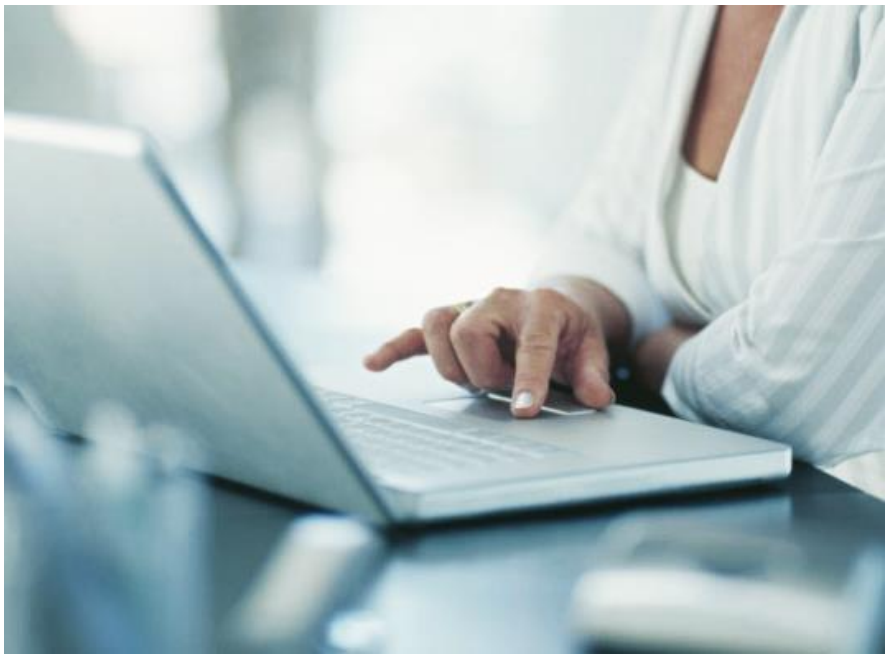
Cloud9 System Upgrade
Performance Test Plan



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1. Document Control

1.1 Document Modification History

Version	Date	Initials	Remarks
0.1	06/05/16	KP	Initial draft
0.2	11/08/16	JN	Updates
0.3	29/06/17	BG	Updates
0.4	17/07/17	KP	Updates

1.2 Terminology

Term	Definition
SLA	Service Level Agreement
Soak test	A performance test run for long periods of time
Load test	A performance test run to test the system using a specific expected load
Scalability test	A performance test run to test if the current system will cater for growth
RAID	A document that lists the Risks, Issues, Assumptions and Dependencies identified.
Volumetric	Specifies how much data is needed to execute a test without over or under testing the system
Cycle	Defines the phase where test execution occurs

2. Executive Summary

The primary aim of this performance testing effort is to evaluate the performance and stability of Cloud9's upgraded flight management system.

Cloud9's main concern is that the upgraded system may not be able to handle the expected peak load usage as well as the existing system.

This performance testing effort will be broken down into the following phases, per the fundamental test process:

Analysis: The analysis phase involves determining the high level approach to the testing. This phase has already been completed, with the output incorporated into this document.

Design: The design phase aims to flesh out the high level details obtained during analysis with the intention of producing a detailed test plan. This phase has already been completed with the output being this document.

Implementation: This phase will involve the creation of the Jmeter scripts which will be used to simulate user activity. The activity to be simulated has been defined by the business and contained within this document. This phase is expected to take 3 days.

Execution: The execution phase will involve executing the test scenarios and collating the results. Two scenarios have been identified for this performance testing effort – a peak load test of the existing system (baseline) and a peak load test of the upgraded system (benchmark). These will be used to evaluate whether the upgraded system performs at least as well as the existing system. Response times of the various business processes will also be monitored via the Jmeter toolset. This phase is expected to take 2 days to complete. An interim results report will be sent to the business after each test.

Closure: The completion phase involves the analysis of all the test results and the creation of a detailed overall report. The report will highlight any findings and recommendations. This final results report will take 1 day to produce.

Given that the analysis and design phases are now complete, the rest of this performance testing effort is expected to take 6 days to complete.

3. Situation

3.1 Business and Project Background

Cloud9 has a web based system which is currently being used by their customers to manage flight bookings. At the time that the original system was built, Cloud9 didn't have enough budget or in-house skills to use a more feature rich database and used SQLite instead. The company is now in a position to upgrade the system to use a more feature rich database. They've chosen to use MySQL.

