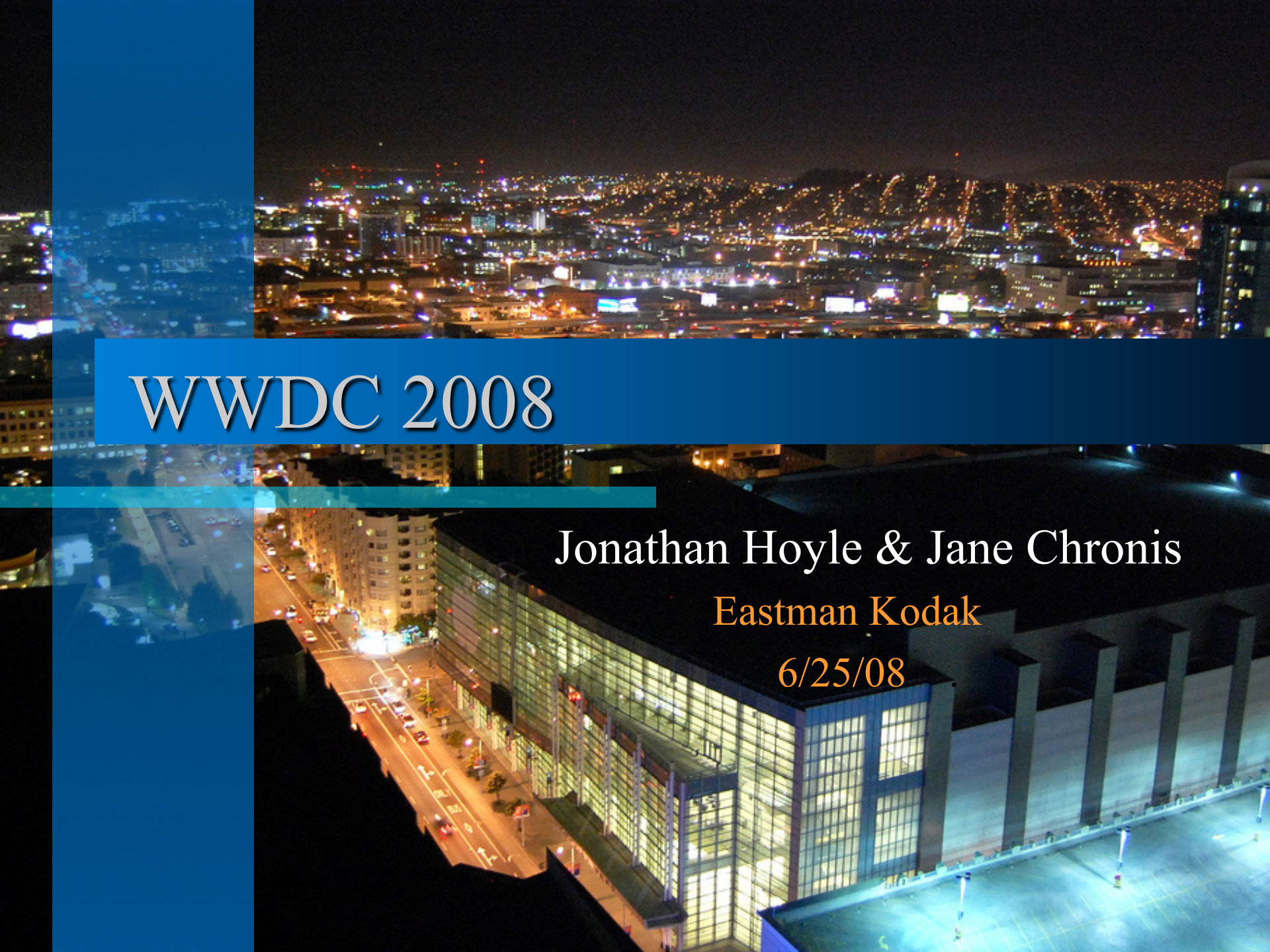


WWDC 2008

Jonathan Hoyle & Jane Chronis

Eastman Kodak

6/25/08

WWDC 2008

- 1st sell-out in conference history
- 5,200+ WWDC attendees
- Over half are 1st time
- >1000 Apple engineers
- 147 sessions, 169 labs
- 8 simultaneous tracks

WWDC Growth

- Four straight years of record attendance
  - 2005: 3800+
  - 2006: 4200+
  - 2007: 5000+
  - 2008: **5200+**
- Engineers, QA
- IT, Sys Admins
- Managers

WWDC Special Events

- Keynote
- ADC Reception
- Design Awards
- Stump the Experts
- Apple Party

Steve Jobs Keynote

- Concentrated on iPhone
  - 3G iPhone
  - iPhone SDK 2.0
  - Price reductions
  - New countries
- .Mac replaced by MobileMe
- Snow Leopard after lunch

ADC Reception

ADC Reception

Apple Design Awards

Stump the Experts

- Q: On the logic board for the PowerMac G4 Mirror Drive Door, in the space between the ATA-33 and ATA-66 bus connectors, there are pads for three parts that are not included on the production board. What are the names used on the logic board below these empty spaces to describe these parts?
- What is this sound?
- Which Apple software product mentions the "APPLE-81" computer?

