XME: X Modular Event System

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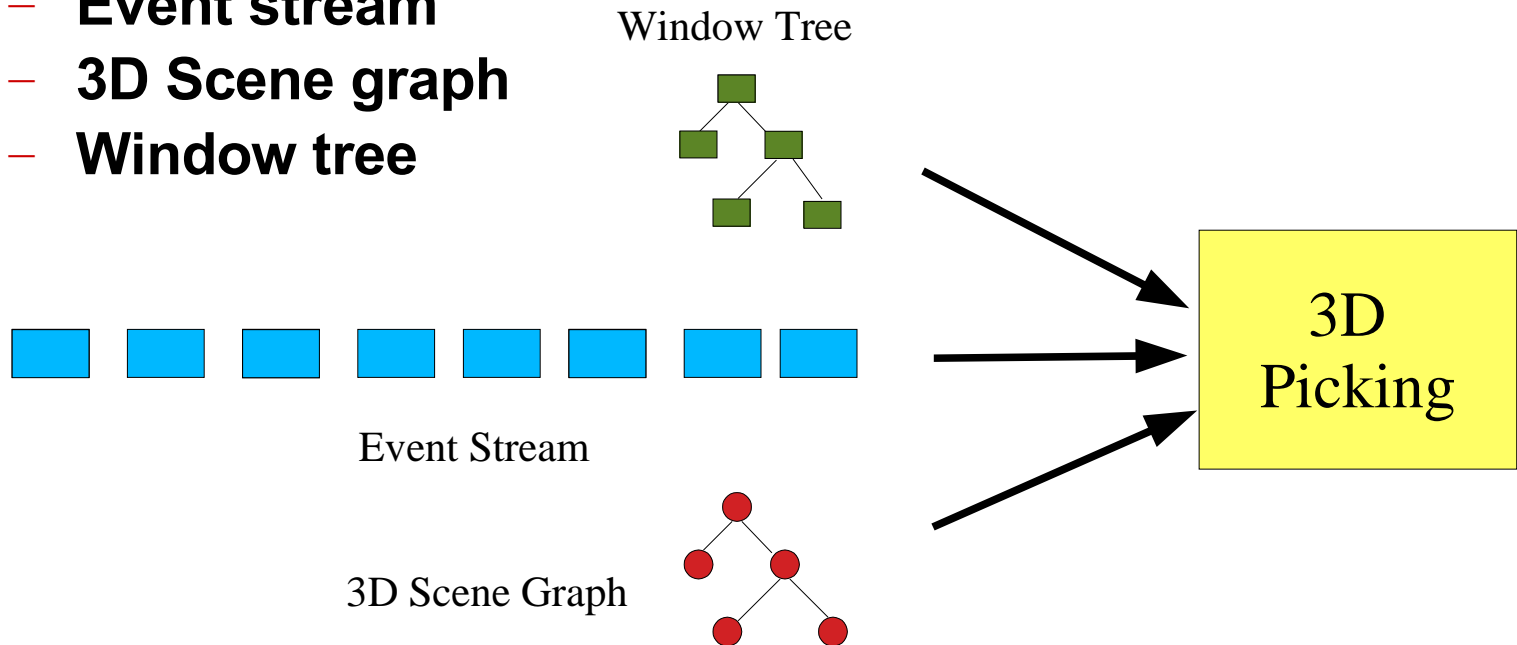**Project Looking Glass**
Sun Microsystems

What is XME?

- **A modular event system for X**

- **Runs in either:**
  - **The X server, or**
  - **A special client: the Event Manager client**

- **Based on X server dix/events.c,grabs.c**

- **Modular: clearly identified inputs and outputs.**

- **Uses X server code for exporting:**
  - **Window tree**
  - **Grab requests**

Why Bother?

- ## Some clients need more control over the event stream
  - ### Example: 3D window systems (Looking Glass, Croquet)

- ## Need to bring together in one place:
  - ### Event stream
  - ### 3D Scene graph
  - ### Window tree

Window Tree

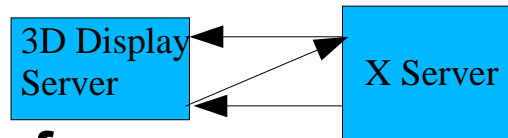Event Stream

3D Scene Graph

3D Picking

Why Bother?

- **Also: Need unified 2D/3D grabs**
  - **If a 2D client grabs: captures device events even if over a 3D object**
  - **If a 3D client grabs: captures device events even if over a 2D object**
  - **Requires all grab processing to be performed in one place**

Alternative Approaches

- ## Scene graph in X server
  - Downside: Challenging to shoehorn a multithreaded system into aggressively single threaded X server.

