

Deployment and Operations for Software Engineers 2nd Ed

Chapter 1—Platform preliminaries

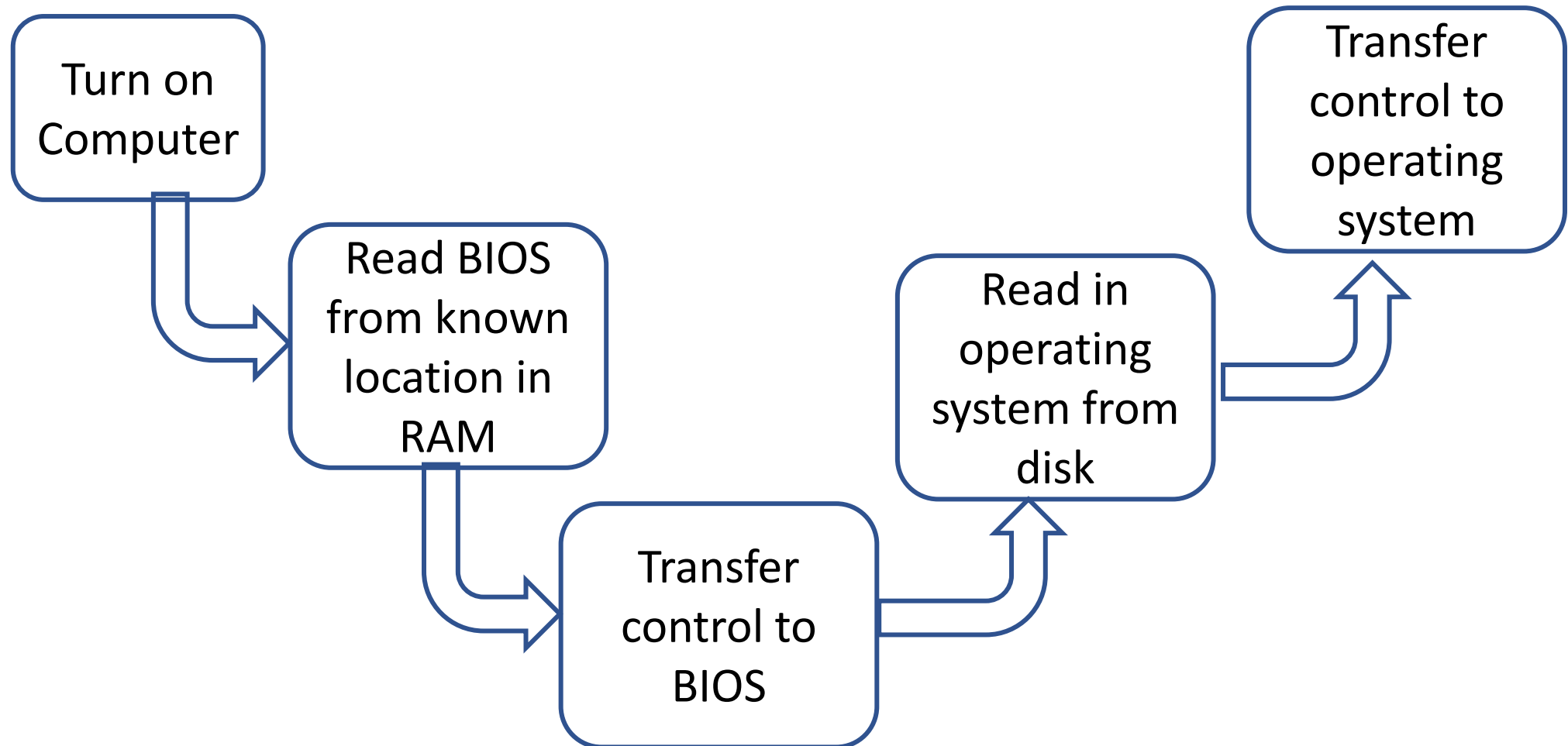


Outline

- **Basic Computer Concepts**
- Distributed System Issues
- Quality Attributes



Boot process





Stateful and Stateless

- State is another term for data.
- In order to execute, a component requires both executable code and data.
- Data must be furnished to a component.
 - Parameters
 - External store
 - Component remembers from prior call
- A stateful component will remember data from previous calls.
- A stateless component will not remember – can only get data from parameters or external store.



Computer Resources

- A computer has four types of resources
 - Central Processing Units (CPU)
 - Memory
 - Disks
 - Network connections



Central Processing Unit

- Basic processing portion of a computer
- A computer may have multiple CPUs
- One CPU can be shared among multiple processes.
- Isolation is maintained by Operating System scheduler.



Memory

- A physical computer has a fixed amount of memory
- Shared among processes.
- Isolation maintained by hardware.



