

XCWM:
The X11 Composite
Window Manager Library

Jess VanDerwalker

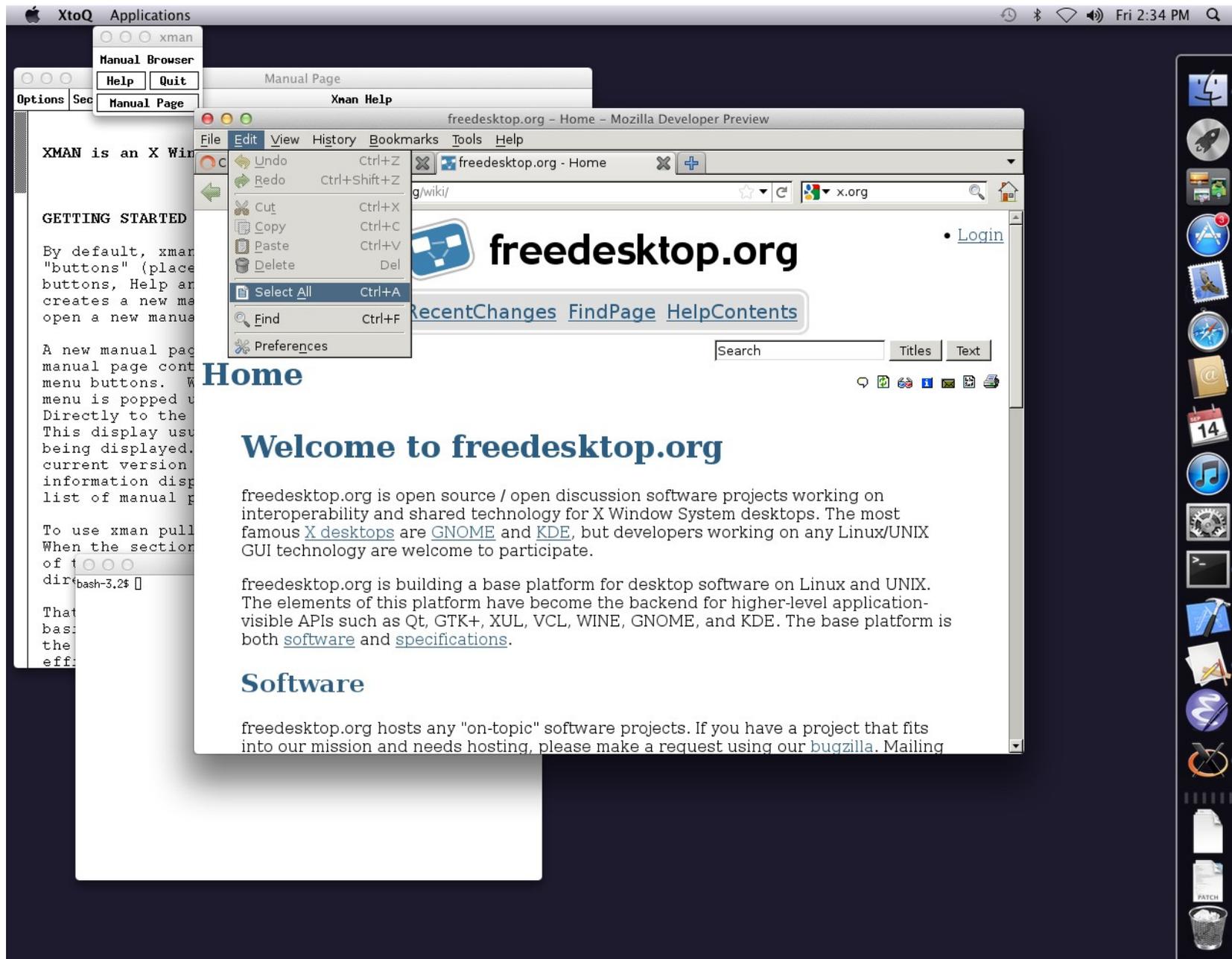
Background

- Portland State University Capstone project
 - Original team:
Ben Carr, Ben Huddle, Aaron Skomra,
Braden Wooley, Jess VanDerwalker
 - Sponsors:
Jamey Sharp
Josh Triplett - XCB development
Jeremy Huddleston Sequoia - XQuartz

