Midterm (Testability) Review

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Cpt. S 464/564 Lecture

Auxiliary Material (not from text)

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Musings on COVID-19

- Unprecedented times….. But “this, too, shall pass”…
- Be a good citizen: avoid transmitting & infecting others!
Big Picture on Exam

• 2 Hours to Take it: 3pm-5pm Thursday
• I will be online for questions
  – via zoom chat; (emergency my mobile 509-592-0238)
• I historically like a low median on exams in this class (~75)
• But for this one (a first online for me) that is too risky
• ~25 questions
  – Some T/F or multiple choice
  – Some short, focused answer without much though
  – A handful that will require more analysis (not just look up)
  – (don’t forget to read Chap X.1)
  – These slides are NOT exhaustive (but probably 90% of material); HW questions topics may be tested deeper than other topics
• Now on to testability…
Introduction (slides, not from text)

• What is a DS?
• Advantages & consequences
• Timeline (very basic; not all the details)
• Distributed vs. Parallel Computing
  – A basic compare/contrast level of knowledge
• Example Local vs. Remote Procedure Call
Chap1: Characterization of DSs

• Compare/contrast mobile computing & ubiquitous computing
• Spontaneous interoperation
• Heterogeneities
• Transparencies
Chap2: System Models

• Difficulties & Threats for DSs (crucial context!)
  – Wide varying modes for use
  – Wide range of system environments
  – Internal problems

• Physical models: HW graph

• Architectural models: Logical SW+interaction graph
  – Goal: ensure structure meets present (& likely) future req.
  1. Core underlying architectural elements (entities, roles,...)
  2. Composite arch patterns (layering, tiered, …)
  3. MW platforms supporting
     – End-to-End (E2E) paper

• Fundamental models: interaction, failure, security
Middleware Slides & Papers

• Middleware Slides
  – Why does middleware exist?
  – What is middleware?
  – What does it help with?
  – How is it different from using network sockets
    • At a high level, not the nitty gritty
  – Is there only one layer of middleware?

• End-to-End (E2E) paper
  – Understand basic argument here and apply it

• Schantz Distributed Systems Chapter (HW0)
  – Nothing in particular, but you should be able to use the overall lessons/progress/history here as an example
Chap3: Networking

• NO NITTY GRITTY DETAILS ARE TESTABLE

• ONLY things that were the topic of a homework question, PLUS

• BASIC IDEAS of layering: what layers do for you, how each layer adds on a header on sending side then removes it on receiving side, …

• What are the 7 layers, and in a nutshell what do they do?
  – Just knowing Figure 3.5 suffices; only the “Internet Stack” Layers 1-4 (wired/wireless medium, Ethernet, IP, UDP or TCP
Chapter 4: Interprocess Communication

• API for Internet protocols
  – What it hides, compared to using the low-level protocol such as TCP
  – Java API useful for understanding above, but not directly testable

• External data representation and marshalling
  – What it is, why needed, two techniques for data
  – CORBA vs. Java vs. XML (at a high level)

• CORBA Object References NOT testable (alter with Chapter 8)

• Multicast communications

• Network virtualization: overlay networks

• Case Study: MPI (564 only)
Chapter 5: Remote Invocation

• Request-Reply
  – What is is & what RCP+RMI below hide
  – What do the 3 primitives (doOoperation....) do
  – What are R, RR, and RRA

• Remote Procedure Call (RPC)
  – RPC call semantics (also apply to RMI)

• Remote Method Invocation (RMI)

• Difference between RPC and RMI