



SNS COLLEGE OF TECHNOLOGY



Coimbatore-35
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DEPARTMENT OF INFORMATION TECHNOLOGY

23CST202 – Operating Systems **II YEAR - IV SEM**

UNIT 4 – FILE SYSTEMS



FILE SYSTEMS

- ▶ File concept
- ▶ Access methods
- ▶ Directory structure
- ▶ Files System Mounting
- ▶ File Sharing
- ▶ Protection



File Types – Name, Extension

- ▶ Different file types are supported by operating systems.
- ▶ Each file type can have different extensions.
- ▶ Figure shows examples of different file types and different extensions for each file type.
- ▶ For example a source code file can have the extensions .c or .cc or .java and so on.



File Types – Name, Extension

file type	usual extension	function
executable	exe, com, bin or none	read to run machine-language program
object	obj, o	compiled, machine language, not linked
source code	c, cc, java, pas, asm, a	source code in various languages
batch	bat, sh	commands to the command interpreter
text	txt, doc	textual data, documents
word processor	wp, tex, rrf, doc	various word-processor formats
library	lib, a, so, dll, mpeg, mov, rm	libraries of routines for programmers
print or view	arc, zip, tar	ASCII or binary file in a format for printing or viewing
archive	arc, zip, tar	related files grouped into one file, sometimes compressed, for archiving or storage
multimedia	mpeg, mov, rm	binary file containing audio or A/V information



File Access Methods

- ▶ Information stored in files must be accessed.
- ▶ There are different methods to access files.
- ▶ Some systems support only one method.
- ▶ Some systems support multiple methods and the right one is chosen based on the application.
- ▶ The different methods of file access are sequential access, direct access and indexed sequential access.
- ▶ We learn each of these methods in this section one after the other.

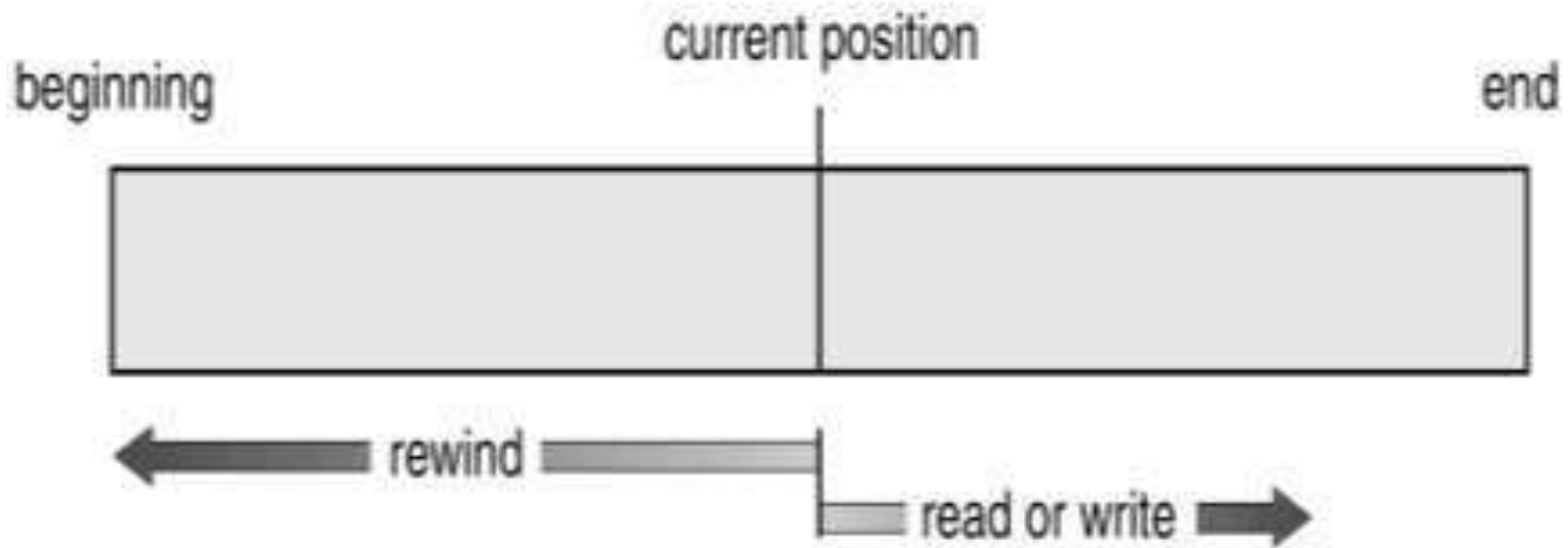


Sequential Access

- ▶ The sequential access is the simplest and the most common file access method. In this method, the contents of a file are accessed one after the other. That is, information is processed one record after another. The possible operations can be
 - ▶ read next – read the next record
 - ▶ write next – write the next record
 - ▶ reset – reset the file pointer to the initial record



Sequential Access





Sequential Access

- ▶ Figure shows the possible operations using sequential access method.
- ▶ The current file position is shown.
- ▶ From the current file position, it is possible to read the next record or write the next record or rewind back to the beginning of the file.
- ▶ Using the sequential access method, it is not possible to access any disk block in random.



Direct Access

- ▶ The direct access method is based on the disk model of the file.
- ▶ File contents are stored in disk blocks in the disk.
- ▶ Disks allow access to any random block.
- ▶ Direct access also allows arbitrary blocks to be read and written.



Direct Access

- ▶ With direct access, the following operations are possible:
- ▶
- ▶ *read n* – read the *n*th block
- ▶ *write n* – write to the *n*th block
- ▶
- ▶ *position to n* – move the pointer to the *n*th block
- ▶ *read next* – read the next block after moving to the *n*th block
- ▶ *write next* – write to the next block after moving to the *n*th block
- ▶ *rewrite n* – rewrite the *n*th block



Direct Access

- ▶ where n is the block number relative to beginning of file
- ▶ it is possible to implement sequential access using the operations used for direct access.
- ▶ Figure shows the sequential access operations and the corresponding operations in direct access method.
- ▶ Thus, it is possible to simulate sequential access on a direct file.
- ▶ But, direct access cannot be simulated on a sequential access file.



Direct Access

sequential access	implementation for direct access
<i>reset</i>	<i>cp = 0;</i>
<i>read next</i>	<i>read cp;</i> <i>cp = cp+1;</i>
<i>write next</i>	<i>write cp;</i> <i>cp = cp+1;</i>



Other Access Methods

- ▶ In another access method, an index is built which contains pointers to various blocks of the file.
- ▶ To find a record, the index is searched, and the pointer is used to access the file and the desired record.
- ▶ Searching through an index is faster.
- ▶ When the file size becomes large, the index file also becomes large.
- ▶ Therefore, to make the access faster, another secondary index can be maintained for the primary index file.
- ▶ The primary index file will have pointers to secondary index files, and the secondary index files point to blocks of the file.
- ▶ Figure shows an example of how an index file is used.



Other Access Methods