Disk

- Keeps persistent values.
- Values are read or written
- Can be rotating or solid state
- Isolation maintained by routing all read/write requests through the operating system which keeps track of access controls



Network Connections

- Allows processes on the computer to send or receive messages from other computers
- Messages are tagged with identifier of sender or designated recipient
- Operating System routes messages according to tags.



Issues

- In a network, all communication between nodes must be by messages. Issues associated with messages are
 - Discovery
 - Scaling
 - Message Communication Patterns
 - Failed components



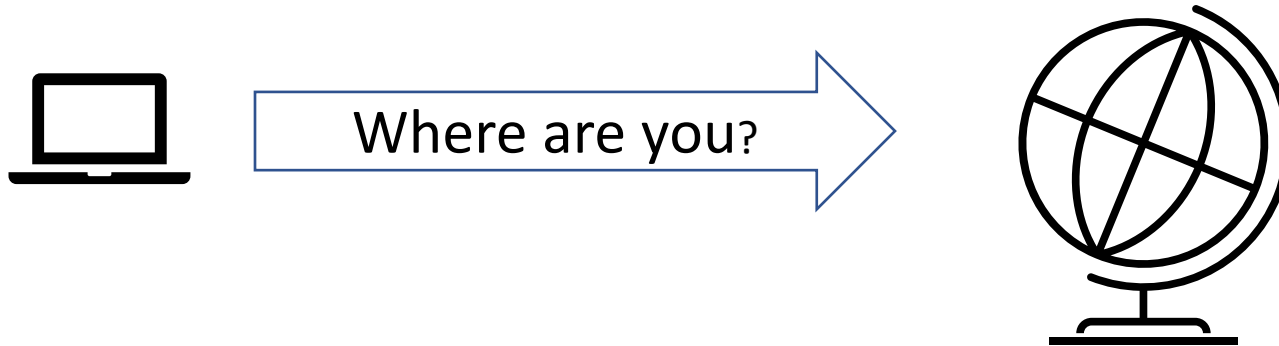
Outline

- Basic Computer Concepts
- **Distributed System Issues**
- Quality Attributes



Discovery

- Finding an address to go with a name





Scaling

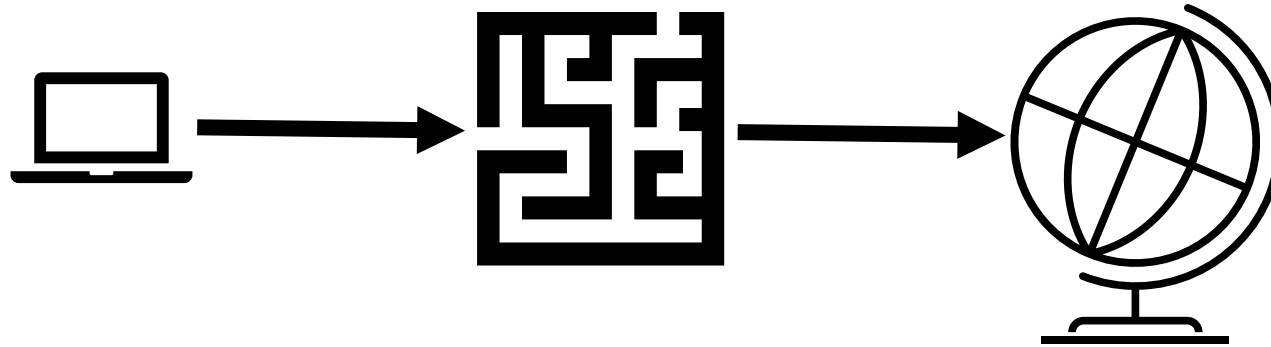
- Increasing the number of messages a service can handle





Message Communication Patterns

- Arranging for the message to be delivered to a known recipient while maintaining security and load restrictions.

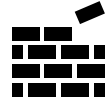


How do I get a message to you?



Failed Components

- Components may fail.
 - The failure must be detected
 - and repaired.





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- Basic Computer Concepts
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- **Quality Attributes**



Quality Attributes

- A quality attribute (QA) is a measurable or testable property of a system that is used to indicate how well the system satisfies the needs of its stakeholders
- There are dozens of quality attributes, we will define three here.
 - Performance
 - Availability
 - Security – discussed later



Performance

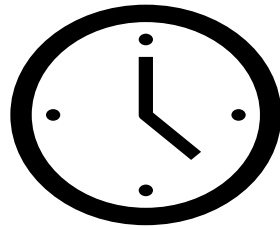
- Measured by latency and throughput
 - Latency is the time taken to respond to a request.
 - Throughput is the number of operations per unit time





Availability

- Usually measured as the percentage of time a system is available for service.



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