University of
South Australia

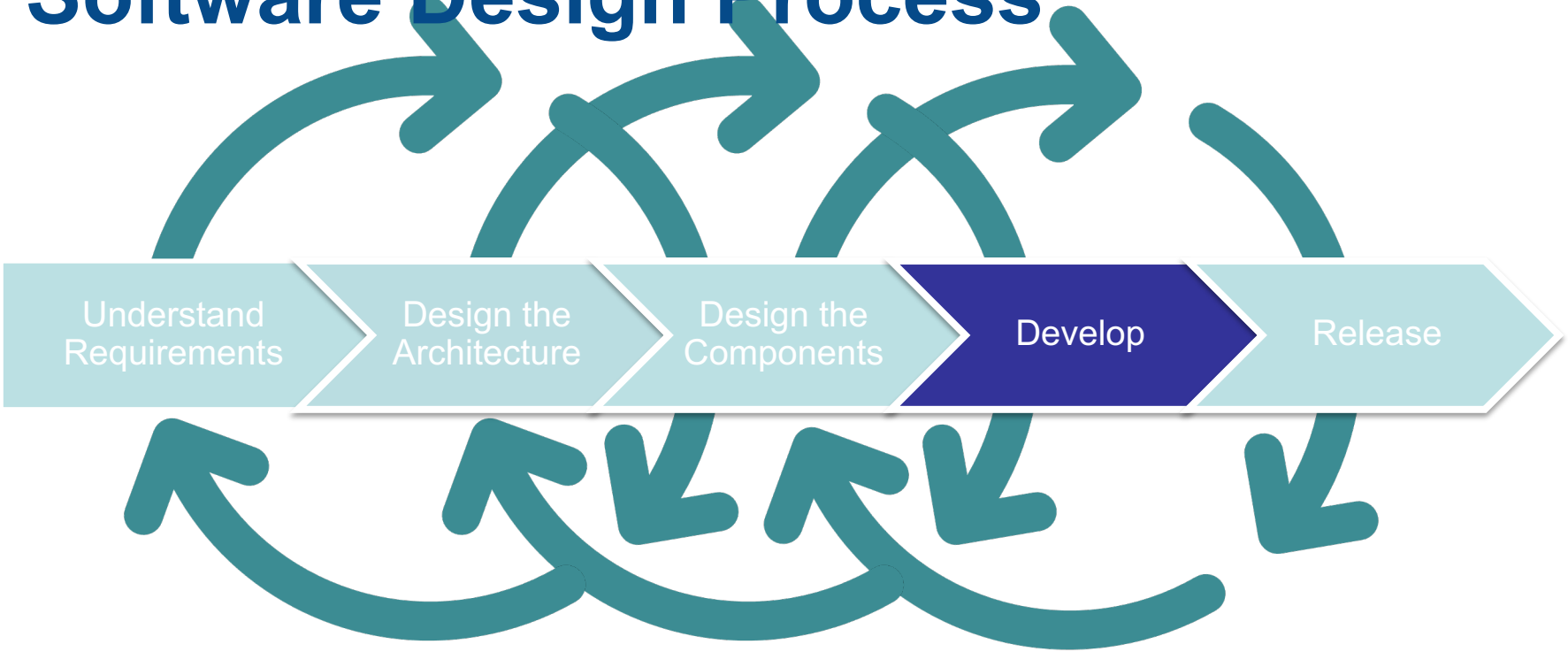
INFS 2044

Workshop 5b Answers

Preparation

- Read the required readings
- Watch the Week 5 Lecture
- Bring a copy of the workshop instructions (this document) to the workshop

Software Design Process



Where We Are At

- Designed components, their interfaces, and their interactions
- Documented implementation design using UML Sequence diagrams and UML Class diagrams
- Assessed designs using Design Principles
- “Repaired” designs using Design Patterns