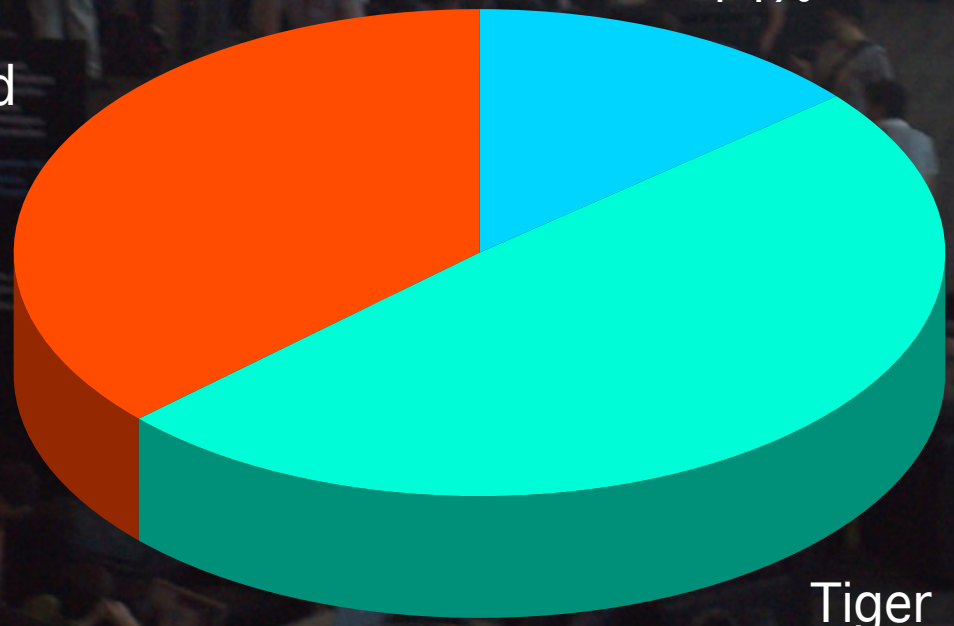
Apple Party

Apple Party

Technology Report

- Snow Leopard
- Xcode 3.1
- Multicore programming
- 64-bit kernel
- Bonjour
- Printing
- Scanning
- Airport

Current Mac OS X Share



Mac OS X 10.6 Snow Leopard

- Intel-based Macintoshes only
- No new user-level features
- Significant concentration on performance
- New API's: OpenCL, Grand Central
- Improve frameworks of current features
- Snow Leopard Developer Goals:
  - Completely Carbon-free code
  - Compile apps for Intel 32/64
  - Compile drivers,plugins 3-way fat (no PPC 64)

Xcode 3.1

- Xcode 3.1 runs in 10.5 or 10.6
- Xcode 3.1 has three compilers:
  - gcc 4.2 (default)
  - gcc 4.0
  - LLVM (new optimized code generator)
- Each is binary compatible with gcc 4.0
- gcc 3.3 is now officially dead
- Additional languages for Cocoa

gcc 4.2 Features

- OpenMP
- Optimizations, dead code elimination, etc.
- Weak linking to frameworks:
  - Dynamic linking at runtime
  - If framework missing, fcn ptrs return NULL
- Better security:
  - Stack canaries
  - Object size checking for libraries
- Snow Leopard was built with gcc 4.2

LLVM Features

- Most gcc 4.2 features (partial OpenMP)
- 3-way binary compilation (no PPC 64)
- High Tech optimizer & code generator
- Link-time optimizations
- Two front ends:
  - gcc 4.2
  - Clang (2-3X faster)
- LLVM is open source (Apple contributor)

Cocoa "Language Neutrality"

- Objective-C (native)
- Ruby
- Python
- AppleScript (no Cocoa Bindings)
- Cocoa/Java de-supported
- Each has complete Xcode and Interface Builder 3.1 support
- Samples in `/Developer/Examples`