The upgrades have already been made and the system has passed functional testing. Cloud9 would now like to determine whether switching the database to MySQL had any adverse effect on performance before they go live with the solution.

3.2 Test Objectives and Requirements

3.2.1 Objectives

The objectives of this testing effort are:

1. Baseline the existing system (SQLite database backend).
2. Benchmark the upgraded system (MySQL database backend) to evaluate how it performs in relation to the previous version.

3.2.2 Requirements

Based on the above objectives, the testing requirements for this effort are:

1. Run a peak load test against the existing system with 10 concurrent users doing the key processes as identified by the business (baseline the existing system).
2. Run a peak load test against the upgraded system with 10 concurrent users doing the same key processes as the baseline and compare the results against the baseline i.e. benchmark the upgraded system.

3.3 Stakeholders

The following are the acceptance stakeholders that will approve this performance testing effort, review the results and agree the implementation.

3.3.1 Approvers

#	Area	Individuals
1	IT	John Davis (Project Manager)

3.3.2 Reviewers

#	Area	Individuals
1	Testing	Matt Smith (Test Manager)

3.4 Scope

3.4.1 In scope

The following aspects of performance testing are considered in scope:

1. Script creation
2. Scenario creation
3. Execution of a Load test
4. Results reporting

3.4.2 Out of Scope

The following aspects of performance testing have been agreed as out of scope:

1. System Tuning
2. Functional testing
3. Data creation
4. Endurance testing
5. Spike testing
6. Stress testing
7. Usability testing
8. Anything else not defined as “In scope”

3.5 Deliverables

The following deliverables are planned from the performance testing.

Ref.	Deliverable Description
D1	Test plan (this document)
D2	Test scripts
D4	Test scenarios
D5	Test results report

4. Risks and Assumptions

4.1 Risks

The following Risks have been identified as being applicable to this performance testing project.

No	Risk	Likelihood	Impact	Mitigation	Owner
R1	Environment is delayed.	M	H	Project to ensure that environment is available on time. Clear communication from all parties must be maintained throughout the testing process.	PM
R2	Environment not under strict change control	M	H	Environment should be maintained under strict change control. All teams to be aware of any changes of any approved changed	PM
R3	System under test fails a stage of performance testing	L	H	If the system under test fails performance testing at any stage and a configuration or code change needs to be made, performance testing must start from the beginning as existing test scripts will not function. If this is necessary, a new test plan will be created.	PM
R4	No timely access to a Project Developer/Business Analyst	M	M	Project to ensure that Testing Services has timely access to all required resources. No timely access could mean that testing is delayed.	PM

4.2 Assumptions

In producing this strategy the following assumptions have been made:

#	Assumption	Impact if incorrect	Owner
A1	Volumetric analysis is correct and closely matches the workload handled by the production system. This includes business processes iteration volume, bulk data in the system as well as transactional data.	Tests will not reflect real-world load.	PM
A2	Other usage of testing network and infrastructure will not significantly impact performance.	Test results will be inaccurate.	PM
A3	The business processes selected for scripting to be part of the load placed on the system offer sufficient coverage of functionality and follow the representative usage patterns from production.	Incorrect scope of testing.	TS/PM
A4	Technical support, development teams and BA are available at all times.	Test plan timelines will not be met.	PM
A5	System has passed functional testing before being delivered to performance team.	System under test may need to be re-coded meaning test plan timelines will not be met.	PM
A6	The environment specification including hardware, network and software builds/releases are identical to the production system.	Test results will be inaccurate.	PM

5. Test Approach

5.1 Business Processes

The business, with support from the testing team, have defined the following process to be included in both the baseline and benchmarking scenarios.
The detailed steps for these processes are as follows:

5.1.1 BP01_Registration

Step	Action	Expected Result	Transaction
1	Go to the Cloud9 URL	Homepage is loaded.	BP01_Home
2	Click on Register	Registration form is loaded.	BP01_Register
3	Type the first name	First name is entered.	
4	Type the last name	Last name is entered.	
5	Type email address	Email address is entered.	
6	Type a password	Password is entered.	
7	Click on submit	User is registered successfully.	BP01_SubmitRegistration

