**File-System Interface**

Chapter 10 Addendum

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**a.out File Format**

Old Unix executable

- exec header
  - Load & link parameters
  - Mandatory
- text segment
  - Machine code
- data segment
  - Initialized data
- text relocations, data relocations, symbol table
  - Linker data for combine binary files
- string table
  - symbol names as strings

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**COFF**

Common Object File Format (System V, WinNT)

- Added multiple named sections in the object file
- Added a debug data format
- Can be loaded an any address

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**ELF**

Executable and Linkable Format (SVR4)

- Format
  - ELF header
  - 0 or more segments - execution information
  - 0 or more sections - linking & relocation information
- Segments enclose 1 or more sections
- Segments and sections are listed in a program header and section header tables
The Unix File System

Files and hard links

- i-nodes contain all file information except the file name
- Directories
  - match file names with i-nodes
  - contain at least 2 files
  - dot (.)
  - dot dot (..)
- Files may have more than one name (i.e., more than one link)
- Details are transparent to the user

Hard vs Soft Links

Unix ln (link) command

- In fred wally
- ln -s fred sid

File Protection

Different problems - different solutions

- Logical
  - Modes: read, write, and execute
- Physical
  - Hardware failure
  - Vandalism
  - Stupidity
- Disaster
  - Off-site storage