



# SailPoint IAM Upgrade Performance Test Closure Report

Version 1.0



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## Revision History

Author	Date	Version	Comments
Vimal Raj	14-Sep-22	0.1	Baseline version
Vimal Raj	18-Sep-22	1.0	Updated Management Summary

## Approved By

Approvers	Date	Version	Role
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Table of Contents

1. Background ..... 4

2. Performance Test Objective ..... 4

3. Management Summary..... 4

4. Performance Test Scope ..... 5

    4.1. Transaction in Scope ..... 5

    4.2. Out of Scope..... 5

5. Performance Test Execution ..... 6

    5.1. Performance Test Scenarios and Status..... 6

6. Performance Result Summary..... 8

    6.1. 100% Load Test..... 8

        6.1.1. Key Performance Indicators:..... 8

        6.1.2. Response Time Analysis for Key User Actions:..... 8

        6.1.3. Resource Utilization: ..... 8

    6.2. Endurance Test ..... 9

        6.2.1. Key Performance Indicators:..... 9

        6.2.2. Response Time Analysis:..... 9

        6.2.3. Resource Utilization: ..... 9

7. Exit Acceptance Criteria..... 10

8. Performance Tuning ..... 11

9. Defect Summery ..... 11





10. Annexures ..... 12

## 1. Background

Bank Muscat (hereafter referred as BM) has intended to upgrade the IAM application version from V7.3 to V 8.2 P2 and upgrade the infrastructure for DB and WebSphere (Oracle database from Oracle 12C to 19C and WebSphere Application server from V8.5 to 9). In this process, Bank Muscat has planned for Performance testing of the IAM Application. In line to the requirements & expectations of BM IT Management, Maveric has extended their Performance Testing and Performance Engineering services.

## 2. Performance Test Objective

The objective and scope of the performance testing are provided below

Objective	Status
To measure the end to end response time while handling 150 concurrent user loads	
To verify the load handling capacity of IAM application for the derived 2027 volume (640 transactions)	
To measure the performance of the IAM application while handling 50% user load for a prolonged duration of 4 hours	
To monitor the server metrics not limited to CPU, Memory, Disk I/O & Network during execution and ensure the resources utilization are under threshold limits of 75%.	

## 3. Management Summary

- ▶ Upgraded IAM application were performance tested in SIT environment for the revised peak concurrent user load of 150 users and peak hour volume of 635 transactions were able to handle 100% of 2027 concurrent user load with all 100% of the transactions response time under SLA and achieved 99% of expected volume (Achieved: 635 transactions | Expected: 640 transactions)
- ▶ Endurance test were performed for a duration of 4 hours with 91% transactions had response time below SLA and achieved 100% of expected volume were achieved (three times the 100% load). No memory related issues were observed for the period of the run (Achieved: 1920 transactions | Expected: 1920 transactions)
- ▶ User concurrency was revised from 305 to 150 as per the discussion with IT Management and the same was approved by Steering Committee
- ▶ Resource utilization were observed under acceptable threshold (<60%) in terms of CPU & memory for both Load and Endurance execution, however the Memory utilisation in DB servers were highly utilised throughout the executions since its shared with both SIT and UAT
- ▶ Query indexing and optimization were recommended based on the AWR analysis to reduce the DB response times which in turn reduced the response times for login transactions

## 4. Performance Test Scope

### 4.1. Transaction in Scope

The below mentioned are the transactions finalized for the performance testing of IAM application,

- ▶ Connected system access request
- ▶ Disconnected system access request
- ▶ View Dashboard (Login and Logout)

### 4.2. Out of Scope



- ▶ Transactions apart from the agreed profile/modules in IAM were not performance tested
- ▶ Performance execution will not cover any testing types other than agreed scope (Load /Volume, Endurance). Also, any metrics related to UI of IAM application
- ▶ Any form of functional testing including field level validations, systems testing & integration testing are not in scope
- ▶ Ticket approval transactions were not in scope of performance testing
- ▶ Backend validation to check if access is created in backed systems were not in scope of performance testing

## 5. Performance Test Execution

The below mentioned are the Performance test execution scenarios executed to measure the IAM application.

