Choosing the Right Cloud Provider for Your Business

Abstract

As cloud computing becomes an increasingly important part of any IT organization's delivery model, assessing and selecting the right cloud provider also becomes one of the most strategic decisions that business leaders undertake.

The accumulation of the necessary data to base cloud buying decisions is often achieved in production, or reproduction models mainly as paid customer engagements or trial engagements – which often occurs AFTER the major decisions have been made in the sales process.

This white paper will deliver data that provides valuable information based on real compute scenarios to assist buyers of cloud services in understanding how their workloads might perform and what costs are associated with those environments across multiple cloud computing platforms BEFORE they invest in the selection of a cloud computing provider.

Introduction

Nearly every company in the world is evaluating or deploying cloud solutions. With cloud computing becoming more widely utilized, it is important for organizations to understand ways to maximize the benefits and minimize risks of a cloud migration.

The cloud computing market is emerging, and therefore information and data to help businesses make the most informed decisions is often limited to sales and marketing data provided by the cloud computing companies themselves. Additional tools such as blogs, testimonials and analyst organization reports are available, but mainly consist of high-level data points that do not take into account key measurements from the existing infrastructure and workloads to allow someone to construct a migration plan, cost analysis and ROI for the cloud migration project.

This paper offers accurate and complete data obtained during a professional cloud assessment on NaviSite's NaviCloud® and NaviCloud Director™ versus Rackspace® and Amazon Web Services™ (AWS™). The purpose of these results is to understand how identical configurations and workloads perform within each environment and how to accurately calculate the "real costs" of each provider.

About NaviCloud Director

NaviCloud Director offers the ability to quickly build your application, scale it up, scale it down as well as connect it to existing physical or virtual environments.

NaviCloud Director is an Infrastructure-as-a-Service (IaaS) platform that leverages VMware® vCloud® Director® 5.1, and is designed to provide businesses a flexible and versatile self-service platform well suited for cloud-based production applications.

Additional key features include:

- Easy access through AppCenter, vCloud Director, and APIs
- Mix and match billing models for fixed costs or pay as you go
- Flexible network architectures allowing for optimal application configuration or regulatory compliance
- Software-defined networking technology
- Templates available for Windows® 2008/2012 and CentOS
- Ability to access and integrate with other NaviCloud and NaviSite® Managed Services to accommodate complex applications and business needs

About NaviCloud

NaviSite's original cloud platform that has been through many upgrades, offers you a production-ready, secure, and fully managed cloud-computing infrastructure. With a full range of managed cloud services and enterprise-hosted application options, NaviSite significantly reduces your IT costs and management headaches.

Benefits include:

- Customizable cloud computing solutions to meet complex IT demands
- Superior customer service and support
- Unparalleled Service Level Agreements (SLAs)
- Multi-pronged enterprise-level cloud computing security
- Usage-based billing

About Rackspace

The Rackspace cloud provides on-demand scalable website, application and storage hosting backed by Fanatical® Support®. Through its suite of cloud solutions, the Rackspace cloud enables developers and IT managers to minimize the hassles, upfront investments and high costs associated with dedicated hardware, while offering the ability to scale hosting resources.

With the Rackspace cloud, you can deploy one to hundreds of cloud servers easily, for as long (or little) as you need them. Cloud servers provide a virtual instance of a physical machine with predetermined combinations of RAM, HDD and CPU allocations.