5.1.2 BP02_ViewItinerary:

Step	Action	Expected Result	Transaction
1	Go to the Cloud9 URL	Homepage is loaded.	BP02_Home
2	Type a username	Username is entered	
3	Type a password	Password is entered	
4	Click on Sign in button	User is logged on and on the Itinerary page.	BP02_ViewItinerary
5	Click on Logout link	User is logged out.	BP02_Logout

5.1.3 BP03_Book a Flight:

Step	Action	Expected Result	Transaction
1	Go to the Cloud9 URL	Homepage is loaded.	BP03_Home
2	Type a username	Username is entered	
3	Type a password	Password is entered	
4	Click on Sign in button	User is logged on and on the Itinerary page.	BP03_ViewItinerary
5	Click on Book Flight link	Book Flight page is display	BP03_LoadBookFlightPage
6	Select Origin city	Origin city is selected	
7	Select destination city	Destination city is selected	
8	Enter seat	Seat is entered	
9	Select Class	Class is selected	
10	Click on Book button	Flight is booked successfully	BP03_BookTheFlight
11	Click on Logout link	User is logged out.	BP03_Logout

5.1.4 BP04_UpdateFlight:

Step	Action	Expected Result	Transaction
1	Go to the Cloud9 URL	Homepage is loaded.	BP04_Home
2	Type a username	Username is entered	
3	Type a password	Password is entered	
4	Click on Sign in button	User is logged on and on the Itinerary page.	BP04_ViewItinerary

5	Click on Update link	Update page is display	BP04_LoadUpdateFlightPage
6	Select Origin city	Origin city is selected	
7	Select destination city	Destination city is selected	
8	Enter seat	Seat is entered	
9	Select Class	Class is selected	
10	Click on Update button	Flight is updated successfully	BP04_UpdateFlight
11	Click on Logout link	User is logged out.	BP04_Logout

5.1.5 BP05_DeleteFlight:

Step	Action	Expected Result	Transaction
1	Go to the Cloud9 URL	Homepage is loaded.	BP05_Home
2	Type a username	Username is entered	
3	Type a password	Password is entered	
4	Click on Sign in button	User is logged on and on the Itinerary page.	BP05_ViewItinerary
5	Click on Delete link	The flight is deleted	BP05_DeleteFlight
6	Click on Logout link	User is logged out.	BP05_Logout

5.2 Test scenarios

The actual volume of load that will be applied has been agreed by the business as a reflection of production-like loads. The users will be ramped up in 2 minutes, after which there will be a steady phase of 5 minutes. Ramp down of users will occur simultaneously.

5.3 Volumetric

The tables below shows the details of the information to be used to conduct the benchmark and baseline tests.

Script	#Users	Transactions/hr	Transactions/user/hr	Pacing (seconds)
Registration	2	100	50	72
ViewItinerary	3	600	200	18
BookFlight	3	300	100	36
UpdateFlight	1	50	50	72
DeleteFlight	1	20	20	180

5.4 Measurable success criteria

The upgraded system will be considered a success if it performs on average at least as well as the existing one.

6. Test Environments & Data

This section outlines the test environment hardware and software to be used by the testing team to develop and execute test scripts and scenarios.

6.1 Test Environment

6.1.1 Existing environment

The existing Cloud9 flight management system is web based and is written in PHP. The architecture is 2 tier, with the storage and web server layers existing on the same machine. A SQLite database is being used.

6.1.2 Upgraded environment

The upgraded Cloud9 flight management system is identical to the existing environment except in terms of the database backend which uses MySQL instead of SQLite.

Whilst a scaled down environment can be used to create the test scripts, a dedicated production-like environment will be required for test execution.

The business has confirmed that the following production-like environment is available to the performance testing team immediately:

Role	Host Name	IP Address	Specification	Notes
Web server	DCZC0111CVP	192.168.1.1	Windows 7 Enterprise (32-bit), 2G Ram, 1.5GHz Intel Core 2 Duo Processor	URL: TBC

6.1.3 Environment Monitoring

Monitoring will enable the performance testing team to find the bottlenecks in the system. The following counters will be monitored in aid of this:

Component	Monitors required	Relevant tools/sources
Web server	%Processor Time %Committed bytes in use	PerfMon (windows tool)

6.2 Test Data

All test data will be generated by the performance test team.

7. Project Planning & Estimation

7.1 Proposed Project Schedule

	Day	1	2	3	4	5	6	7	8	9
1	Analysis/Design									
2	Implementation									
3	Execution									
4	Closure									

Note that analysis/design has already been completed with the output being this document.