### 5.1. Performance Test Scenarios and Status

Test Round	Load Scenario	Actual Date	Response Time	Volume Achieved	RAG	Comments
Round 1 Cycle 1	100% Load Test	07-Aug-2022	77.77% < SLA	38%	●	<ul style="list-style-type: none"> <li>▶ Out of 9 user action/pages, 2 user action were not under agreed SLA (77.77% of under SLA of 5 sec)</li> <li>▶ 453 successful E2E Transactions were achieved during the test run wherein the expected volume was 1195 transactions (38% of Volume Achieved)</li> </ul>
Round 1 Cycle 2	100% Load Test	16-Aug-2022	0.1% < SLA	36%	●	<ul style="list-style-type: none"> <li>▶ Out of 11 user action/pages, 10 user action were not under agreed SLA (0.1% of under SLA of 5 sec)</li> <li>▶ 344 successful E2E Transactions were achieved during the test run wherein the expected volume was 1055 transactions (36% of Volume Achieved)</li> </ul>
Round 1 Cycle 3	100% Load Test	18-Aug-2022	0% < SLA	44%	●	<ul style="list-style-type: none"> <li>▶ Out of 11 user action/pages, all user action was not under agreed SLA (0 % of under SLA of 5 sec)</li> </ul>

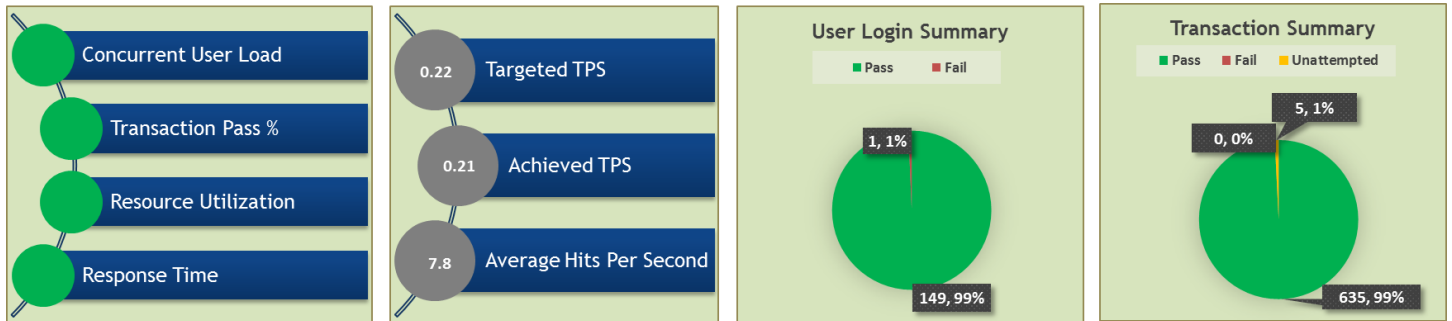
						<ul style="list-style-type: none"> <li>▶ 468 successful E2E Transactions were achieved during the test run wherein the expected volume was 1055 transactions (44 % of Volume Achieved)</li> </ul>
Concurrent users and SLA were revised by BM IT Team (Qasim Mohammed/Pankaj) based on the data retrieved from the production and the same was approved in PSC, email attached in the annexure						
Round 2 Cycle 1	100% Load Test (Revised Load)	08-Sep-2022	100%<SLA	99%		<ul style="list-style-type: none"> <li>▶ Out of 11 user action/pages, all user action was not under agreed SLA (100% of under SLA of 5 sec)</li> <li>▶ 635 successful E2E Transactions were achieved during the test run, wherein the expected volume is 640 (99% of Volume Achieved)</li> </ul>
Round 4 Cycle 1	Endurance Test	08-Sep-2022	91%<SLA	100%		<ul style="list-style-type: none"> <li>▶ Out of 11 user action/pages, 10 user action were under agreed SLA (91% of under SLA of 5 sec)</li> <li>▶ 1920 successful E2E Transactions were achieved during the test run, which is thrice the 100% Load (100% of Volume Achieved)</li> </ul>

