



Software Product Description

PRODUCT NAME: Compaq Open3D Version 4.9B for OpenVMS Alpha

SPD 45.08.22

DESCRIPTION

The Compaq Open3D Version 4.9B for OpenVMS Alpha product provides the capability of running the following graphics accelerators on Compaq Alpha workstations and AlphaStation products:

- ZLXp-L family: ZLXp-L1 and ZLXp-L2
- PowerStorm 3D30 and PowerStorm 4D20

Compaq Open3D for OpenVMS Alpha requires DECwindows Motif Version 1.2-5 or later for OpenVMS Alpha. For more information about its features, refer to the DECwindows Motif for OpenVMS Alpha Software Product Description (SPD 42.19.xx). In conjunction with DECwindows Motif, Compaq Open3D provides a complete development and run-time environment for 2D and 3D applications.

Compaq Open3D supports the X Window System client/server model for network-transparent graphics and windowing. The DECwindows X11 display server provided with Compaq Open3D can display output from:

- 2D client applications supporting Release 6 of the X Window System, Version 11 (X11R6)
- 3D client applications supporting the OpenGL 3D extensions to the X Window System

Compaq Open3D provides X- and OpenGL-compliant servers for the ZLXp-L and PowerStorm 3D30/4D20 graphics accelerators. Furthermore, Compaq Open3D includes the Compaq implementation of the OpenGL application programming interface (API), provided as a set of programming libraries.

Compaq Open3D now supports Common Desktop Environment (CDE), the default graphical user interface for OpenVMS. CDE provides a consistent user interface for end users and a coherent development environment for application developers across multiple OpenVMS platforms.

Graphics Servers

Compaq Open3D provides the device-dependent portions of the DECwindows X11 display server to support the ZLXp-L and PowerStorm 3D30/4D20 PCI graphics accelerators. These device-dependent portions include the device-dependent X layer, device drivers, server extensions, and hardware-specific microcode. The device-independent portions of the X11 display server are provided by DECwindows Motif for OpenVMS Alpha.

The DECwindows X11 display server provided with Compaq Open3D is a port of the standard X11R6 display server. By offering this server, Compaq can consistently incorporate X Consortium display server enhancements in future releases of Compaq Open3D.

Extension Support

In addition to support for core X11R6, all DECwindows servers support the following extensions through DECwindows Motif:

- X Imaging Extension (XIE)
- XTRAP
- SHAPE
- MIT multibuffering
- MIT SHM (Shared Memory)

- XInputExtension
- DECStereo Extension (ZLXp-L and PowerStorm 3D30/4D20, families of options)
- Support for Overlays (ZLXp-L family and PowerStorm 4D20)
- MITmisc

For more details on these extensions, refer to the DECwindows Motif for OpenVMS Alpha Software Product Description (SPD 42.19.xx).

The Compaq Open3D ZLXp-L family of graphics servers and the PowerStorm 3D30/4D20 graphics servers support the following additional extension:

Version 1.1 of the OpenGL Extension to the X Window System (GLX), as defined by the OpenGL Architecture Review Board. GLX allows an OpenGL client on one vendor's platform to run across a network and display the results on another vendor's server.

Server Enhancements

The Compaq Open3D ZLXp-L family of graphics servers and the PowerStorm 3D30/4D20 graphics servers support additional hardware features of the corresponding graphics accelerators through a set of library routines and device-specific server extensions. These libraries and server extensions allow the application developer to access the overlay planes and stereo viewing hardware (when applicable) on these units.

Multihead configurations (the simultaneous use of more than one graphics accelerator) are also supported as shown on the chart in the MULTIHEAD MATRIX section later in this SPD.

Programming Support

Compaq Open3D includes the OpenGL 3D rendering API programming library for building 3D applications.

Programming support is also provided by DECwindows Motif that runs on the OpenVMS Alpha operating system, which includes the standard X and OSF/Motif libraries and tools (Xlib, Xtoolkit intrinsics, OSF/Motif UIL compiler), and Compaq added-value extensions. Used with the Compaq Open3D libraries, the DECwindows Motif standard graphics and windowing Application Programming Interface (API) provides a robust environment for developers creating interactive 2D and 3D graphics applications.

For more details on the graphics programming environment provided with the DECwindows Motif that runs on the OpenVMS Alpha operating system, see the Software Product Description 42.19.xx.

