

*X3D-PEX (PEX): 3D GRAPHICS IN
A DISTRIBUTED WINDOW SYSTEM*

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**X3D-PEX (PEX): THREE-DIMENSIONAL
GRAPHICS IN A DISTRIBUTED WINDOW
SYSTEM**

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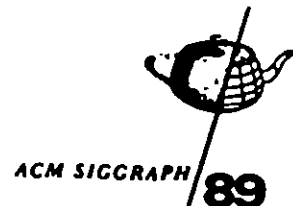
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PEX Introduction and Overview

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Disclaimer:

This document has not been thoroughly reviewed by the PEX Architecture Team. I have attempted to document at a higher level the current consciousness that defines the PEX extension. Due to a lack of a proper review cycle within the PEX Architecture Team, this document may still contain material where differences of interpretation exist. Nevertheless, I am releasing it at this point because the Architecture Team believes that the majority of information is correct, and that it is more important to make this document available to the public immediately than to hold it up for a thorough Architecture Team review cycle. It is anticipated that this document will eventually be "blessed" by the PEX Architecture Team. The PEX Protocol Specification and Encoding Document currently comprise the definition of the PEX extension. It is hoped that over time, all necessary semantics described herein but absent from the current PEX protocol document will be added to the protocol definition. Alternatively, at some point this document may get Architecture Team approval as part of the definition of the PEX extension. Until then, this document should not be construed to be a definition of the PEX extension, but as an aid to understanding it.

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1. Introduction

PEX (a PHIGS/PHIGS+ Extension for X) is a 3D graphics extension to the X Window System† that efficiently supports PHIGS and PHIGS+. PEX is designed to provide a network transparent 3D graphics interface across a range of workstation products with raster graphics capability.

This document is an attempt to explain the behavior of the PEX server extension from the point of view of a client sending protocol requests. The descriptions in this document complement those found in the *PEX Protocol Specification*⁷ document by presenting a more global view of the operation of the PEX extension. Furthermore, the descriptions in this document are intended to be conceptual in nature; a PEX implementation is free to implement the functionality in many different ways, as long as the apparent effect of a request remains the same. This document is specifically not intended to be a description of the implementation architecture of a PEX server extension, nor is it intended to be a description of how a PHIGS/PHIGS+ library would be implemented on top of PEX.

PEX is designed to extend the capabilities of X by providing 3D graphics functionality within the X Window System's client/server model.^{4,6} The display is controlled by a process known as the *server*. The client application communicates with the server via a byte stream. The application and server processes can therefore run on two separate host machines and communicate over a network connection. A client-side library of interface routines can then be used to communicate to the X server's PEX extension. The byte-stream protocol for PEX is described in the *PEX Protocol Specification*⁷ and the *PEX Protocol Encoding Document*.⁵

PEX is designed to efficiently support PHIGS¹ and the stable functionality enhancements to PHIGS known as PHIGS+.³ PHIGS and other graphics standards products² play a key role in the computer graphics marketplace. Applications written using these standards are easily ported to many different types of hardware. PEX is intended to serve as a foundation for efficient implementation of these graphics standards in the X Window System environment.

This interface is proposed as a standard 3D graphics extension for the X Window System. Since this has many and far-reaching implications, additional suggestions, thoughts, comments, and criticisms are welcome.

† The X Window System is a trademark of MIT.