

# Service-Based Architecture

CSSE6400

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### Definition 1. Distributed System

A system with multiple components located on different machines that communicate and coordinate actions in order to appear as a single coherent system to the end-user.

## Quote

A distributed system is one in which the failure of a computer you didn't even know existed can render your own computer unusable.

– Leslie Lamport [Turing Award, 2013]

### Definition 2. Service-Based Architecture

System is partitioned into business domains that are deployed as distributed services. Functionality is delivered through a user interface that interacts with the domain services.

# Service-Based Architecture



## Terminology

**User Interface** Provides access to system functionality

**Services** Implement functionality for a single,  
independent business process

**Service APIs** Communication mechanism between UI  
and each service

**Database** Stores persistent data for the system

### Definition 3. API Abstraction Principle

Services should provide an API that hides implementation details.

#### Definition 4. Façade Design Pattern

Provide a simple, abstract interface to use a service domain's functionality. A component within the service coordinates how to deliver the requested functionality with the service's internal components.



### Definition 5. Independent Service Principle

Services should be independent, with no dependencies on other services.

### Question

What are the consequences of having a shared database?

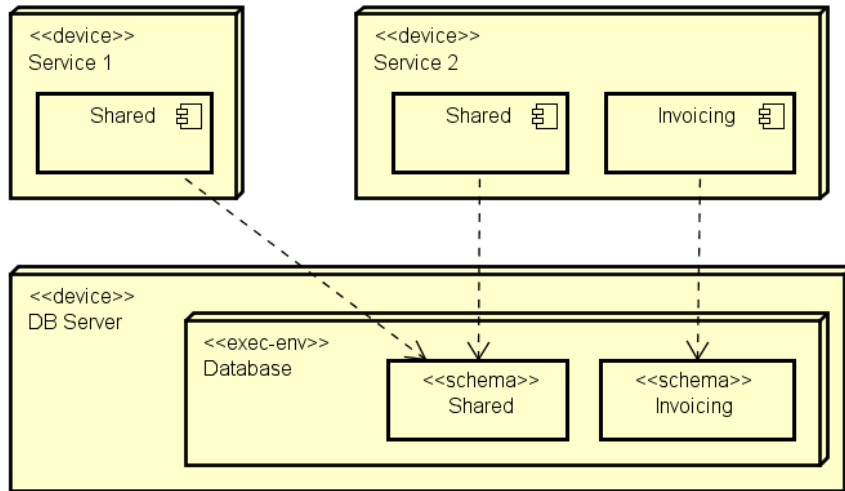
### Question

What are the consequences of having a shared database?

### Answer

Increased *data coupling*.

# Logical Partitioning of Persistent Data



# Separate Databases



# Separate UIs



# Sahara: Context Diagram

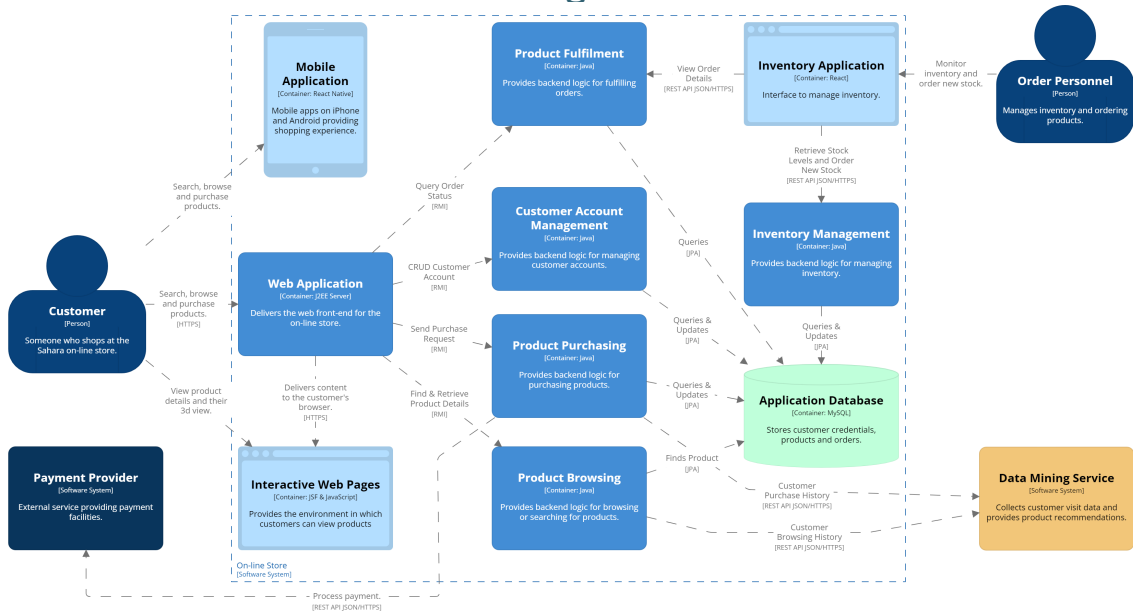


Oi!

