Case Study: Financial Company-Cloud Application Performance Tuning and Cost Optimization

Business Context:
Capitis Solutions Inc. is playing a key role in building the next generation backend computation platform for the mortgage industry. This platform is expected to handle multibillion dollars of assets and cash flows. Due to the mission critical nature of the project, the platform architecture is designed to be highly available and scalable.

The application workload increases on a monthly cycle for a limited period lasting a few days. This cyclical workload makes it an ideal candidate for elastic scaling during the critical performance periods each month. Although AWS elastic computing provides horizontal and vertical scaling on-demand, customers risk paying more than necessary for the service if they do not take the AWS cost structure into account during performance tuning.

Customer Challenge

Cloud application testing and performance tuning bring additional challenges to the development lifecycle than those encountered in traditional data centers. New test and performance tuning challenges include:

- Test frameworks must be able to perform stress and load tests on new instances created through auto scaling groups
- Aggregation of monitoring and performance metrics from multiple sources
- Selection of the best compute instances based for application services, messaging and database layer
- Selection of optimized versus GP2 EBS volumes along with corresponding IOPS
- Balancing the number of reserve versus on-demand instances
- Lack of Oracle Real Application Cluster (RAC)-based configurations to increase performance in AWS environment
- Identifying the correct backup storage policies and options
- Streamlining batch workloads to maximize throughput while optimizing AWS resource requirements

AWS and Partner Solution

To meet these challenges, Capitis Solutions created an elastic test framework able to dynamically adapt to scaled applications using load profile calculations. The optimized solution took advantage of the following AWS services:
- M4 machine class for application server instances while R3 instances for Oracle database instances
- Optimized EBS volumes combined with provisioned IOPS to achieve desired throughput
- Weekly RMAN L0 backups combined with daily L1 backups using s3 storage
- Gathering performance metrics by tapping into AWS cloud watch capabilities

The Capitis engineers also created an impact analysis of the different solutions being considered by the customer. The impact analysis clearly communicated the cost/technology tradeoffs enabling technically sound decision making as well as an informed business decision.

Capitis Solutions lessons learned and accelerators:

- Even though AWS platform provides native scalability capabilities, there are additional dimensions not in play during traditional data center application performance tuning
- Performance tuning must take AWS cost models into account or the solution may become more costly than traditional data center hosting
- Having tool support tailored to elastic cloud instances is critical to success.
- Scaling relational databases has additional constraints that can be met by carefully selecting the correct compute, storage and IO capabilities of AWS

Results & Benefits

By leveraging AWS and our Capitis Test Framework, Capitis Solutions was able to help our customer meet the challenge of achieving a high performance platform while optimizing AWS resource costs. Our innovative, cloud-native test framework accelerated platform performance tuning in a cost effective manner, playing a key role in achieving the desired system performance. Using this framework and monitoring we were able to advise our customer how to select the best AWS compute, storage and network resources to meet their technical requirements within budget.

To learn how you can achieve similar results contact info@capitissolutions.com.