Load and Performance

Test Plan

|  |  |
| --- | --- |
| Key | Value |
| Application Name | <ACME-Management> |
| Scope | Measure response times and stability |
| Test Lead | R.Scheiwiller |
| Tickets | <https://your-jira.your-company.com/browse/LUP-8008>  <https://your-jira.your-company.com/browse/LUP-9009> |

Document History

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| --- | --- | --- | --- |
| Author | Date | Version | Comment |
| R.Scheiwiller | 01.01.1970 | v42.5 | Initial Version |
|  |  |  |  |

Document Review

|  |  |  |
| --- | --- | --- |
| Author | Date Reviewed | Comment |
| Jane Doe | 01.01.1970 | Initial Version |
|  |  |  |

Project Contacts

|  |  |  |
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| Project Lead |  |  |
| Test Manager |  |  |
| Architect |  |  |
| Developer |  |  |
| […] |  |  |

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# Introduction

* Describes lup approach
* Describe goal target

# Systems under Performance Test

## General Information

|  |  |
| --- | --- |
| Key | Value |
| Application Purpose | <General description of what the application is used for.> |
| Application URL | <URL> |
| Technology Stack | <Java>  <Springboot>  <Hibernate>  <…> |
| Code Repository | <Link to Repo or N/A > |
| Known Issues | <Memory Leaks>  <Known slow use cases>  <Application outages>  <…> |

## Application Achitecture

<Add Diagram or link to architecture document>

## System Achitecture

<Add Diagram or link to architecture document>

# Requirements & Design

## Testing Scope

### In Scope

The following components of the system are in scope of the testing and of the analysis:

|  |  |  |
| --- | --- | --- |
|  | Component | Comment |
|  | Frontend Layer | Application “ACME” |
|  | Backend Layer | Application “Foo” and “Bar” |
|  | Database |  |
|  | Calls to Service Providers |  |
|  | 3rd Party Services | Calls to “www.giveresponse.com/api/” |
|  | Other |  |

### Out of scope

Out of scope are all other applications and components not mentioned above.

## Testing Targets

The following targets are in scope of the load and performance testing

|  |  |  |  |
| --- | --- | --- | --- |
|  | Metric | Target(s) | Comment |
|  | Response Time | 90 percentile <= 3 sec | For all transactions except reporting functionality |
|  | Subsystem Response Time | 90 percentile <= 1 sec | Target for System <A> and <B> |
|  | CPU Usage | Average <= 75% |  |
|  | Server Memory Usage | Average <= 75% |  |
|  | Errors | Rate <= 5% | Error Rate below 5% for the entire test |
|  | Stability | 8 hours | Application is stable for 8 hours of average load |

## Test Environment

The environment used for performance testing must have the same configuration like the productive environment regarding hardware, system and application settings.

## Use Cases

The list of use cases can be found in the use case documentation:

* <https://www.your-company.com/files/docs/1970-01-01_ACME_UseCaseDescription.docx>

## Test Scenarios

Terminology used in this chapter:

* **Users:** The number of users simulated and executing this script. (Might be done with less user accounts)
* **Exec/h:** The number of script executions per hour(total executions of all users).
* **Start Offset:** The offset of the script start from the actual test start.
* **Ramp Up Users:** Number of users started in parallel on each ramp up interval.

### Average Load

**Scenario Details**

|  |  |
| --- | --- |
| Key | Value |
| Description | Average business day simulation with common use cases. |
| Test Duration | 1 hour |
| Total Users | 190 Users |
| Total Executions | 2500 Executions/h |

**Load Configuration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Use Case | Users | Exec/h | Start Offset | RampUp Users |
|  | ACME\_01\_BrowseProducts | 100 | 1500 | 00:00:00 | 2 |
|  | ACME\_02\_ManageCart | 20 | 300 | 00:00:00 | 2 |
|  | ACME\_03\_ApplyGiftCode | 5 | 100 | 00:00:00 | 2 |
|  | ACME\_04\_Checkout | 70 | 700 | 00:10:00 | 1 |
|  | ACME\_05\_PrintReport | 15 | 300 | 00:00:00 | 1 |

### Peak Load

**Scenario Details**

|  |  |
| --- | --- |
| Key | Value |
| Description | Peak business day simulation(3 times average load) with common and uncommon use cases. |
| Test Duration | 1 hour |
| Total Users | 630 Users |
| Total Executions | 8700 Executions/h |