Multicore Programming

- In general very difficult:
  - Creating/managing pthreads & mutexes
  - Cocoa's *NSOperation* not much better
  - How many cores do you have? 4? 8?
- Two new solutions in Snow Leopard:
  - OpenMP (C/C++/cross-platform standard)
  - Grand Central Dispatch (Cocoa/10.6 only)
- Dynamically determines # threads, etc.
- Each requires Xcode 3.1/gcc 4.2

OpenMP Example

- We wish to parallelize this loop:

```
for (k = 0; k < numItems; k++)
    z[k] = x[k] + y[k];
```

- Simply insert these two *#pragma*'s:

```
// parallelize this loop
#pragma omp parallel shared(x,y,z,chunk) private(k)
{
    #pragma omp for schedule(dynamic,chunk) nowait
    for (k = 0; k < numItems; k++)
        z[k] = x[k] + y[k];
}
```

64-bit "Top to Bottom" *for real…*

- WWDC 2007 Steve Jobs: "Mac OS X 10.5 Leopard is fully 64-bit *Top to Bottom*"
- Not true: Leopard kernel remained 32-bit
- Snow Leopard has 32/64-bit kernel
- Completely transparent to applications
- Drivers, Kexts, etc. must be ported to K64
- These should be compiled 3-way fat (no PPC 64, since Rosetta is 32-bit only)