Note: The above RAG (Red, Amber & Green) status are denoted based on the test results, the major counters that were taken into consideration are Response Time, Throughput, Resource Utilization and Hits per Second.

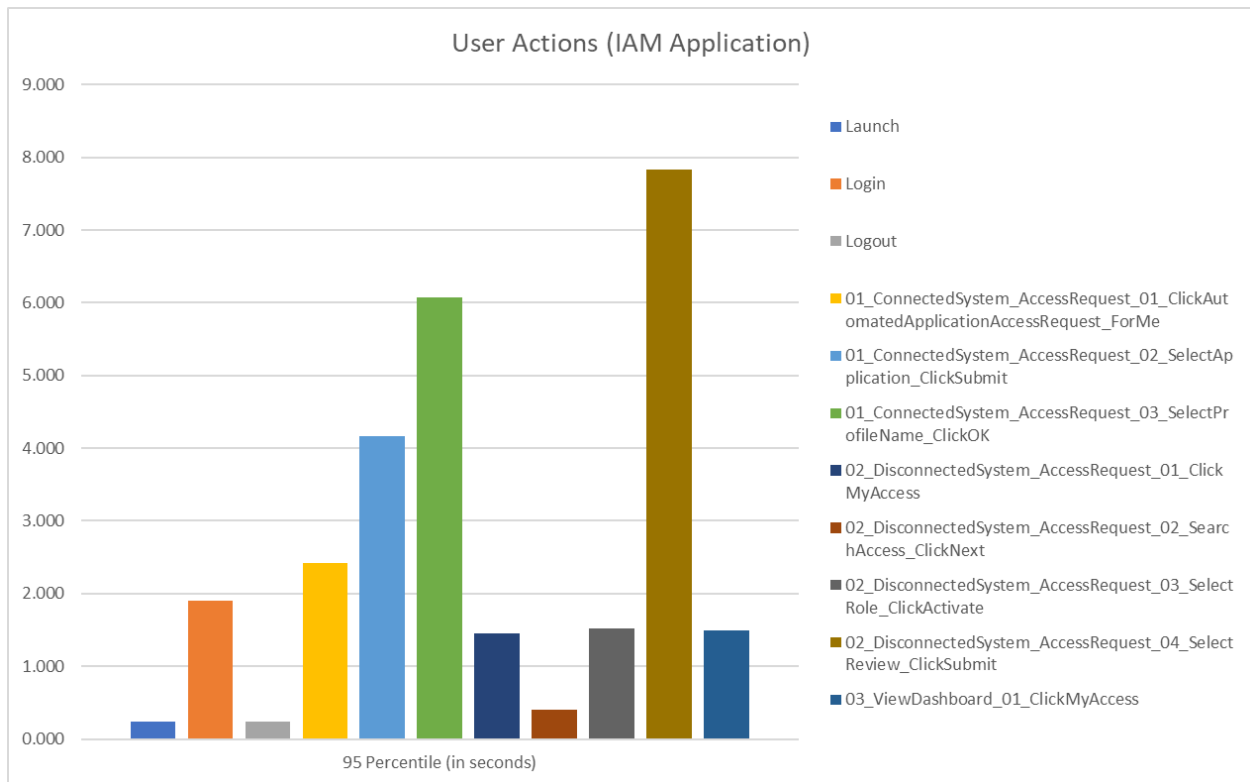
## 6. Performance Result Summary

### 6.1. 100% Load Test

#### 6.1.1. Key Performance Indicators:



#### 6.1.2. Response Time Analysis for Key User Actions:



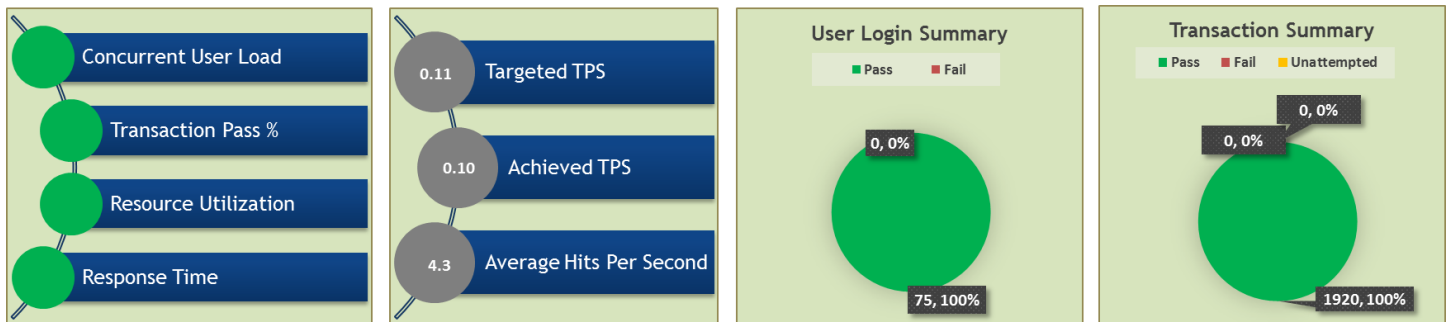
#### 6.1.3. Resource Utilization:

Category	CPU		Memory	
	Avg. CPU%	Max CPU%	Avg. Memory%	Max Memory %
Application Server	25	68	47	48
Database Server	2	3	96	97

