Distributed Systems

COMP90015 2019 Semester 1
Tutorial 01

Our Expectations

- Come prepared to get the most benefit out of this tutorial!
- Think of this tutorial as more of a conversation, it’s to get discussion going about Distributed Systems

Tutorial Structure

- Review of previous week’s content via questions
- Demonstration time
- Discussion on Article

1. Provide a definition of a Distributed System

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- A system in which hardware or software components located at networked computers communicate and coordinate their actions only by passing message [Coulouris]

- A collection of independent computers that appears to its users as a single coherent system [Tanenbaum]

2. Briefly explain the difference between a computer network and a distributed system.

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A Computer Network: Is a collection of spatially separated, interconnected computers that exchange messages based on specific protocols. Computers are addressed by IP addresses.

A Distributed System: Multiple computers on the network working together as a system. The spatial separation of computers and communication aspects are hidden from users.

3. List three reasons for using a distributed system.

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Resource Sharing

- Hardware Resources (Disks, printers, scanners etc.)
- Software Resources (Files, databases etc)
- Other (Processing power, memory, bandwidth)

Benefits of resource sharing:

- Economy (cost effective)
- Reliability (fault tolerance)
- Availability (high uptime)
- Scalability (extendible)

4. Briefly explain four consequences when using distributed systems, i.e. issues that arise that are not present otherwise.

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- Concurrency
- Heterogeneity
- No Global Clock
- Independent Failures

Java IDE

IDE - Integrated Development Environment

Used to facilitate development, options available:

- Eclipse (supported by this subject)
- IntelliJ
- Netbeans

Quick Eclipse Demo

- Create a new Eclipse project
- Add a JAR file (internal / external)
- Build an executable jar file

Create a new Eclipse Project

http://www.tutorialspoint.com/eclipse/eclipse_create_java_project.htm

Add a JAR file (internal / external)

Build an executable jarfile

Extra Question Slide

What are the things to consider when building a distributed system

- Geography: Will this system be global, or will it run in “silos” per region?
- Data segregation: Will this system offer a single- or multi-tenancy model?
- SLAs: Availability, latency, throughput, consistency, and durability guarantees must all be defined.
- Security: IAAA (identity, authentication, authorization, and audit), data confidentiality, and privacy must all be considered.
- Usage tracking: Understanding usage of the system is necessary for at minimum day-to-day operations of the system, as well as capacity planning. It may also be used to perform billing for use of the system and/or governance (quota/rate limits).
- Deployment and configuration management: How will updates to the system be deployed?