Announcements

• Class website
  • http://sunset.usc.edu/classes/cs578_2014/

• TA Office hour
  • Taper Hall of Humanities (THH) #115
  • Tue/Thu 9-10 AM
  • No need to make an appointment
HW2

USC CSCI 578, Fall 2014

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HW2

• You be a software architect (again)!
• BOINC Case Study
• Exposure to modeling a rich software model
• Estimating non-functional system properties
  • Energy consumption
  • Message latency
  • Memory usage
The Challenge

• How do you know the consequences of your changes?
• One little change can break the entire system!

• Experience will tell.

• What if a model can tell you the consequences?

• Model-driven software engineering approach
  • Providing the rationale that software architects need upon making design decisions
XTEAM

- eXtensible Tool-chain for Evaluation of Architectural Models
  - Implements a model-driven engineering (MDE) approach to software architecture

- Advantages
  - It provides design rationale
  - Can be used for weighing architectural trade-offs
An XTEAM Example

- Energy consumption simulation
- Computes consumed energy:
  - Per-component
  - Per-time
- Various analyses
  - Energy consumption
  - Message latency
  - Memory usage

The BOINC Model
Tasks You Will Perform

• Find components and connectors that spend too much energy (more than 1 million units of energy)

• Vary the size of a message; what properties are affected?

• Vary the number of volunteers; how many volunteers do you need to achieve the envisioned computation performance?

• You got a research fund. Let’s integrate a cloud to boost the computation power.
  • Add a cloud component to your model
  • Implement a load balancing algorithm in your model
  • Assess how the system properties change by the addition