

PORTABILITY AND STANDARDIZATION

5.4 Portability and Standardization

portability

The ability to be easily accessed by different systems and applications.

5.4.1 Factors Affecting Portability

5.4.2 Achieving Portability

File Access

- File organization is static.
- File access is dynamic.

Sequential Access

sequential access

Access of data in order.

Accessing data from a file whose records are organized on the basis of their successive physical positions.

- Sequential access processes a file from its beginning.

Sequential Access



- All operating systems support sequential access of files.
- Sequential access is the fastest way to read or write all of the records in a file.
- Sequential access is slow when reading a single random record, since all the preceding records must be read.

Direct Access

direct access

Access of data in arbitrary order, with variable access time.

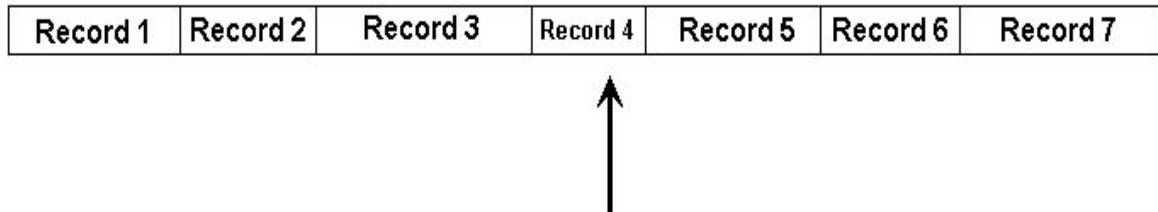
Accessing data from a file by record position with the file, without accessing intervening records.

relative record number

An ordinal number indicating the position of a record within a file.

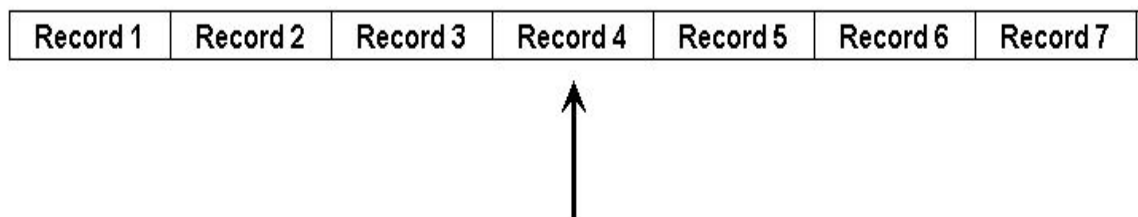
- Direct access processes single records at a time by position in the file.

Direct Access

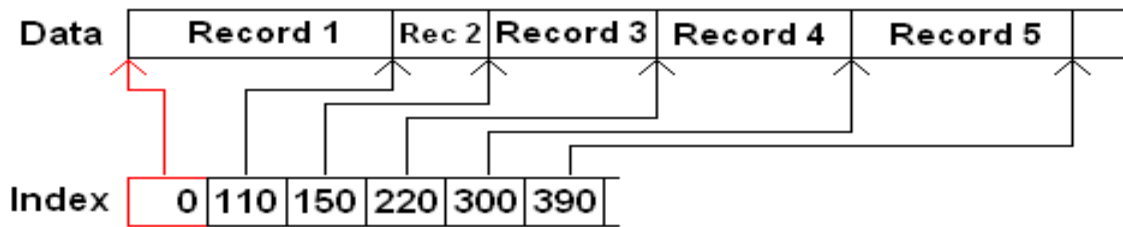


- Mainframe and midrange operating systems support direct access of files.
- The Windows, DOS, UNIX, and Linux operating systems do not natively support direct access of files.
- When using Windows, DOS, UNIX, and Linux operating systems applications must be programmed to use direct access.
- Direct access is slower than sequential when reading or writing all of the records in a file.
- Direct access is fast when reading a single random record, since the preceding records are ignored.
- Direct access allows individual records to be read from different locations in the file without reading intervening records.
- When files are organized with fixed length records, the location of a record in a file can be calculated from its relative record number, and the file can be accessed using the seek functions.

Direct Access



- $\text{ByteOffset} = (\text{RRN} - 1) \times \text{RecLen}$
- When files have variable length records supported by an index, the records can be accessed directly through the index, with the use of the seek function.



- For direct access to be useful, the relative record number of the record of interest must be known.
- Direct access is often used to support keyed access.

Keyed Access

keyed access

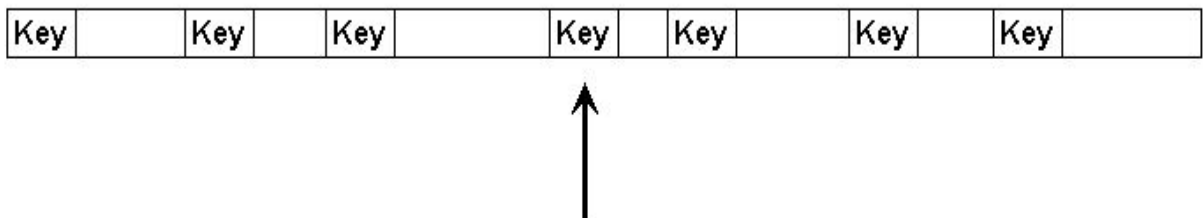
Accessing data from a file by an alphanumeric key associated with each record.

key

A value which is contained within or associated with a record and which can be used to identify the record.

- Keyed access processes single records at a time by record key.

Keyed Access



- Mainframe and midrange operating systems support keyed access of files.
- The Windows, DOS, UNIX, and Linux operating systems do not natively support keyed access of files.
- When using Windows, DOS, UNIX, and Linux operating systems applications must be programmed to use keyed access.
- Keyed access will be covered in more detail in later chapters.

metadata

Data which describes the data in a file or table.