EECS 211
Advanced System Software
Winter 2005

Assignment 1

Posted: January 10, 2005
Due: January 17, 2005

Topic: The Nachos system

Instructions:

The goal of this first assignment is to get familiar with the Nachos operating system that we will be using for this and the following assignments.

Task 1: Get an overview about Nachos
To make you familiar with Nachos, read Appendix C from the text book. Note that this chapter is not printed in the book, but provided online at the publisher's web site: http://www.wiley.com/college/silberschatz.
For your convenience, a local copy is available on the course web site in the resource section: http://eee.uci.edu/05w/15810/resources/nachos.pdf

Task 2: Setup the Nachos system
To get started, you need to install the Nachos system in a working directory for EECS 211, as follows:
- We will use the EECS department servers as working platform, namely **east.eecs.uci.edu** (or, as alternatives, **malibu.eecs.uci.edu** and **newport.eecs.uci.edu**). If you do not have any account on these machines, send an email to the course instructor and an account will be created for you.
- Working with Nachos requires the use of two compilers, one for the native operating system (SunOS 5.8 on SPARC), and one cross-compiler for the Nachos system which is simulated to run on a MIPS architecture. We will use the GNU C/C++ compiler version 2.95.3 in both cases. To make sure you use the correct compilers, please add the directory **/users/faculty/doemer/eecs211/bin** to your execution path, i.e. **setenv PATH /users/faculty/doemer/eecs211/bin:$PATH** This is probably best done in your setup files, i.e. file **.cshrc**, otherwise you will have to repeat this command every time when you login.
- Next, you obtain a copy of the Nachos tar-ball and install it. The following commands will create a new directory for EECS211 in your home directory, copy the tar-ball for this course over from the class directory, and extract the sources.
    - **mkdir eecs211**
    - **cd eecs211**

- o `cp      /users/faculty/doemer/eecs211/nachos-3.4-patched4EECS211.tar.gz .`
    - o `gtar xvzf nachos-3.4-patched4EECS211.tar.gz`
    - o `cd nachos-3.4`
    - o `more README`
- The file `README` describes the details of the usual setup process for Nachos. Note that most of the steps have already been applied to the patched tar-ball, so you don't need to worry about them. You may, however, read some of the documentation files listed in this file.
- The next step is to compile the basic Nachos system.
    - o `cd code`
    - o `gmake`
- This will compile the basic system and all the assignment sub-directories. If everything goes well (there should be no errors or warnings), you should have Nachos installed now.
- Test the installation by going into the first assignment sub-directory and start the system:
    - o `cd threads`
    - o `./nachos`
- This final step should show logging information about two threads running alternatively 5 times. After the threads exit, the system will halt the simulated machine, show some statistics, and then terminate.

Task 3: Understand the Nachos system

Before you now dig into writing code, it is very important that you *understand* the Nachos software. There is a lot of documentation provided and a lot of source code that you should actually read and understand, before you start coding yourself. So, take the time to read through it, understand it, and if anything is unclear, go back and read again. Remember, this will pay off multiple times in reduced coding and debugging time.

The following is a suggestion on the items to read, and on the order in which to read them:
- README   (see above)
- nachos.ps   (overview, similar to the book chapter)
- doc/overview.ps   (follow the suggestions at the bottom)
- doc/thread.ps   (main document for this assignment!)
- code/threads/*.h   (header files, well-commented, very important)
- code/threads/*.cc   (implementation sources, to be extended)

For the sources, it is useful to follow the order suggested in the doc/threads.ps document.

Deliverables:
- none (but keep in mind, the next assignment relies on this one!)

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