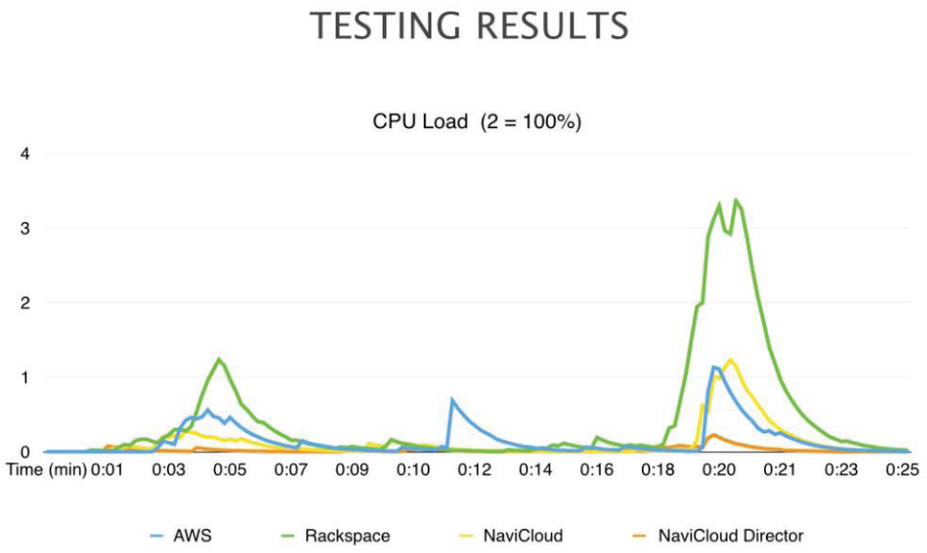
About AWS

Amazon Web Services (AWS) provides a suite of solutions that enables organizations to leverage Amazon.com's technology infrastructure and content via simple API calls. Using services such as Amazon EC2™, Amazon S3™, and Amazon SQS™, organizations can cut fixed costs by letting Amazon do the "heavy lifting" of building and managing their infrastructure. AWS helps organizations focus on their idea and develop Web applications in a reliable, scalable, and cost-effective manner.

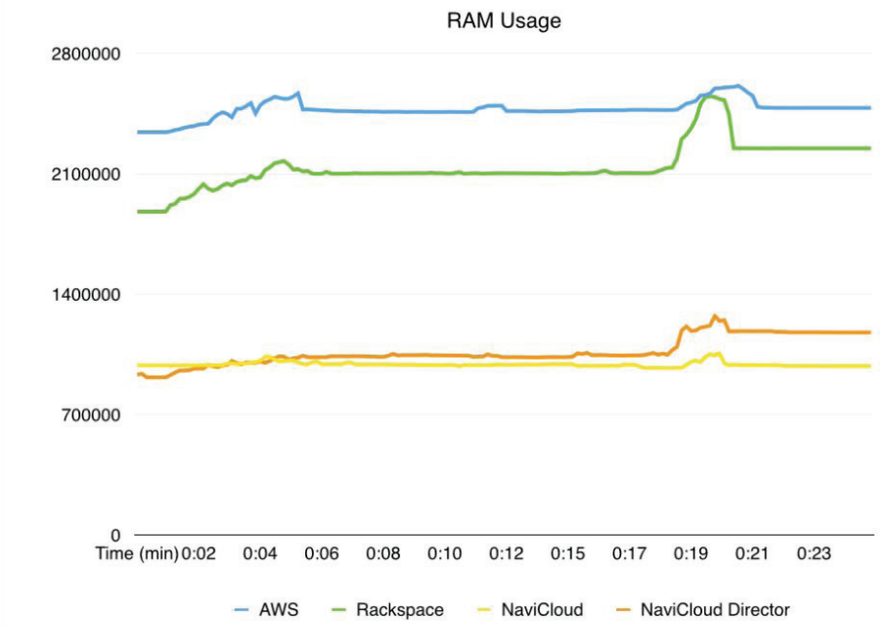
The Professional Cloud Assessment – Methodology and Results

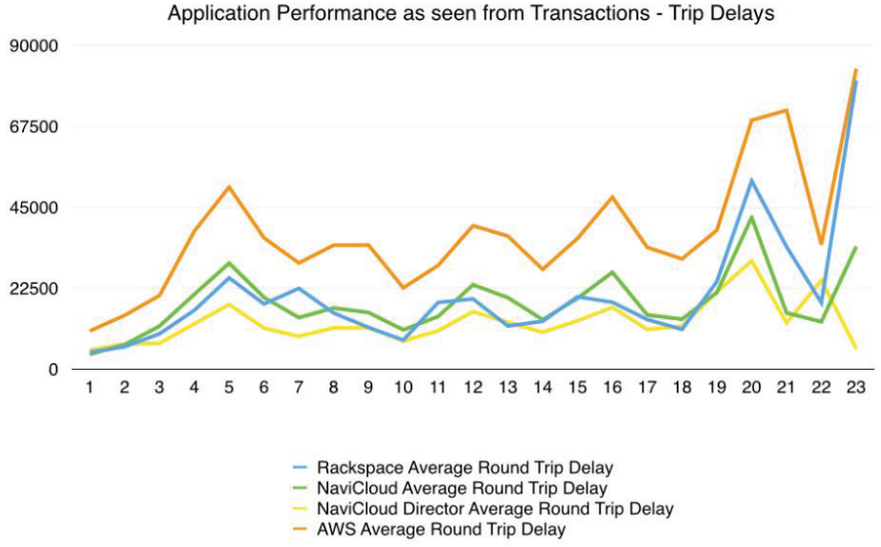
By now, most organizations have thought about migration to the cloud and evaluated top-class cloud IaaS providers. Presumably all these organizations did their best to be diligent when investigating potential cloud suppliers. But in the real world there is never enough time, money or resources to do a complete evaluation. The best solution is a professional cloud assessment. The following are the results of a cloud assessment conducted by Rick Blaisdell, the cloud computing expert, on four cloud platforms: NaviSite's Navi-Cloud, NaviCloud Director, Rackspace and Amazon Web Services (AWS).

