System Design

Systems Analysis & Design

Learning Objectives

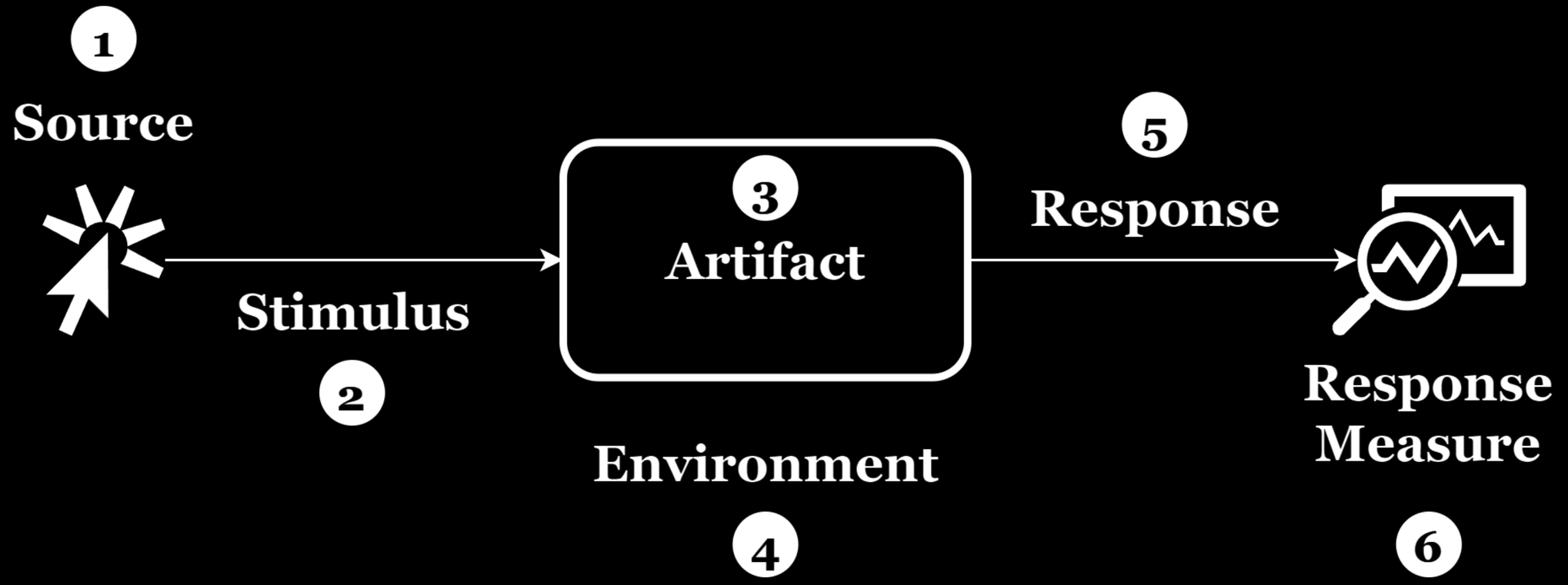
By the end of this session, you will have acquired the following information:

- Definition of software architecture
- Six parts of quality attributes
- Conway’s law

Software Architecture

- Software architecture is the set of high-level structures needed to reason about the characteristics of the system.
- These structures comprise software elements, relations among them, and properties of both.
- The enterprise provides environments for, and constraints on, the software architecture.
- The characteristics of the system are documented in terms of quality attributes.

Quality Attribute



Illustrative Examples

Availability Scenario: The primary database in a failover group fails. This failure is automatically detected, and geo-failover to a secondary database is completed in less than 1000 ms.

- Source: primary database
- Stimulus: failure
- Artifact: geo-failover group
- Environment: normal operation
- Response: geo-failover to secondary database
- Response Measure: less than 1000 ms

