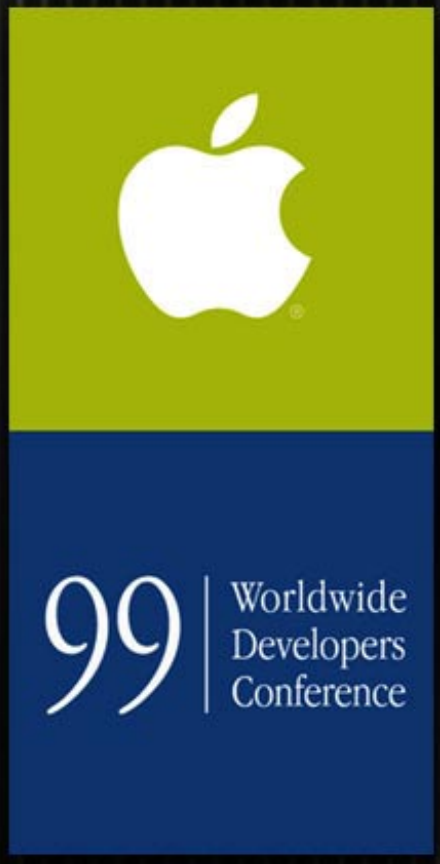
Welcome

To Advance through Presentation
Use Page Up and Page Down Keys



File Manager Changes in Mac OS 8

Mark Day

Mac OS 8 File Manager Limit Buster

348

8169

Big Changes Are Coming

About This Session

- New APIs with New Functionality
- Application Compatibility

HFS Plus APIs

- An extension of current APIs
- In Carbon

New Functionality

- Unicode filenames
- Files (forks) larger than 2GB
- Multiple forks
- New catalog info
- Getting info “in bulk”

Works on All Volume Formats

- Applications can use the new APIs
- No checking if a volume implements them
- HFS and HFS Plus directly implement APIs
- Can be implemented by external filesystems
- Emulation layer for other volumes

Emulating the New APIs

- Volumes have the same old limits
  - 2 GB files
  - 31 byte names (single script)
  - 2 forks
  - Current catalog info fields

Unicode in the APIs

- Passed as 16-bit Unicode
- Inputs passed as length and pointer
- Outputs returned as a structure
- Composed or decomposed
    - Converted automatically
    - May be returned differently

Unicode Filenames

- Filenames up to 255 characters
- No pathnames
    - Too big
    - Don’t uniquely identify a volume
    - Break if file is moved or renamed
- FSSpec replaced by FSRef

FSRefs

- Identify files and directories
- Opaque data structure
- Only for objects that exist
- Runtime, not persistent
- Behavior in between FSSpec and File ID
- Get them from APIs
- Converting between FSSpec and FSRef

Creating a File

```
OSErr           err;
FSCatalogInfo   catalogInfo;
FSRef           theRef;

catalogInfo.finderInfo.fileType = 'TEXT';
catalogInfo.finderInfo.fileCreator = 'Surf';
catalogInfo.finderInfo.finderFlags = kIsStationery;
err = FSCreateFileUnicode(
    parentRef,
    nameLength, name,
    kFSCatInfoFinderInfo,
    &catalogInfo,
    &theRef);
```

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Files (Forks) Over 2GB

- Signed 32-bit offset replaced by signed 64-bit offset
- Mac OS 8 implementation limit of 2TB
- Carbon on Mac OS X supports over 2TB
- Uses 16-bit file reference numbers
- Cannot mix old and new APIs on the same refnum

Multiple Forks per File

- Files and directories
- Only supported by some volume formats
- Not supported on HFS Plus initially
- Identified by Unicode name
- New APIs to create, delete, iterate

New Catalog Info

- Dates in UTC
- Two modification dates
- Last access date
- Permissions
- 64-bit sizes (data and resource fork)
- Filename's text encoding

Catalog Info APIs

- Individual fields are optional
- Filename (in Unicode)
- FSRef
- FSSpec

Getting Info “In Bulk”

- Return multiple files or directories per call
- Outputs are optional
- Returns arrays, one element per file
- Returned by CatalogSearch, too!

GetCatalogInfoBulk

```
enum { kMaxItems = 10 };
UInt32                  actualCount;

FSCatalogInfo           catalogInfos[kMaxItems];
FSRef                   fsRefs[kMaxItems];
FSSpec                  fsSpecs[kMaxItems];
HFSUniStr255            names[kMaxItems];

FSCatalogInfoBitmap     whichInfo =
   kFSCatInfoGettableInfo & ~kFSCatInfoValence;

CatPositionRec          catalogPosition;
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catalogPosition.initialize = 0;

do {
    err = FSGetCatalogInfoBulk(
            &whichDirectory,
            &catalogPosition,
            kMaxItems, &actualCount,
            whichInfo, &catalogInfo,
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            fsSpecs,
            names);

    /* do something */
} while (err == noErr);
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Application Compatibility

File Control Blocks

- New fields for HFS Plus APIs
- Current FCB table is gone

More Open Files (For Current APIs, Too!)

- The old limit was 348

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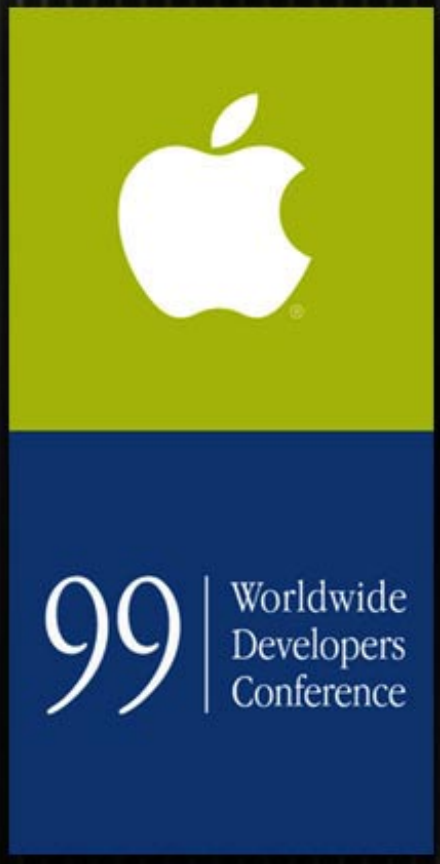
- The old limit was 348
- The new limit will be 8169
- Up to 512 font files

What You Should Do

- Use the seed releases
- Report bugs
- Use the published APIs
  - DO NOT access FCBs directly
- Check for errors when opening a file
  - permErr, afpAccessDenied
  - fsDataTooBigErr

For More Information

- Technical Q&A FL-10
http://developer.apple.com/qa/fl/fl10.html
- Guide to the File System Manager
ftp://ftp.apple.com/developer/Development_Kits/File_System_Manager.sit.hqx



Q&A

Think different.™

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