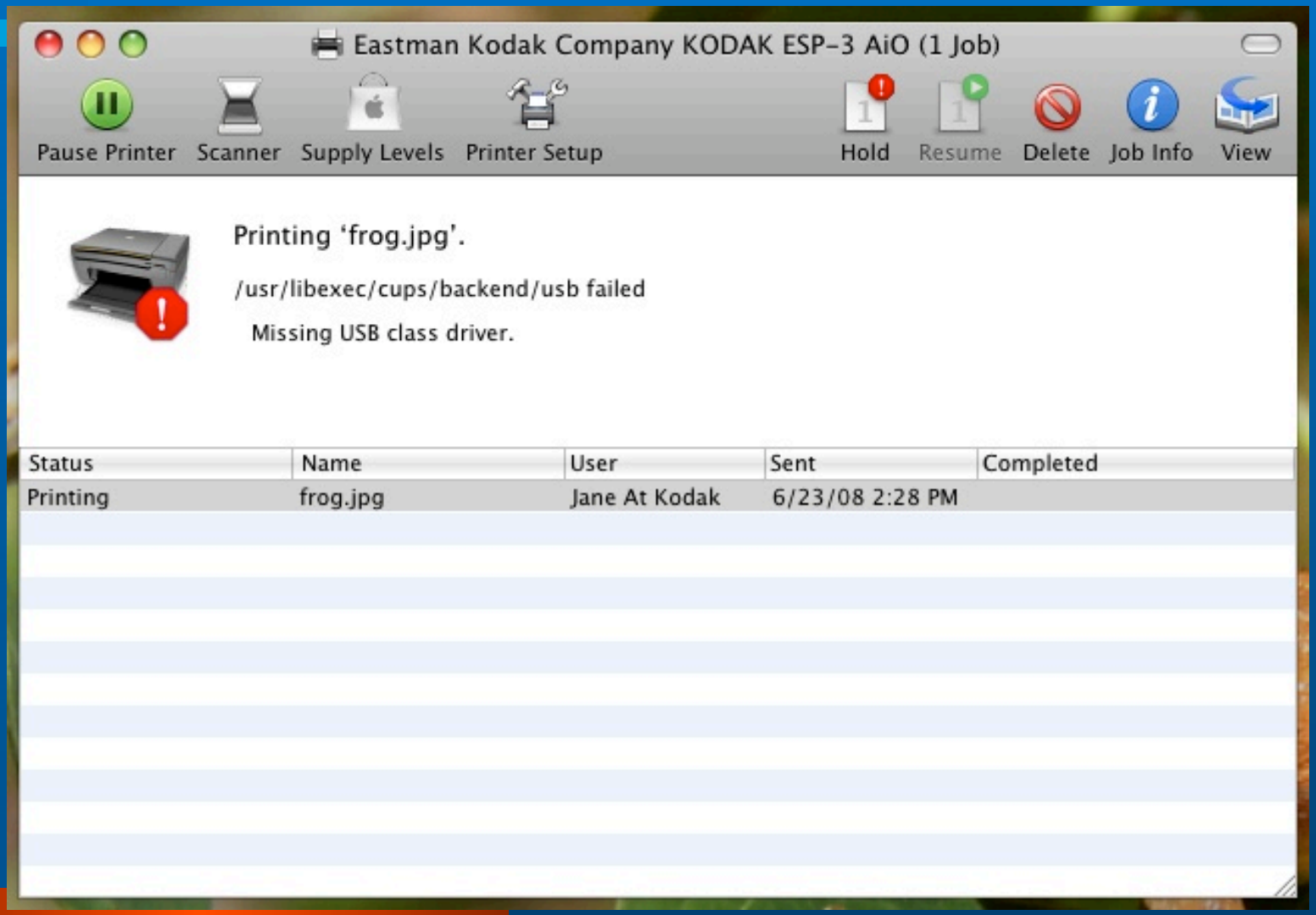
Bonjour

- AppleTalk is officially dead in Snow Leopard
- Three Bonjours API's available in 10.6:
  - NSNetServices (Cocoa/Objective-C based)
  - CFNetServices (Core Foundation/C-based)
  - `dns_sd.h` (lowest level/cross-platform)
- Names do ***not*** have to be unique!
- No refresh button: give user live updates
- Use windowed lists, not pull-down menus
- Expect multiple users from a single host

