Problem session, 02/16/2015

Memory Management: Consider a system that does not contain hardware support for setting or clearing dirty bits.

a. Explain the benefits of knowing if a page is dirty or clean.

b. Describe how setting and clearing dirty bits can be efficiently emulated by the OS. To make your answer clear, specify any changes in how the page tables are used and any new data structures that are needed. Explain what happens on a read and write to a given page; if some read or write operations act differently than others, explain each case.

c. Imagine that you would also like to implement copy-on-write. Explain copy-on-write and give a specific example of where it is particularly useful.

d. Describe how copy-on-write could be incorporated into this system (i.e., a system with no hardware support for dirty bits).