Section 1: Introduction to Simics

Henry Cook
CS152 - Spring 2008

Familiarity survey

- C
- Python
- gdb
- Unix/Linux/Solaris
What are we doing in labs?

- Giving you an environment to:
  - Run code on a variety of platforms
    - Not all of which are actually available to us
  - Benchmark and experiment
  - Change things about the hardware
    - Access to multiple abstraction layers
  - See how architectural mechanisms work in practice on real software

What is Simics?

- Efficient, instrumented, system level instruction set simulator
  - Run as fast, or faster than, target machine
  - Gather detailed information at run time
  - Model target at level at which OS acts
  - ISA-aware, simulates each instruction
  - Runs unmodified OSes and workloads
Why are we using Simics?

- Scripting capabilities
- Academic licensing
- Can run real software, quickly
- Intro to functional/timing simulators
- Outside relevance
  - Program analysis, computer architecture research, and kernel debugging

Terminology

- Host machine
  - Machine/OS on which Simics is running
- Target machine
  - Machine/OS which Simics is simulating
- Neither the architecture nor the OS of either machine need be the same
- Steps vs. cycles vs. instructions
Environment

- Similar to gdb, command line interface
- Simics CLI has built in scripting
  - Can also write scripts in Python
- Checkpointing
- Different modes of execution
  - Fast, stalls, MAI
  - Speed vs. accuracy

Major Components

- Functional
  - Modules
    - Written in C, Python, DML
    - Devices, components, boards, machines…
    - Attached by Simics or Python scripts

- Timing
  - Memory, caches, Simics MAI
  - Declare or calculate delay of modules
Demo!

Gritty details

- Might compile code in separate environment
  - E.g. compile on Solaris/SPARC, run on Linux
- Need X11 at client machine
  - http://inst.eecs.berkeley.edu/connecting.html#xwindows
- Instructional servers
  - http://inst.eecs.berkeley.edu/cgi-bin/clients.cgi?choice=13
Office Hours?

- Monday 9:30 - 10:30
- Monday 1:30 - 2:30
- Friday 10:30-11:30
- Friday 2:00-3:00