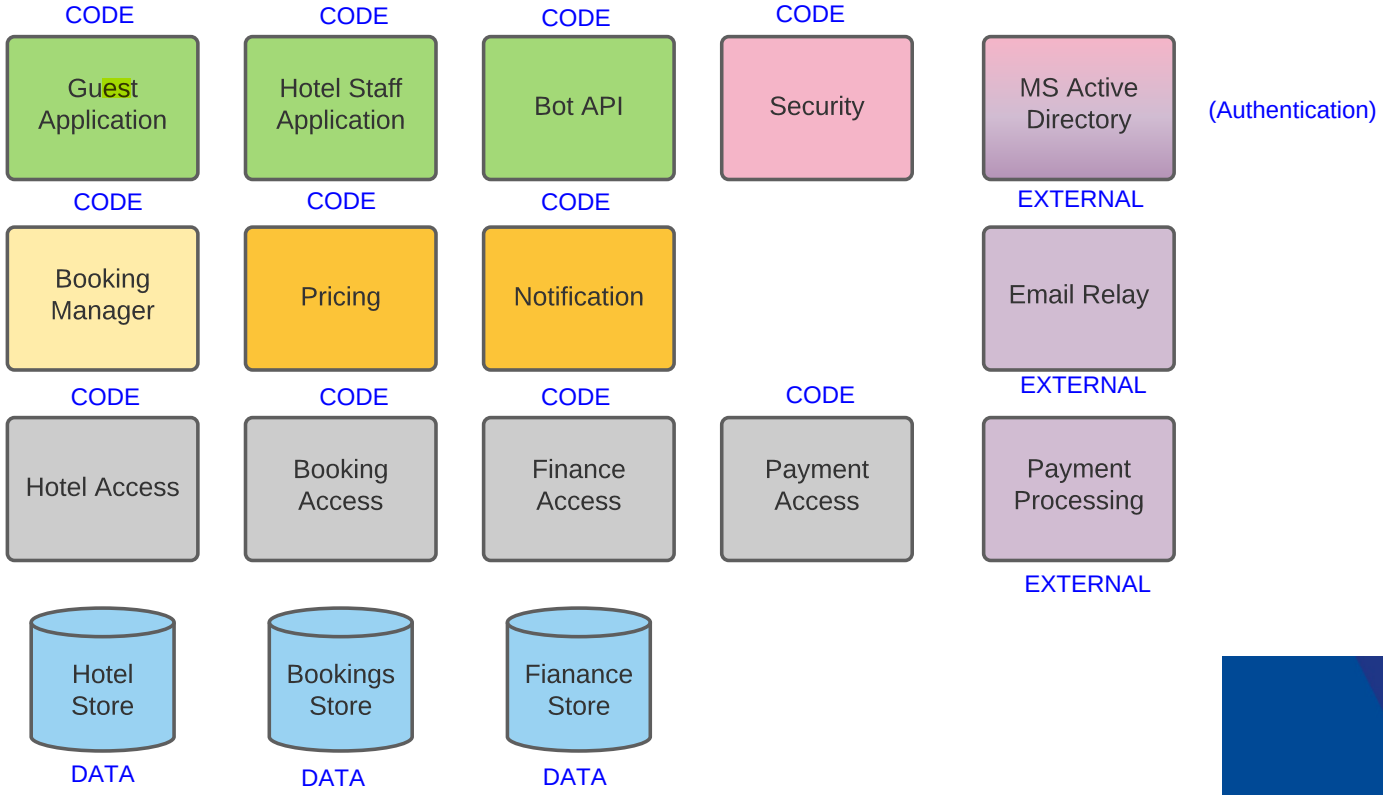
Learning Objectives

- Define components, connectors, and deployment design
- Document deployment design using UML Deployment Diagrams
- Assess non-functional properties of deployment designs

Task 1. Packaging Design

- Define the deployable components for the Booking System.
- Use the decomposition of the Booking System shown on the next slide as the basis for your component design