OpenGL

OpenGL is the software interface that enables application developers to produce high quality images of 3D objects. OpenGL has been designed to work with various operating and window system environments. The version of OpenGL supplied as part of Compaq Open3D has been integrated with the X Window System, which allows the support of network-transparent 3D graphics.

The OpenGL API and X protocol extensions are defined by the OpenGL Architecture Review Board, of which Compaq is a founding member. To enhance the compatibility of different vendors' implementations of OpenGL, a suite of conformance tests has been developed to determine if a vendor's implementation of OpenGL conforms to the specification. The Compaq implementation of OpenGL has passed all tests required of a conformant implementation of OpenGL Version 1.0, GLX Version 1.1, and OpenGL Utility Library (GLU) Version 1.2.

OpenGL is packaged as a set of dynamic shared libraries against which an application is linked. The shareable images are activated at run-time as needed.

OpenGL supports a wide variety of 2D and 3D functionality, including:

- Graphics primitives
 - Points
 - Lines
 - Polylines
 - Fill area
 - Triangle strips
 - Triangle fans
 - Quadrilateral meshes
 - Trimmed and untrimmed NURBs (nonuniform rational B-splines)
- Object properties
 - Line type and width
 - Color
 - Character attributes
- Viewing and transformation operations
- Rendering styles
 - Flat shading
 - Smooth shading
 - Hidden line hidden surface removal (HLHSR)
- Advanced rendering features
 - Antialiasing
 - Texture mapping

- Alpha blending
- Transparency
- Accumulation buffers for effects such as depth of field, motion blur, shadows, and fog

Character Fonts

Compaq Open3D includes a series of stroke precision character fonts. These character fonts were digitized by Dr. Allen V. Hershey of the Naval Surface Weapons Laboratory, and supplied to Compaq by the National Bureau of Standards.

CONFORMANCE TO STANDARDS

The following have passed the tests required of a conformant implementation of OpenGL Version 1.0, GLX Version 1.1, and GLU Version 1.2:

- The Compaq implementation of OpenGL
- ZLXp-L and PowerStorm 3D30/4D20 servers

In addition, Compaq Open3D is designed to conform with the following standard:

X Window System Version 11 Release 6 (X11R6)

HARDWARE REQUIREMENTS

The following PCI systems are supported:

System Processor	Graphics Accelerators Supported
DIGITAL AlphaStation 200 4/100	ZLXp-L1, ZLXp-L2
DIGITAL AlphaStation 200 4/166	ZLXp-L1, ZLXp-L2
DIGITAL AlphaStation 200 4/233	ZLXp-L1, ZLXp-L2
DIGITAL AlphaStation 250 4/266	ZLXp-L1, ZLXp-L2
DIGITAL AlphaStation 255/233	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 255/300	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20,

DIGITAL AlphaStation 400 4/233	ZLXp-L1, ZLXp-L2
DIGITAL AlphaStation 500/266	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 500/333	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 500/400	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 500/500	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 600 5/266	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 600 5/300	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 600 5/333	ZLXp-L1, ZLXp-L2, PowerStorm 3D30, PowerStorm 4D20
DIGITAL AlphaStation 600A 5/500	PowerStorm 3D30, PowerStorm 4D20
DIGITAL Personal Workstation 433au	PowerStorm 3D30, PowerStorm 4D20
DIGITAL Personal Workstation 500au	PowerStorm 3D30, PowerStorm 4D20
DIGITAL Personal Workstation 600au	PowerStorm 3D30, PowerStorm 4D20
DIGITAL Personal Workstation 433au (enhanced version)	PowerStorm 3D30, PowerStorm 4D20
DIGITAL Personal Workstation 500au (enhanced version)	PowerStorm 3D30, PowerStorm 4D20
DIGITAL Personal Workstation 600au (enhanced version)	PowerStorm 3D30, PowerStorm 4D20

Disk Space Requirements (Block Cluster Size = 1)

Disk space required during installation (files compressed): 49K blocks

Disk space required after installation (files uncompressed): 49K blocks

These figures refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options.

Memory Requirements for DECwindows Motif:

The minimum supported memory for Compaq Open3D running in a standalone DECwindows Motif environment, with both the client and server executing on the same system, is 64 MB. The memory size suggested for most typical hardware configurations, however, is more than 64 MB, depending on the system.