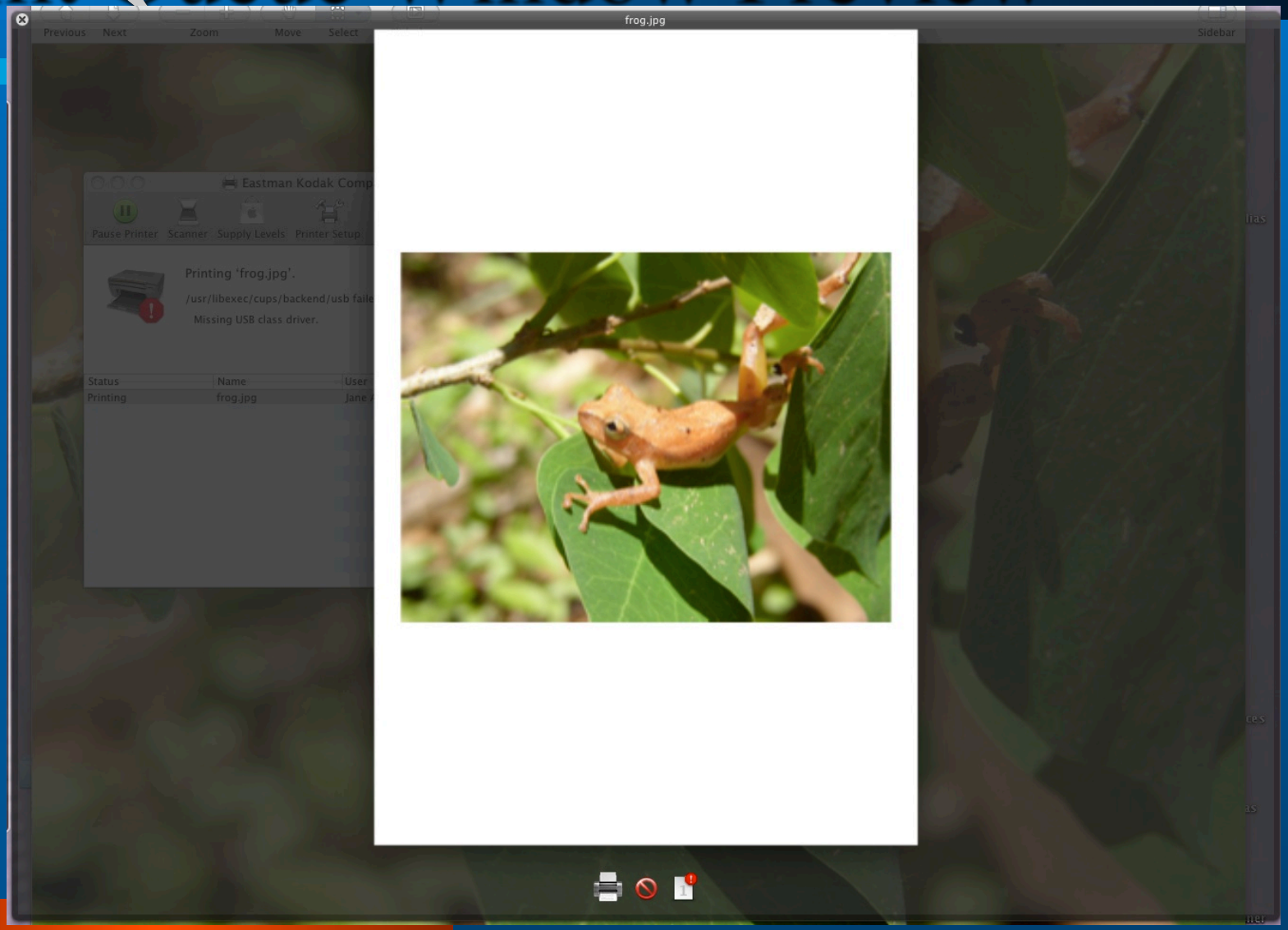
Printing in Snow Leopard

- Deprecated
  - AppleTalk is gone (use Bonjour)
  - Tioga drivers and Carbon PDE headers are removed, though “well-written” existing drivers will run.
- Architectures
  - All components 32/64-bit Intel
  - For PDE’s, add 32-bit ppc (Rosetta) and be garbage-collection aware for all architectures

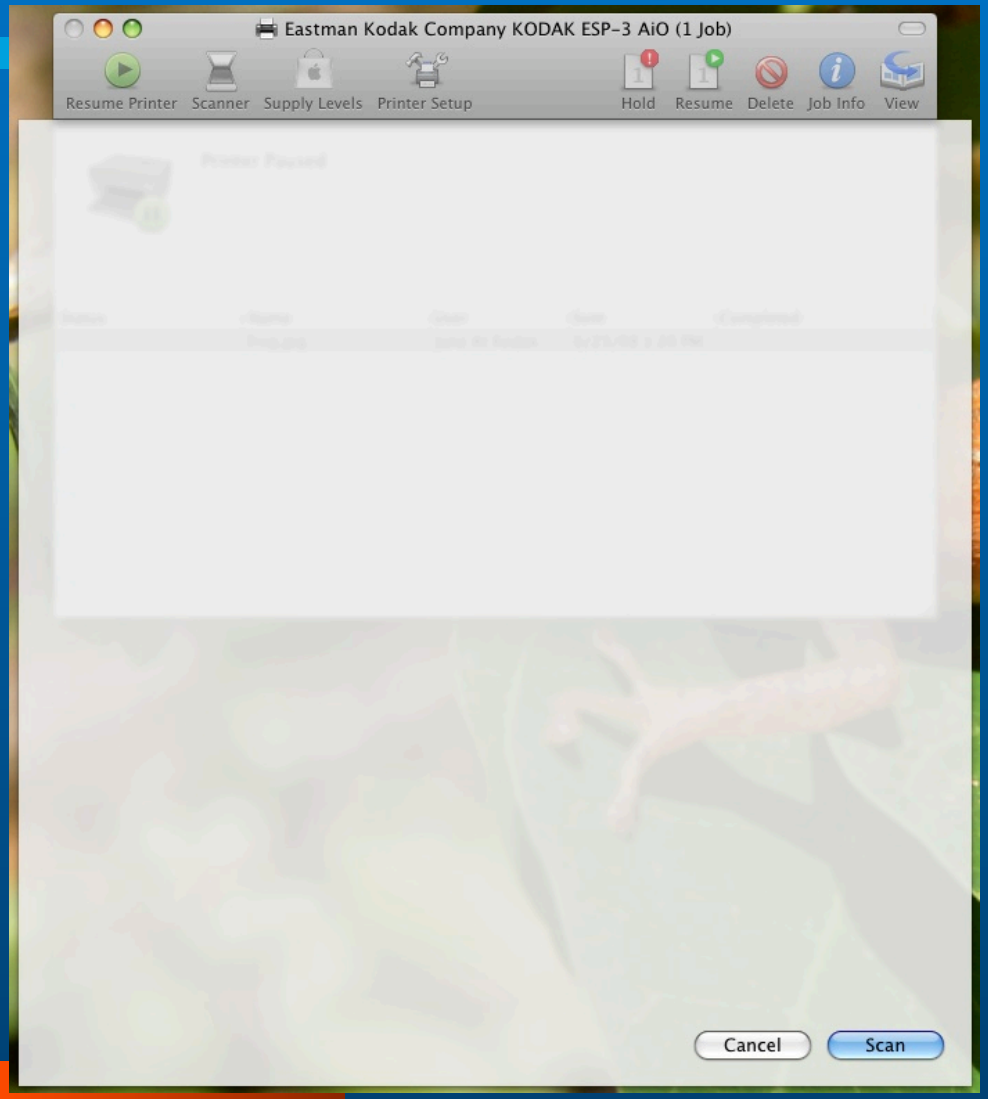
Print Queue Window



Print Queue Window Preview



Print Queue Scanning



CUPS in Snow Leopard

- CUPS 1.4
- CUPS DDK
- Validation w/ cupstestppd
- Standard API for printer utilities to run stuff through CUPS instead of directly through IOKit.
- Preview of queued jobs
- Sandbox - security improvements - Limited read/write access to file system (may hurt data collection!)