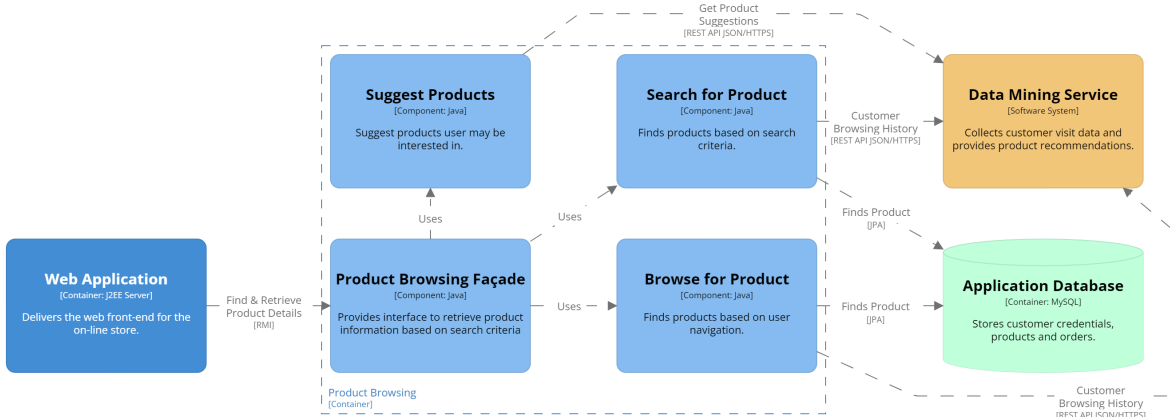
Slide to introduce domain services for Sahara example.



# Sahara: On-line Store Container Diagram



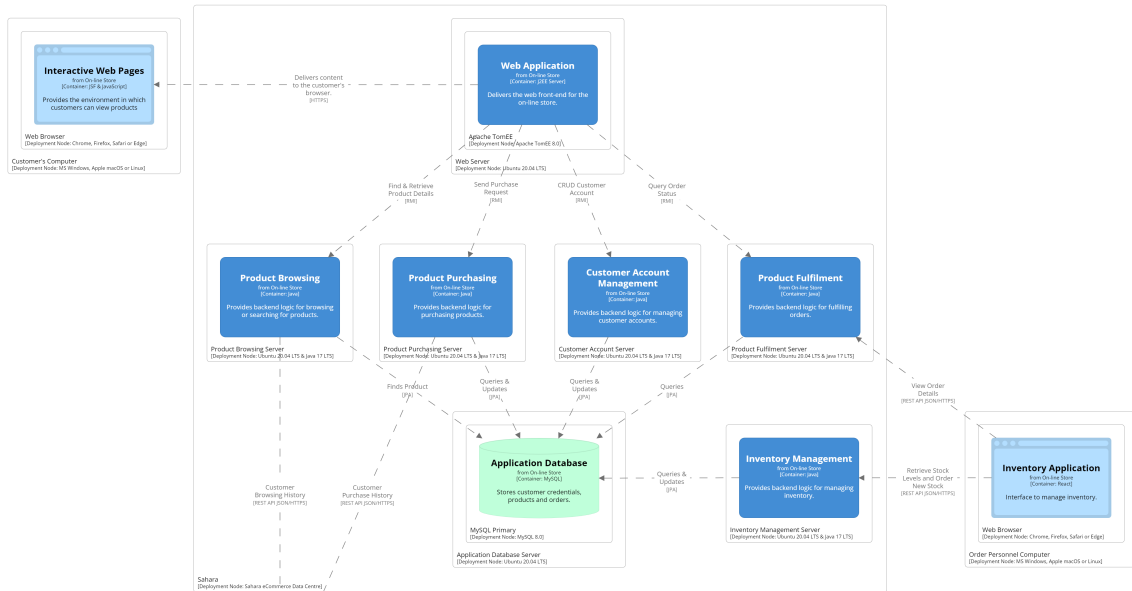
# Sahara: Product Browsing Component Diagram



Oil!

REST API for Product Browsing?

# Sahara: Deployment Diagram



Oi!

Issue of failures in distributed systems?  
Show service architecture for Sahara and summarise parallel flows through services.  
Aside about stateless services and possible multi-threaded web pages (e.g. JSF).  
Comment about Services being domain partitioning, but Service internals may be technical or domain paritioned.

## Pros & Cons

Simplicity Core system & Plug-in interface



Extensibility Plug-ins



Interoperability Plug-ins



Scalability



Reliability

