring customers of application investment protection
- Facilitates integration with multi-vendor environments for faster, more effective decision making
- Increased portability of commercial X Windows solutions
- Includes development tools for faster, more efficient development of applications
- Support for developers to adapt user interface to local languages
- Allows terminals to access existing commercial applications thereby preserving investments in block mode applications
- Facilitates movement to client/server computing increasing desktop performance through usage of workstation MIPs

Increased user productivity through consistent look and feel

OSF/Motif is the graphical user interface (GUI) component of the application development environment of the Open Software Foundation (OSF).

The OSF/Motif environment provides behavior consistent with Presentation Manager, the defacto standard for PC user interfaces, along with an enhanced 3D appearance. With the OSF/Motif user interface, software developers can design applications whose behavior is consistent across the DOS, OS/2, and HP-UX and MPE XL operating systems. A consistent OSF/Motif compliant user interface allows users to move easily and transparently between systems and applications. Users can leverage development time and experience gained across all environments, reducing training and documentation costs and improving user productivity.

Customers are assured of application investment protection

HP was among the first computer vendors to support the X Window System, and is an active member of the X Consortium and other X11 standards bodies. HP was a major contributor of technologies for the OSF/Motif user environment and also engineered the OSF/Motif toolkit. HP's commitment to these standards bodies means customers are assured of long term software investment protection.

Faster, more effective decision making

The X Window System protocol is a LAN-based network interface between applications and the display server and is based on TCP/IP over Ethernet (or IEEE 802.3). Because the X windowing protocol is a vendor-independent standard, HP Motif XL based applications can be displayed on a server along with other vendors' X Windows applications. This interoperability allows HP 3000 applications to be displayed concurrently with, for example, shop floor manufacturing packages running on other vendor systems. The end-user benefits from this transparent interoperability by simplifying access to distributed information yielding faster and more effective decision making.

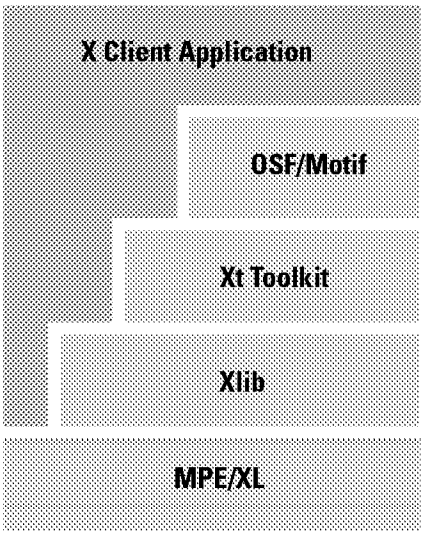


Figure 2: X11 Programming Environment

Access to full breadth of commercial X Window System solutions

Current applications written using X Windows and OSF/Motif can now port to MPE XL, thus increasing the number of solutions available on the HP 3000 with state-of-art user interface technology.

Faster, more efficient development of applications

HP Motif XL provides three levels of programmatic tools: Xlib, Xt intrinsics, and OSF/Motif widgets. A developer can choose to program with only one or with any combination of these tools.

Note: HP Motif XL does not include support of the OSF/Motif user interface (UIL) components.

Xlib

Xlib is a low-level, flexible programming library used to draw lines, receive input, manipulate windows, and more. Most developers use Xlib when writing an X Windows program, though many will use higher level tools when implementing the user interface. MPE XL provides C language support for Xlib. Xlib's main features are:

- Window manipulation - set, request window attributes - create, destroy windows
- Graphics capabilities - line drawing - polygon operations - bit-map operations - colormap management - text placement - font management
- Hardware control - support for multiple screens and displays - control of pointing devices and keyboard - network transparency of application input/output

Xt intrinsics

The Xt intrinsics is the layer of the X Windows Toolkit that allows a developer to create widgets - user interface components such as scrollbars, buttons, and menus. These components are extensible and can be combined with widgets and gadgets from other sources such as the OSF/Motif widget set.

The X Consortium has endorsed the Xt intrinsics as a standard part of the X Window System to be provided by all vendors of X Windows based products.