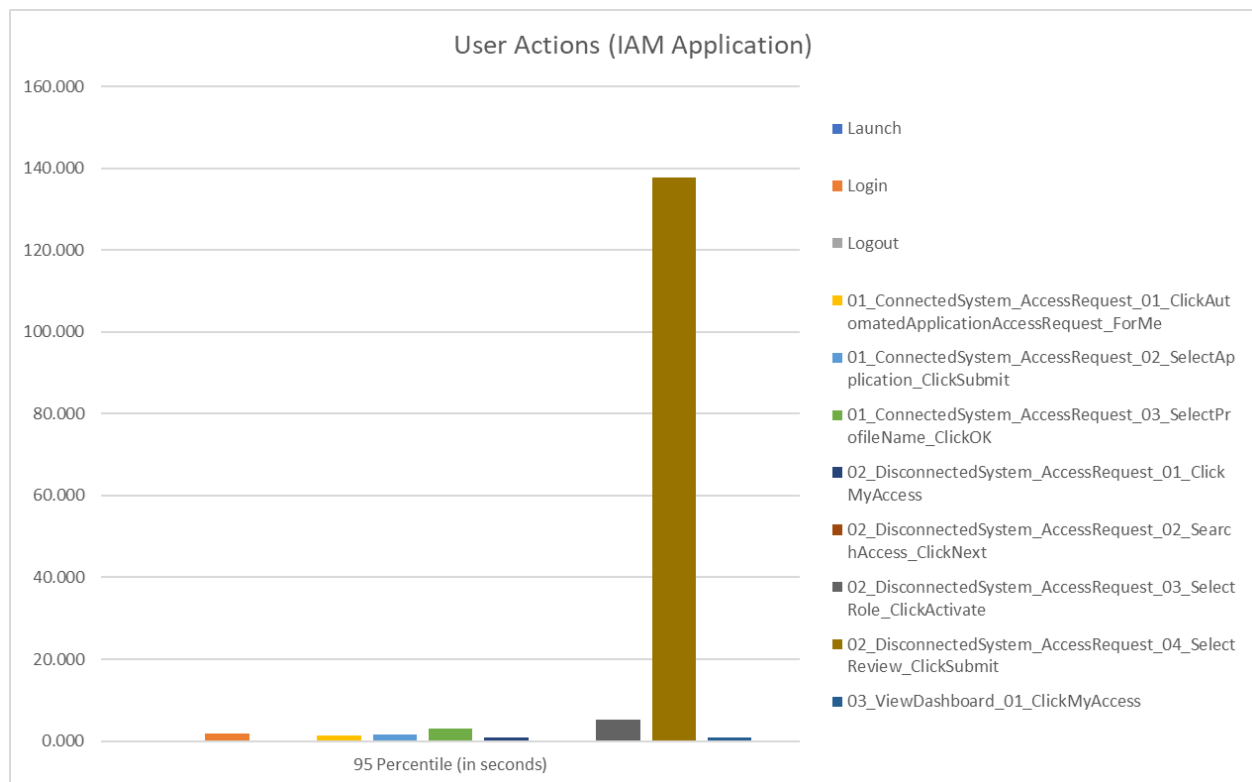


## 6.2. Endurance Test

### 6.2.1. Key Performance Indicators:



### 6.2.2. Response Time Analysis:



### 6.2.3. Resource Utilization:

Category	CPU		Memory	
	Avg. CPU%	Max CPU%	Avg. Memory%	Max Memory %
Application Server	18	39	45	48
Database Server	2	3	96	97

## 7. Exit Acceptance Criteria

Criterion		Compliance	Remark
All the scheduled rounds of execution should be completed – 100% Execution completion			All planned round of execution completed
Key Performance indicators within SLA	95% response times across user actions within the agreed SLA		<b>Load Test:</b> 100% of user actions were within the agreed SLA  <b>Endurance Test:</b> 91% of user actions within the agreed SLA and the deviation was agreed IT Management and Streeting Committee
	95% of throughput across all rounds of execution		Throughput were achieved in both the rounds of execution
	Less than 5% of defects/failures across all rounds of execution		Error percentage were within the permissible limits for load and endurance execution
	Resources utilization are under threshold limits of 75% across all server stake		<b>CPU Utilisation:</b> Within the permissible limits  <b>Memory Utilisation:</b> DB memory utilisations were above 96% during the non-PT time as the same is shared with SIT an UAT deviation was agreed IT Management and Streeting Committee