XCWM Goals

- API that allows display of X11 clients in non-X environments
- Increase code reuse and improve maintainability
- Lead to deprecation of specific DDX's in server code base
- XCB as interface to X protocol
- DAMAGE and Composite extensions

XtoQ



Where we are...

- Basic window manager functionality
- Support for a subset of ICCCM and EWMH protocols
- Functional mouse and keyboard input
- Support for override-redirect windows

Basic functionality

XCWM:

- Create and maintain data structures
- Catch and process X events, pass to WM code
- Catch and process WM events, pass to X
- Provide access to data

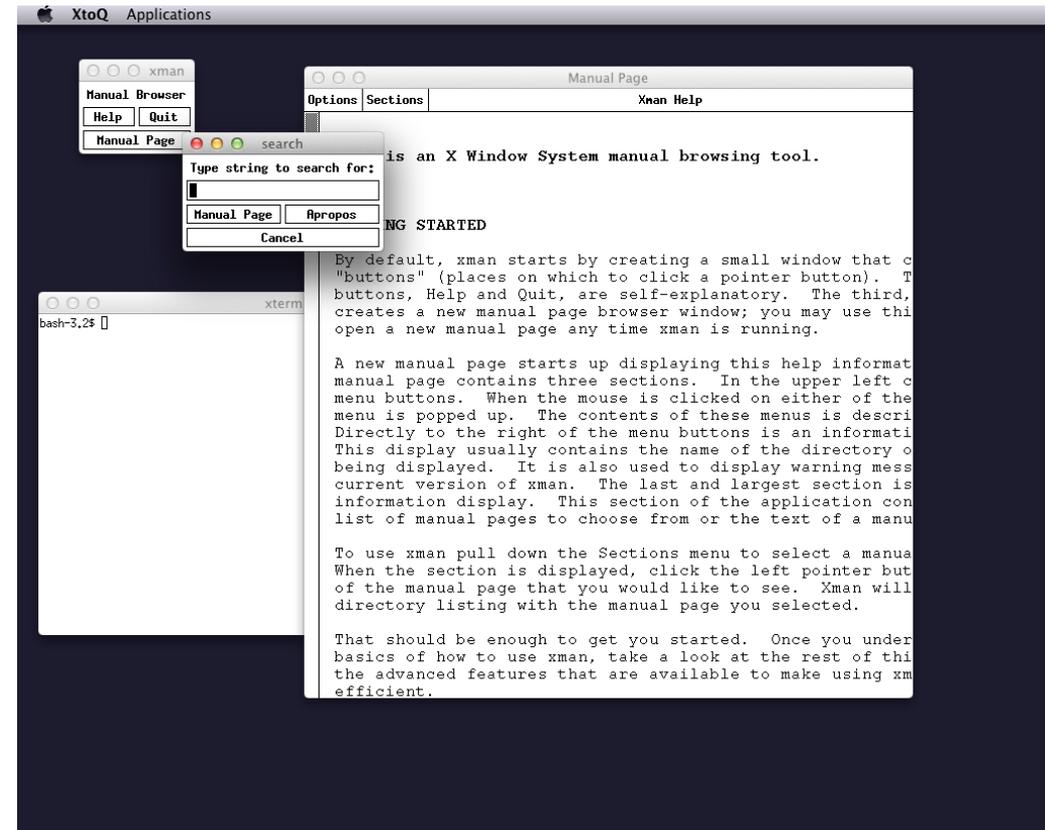
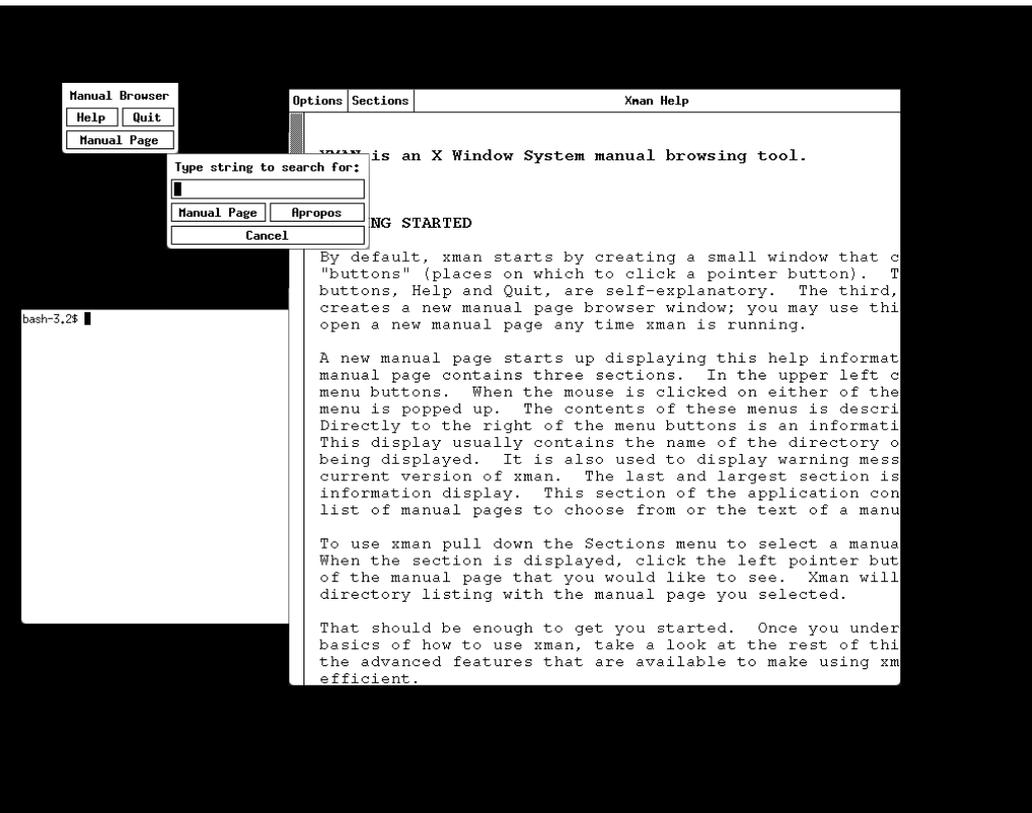
Window Manager:

