- ....
- NeXTSTEP Mac OS X ....
- Project Looking Glass 3D ....
- Windows ....
- Linux ....

Wayland

Linux Wayland Wayland X
Compositing Window Manager

Stacking Window Manager

Windows 3.11

Desktop Metaphor
" " "

"" 800x600   \(800 \times 600 \times 3 \approx 1.4 \text{MiB}\)
30Hz 30FPS CPU   \(1.4 \times 30 = 41 \text{MiB}\)   VESA   \(25 \text{MHz} \times 32 \text{bits} = 100 \text{MiB/s}\)
Windows 3.1 1MBCPU

1.
2.
3.

X11 twm XP Windows Mac OS
Windows XP
hack

NeXTSTEP Mac OS X

....

NeXTSTEP
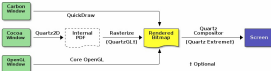
Windows PC Macintosh Jobs
NeXTSTEP Mac OSX

NeXTSTEP GUI X Windows
NeXTSTEP   Display PostScript (DPS)
(Display) PostScript PostScript

DPS   Mac OS X Mac API
(carbon) Adobe Display PostScript
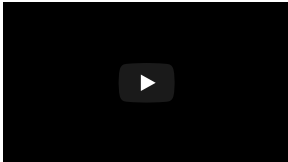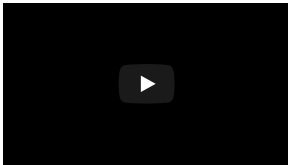Mac OS X Quartz PDF

Mission Control

Mac OS X   20013 Mac OS X
v10.0

Mac OS X v10.2 Quartz Extreme
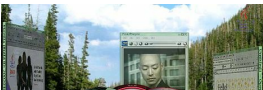20031 Mac OS X v10.3 Exposé (Mission
Control)

Mac OS X Exposé

Project Looking
Glass 3D

2003   Linux Solaris
Java3D   Project Looking Glass 3D LG3D
Google Project Glass

LG3D

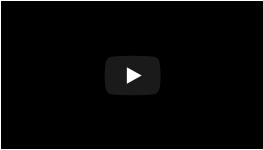LG3D　LG3D　Mac OS X

Wayland　LG3D

LG3D　GPL　　　　LiveCD　　　12
VirtualBox　LiveCD ......

Exposé　2003623 Apple
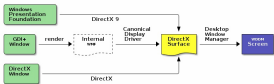Worldwide Developers Conference　LG3D
200385 LinuxWorld Expo

Windows

Longhorn　Wobbly

Windows　XP　Mac OS X
Windows　2003 Project Longhorn
wobbly　Windows Vista　　　　　　　　Desktop Window
Manager (DWM)　DWM　Mac OS X

Mac OS X　Windows Vista　Win32API
GDIGDI+ Longhorn　WPF　WPF
DirectX　WPF　DirectX　GDI
DirectX　GDI　　　　　　Windows Metafile (WMF)
WMF　Mac OS X　Quartz　PDF　NeXTSTEP
　DPS WMF　Canonical Display Driver
(cdd.dll)　DirectX　DWM DWM　CDD
　DirectX

WPF　C/C++　Windows　Office
2007　Ribbon　C/C++　.Net　WPF
　OS X　Objective-C　Cocoa API　Quartz

DirectX　Windows Vista　WDDM
DirectX　Windows XP　DirectX
　DirectX　　WDDM　Vista
DirectX　DirectX　DWM　DWM
DirectX　DirectX

DWM　　　　　　　　　　　　　　DWM　DirectX
GPU

DWM　Vista　Windows 7　　　Aero Glass
　Flip 3D Aero Peek　Windows 8
Windows 8　Modern UI

Linux

Linux　X　Wayland　X