OSF/Motif widgets Graphics Server

Built using the Xt intrinsics, OSF/Motif widgets provide developers large productivity gains with a set of tools for constructing consistent, easy-to-use application user interfaces. The OSF/Motif widgets provide a 3D appearance and behavior consistent with Presentation Manager, reducing training and documentation costs for applications ported to multiple operating systems. The OSF/Motif higher level programming interface provides benefits including:

- Dynamic modification of widgets for developers
- Widget classing for developers
- Configurability of applications for users
- Keyboard interface for users

Software developers are not limited, however, to the predefined set of OSF/Motif widgets provided by HP. HP's tools provide the ability to create new widgets to address specific user needs, and many developers will use both predefined and custom widgets to develop their user interface.

OSF/Motif Widget Set on the Graphics Server

Basic Widgets

- Static text and graphic area
- Task activator
- Pushbutton with user-drawn graphic
- Pushbutton with drawn arrow graphic
- Button with state
- Button for cascading menus
- Lines for separating areas
- Slider for getting numeric values
- Scroll control
- Text entry and editing

General Container Widgets

- Arbitrary placement of sub-class widgets
- Placement using alignment layout constraints
- Vertical resizable panes
- Graphics workspace
- Row and/or coloum alignment

Special Containers

- List of strings
- Input pad with transcript
- Widget for selecting one among a list of strings
- Special SelectionBox to deal with selecting files
- Top-level application window
- Message plus special buttons
- Scrolled text
- Scrolled list
- Collection of ToggleButtons
- General scrolled area
- Container to provide bevelled framing

Menus

- Bar area with buttons for pulldowns
- Pulldown menu from MenuBar or CascadeButton
- Menu popped up by client
- Menu used for selecting an option value

Popup Dialog Windows

- Popup Form
- Popup BulletinBoard
- Popup SelectionBox
- Popup FileSelectionBox
- Popup MessageBox
- Warn user of invalid or dangerous condition
- Give information to user
- Prompt user for text input
- Obtain answer from user
- Warn user, request resolution
- Allows user to cancel lengthly operating

OSF/Motif Gadget Set on the Graphics Server

Basic gadgets

- Object
- RectObj
- XmGadget
- XmArrowButtonGadget
- XmLableGadget
- XmPushButtonGadget
- XmSeparationGadget
- XmToggleButtonGadget

OSF/Motif gadgets

Gadgets are best described as windowless widgets. They provide essentially the same functionality as their counterpart widgets, but do not create windows. Gadgets require fewer resources and deliver improved performance, both in execution time and data space.

Allows developers to adapt user interface to local languages

HP Motif XL offers transparent support for the international customer. X Windows applications developed on the HP 3000 can be adapted to a local languages to provide support for multiple clients running different languages on a monitor.

Offers OSF/Motif GUI appearance while preserving investments in block mode applications

HP Motif XL allows transparent access to MPE applications using hpterm blockmode terminal emulator feature. This allows VPLUS applications to appear as windows on X Windows display devices. The hpterm blockmode capability supports the most frequently used features of the 2392A, 700/92 and 2622A terminals.

Increased desktop performance through usage of workstation MIPs

The X Window System facilitates the movement to the client/server computing model. The display server controls all the input and output devices: keyboard, mouse, monitor, etc. The graphics-assist server manages the movement, sizing and positioning of windows. The client is the X Windows application program based on HP Motif XL that runs on a host HP 3000 system. The client and server communicate using the X Window System protocol independent of the specific hardware or operating system used. By distributing the display management, window management and application program processing functions, the user utilizes workstation MIPs more effectively.

HP Motif XL supports a variety of X Windows display servers

HP's X Windows System display servers are also available across the entire family of HP 9000 Series 300/400 workstations and HP 9000 Series 800 systems, and X terminals. With this wide price/performance range of server hardware platforms, application developers and end-users enjoy freedom and flexibility in the choice of hardware.

