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# OHI Claims Adjudication Performance Test

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Oracle Health Insurance Claims Adjudication Version  
3.20.2.0.0 on an Oracle Cloud Infrastructure

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## Introduction

This white paper describes the claims processing performance and scalability capabilities of Oracle Health Insurance Claims Adjudication Version 3.20.2.0.0 on an Oracle Cloud Infrastructure. This bench-marking exercise was undertaken to determine whether Oracle Health Insurance Claims Adjudication can support large number of claims processing for healthcare payers. Please note that the benchmark data in this white paper is intended for general information purposes and not as a substitute for implementation-specific sizing or benchmarks.

## Scope

Both benefits and pricing flow were tested during claims processing benchmark performance tests.

## Topology and Configuration

This section describes the hardware topology of the systems used for the performance test as well as the hardware and software used.

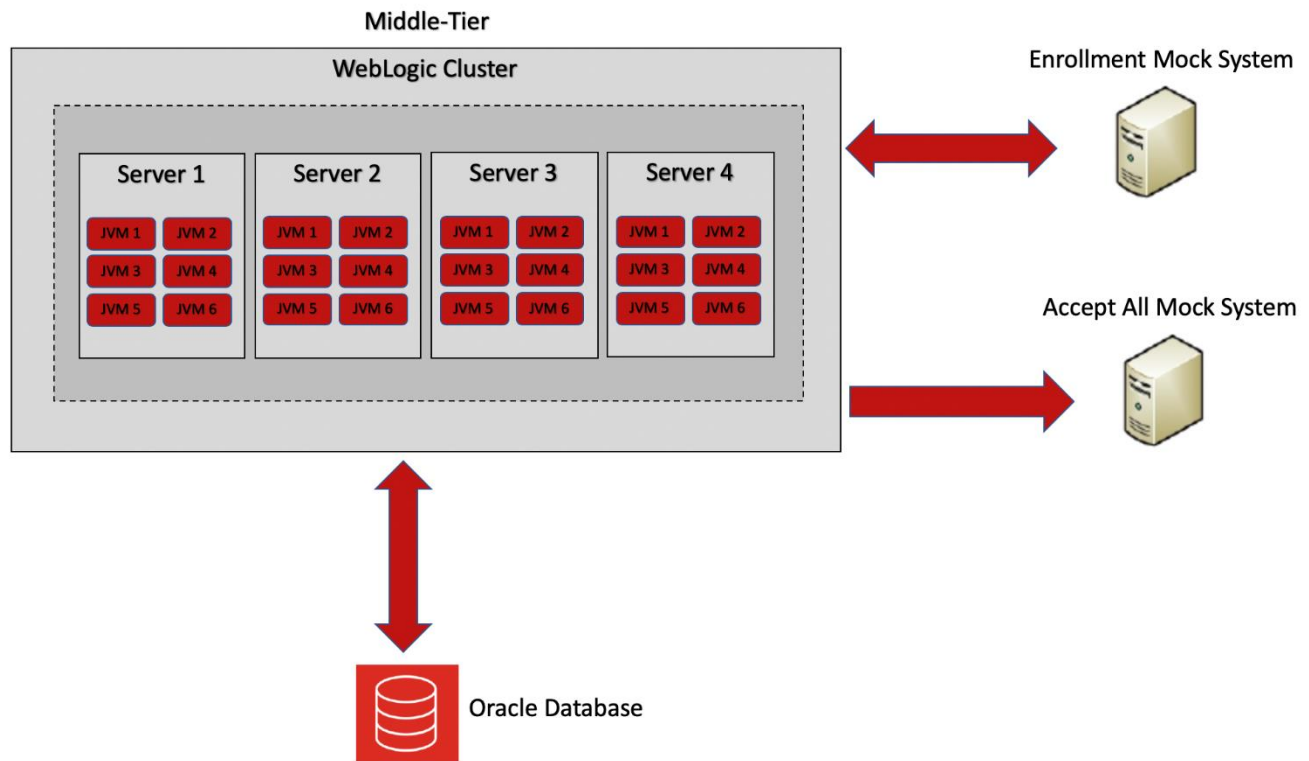


Image 1. Hardware topology diagram

## Hardware

### Middle-Tier (4x)

- OCI Compute X7
- 24 core processors
- 320 GB memory
- Oracle Linux Server

## Database

- Oracle Exadata
- 2 Node RAC
- 92 OCPU per node
- 1440 GB memory

### Software

- Java: 1.8.0\_251
- WebLogic: 12.2.1.3.0
- Database: 19.7.0.0

### Middle-Tier Configuration

- 4 GB heap memory
- G1GC garbage collector
- 16 core work manager threads (per JVM)

### Database Configuration

This lists only memory configuration. Please see the installation guide for other (recommended) database configurations.