- Render X client pixmaps with native decorations
- Respond to XCWM events, update windows accordingly
- Pass local window events to XCWM

Basic window management

dummy driver

XtoQ



Event handling

From X:

- while loop with `xcb_wait_for_event()` running in separate thread
- Events passed to WM through WM provided callback function

From WM:

- Passed to X through XCWM function calls
- WM provides asynchronous dispatching if necessary

Client window mapped

XCB_MAP_NOTIFY
received from server

Determine if window
is being managed

Query attributes
of window

Send window created
event through callback

- size
- position
- override-redirect
- WM_NAME
- WM_SIZE_HINTS
- _NET_WM_WINDOW_TYPE
- ...

XCWM

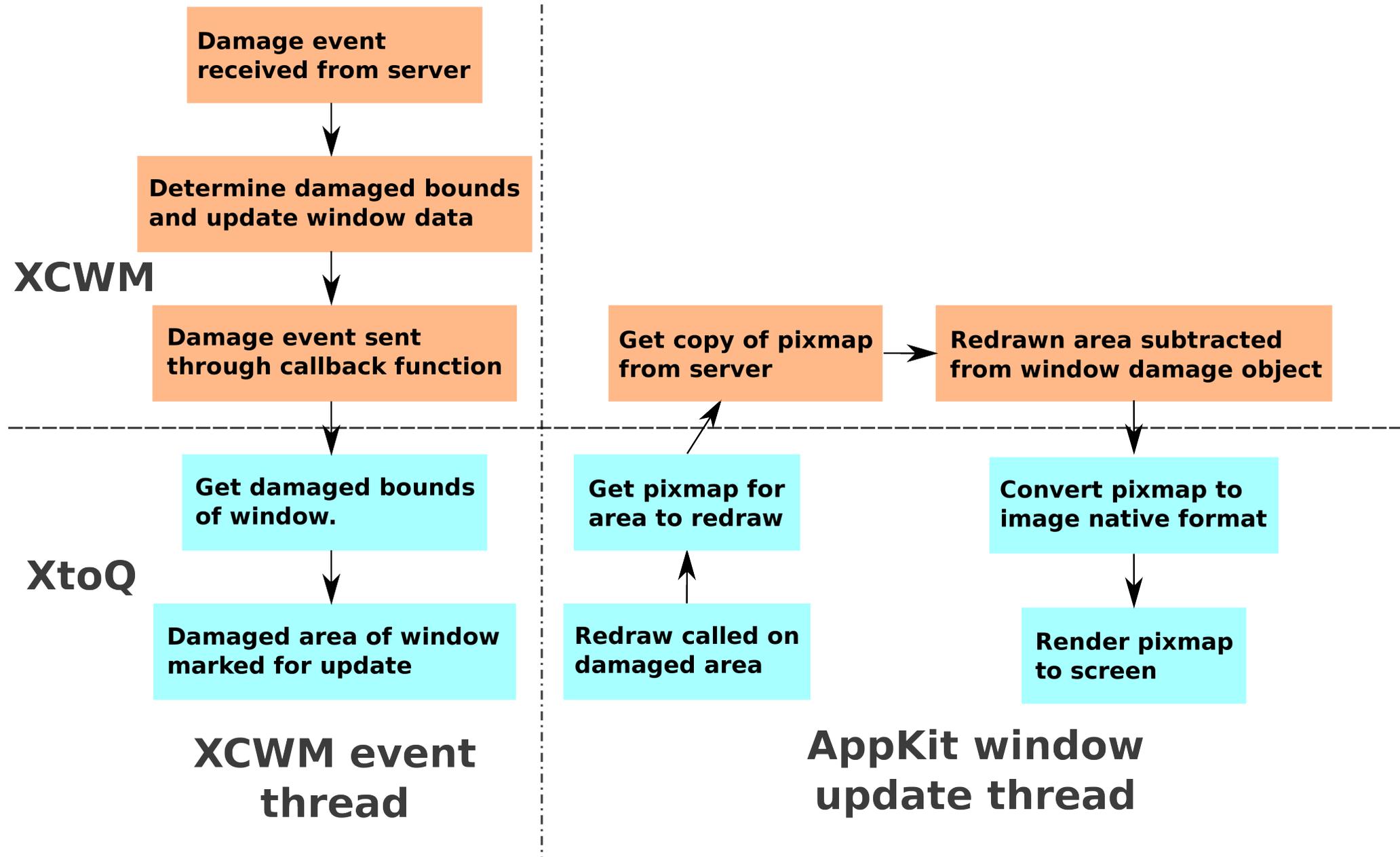
XtoQ

Query window attributes
through accessors

Create NSWindow
based on attributes

Render new window
to screen

Damage event and window update path



Keyboard and mouse input

Input event caught
by AppKit

Event type
determined

XCWM handler called using
asynchronous dispatch

XtoQ

XCWM

XTEST call to
inject input event

Server

Determine input
destination client
from focused window /
mouse position

Future work

- More ICCCM / EWMH protocol support
- Rethink event loop
- XtoSomethingElse
- Replace XTEST

Want to contribute?

XCWM git repository:

<http://cgit.freedesktop.org/xorg/lib/libxcwm/>

Contact:

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