Introduction 1

The Solaris® PEX™ package contains the Sun Microsystems implementation of PEXlib and PEX Server extension; PEXlib is an industry standard 3D graphics application program interface (API) library for accessing PEX; PEX is a protocol extension to the X Windows protocol for supporting distributed 3D graphics.

The current release of Solaris PEX PEXlib has PEX 5.1 support, and it has a performance enhancement for applications running locally.

The current release of Solaris PEX server has PEX 5.1 support, and it is a dynamically loadable, shared-object module that is automatically loaded when the first PEX protocol request is received by the OpenWindows X11 server.

The Solaris PEX server is a *display server*—that is, it generates and controls the display on which your application draws 3D graphics. The application program that specifies the drawing may or may not be running on the same machine as the server. If the application and server are running on the same machine, your application is running *locally* (that is, "non-networked"). If the application and server are running on different machines, your application is running *remotely* (that is, over a network).

It is important to recognize the context in which the term *server* is used in this document. When we refer to the Solaris PEX server, we mean the display server, *not* a traditional application server or file server. In fact, we typically refer to the application that sends PEX requests to a Solaris PEX display server as a *client*. This is consistent with the X Window System™ usage of the terms *server* and *client*.

PEXlib and the server extension:

- Operate in the Solaris environment
- Provide networked access to 3D graphics in the OpenWindows X11 server
- Provide a compliant PEX 5.1 implementation
- Provide support for Common Open Software Environment PEX 5.1 extensions
- Provide the Evans & Sutherland and Hewlett-Packard double-buffering escape extensions
- Provide additional Sun extensions through PEX Escapes, GDPs and GSEs
- Provide support for Independent Hardware Vendors's (IHV's) frame buffers via the Sun Open Graphics Initiative (OGI)

Note – The PHIGS Workstation subset is not supported in this release.

Environment Variables Used by Solaris PEX

SUNPEX_DIRECT_ENABLE

This environment variable is applicable when running PEXlib applications locally, that is, on the same machine that the PEX server is running. Setting this environment variable enables PEXlib to use a direct path to the graphics capabilities on your machine without having to pass through the PEX protocol interface to the server. The PEX protocol interface requires that PEXlib encode your application data, and that the PEX server receiving it decode it. Hence, setting this environment variable before running your application (locally) eliminates the overhead associated with encoding and decoding data, and may result in improved performance. In addition, several performance enhancements have been added to the direct path, therefore; in certain circumstances, it is possible to realize a substantial improvement in performance by setting this environment variable.

SUNPEX_USE_VERTEX_COLOR

When *PEXSetSurfaceInterpMethod* (or *PEXSetBFSurfaceInterpMethod* for back-facing facets) is set to *PEXSurfaceInterpNone*, i.e. when shading is turned off, the PEX specification dictates that graphics primitives be rendered using the color of the first vertex, the facet color (if vertex color data is not present), or the context's surface color (if neither vertex nor facet color data is present). However, on GX and GX+ type framebuffers, when shading is turned off, primitives are rendered using the context's surface color, while the vertex and facet colors of the primitive are completely ignored. The user can force PEX to select the primitive color in accordance with the PEX specification by setting this environment variable. Note that there is a performance trade-off involved here, and that setting this environment variable may adversely affect performance.

SUNPEX_XGL_ERROR_DETECT

This environment variable enables or disables additional PEX server internal error checking. When this environment variable is set, additional error checking tests are executed as part of any PEX call and additional diagnostic error messages may be generated. Otherwise, the additional error checking tests are not performed. Note that there is a performance trade-off involved here, and that setting this environment variable may adversely affect performance.

SUNPEX_MAX_STRUCT_DEPTH

This environment variable can be used to set the maximum levels of structure hierarchy that PEX can traverse. The default value is 1024.

Colormap Flashing

In order to avoid colormap flashing, it is recommended that a standard colormap defined in the standard colormap properties be used. The CGE color utilities included in the CGE example directory assumes that the `RGB_DEFAULT_MAP` property contains an entry for all the PEX supported visuals. Solaris PEX only supports PseudoColor visuals on 8-bit devices. To ensure that there is an entry for the PseudoColor visual in the `RGB_DEFAULT_MAP` property, run *xstdcmap -default* from the X startup script.

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PHIGS Workstation Subset (PWS) Deprecation

This version of Solaris PEX does not support the PHIGS Workstation subset of PEX. Users are encouraged to port their existing PHIGS workstation subset applications to the immediate mode subset or the structure rendering subset.

Execution Requirements

To run Solaris PEX, your system needs the following:

- The most current releases of Solaris operating environment and OpenWindows.
- The most current release of XGL

To install Solaris PEX, refer to the *Software Developer Kit Installation Guide*.