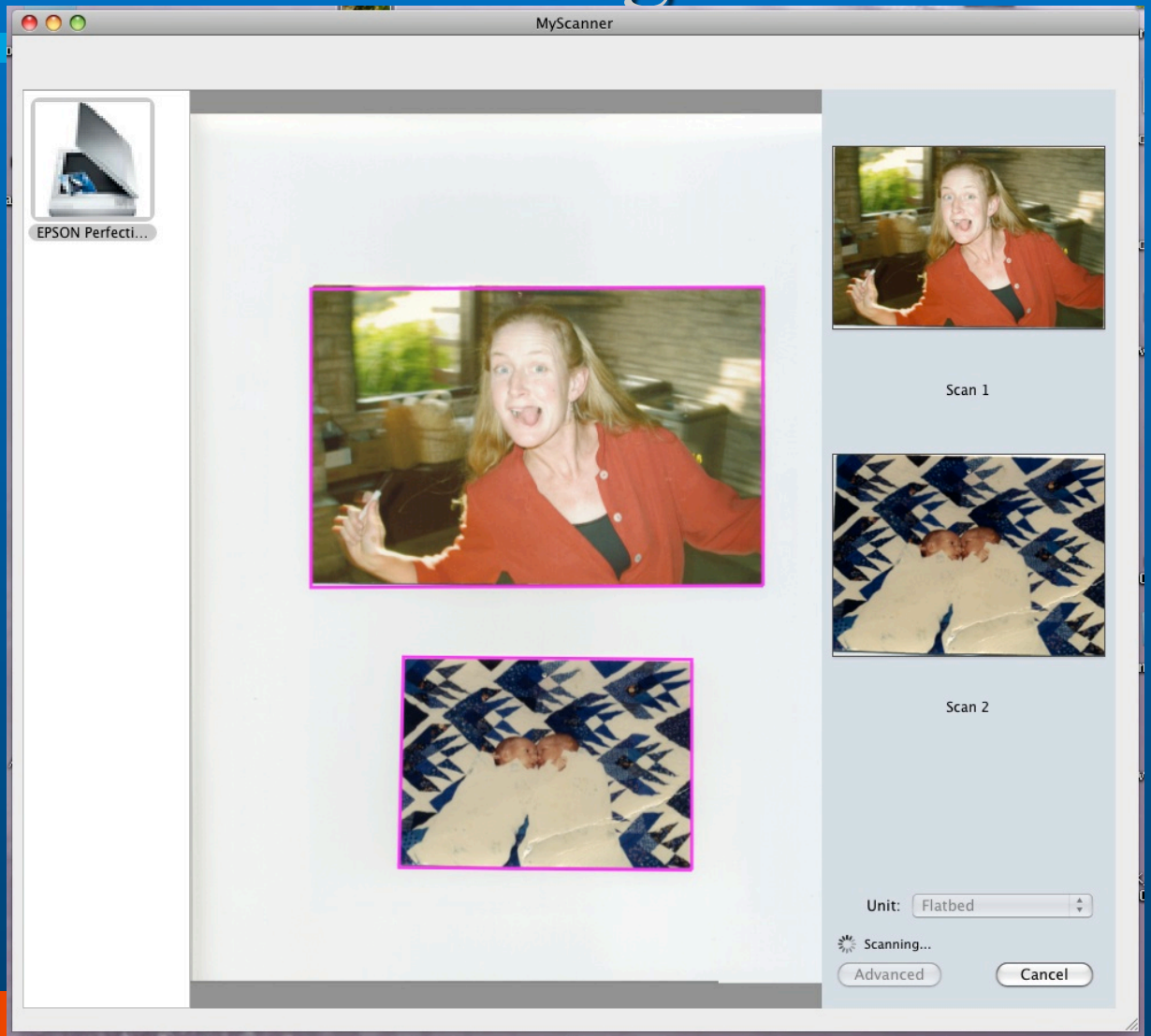
Scanning

- PDFKit (lab question)
  - Easy ability to make multi-page PDF docs (no OCR) in OS 10.5 and above.
- Network Button-listening (lab question) – 3 alternatives offered
  - Register Scan Host capability in Snow Leopard (for *"smart"* devices which can display a choice to user)
  - Dedicated host for the printer (protocol host-to-host)
  - 3 ??
- Advancing bias for ICA over TWAIN drivers