**Load Configuration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Use Case | Users | Exec/h | Start Offset | RampUp Users |
|  | ACME\_01\_BrowseProducts | 300 | 4500 | 00:00:00 | 2 |
|  | ACME\_02\_ManageCart | 60 | 900 | 00:00:00 | 2 |
|  | ACME\_03\_ApplyGiftCode | 15 | 300 | 00:00:00 | 2 |
|  | ACME\_04\_Checkout | 210 | 2100 | 00:10:00 | 1 |
|  | ACME\_05\_PrintReport | 45 | 900 | 00:00:00 | 1 |

### Baseline Test

**Scenario Details**

|  |  |
| --- | --- |
| Key | Value |
| Description | Minimal load including all use cases to check maximum reachable performance. |
| Test Duration | 20 minutes |
| Total Users | 5 Users |
| Total Executions | 50 Executions/h |

**Load Configuration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Use Case | Users | Exec/h | Start Offset | RampUp Users |
|  | ACME\_01\_BrowseProducts | 1 | 10 | 00:00:00 | 2 |
|  | ACME\_02\_ManageCart | 1 | 10 | 00:00:00 | 2 |
|  | ACME\_03\_ApplyGiftCode | 1 | 10 | 00:00:00 | 2 |
|  | ACME\_04\_Checkout | 1 | 10 | 00:10:00 | 1 |
|  | ACME\_05\_PrintReport | 1 | 10 | 00:00:00 | 1 |

### Stability Test

**Scenario Details**

|  |  |
| --- | --- |
| Key | Value |
| Description | All use cases with average load running for a full business day. |
| Test Duration | 8 hours |
| Total Users | 210 Users |
| Total Executions | 2900 Executions/h |

**Load Configuration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Use Case | Users | Exec/h | Start Offset | RampUp Users |
|  | ACME\_01\_BrowseProducts | 100 | 1500 | 00:00:00 | 2 |
|  | ACME\_02\_ManageCart | 20 | 300 | 00:00:00 | 2 |
|  | ACME\_03\_ApplyGiftCode | 5 | 100 | 00:00:00 | 2 |
|  | ACME\_04\_Checkout | 70 | 700 | 00:10:00 | 1 |
|  | ACME\_05\_PrintReport | 15 | 300 | 00:00:00 | 1 |

### Scalability Test

**Scenario Details**

|  |  |
| --- | --- |
| Key | Value |
| Description | Increase the load every hour by the average load. |
| Test Duration | 1 hour for every load level |
| Total Users | N/A |
| Total Executions | N/A |

**Load Configuration**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Use Case | Users | Exec/h | Start Offset | RampUp Users |
|  | ACME\_01\_BrowseProducts | 100 | 1500 | 00:00:00 | 2 |
|  | ACME\_02\_ManageCart | 20 | 300 | 00:00:00 | 2 |
|  | ACME\_03\_ApplyGiftCode | 5 | 100 | 00:00:00 | 2 |
|  | ACME\_04\_Checkout | 70 | 700 | 00:10:00 | 1 |
|  | ACME\_05\_PrintReport | 15 | 300 | 00:00:00 | 1 |

### Page Request Analysis

This test scenario is used for analysis of single page requests, with the intention of finding potential performance improvements on the page using tools like Google Insights or Page Analyzer.

The following use cases should be analyzed:

* Loading a Product page with 100 products: <https://acme-test.your-company.com/app/productlist>
* Opening the dashboard: <https://acme-test.your-company.com/app/dashboard>

## Data

### Test Database Setup

The amount and complexity of the data is a main factor on how fast it will be processed by your application. Therefore the quality of test data is crucial for simulating productive like load. The database should contain data in the same volume and complexity as in the productive environment. For an existing application, the best way is to clone the database from the productive environment to the environment used for testing.

### Test Users

* Realistic data Volume
* Data needed for testing
* Users and Access Rights
* Rollback

### Test Data

# Used Tools

* Testing
* Monitoring
* Analysis
* Client Side Analysis
* Defect Tracking

# Risks

List of risks with impact probability and criticality.

# Appendix

## Description of Load Test Scenarios

## Glossary