- ## "Z Model"
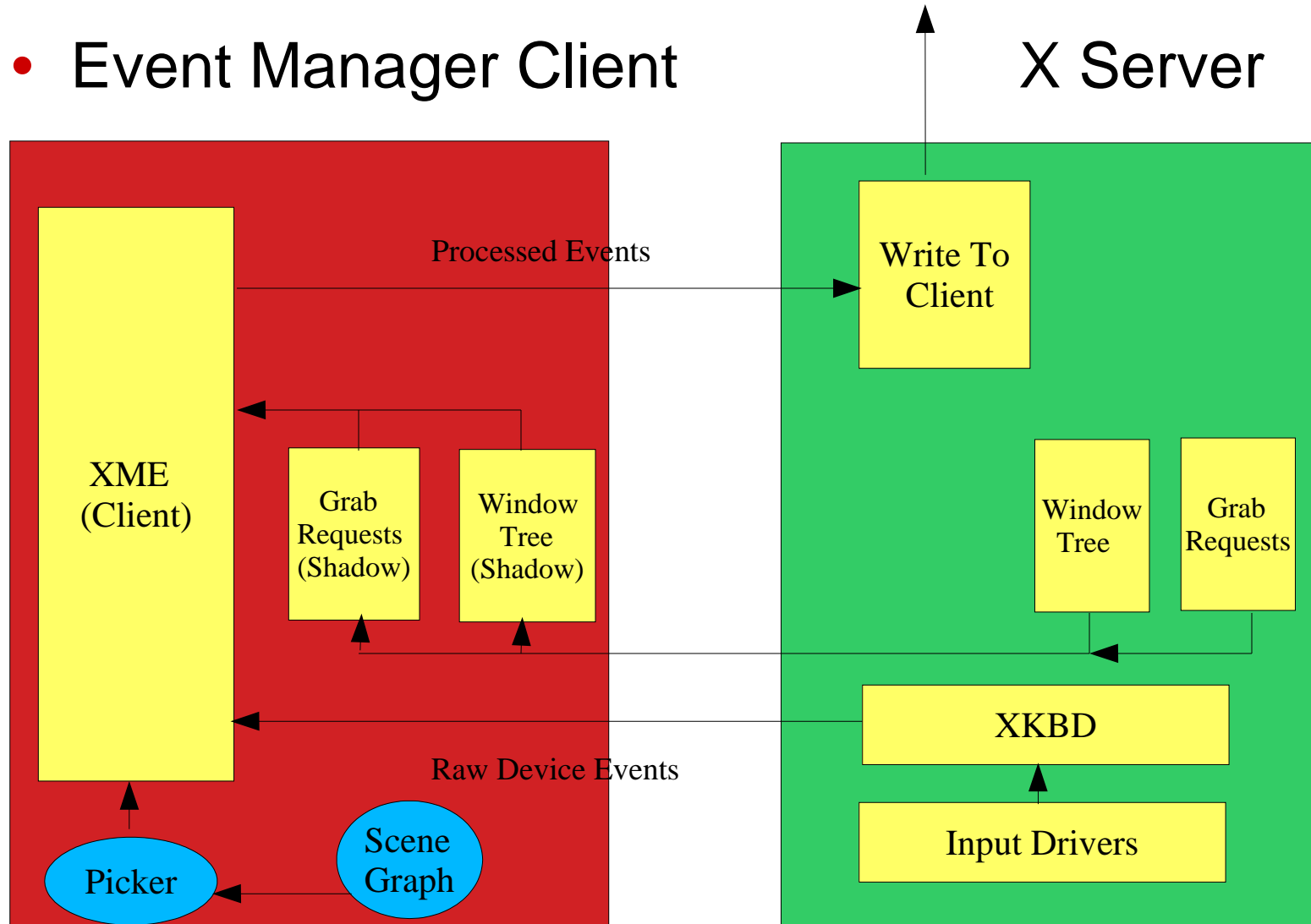
3D Display Server ⟷ X Server

  - Downside: Performance
    - Requires 2 pick operations
    - Event path is convoluted
    - Gratuitous context switches

- ## Shared Memory Downsides
  - Scene graph: Huge code change
  - Window tree: Lock waits block X server
  - Both: Synchronization: Event/window synchronization isn't exactly the same as in the normal X Server

Solution: XME

- Event Manager Client

X Server

Processed Events

Write To Client

XME (Client)

Grab Requests (Shadow)

Window Tree (Shadow)

Window Tree

Grab Requests

XKBD

Raw Device Events

Input Drivers

Picker

Scene Graph

Status

- **Proof-of-concept Implementation**
    - **Standalone Event Manager client**
    - **Runs GNOME**
    - **Runs Mozilla**
    - **Needs more debugging, but a good start.**

Futures

- **Integrate into Looking Glass**
  - **Could also be integrated into Croquet.**

- **Add XINPUT support.**

- **Unified code base -> Easier maintenance**
  - **Building X server and Event Manager client from same code base would reduce duplication**

- **Keith's Input Redirection**
  - **XME could Input Redirection use for input**
  - **Input Redirection clients could use XME to avoid implementing their event manager from scratch.**
  - **Useful if semantics are similar to X server**

- **Distant Future:**
  - **Input drivers + XKBD move into Event Manager client**

Quick Update on Project Looking Glass

- **Open Source Project Established**
  - **http://lg3d-core.dev.java.net**

- **Release 0.61 shipped**
  - **Focus: most X apps now work**

- **A LiveCD version is in the works**

- **Next major release: June 2005**
  - **Focus: X Performance, 3D applications**

- **Come join us!**