The system configuration and performance requirements of DECwindows Motif applications can determine the memory needed on your system as follows:

- Less memory may be required on the client system (where the software is installed and executed) if the server (component displaying the application) resides on another system.
- More memory may be required on a system where improved performance is desired or where several applications are running.

MULTIHEAD MATRIX

Multihead configurations are supported per the following chart and are subject to the PCI slot limitations of the system:

Configuration	# of Heads Supported
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**DIGITAL AlphaStation 255/233,
DIGITAL AlphaStation 255/300**

Graphics Accelerators:

PowerStorm 3D30	2
PowerStorm 4D20	2
<i>Can run a combination of PowerStorm 3D30/4D20s.</i>	

**DIGITAL AlphaStation 500/266,
DIGITAL AlphaStation 500/333,
DIGITAL AlphaStation 500/400,
DIGITAL AlphaStation 500/500**

Graphics Accelerators:

PowerStorm 3D30	3
PowerStorm 4D20	3

Can run a combination of PowerStorm 3D30/4D20s.

**DIGITAL AlphaStation 600 5/266,
DIGITAL AlphaStation 600 5/300,
DIGITAL AlphaStation 600 5/333,
DIGITAL AlphaStation 600A 5/500**

Graphics Accelerators:

PowerStorm 3D30	3 (4 if 2D only)
PowerStorm 4D20	3 (4 if 2D only)
<i>If 3 heads, can run a combination of PowerStorm 3D30/4D20s; if 4 heads, must be all PowerStorm 3D30s or all PowerStorm 4D20s.</i>	

**DIGITAL Personal Workstation 433au,
DIGITAL Personal Workstation 500au,
DIGITAL Personal Workstation 600au**

Graphics Accelerators:

PowerStorm 3D30	3 (4 if 2D only)
<i>If 3 heads, can run three PowerStorm 3D30s or three PowerStorm 4D20s; if 4 heads, must be all PowerStorm 3D30s.</i>	
PowerStorm 4D20	3
<i>Can run three PowerStorm 3D30s or three PowerStorm 4D20s.</i>	

**DIGITAL Personal Workstation 433au (enhanced version),
DIGITAL Personal Workstation 500au (enhanced version),
DIGITAL Personal Workstation 600au (enhanced version)**

Graphics Accelerators:

PowerStorm 3D30	3 (4 if 2D only)
<i>If 3 heads, can run three PowerStorm 3D30s or three PowerStorm 4D20s; if 4 heads, must be all PowerStorm 3D30s.</i>	
PowerStorm 4D20	3
<i>Can run three PowerStorm 3D30s or three PowerStorm 4D20s.</i>	

SOFTWARE REQUIREMENTS

The following software is required to run Compaq Open3D Version 4.9B:

- OpenVMS Alpha Operating System Version 7.2-x, or later
- DECwindows Motif Version 1.2-5 or 1.2-6 for OpenVMS Alpha

Compaq Open3D Version 4.9B requires the following language for the development of applications and programs that use Compaq Open3D on OpenVMS Alpha:

DEC C Version 5.6 or higher for OpenVMS Alpha

OpenVMS Alpha Tailoring

The following OpenVMS Alpha components are required for full Compaq Open3D functionality:

- OpenVMS Alpha required save set
- Network support
- Programming support
- OpenVMS Alpha workstation support

GROWTH CONSIDERATIONS

The minimum hardware and software requirements of future Compaq Open3D versions may differ from the requirements of the current version.

DISTRIBUTION MEDIA

This product is distributed on the OpenVMS Alpha Software Library Package CD-ROM (order number QA-03XAA-H8).

Online documentation only is distributed on the OpenVMS Alpha Online Documentation Library CD-ROM (order number QA-4KM8A-G8). Binaries only are distributed on the OpenVMS Alpha Software Products Library CD-ROM (order number QA-4KL8A-A8).

These library packages contain the Compaq Open3D software binaries and online documentation in Bookreader and PostScript format. The Compaq Open3D documentation is also available in printed form, which can be ordered separately.

ORDERING INFORMATION

- Software License Compaq Open3D: QL-0ADA*-AA
- Software Library Package CD-ROM: QA-03XAA-H8
- Software CD-ROM kit: QA-0ADAA-H8
- Software Documentation Compaq Open3D: QA-0ADAA-GZ
- Software Product Services Compaq Open3D: QT-0ADA*-**

* Denotes variant fields. For additional information on available licenses, services, and media, refer to the appropriate price book.

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