Buffers

Data Transfer

- Reading and Writing Files-
  - Logical record - the unit of data as user thinks of it
  - Physical record - the unit of data that OS processes
  - Block - basic unit of data transfer to disk (same size as physical record)
  - Buffer - storage area in main memory for use in data transfer (same size as physical record)

I/O Model Organization

Writing Data Out to Disk

- write (fd, data_addr, count);
- for (i=0; i<m; i++)
  - for (j=0; j<n; j++)
  - write(fd, a[i][j], sizeof a[0][0]);

Buffering

- OS must fill up one buffer before actually writing the block out to disk.

Buffering Schemes

- (a) No buffering
- (b) Single buffering

I/O Scheduling
Buffering Schemes (cont’d)

Write System Call

Pseudo-code for write system call:
write(fd, data_addr, count) {
    if (enough space remains in current buffer) {
        copy count bytes from data_addr to buffer
        buflen = count;
    } else {
        b = number of bytes still available in the buffer:
        copy b bytes of data into buffer;
        /* buffer is now full */
        write buffer to disk;
        reset buffer pointer to beginning of buffer;
        reset buflen to zero;
        copy (count - b) bytes to buffer;
        buflen = (count - b);
    }
}

Buffer Pool

Figure 11.6  I/O Buffering Schemes (input)