Workstations supporting access to HP Motif XL include the HP 9000 Series 300/400 as well as the Series 800. HP-UX based HP 9000 Series 300/400 X11 servers are available for all Series 300/400 CPUs as well as current graphics board options, from 512 x 400 medium-resolution to 1280 x 1024 high-resolution color graphics. X11 servers are available for all supported Series 800 bitmapped displays.

X Terminals from HP are available with the HP 700/X family of X Window System graphics terminals. The family consists of a comprehensive set of low-cost color and monochrome bundled configurations. When included as components of an engineering, manufacturing, or business solution, the HP 700/X terminals can substantially reduce the overall hardware, administration and maintenance costs.

Note: Apollo Domain X11 servers are currently not supported with HP Motif XL.

X11 Clients and Utilities on the Graphics Server

Standard X Clients

- bitmap: bitmap editor and converter utilities
- resize: resets shell parameters to reflect the current size of window
- uwm: window manager
- xclock: analog/digital time of day clock
- xfd: display fonts
- xhost: server access control program
- xload: graphical representation of average host CPU load
- xlsfonts: list fonts
- xmodmap: utility for displaying and modifying keymaps
- xrdb: server resource database utility
- xrefresh: refreshes all or part of the display
- xset: used to set various user preference options of the display
- xsetroot: utility for setting root window parameters
- xterm: DEC VT102 and Tektronix 4014 terminal emulator
- xwd: image dumping utility
- xwud: image undumping utility
- xwininfo: display window information

Additional HP Clients

- mwm HP OSF/Motif window manager
- hpwm: HP window manager
- hpterm: HP TERM 0 terminal emulator with some blockmode support
- xinitcolormap: initiliazes the colormap
- xseethru: opens a transparent window
- xwcreate: creates a new window for use by Starbase applications
- xwdestroy: destroys one or more existing windows

Standard X Utilities

- bdftosnf: BDF to SNF font compiler
- mkfontdir: creates font.dir file in font directory
- rgb: color database creator, creates rgb.pag and rgb.dir from rgb.txt
- xinit: used to initiate the X server and client(s)

Additional HP Utilities

- sb2xwd: translates Starbase bitmap to xwd bitmap format
- xpr: prints the contents of a window
- xwd2sb: translates xwd bitmap Starbase bitmap format
- x11start: startup script
- gwind: window helper daemon
- gwindstop: terminates window helper facility

Graphics server provides additional clients and utilities

The graphics-assist server is required to establish the initial connection from the X-displays to the host HP 3000 and to maintain the run-time window management environment for the displays. An existing HP 9000 Series 300/400 workstation can be used as a graphic-assist server. Users of X Windows displays use hpterm and run NS Services (vt3K) to set up the connection to an HP 3000 host. Once the X Windows application begins, the graphics-assist server provides key X11 client services including HP block mode terminal emulation support (hpterm) and HP OSF/Motif window management (mwm). The HP OSF/Motif window manager provides behavior consistent with Presentation Manager and allows a user to manipulate windows by moving, resizing, iconifying, etc.

System Environment

HP Motif XL requires MPE XL version 3.0 or subsequent versions, Network Services, and an HP 9000 Series 300/400 graphics-assist server with HP-UX and Network Services.

Ordering Information

HP Motif XL developer's kit product includes software for the HP 3000 and documentation. All software is distributed via HP 3000 tape media.

Software and Documentation

Product description
HP Motif XL Developers Kit for the HP 3000
HP Motif XL Programmer's Supplement
HP Motif XL Administrator's Supplement

Optional Documentation Kit

Product number	Product description
B1171-90026	Programming with XLib
B1171-90027	X Toolkit Intrinsics Program Manual (Vol. 4)
B1171-90028	X Toolkit Intrinsics Reference Manual (Vol. 5)
B1171-90029	X Window System C Quick Reference Guide
B1171-90030	Mastering Motif Widgets
B1171-90031	OSF/Motif Information Manual
B1171-90032	OSF/Motif Style Guide
B1171-90033	OSF/Motif Programmer's Reference Manual
B1171-90034	OSF/Motif Programmer's Guide

Certification of comformance with the OSF/Motif user environment is pending

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