Cross Platform Support in Tk

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Tcl/Tk Workshop '95

Tk Today

- **Works with most X servers**
- **Tk tied closely to X features in C API**
  - Of course, uses X API extensively
  - X event model, subwindows, etc.
  - Send command uses X for communication
- **Tk tied closely to X in Tcl interfaces as well**
  - wm protocol; etc.
  - X font names
- **Mac & Windows users clamor for Tk!!!**

Porting Goals

- **Use native Look & Feel**
  - Widgets, default bindings, default colors, etc.
- **Free implementation**
  - Can't use commercial packages
- **Make cross platform scripts easy to write**
  - Scripts should not require conditionals
  - Must write to a portable subset
  - Raise the level of the interface

Schedule

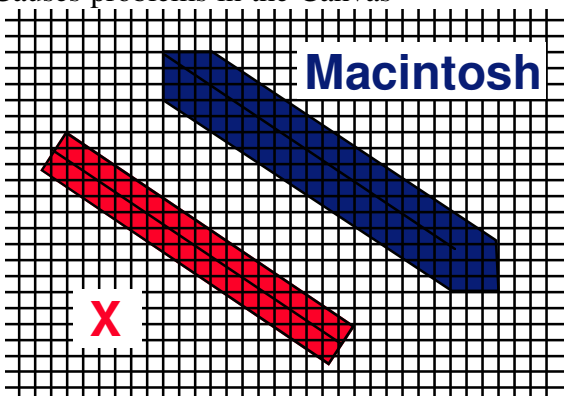
- **Alpha release later this summer**
  - Based on Tk 4.0, Motif Look & Feel.
  - May not be feature-complete: stipples, send
- **Native Look & Feel early next year**
  - Properly written scripts should run on each system and generate the native look & feel for each system.
- **Closer integration with Native Platform > 1yr.**
  - Support for VBXs, Tcl as OSA component, etc.
  - Support may mostly come from Third Parties

Overview of the Issues

- **Drawing Models**
- **Native Look & Feel**
- **Common Dialogs**
- **Indirect Bindings**
- **Menus**
- **Fonts**

Drawing Models

- **Mac, Windows & X have different drawing models**
  - Causes problems in the Canvas



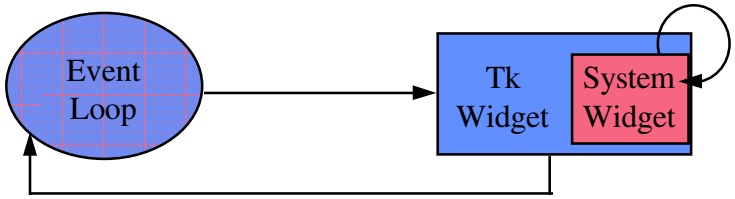
Drawing primitives & X

- **Need cross platform drawing API for extensions**
- **Short term solution**
  - Develop a subset of X for each platform
  - API is a mix of emulated X calls and Tk calls
- **Long term solution**
  - Extend the Tk C API to the point where extensions do not need to use X calls.

Native Look & Feel Support

- **Hard to get Look & Feel 100% right with emulation**
- **Need to track changing OSs**
  - Certain extensions can change look now
  - MacOS plans to have "adjustable" look
  - Windows 3.1, NT, Windows95 all look different
- **Use system widgets**
- **Difficult to get expected Tk behavior**

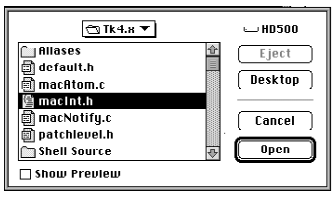
How do you wrap a system widget?

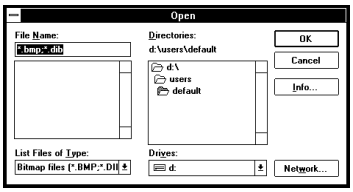


- **System widget may contain its own event loop.**
  - Wrapper may generate Tk events
  - Windows API allows control subclassing
  - Macintosh provides callback hooks
- **Each widget class may have to be done differently.**

Common Dialogs

- **For some interface components, look & feel of individual widgets isn't enough.**





- **Provide a higher-level interface to common dialogs.**
- **Tcl call will generate different dialogs on each system.**
- **Supply missing dialogs for each system**

Indirect Bindings

- **Binding directly to specific keys is non-portable.**
  - Example: Pasting from the clipboard.
    - » Command-v or F4 for Mac
    - » Control-v for Windows
    - » Middle button, L8 or Control-y for UNIX
- **Use indirection in bindings.**
  - Use symbolic name like SysPaste
  - Keep separate mappings for each platform
  - Define a default set of names for common actions

Menus

- **Different systems put menu bars in different places**
  - Mac puts menus at the top of the screen
  - Windows puts menus at the top of each window
  - X uses no consistent strategy
- **Let Tk decide where to put the menu buttons**
  - New abstraction: Menubar
  - Mac: the global menubar should change when a new toplevel becomes the active window
  - Windows & UNIX: the menubar is attached to each window

Fonts

- **The X names are too X-specific (and ugly!).**
  - » -adobe-times-bold-i-normal--10-100-75-75-p-57-iso8859-1
- **Create font object .**
  - » font create body -family Helvetica -size 12 -style {bold italic}
  - » text .t -font body
- **Font requests should never fail.**
  - – Map missing fonts to existing fonts.
  - – Scale fonts. Emulate styles.
  - – Allow for platform specific features.

More Info

- **The paper & these slides**
  - – ftp://www.smli.com/pub/tcl/doc/
    - » portable-tk.ps
    - » portable-tk-slides.ps
- **Tcl/Tk home page**
  - – http://www.smli.com/research/tcl
  - – http://www.smli.com/people/raymond.johnson
  - – http://www.smli.com/people/scott.stanton