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EXIT:
A 3D STANDARD FOR X (FINALLY!)

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So did anything really important happen to the X Window System in the last year or two? I think so.

But let me make it clear that I don't mean what was merely "announced" – no, I mean what actually happened. Computer industry executives are fond of standing on stages to announce common initiatives. Typically, the group announces either:

Something obvious like "The Internet is important and exciting." *–or–*

Something unlikely such as "Unix will be unified."

Attempts to unify Unix have become as predictable as springtime. For X, the CDE initiative promised the desktop equivalent of Unix unification.

The realization of a Common Desktop Environment (CDE) for X has been slow coming. In the last year, the technologies that have most transformed the X and Unix workstation desktop are the world-wide web and the variety of digital media – things CDE says nothing about. And with the blitz from Microsoft known as Windows 95 & NT, workstation vendors are searching for differentiation these days; desktop commonality won't cut it.

While CDE and its ilk are high profile and grab headlines, a concerted and sustained effort is what really makes things happen. There is often little fanfare accompanying such efforts.

So what happened? What's so important?

The good news is that every major X vendor has now embraced OpenGL, the fastest standard 3D graphics interface available. While DEC, IBM, and Silicon Graphics embraced it from the beginning, Sun belatedly licensed OpenGL last August; HP did the same in September.

The long-term benefits are enormous. For the first time, developers can write 3D applications with a single, portable 3D programming interface. Hardware designers now have a concrete model upon which to base their hardware designs. Hardware like the 3Dlabs GLINT chip and recently announced Silicon Graphics hardware scream when running OpenGL. With OpenGL, competitive 3D graphics benchmarks actually make sense. Students and professionals can learn and apply 3D graphics without worry that they are learning or investing in the "wrong" standard.

For all intents and purposes, OpenGL is the 3D standard for the X Window System. Of course, it took some time to get to this point. For the last few years, 3D support for X arguably suffered due to the competition between the PEX and OpenGL

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standards.

At the same time, this competition played an important role in focusing OpenGL's standardization. OpenGL made the clear decision to *not* subset OpenGL's aggressive 3D functionality, to provide a complete sample implementation, and to guarantee conformance using a standard test suite. These actions were undertaken largely to avoid the pitfalls that hindered PEX's adoption.

It also forced OpenGL to live up to the "open" in its name. OpenGL's Architectural Review Board (ARB) actively promotes the standard and makes the OpenGL specifications and the group's minutes available to the public via the Internet. Since its inception, the ARB's membership has expanded with Intergraph and Evans & Sutherland joining the board. Future memberships by HP and Sun are being actively pursued. And, the ARB continues to actively develop the OpenGL standard with GLX 1.1, GLU 1.2, and numerous standard extensions already adopted. As of this writing, the release of the OpenGL 1.1 and GLX 1.2 specification is nearing completion.

OpenGL has also benefited from consistent marketing and positioning. The OpenGL interface is not limited to only X. Implementations for OS/2, Windows NT & 95, and the Macintosh are all available. An investment in OpenGL makes sense no matter what operating systems you use. Also, OpenGL is strengthened by Open Inventor, an object-oriented 3D toolkit that renders via OpenGL.

When you look to purchase new X terminals and workstations, make sure they support OpenGL and demand the fastest performance available in your price range. That way you'll have vital visualization capabilities on your desktop. If you program, find out about OpenGL. A free implementation of the OpenGL API called Mesa is available via the Internet. Mesa is written by Brian Paul at the University of Wisconsin. With it, you can learn OpenGL programming today even without accelerated 3D hardware. When the fancy hardware arrives, you'll be ready for it.

The common wisdom today is that X is "mature" and basically a finished standard. I don't buy it. Within the last year, I now have a way to write a single application that can run on any X vendor's hardware using the single fastest 3D graphics standard with all the network extensibility I expect from X.

You didn't read about it on any magazine cover and executives didn't stand together on a stage to announce it, but X now has a single standard for 3D graphics – and that's exciting.