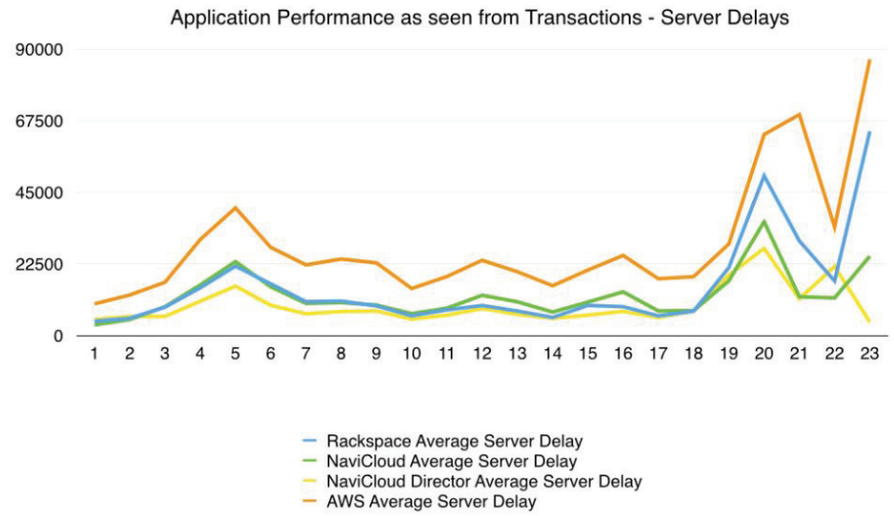
Load testing software was used to create virtual users to simulate a real user's shopping experience. Multiple tests were run and throughout each test the load testing environment increased the virtual users until the threshold of 300 virtual users was reached. Identical installs of Linux (CentOS) based servers were deployed in a three-tier shopping cart application. The virtual machines configured in each location had identical virtual CPU's, RAM and storage configurations and sizes. Tests were run multiple times over a two-day period and the averages from the test results were used to create the benchmarking data. As you can see in the CPU load and RAM usage graphs, Rackspace and AWS consumed more resources than both of the NaviSite cloud environments.



TESTING RESULTS







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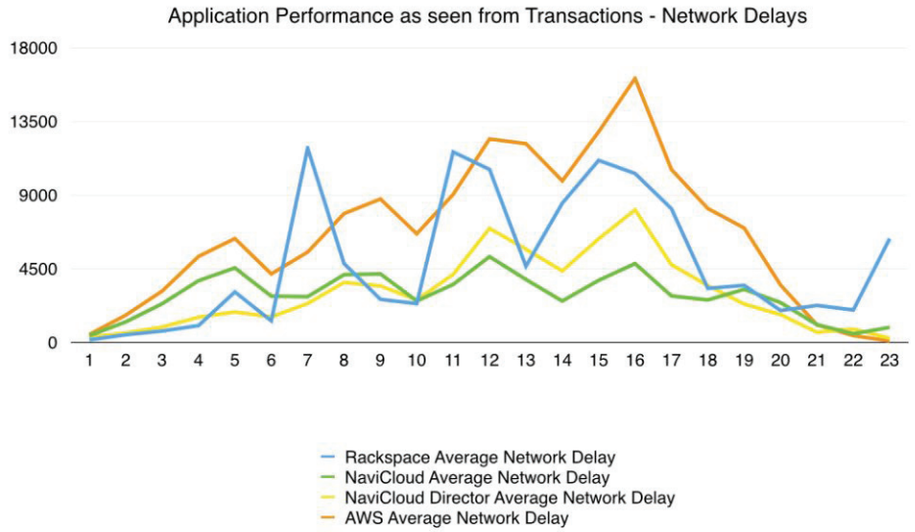
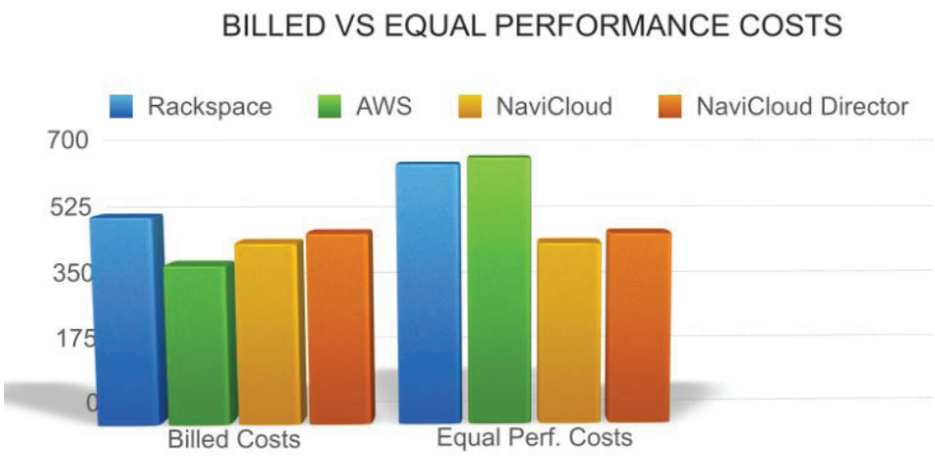