Booking System Components



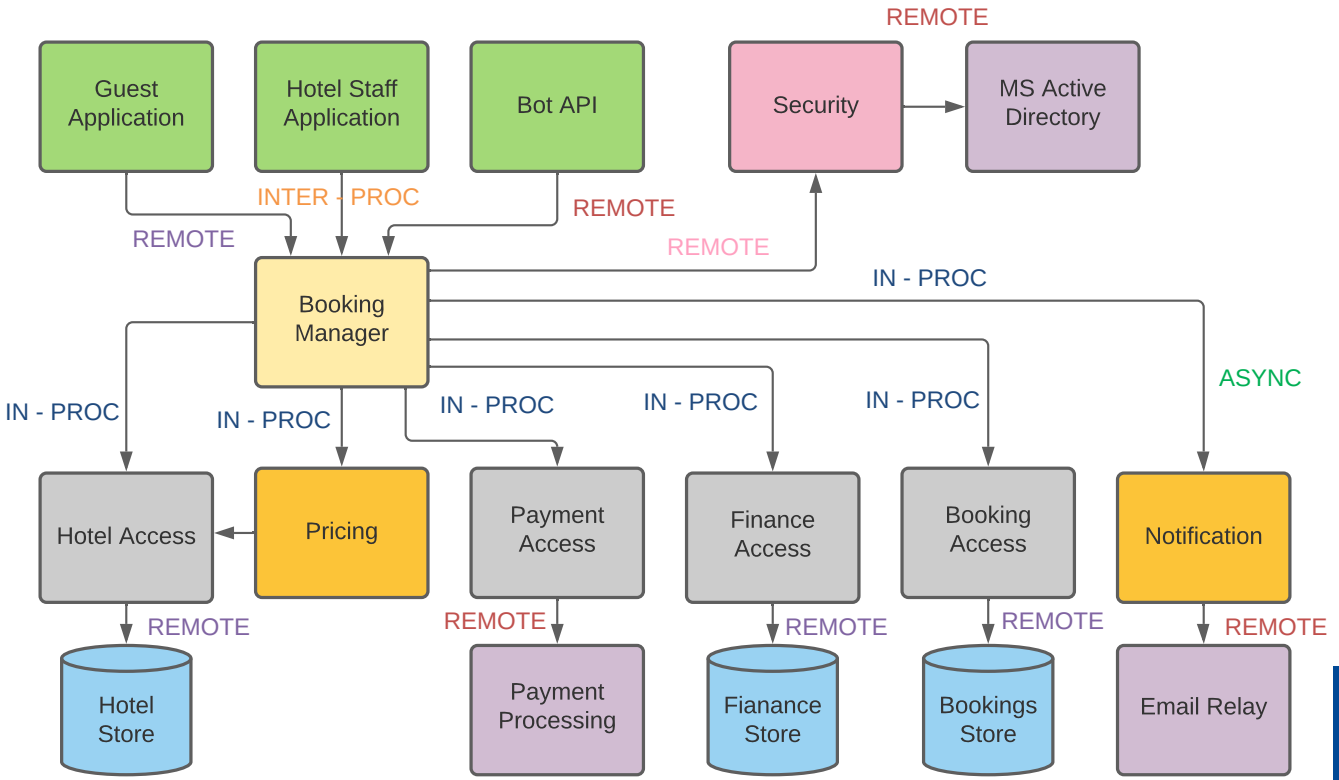
Packaging Considerations Heuristics

- Which elements in the decomposition shall be packaged as stand-alone elements, and which shall be packaged together with other elements?
- Implementation of the components impact
  - Code-only elements may be aggregated with other elements
  - Data-holding elements may be aggregated, subject to non-functional requirements; may be difficult to duplicate (inconsistencies!)
  - External services are separate by definition

Packaging Considerations Heuristics

- Coupling
  - <<depends>> Source code dependencies
  - <<use>> relationships
- Non-functional properties impact
  - Communication latency (non-local connectors)
  - Synchronicity of communication (synchronous vs asynchronous)
  - Maintainability (upgrades & patches)
  - Resource constraints
  - Cost (development & deployment)