Outstanding defect should not have any High / Medium defects			Both the raised defects (Bug 992236, Bug 992237) were resolved/justified
Outstanding low defects should not be more than 5%, outstanding defect must also have an alternative workaround otherwise it must be fixed. Any deviations from this should be approved by Bank			No low severity defects are open in the application

## 8. Performance Tuning

S.No	Performance Tuning
1	DB level indexing were done in the XXAUDITIAM_V table
2	DB level thread pool was increased from 200 to 600





Note: All the performance Tunings are to be deployed and confirmed before go live to maintain the best performance in production

## 9. Defect Summery

Defect ID	Title	State
Bug 992236	High Response Times   100% Load Test	Closed
Bug 992237	High Error Rate   100% Load Test	Closed

Note: The above-mentioned issues were faced due to user credentials with improper data (approval manager details missing) and the work items were in processing phase hence JVM was highly highly utilised. The issue was rectified post migrating to SIT environment with proper test data's (user credentials)

## 10. Annexures

Document Name	Attachment
100% Load Test Execution Summary Report	  BM_IAM_R1C1_100 BM_IAM_R1C1_100 % Load Test-Sep_07.% Load Test-Sep_08.
Endurance Test Execution Summary Report	 BM_IAM_R2C1_End urance Test-Sep_08_
PSC MOM	 {PSC} IAM Upgrade Project PSC slides M

Note: The attached execution summary report is zipped and shared over mail