Online Shopping Store Project

# Phase I

*Develop a scenario for the three (3) identified quality factors. Explain how to test each quality factor for the client-server web application in the space provided. You may add pages if necessary.*

## Quality Factor: Time Behavior

1. **Source of Stimulus**:End-user making a request through the web
2. **Stimulus**:A high number of concurrent users are accessing the online store and using the virtual fitting-room feature simultaneously.
3. **Environment**:Normal Operation
4. **Artifact**:The entire Client-Server system: Client application, Web Server Applications, Application Servers, Database Servers.
5. **Response**:All requests must be processed; system must increase in size to attend more responses.
6. **Response Measure**: All customer queries for clothing, checkout, and other operations must occur in 20-30 seconds.

### **How to Test Time Behavior**

To test time behavior, perform load and performance testing using tools like JMeter or LoadRunner. These tools can simulate many users interacting with the application simultaneously.

* + - 1. Set up test scenarios that reflect typical user interactions, including browsing items, using the virtual fitting-room, and checking out.
      2. Increasing the load on the system to determine how the system behaves under stress.
      3. Monitor and measure the response times for each transaction.
      4. Verify that the system meets the desired performance benchmark of 20-30 seconds response time.
      5. Analyze server resource utilization (CPU, memory, I/O, etc.) to identify potential bottlenecks.

Other tactics to maintain Time Behavior:

* Fault Recovery
  + Active Redundancy
  + Spare
* Fault Prevention
  + Measure transactions
* Fault Detection:
  + Measure Request time

## Quality Factor: Confidentiality and Data Integrity

1. **Source of Stimulus**:Unauthorized user trying to access sensitive data or data from another user.
2. **Stimulus**:Attempted unauthorized data access.
3. **Environment**:Normal Operation and Data Transmission
4. **Artifact**:Customer Data in all of the Client-Server system at rest or in-transit, payment information in Databases, Data transmitted over network.
5. **Response**:The system protects sensitive data using Authentication and Authorization mechanisms and ensures data encryption in-transit and at rest.
6. **Response Measure**: No unauthorized access is granted, and all data breaches are logged.

### **How to Test Confidentiality**

* + - 1. Conduct periodical vulnerability assessments and penetration testing.
      2. Stay up to date with Common Vulnerabilities and Exposures (CVE) and apply fixes accordingly.
      3. Implement scanning of CVE on CI/CD pipeline.
      4. Verify data is encrypted both at rest and in-transit.
      5. Follow zero trust architecture and apply the principle of least privilege.

## Quality Factor: Recoverability

1. **Source of Stimulus**:End-user using the system normally.
2. **Stimulus**:The system experienced an unexpected downtime caused by Infrastructure, Code Change, Code Crash, Network Issue, or 3rd Party Service.
3. **Environment**:Normal Operation
4. **Artifact**:Client-Server Infrastructure, 3rd Party Services, Code
5. **Response**:The system maintains backup infrastructure for Fault Recovery. The system informs users of alternative 3rd Party Vendors if the Current Payment System or current Delivery Method is unavailable. The Code is rolled back to a previous working version if Crash is caused by Code or a mitigation step is procured for the user if no rollback available.
6. **Response Measure**: System recovers in less or equal to 10 minutes of downtime in case of failure.

### **How to Test Recoverability**

* + - 1. Create Disaster Recovery (DR) infrastructure and perform regular DR drills to simulate failures and validate the strategy in the event of a system failure.
      2. Test Data backups and Code Artifacts regularly to ensure they are restored to a previous version withing 10 minutes.
      3. Create Playbooks to guide the current on-call engineer for most common issues.

# Phase II

*Draw each diagram according to the online shopping store situation described in the project description. Take a clear screenshot of each diagram and paste them in the corresponding spaces. You may add pages if necessary.*

## 

## System Diagram

A screen shot of a computer

Description automatically generated

## Container Diagram

A diagram of a person

Description automatically generated with medium confidence

## Deployment Diagram