- pga\_aggregate\_target: 100 GB
- sga\_max\_size & sga\_target: 78 GB

### Test Data Set-Up

In order to make the tests repeatable and manageable, there were two preliminary activities that occurred. We leveraged a code-based driver to load 3,515,480 total members into the system. Of the ~3M members loaded we utilized 249,429 of them to perform the testing.

Additionally, we leveraged and built a code-based driver to push claims to the system leveraging several claim(s) templates. To mimic a production-like situation, several claims (~2 million) were already processed in the system. This allowed the system to be populated with pre-filled/historical data (including financial transactions and details) before the test began.

### Claims Characteristics

On average,

- Every claim contains 3.24 dynamic fields
- Every UB04 claim contains 8.5 claim lines
- Every HCFA 1500 claim contains 2.5 claim lines
- Every encounter claim contains 2 claim lines
- Every claim line contains 13.65 dynamic fields

There were 4 different **HCFA** 1500 claim(s) templates used to create 195,000 **Professional**, 4 different **UB04** claim(s) templates used to create 35,000 **Institutional** claims, and lastly, 1 **Encounter** claim template used to create 21,000 claims.

## Configuration

The following table lists the total number of configuration items.

ENTITY	NUMBER OF RECORDS
Product	2248
Benefit Specification	74966
Product Benefit Specification	1646255
Provider Pricing Clause	37257
Dynamic Logic	1004
External Intervention Rules	256
Combination Checks	49
Claim Event Rules	21
Claim Callout Rules	4
Dynamic Checks	40
Process Field Derivation Rules	12
Dynamic Field Derivation Rule	45
Claim Transaction Event Rules	2

## Callouts

We leveraged a couple of mock services allowing us to mimic external systems. This allowed us to measure the performance of only Oracle Health Insurance (OHI) Claims Adjudication. **\*NOTE\*** There were **no callouts** to external systems defined except enrollment call out.

### Enrollment Response (Mock) Service

The Enrollment Response (Mock) Service was designed in a such a way that it allowed us to generate and return the individual enrollment response at a very high rate of speed.

### Accept All (Mock) Service

The Accept All (Mock) Service allowed us to catch all the “fire-and-forget” requests, e.g. claims event notification.

## Test Execution

This section explains the test execution process. The following steps are performed in the order mentioned below.

1. Stop the application from processing claims (by stopping Oracle Application Queue (AQ) from dequeuing).
2. The aforementioned driver (see Test Data Setup section) ran a series of claim(s) templates, customizing the serviced member, provider, claim code and claim line start date (a random day within/before 10 days of today).
3. Start Oracle AQ dequeuing so that the application can start processing claims.
4. Once all the claims processed, measure the throughput (claim lines processed per second).

The above process is explained in the following diagram.

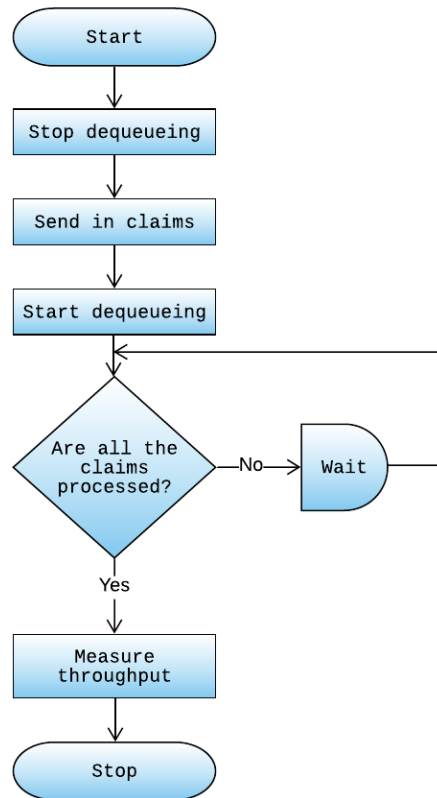


Image 2. Test execution flow diagram

## Test Results

### Claims Processing

The results below display the average of the total processing across three separate claims adjudication cycles. The OHI platform was scaled and leveraged to perform at a rate of **270K** claims adjudicated with an average processing time of **55** mins.

123 RUNS	AVG_TOTAL_TIME_PROCESS	123 AVG_CLAIM_LINES_PER_SECOND	123 TOTAL_CLAIMS_PER_RUN	123 TOTAL_LINES_PER_RUN
3	0 0:56:3.755	240	250,996	805,981

### Summary

The application showed near linear horizontal scalability, resulting in higher throughput (claim lines/second) with an increase in the number of middle-tier nodes. With this hardware configuration, the platform averaged 240 claim lines/s which translates to 75 claims/s or 270,000 claims/hr. The throughput reduces when the database CPU is saturated.

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