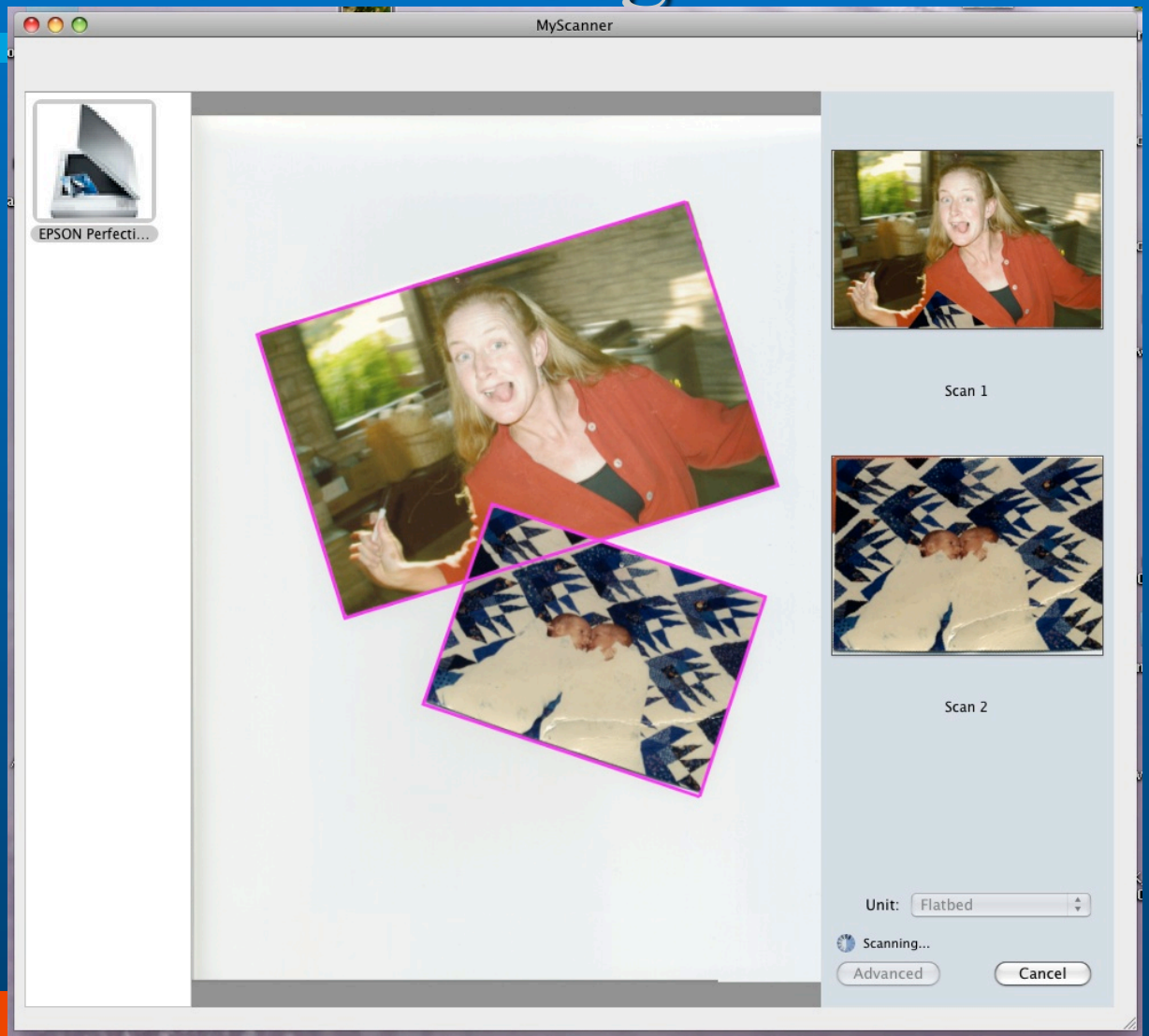
Cocoa Image Kit / Image Capture

- New Framework “ImageCaptureCore”
  - ICDeviceBrowser
  - ICDevice
    - ICScannerDevice
    - ICCameraDevice
- New Quartz (ImageKit) classes
  - IKDeviceBrowserView
  - IKScannerDeviceView
  - IKCameraDeviceView

