Performance tests were conducted using a typical BI application that simulated users performing intensive OLAP manipulations and interactions. These included (but were not limited to) pivots, drills, filters and other interactions using complex metrics. The test application consisted of a range of 1,000 to over 12,000 active users accessing in-memory datasets. More detail about the test set up and test application are discussed on the following page. Test results are shown in the diagram below:

Results and observations

- The maximum number of active users this 8-CPU configuration of MicroStrategy Analytics Enterprise v9.4 (released in October 2013) supports for heavy OLAP analytics is 10,600 active users with an average sub-3 second response time. This equates to approximately 53,000 actual users assuming a 20% ratio of active users to total users.

* Active users are defined as people who perform their BI interaction during the peak hour. A good rule-of-thumb for converting active users to total user population is to assume that 20% of the total population is active during the peak hour.
Test methodology

• Test scripts based on JMeter simulate typical workflows of users accessing MicroStrategy – e.g., log on, run view report, receive report.

• After initial transients are over, end-to-end response time for each user interaction is measured.

• Measurements continue for 1 hour for each data point to ensure stable and statistically significant results.

Test setup

• 1-hour batch window was allotted for cube creation resulting in 100% in-memory operation.

• Optimal data strategy for this application resulted in creation of a 3GB cube.

Test application

Application: OLAP Benchmark App v.1.3.1

• Designed specifically to replicate the OLAP query characteristics typical among MicroStrategy’s enterprise BI customers.

View Reports: 10 total

• Based on a 3GB cube

• 10 view reports with different features

Feature coverage: simulates typical OLAP executions and manipulations that include common MicroStrategy features:

• Different types of metrics, like level metric

• Different functions like count distinct, string function, mode function, and stdev function

• Subtotal from base count distinct calculation

• Different aggregation methods like median aggregation

• And commonly used manipulations, like add view filter, create/remove derived metric, enable subtotal, add to page by, and add derived elements

Analytic complexity: cube returned data 27 million rows x 35 columns

View reports returned data:

• Range: 6,500 to 26,520 rows, 10 to 14 columns

• Average: 10,568 rows and 11.4 columns

Database: Oracle DB

• Logical: Snowflake schema, 4 Dimensions, 37 attributes

• Physical: 1TB. 7B row fact table

Usage pattern

• Scripts simulate large amount of users accessing the same cube for different OLAP actions.

• Each user executes a script simulating a typical workflow of view report execution and manipulation (30 steps).

Definitions and assumptions

• 1 KiloCycle represents the ability to support 1,000 user requests per hour with less than a 2.5-second average response time.

• Active enterprise users submit an average of 5.6 requests per hour (based on analysis of MicroStrategy typical enterprise customers).

• 20% of total user population is active during the peak hour.

Note: All test results described here are specific to the above described application and should not be used for sizing other applications.