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X Server Design

The design of an X server depends greatly upon the platform (hardware) and operating system on which it is implemented. As the capabilities of the underlying technologies increases, the power and capability of the X server also increases.

Device Dependent Layer

- It is this layer that is responsible for localizing the X server to the native environment, be it Windows NT or Solaris.
- This layer swaps bytes of data from machines with differing byte ordering. Byte ordering (MSB and LSB) is noted in each X request.
- This layer hides the architectural differences in hardware and operating systems.
- Maintains device driver dependencies for Keyboard, mouse and video.

Environment Architectures

- **Single Threaded Architecture** - The X server is a single sequential process using the native time-slice architecture for scheduling demultiplexing requests and multiplexing replies, events and errors among X clients.
- **Multithreaded Architecture** - The X server is a multithreaded process capable of exploiting the nature of the operating system by breaking jobs into multiple threads for the operating system and hardware to perform. True pre-emptive multitasking, multithreaded environments offer a high degree of power for the X server.

Today's X Servers

Workstations

- powerful enough to handle complex computing requirements.
- usually display local X clients and a small percentage of network (remote) X clients.

X Terminals

- Dumb terminals with graphics capability.
- Download X Server software from host.
- Less expensive than workstations - simpler to maintain.

PC X Servers

- integrate PC and remote application server access into one common desktop.
- leverage existing PC investment and user skill sets (desktop manipulation and access)
- flexibility - local or remote window management at the user's preference.
- ease of use

Over the last several years the desktop has evolved from a productivity or user-centric environment to one focussed on centralized administration surrounded by the adaptation of Web protocols and a browser based user interface. The latest release of the X Window System from X.Org - X11R6.4 - has addressed the issues of integrating X applications and browsers enabling rapid deployment without re-coding and security.