Booking System <<use>> Rels



Options for Connectors

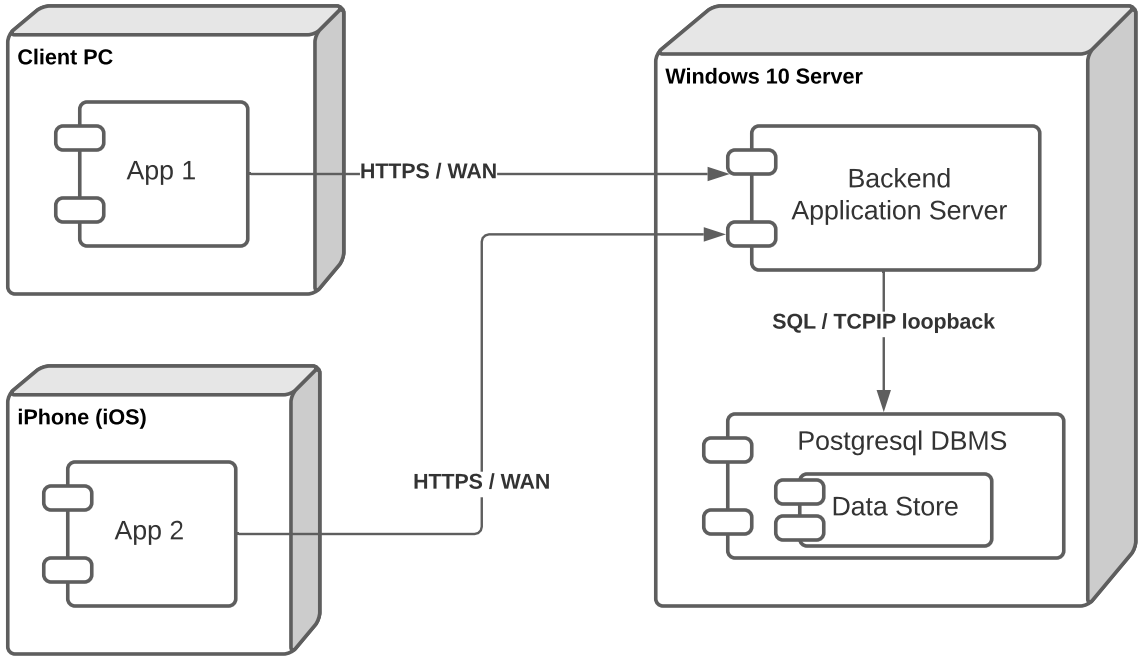
- In-process invocation (only if packaged together)
- Inter-process communication on the same host
- Remote invocation
- Queues for asynchronous communication
- There are many options…

Task 2. Deployment Design

- Create a Deployment Diagram for the Booking System runtime components defined in Task 1.

- Allocate each component to a node, and show how the links and protocols the components use for communication.