Results were compared among the four providers and interestingly the hypothesis that the larger AWS provider would offer an edge in performance was flawed. In limited load conditions, all instances performed similarly. However, as soon as the number of simultaneous users increased, the systems were stressed, similar to what would be experienced in a real-life scenario, during peak shopping times. As the virtual users increased, transaction wait time and failures increased at a rapid pace.

The load handling capacity of each provider, as noted by server timeout data, suggested that an additional number of resources was needed for that provider to perform as well as the top-performing providers. The data was then used to estimate the real costs of each provider if they were configured to operate with similar end user experiences.



Published Versus Actual Costs

NaviCloud and NaviCloud Director's performance metrics were better than Rackspace and AWS in all tests. Rackspace performed better overall than AWS in most of the tests. The performance differences between the tests are likely due to differences in how heavily subscribed a cloud providers system is and the actual performance of the hardware powering the IaaS environment. Newer, state of the art CPU's, RAM and disk will have more performance and efficiency than hardware just a few years older.

The graph below was created by taking the costs that were billed by each provider and estimating what the costs would be if the performance of all systems were similar. This can be accomplished by increasing a combination of virtual servers, CPU's and RAM until the output between each provider was equal to one another. The graph below estimates the percentage more a company would pay using Rackspace or AWS versus NaviCloud.

Conclusions

Under minimal load (first three minutes into the test ramp-up), all servers performed relatively well without any time-outs and observable delays. AWS had higher response times even initially. Subsequently, delays from AWS became distinct as compared to the other three. Overall, both NaviCloud instances fared better than the others.

The slowness is due to the server delays and not the network since the network delay at peak loads affected all systems in a similar manner. However, server delays are apparent and distinguishable throughout the tests. When it comes to deploying an application on physical servers, IT managers are very critical in choice of processors and network architecture. However, when they decide to migrate or launch an application in the cloud, the choice of processors, memory speed and storage are rarely thought through.

Name of the cloud provider, sales pitch and marketing material posted by provider are often the deciding factors. Even with established cloud providers, there are platforms that were adopted early and are still in production. Cloud providers often over subscribe, which decreases overall cloud performance.

How can one assure that a given application would perform at its optimal speed in the cloud? A thorough and careful application assessment prior to making a decision on a cloud provider is a necessity.

Using benchmarking tools like UnixBench, Iperf and system agents to record CPU, memory and disk usage as well as network analyzer tools gives a company valuable insight on how their application will perform in the cloud and what resources will be needed in a cloud environment.

Cloud migration costs, return on investment and ongoing cloud costs can also be accurately calculated if a proper assessment has been completed.

About Rick Blaisdell

Rick Blaisdell, President of Rick's Cloud, is an experienced CTO, creating technical strategies which reduce IT operational costs and improve efficiencies. He has 20 years of product, business development, and high-tech experience with Fortune 500 companies, developing innovative technology strategies, with particular expertise in cloud computing, Software as a Service, virtualization, software development, cloud architecture, product development, strategic planning, business strategy, project management, business process improvement, technical leadership, large scale web architecture, enterprise architecture.

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