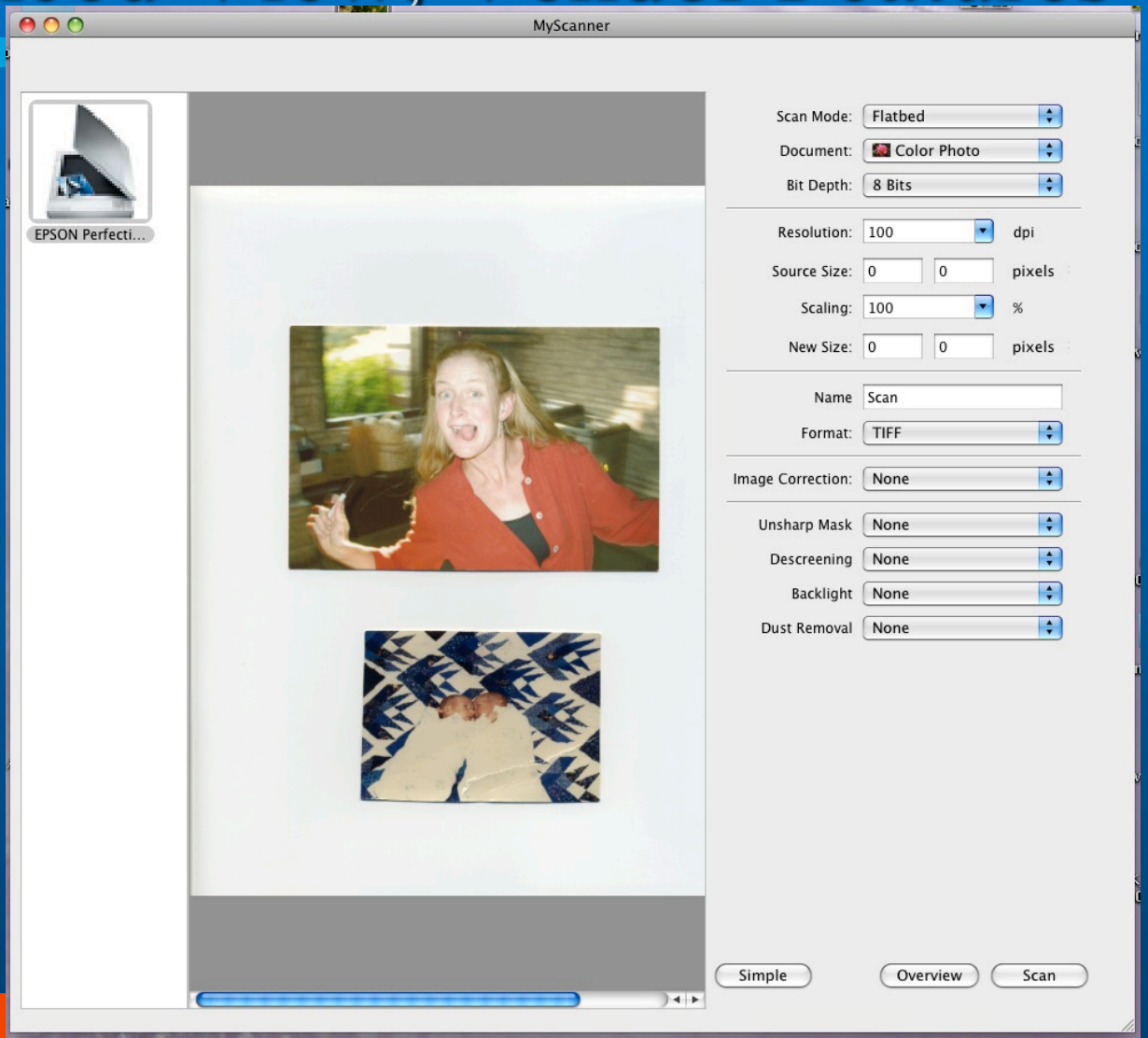
Demo IKScannerDeviceView – Simple View with Segmentation



Demo IKScannerDeviceView – Simple View with Segmentation



Demo IKScannerDeviceView – Advanced View, Vendor Features



Kodak Current State

- Using TWAIN driver with customized UI with segmentation, cropping, image adjustments, and Kodak Perfect Touch
- No standalone app or access from Home Center, but fairly easy to do
- Good usability from Photoshop
- Lousy usability from Apple's Image Capture application.

ICA Questions

- Do we hop on the ICA bandwagon? (Will others use the features? What about Photoshop?)
- Segmentation AND custom vendor features?
- Segmentation – theirs vs ours?
- Image enhancements – theirs vs ours? (KPT has never looked right on the Mac, but we think we can fix it)
- Rendering custom image enhancements in the preview (“Overview”)

Airport

- New Airport API in Snow Leopard
- Obtain network info from base station
- Signal & noise
- Command the Airport to perform a scan
- Connect to a network
- Query about a USB connected device
- Get/Set Airport preferences
- Listen for Airport Events

Q & A