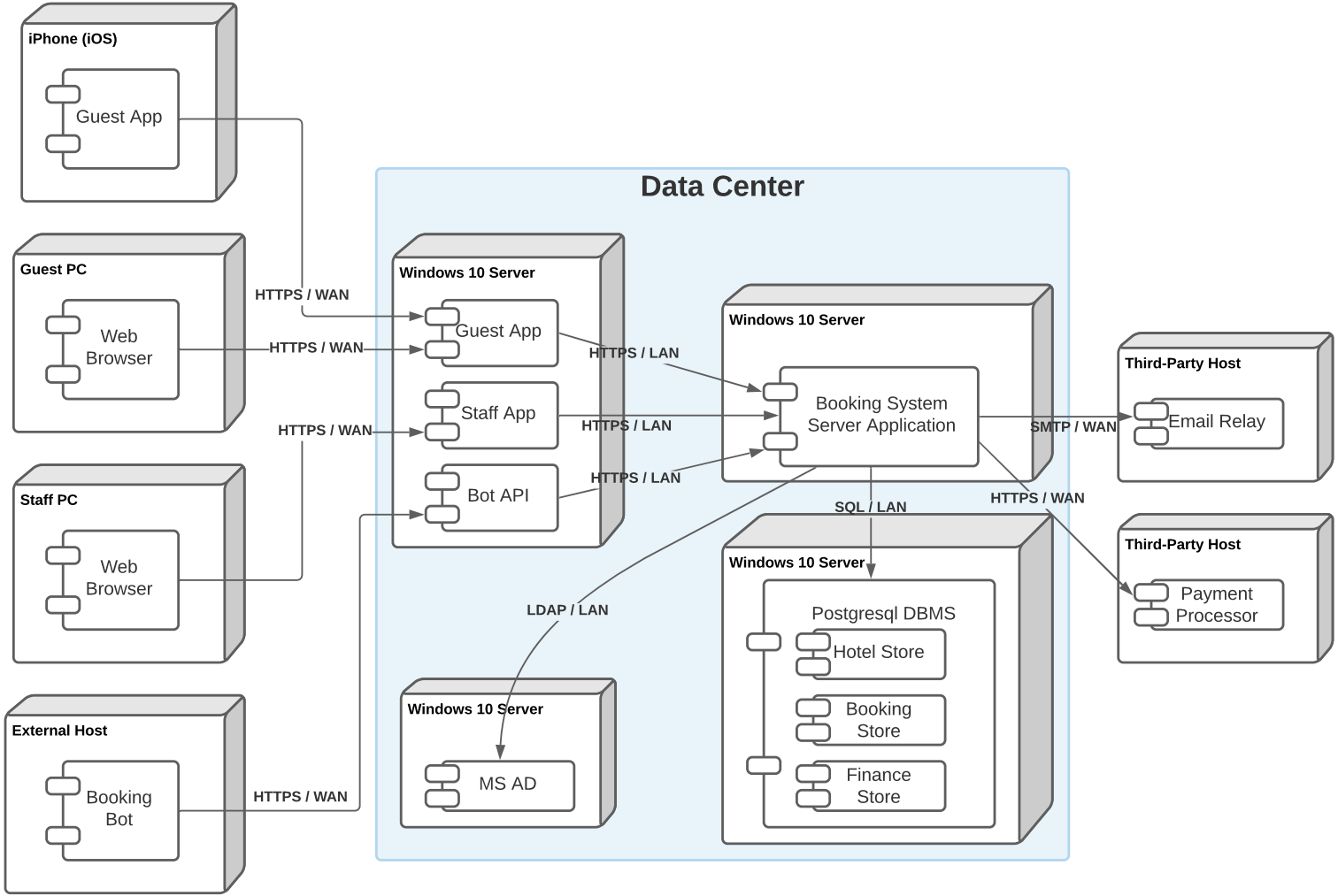
UML Deployment Diagram



Task 3. Non-Functional Properties

- Discuss the non-functional properties of the deployment configuration developed in Task 1.
- Compare the deployment design with that given on the next slide w.r.t:
  - Cost
  - Latency
  - Reliability
  - Maintainability
  - Scalability
  - Security

B


iPhone (iOS)
Guest App
Guest PC
Web Browser
Staff PC
Web Browser
External Host
Booking Bot
HTTPS / WAN
HTTPS / WAN
HTTPS / WAN
HTTPS / WAN
Data Center
Windows 10 Server
Guest App
Staff App
Bot API
HTTPS / LAN
HTTPS / LAN
HTTPS / LAN
Windows 10 Server
Booking System Server Application
SMTP / WAN
HTTPS / WAN
SQL / LAN
LDAP / LAN
Windows 10 Server
MS AD
Windows 10 Server
Postgresql DBMS
Hotel Store
Booking Store
Finance Store
Third-Party Host
Email Relay
Third-Party Host
Payment Processor

You Should Know

- Design deployment of components
- Draw UML Deployment Diagrams
- Assess properties of deployment designs

Activities this Week

- Complete Quiz 5
- Continue working on Assignment 1

Next Week

- Attend INFS2045 System Design Studio
- INFS2044 will resume in Week 10

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