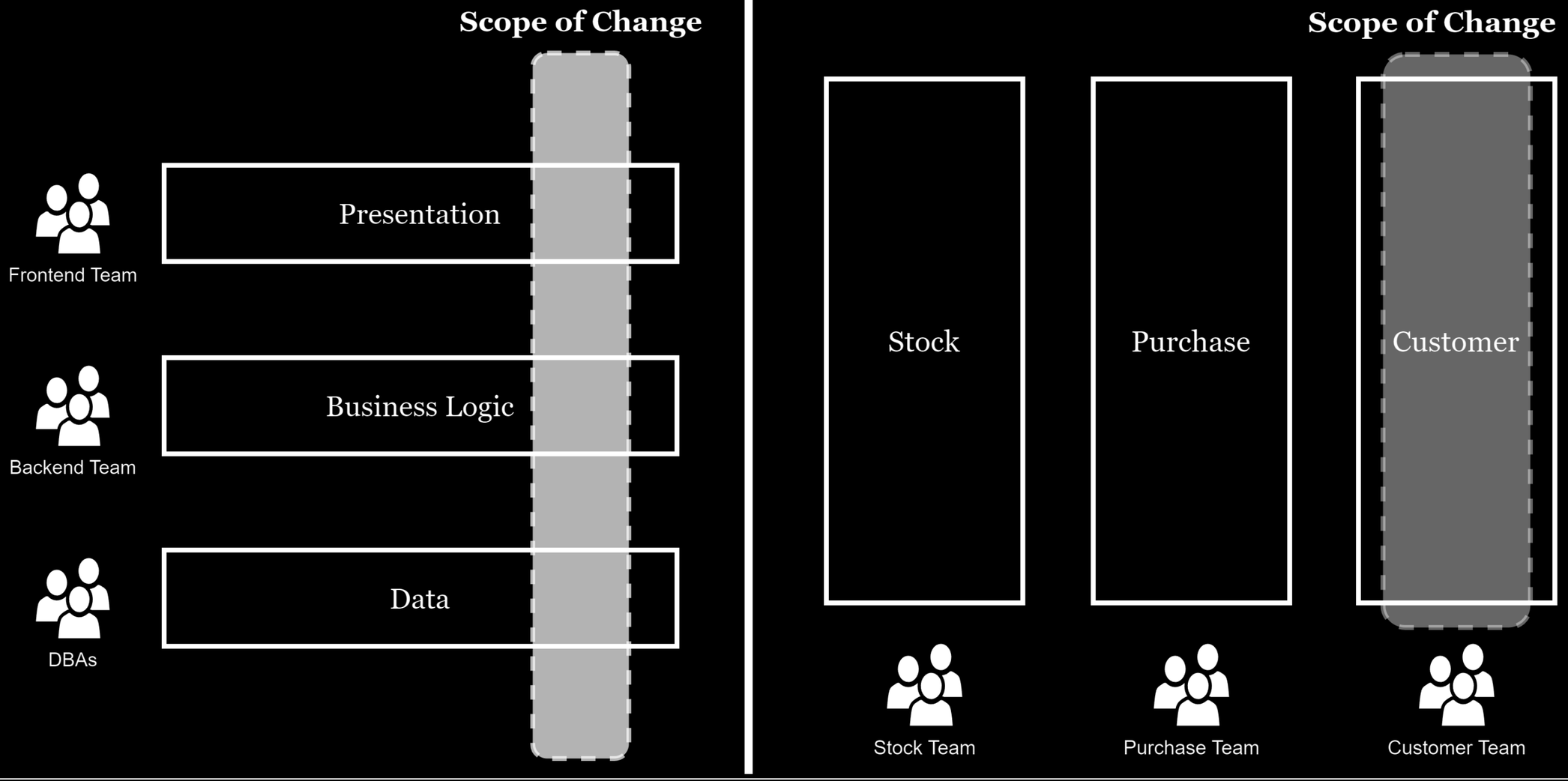
Security Scenario: A physical therapist is permitted to see only the part of a patient's record that deals with orthopedic treatment, but not any other parts or any financial information.

- Source: physical therapist
- Stimulus: attempts to access a patient's record
- Artifact: patient's medical record system
- Environment: normal operation
- Response: view only the orthopedic treatment part of the patient's record
- Response Measure: no other parts or any financial information of the patient's record are visible to the physical therapist

Performance Scenario: A user updates a patient’s account in response to a change-of-address notification while the system is under peak load. The transaction completes in less than 0.75 seconds.

- Source: user
- Stimulus: update a patient’s account due to a change-of-address notification
- Artifact: patient’s account system
- Environment: overloaded operation
- Response: completes the transaction
- Response Measure: less than 0.75 seconds

Conway's law


Scope of Change
Presentation
Business Logic
Data
Frontend Team
Backend Team
DBAs
Scope of Change
Stock
Purchase
Customer
Stock Team
Purchase Team
Customer Team

Further Resources

- Building Microservices: Designing Fine-Grained Systems (pages 36-40)