NetApp®

White Paper

Rent, Lease, or Buy
Consuming Storage in the Cloud

Jeff Whitaker, NetApp

October 2014 | WP-7204

Abstract

As business requirements drive the need for a hybrid cloud strategy, companies must determine how best to run their applications and manage their data—whether in their private data center, near the cloud, or in the cloud. Hyperscale cloud providers offer excellent flexibility by allowing customers to buy raw resources in a consumption model by the hour. NetApp® has released a new way of deploying the cluster Data ONTAP® operating system that runs on hyperscale resources, called NetApp Cloud ONTAP. When combined with NetApp Private Storage for Cloud, Cloud ONTAP offers customers superior choice in how they manage their cloud storage.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1   Options When Acquiring Resources

In the world of transportation, we are all aware of the many ways that we can acquire a vehicle to get us from one location to another. It is a part of everyday life for many of us. Whether we are traveling and need a vehicle for a short period of time to get us to our vacation spot at the beach or ski resort, or to get us to our customer offices we go to our local rental car provider and choose to rent a car that best fits our requirements for the few days we need it. For this specific usage, the rental model solves our transportation needs.

Now, what if we need a vehicle for six months or a year? We know that the daily rates of a rental car agency are no longer practical. The daily rates for even the cheapest vehicles get expensive fast. It's time to attain a vehicle in a way that is more cost-effective for the needed duration. This is the type of situation for which a dealership offers vehicles for lease. You put a modest amount of money down to attain the car and then pay monthly for the desired duration. The rates are much better than what you would get from a rental agency, and after the lease period, you give the vehicle back to the dealership and you have finished.

Then comes the question of long-term usage. You need a primary vehicle for your day-to-day activities and plan to use the vehicle for three years or five years—possibly longer. The leasing option for a year was fine for that limited duration, but if you want to keep the vehicle longer, there is a buyout option that is quite expensive. If you return the vehicle and get another lease, you are looking at another modest down payment to have a vehicle. At this point, the cost of purchasing a vehicle outright makes more sense, because the cost for longer-term ownership is far better than for a long-term vehicle rental and better than the cost of ongoing leasing fees and associated up-front costs for extended periods of time. You can purchase a vehicle and make use of it for its effective life, potentially 10 years or more.

1.1   Acquiring in the IT Industry

When it comes to choosing the resources necessary to run a business, the acquisition is not so cut-and-dried. For some resources, equipment leasing is offered. When it comes to your core infrastructure to run applications that maintain your day-to-day business operations, however, the procurement options are much less variable. Essentially you have a lease, purchase, or finance option for most capital equipment products.

Often, CIOs and IT management must make equipment purchasing decisions and assess how much equipment they will need over the lifecycle of their environment needs. This alone can be mind-boggling. You don't want to make a purchase that's too small and have to go back and request more equipment in short order. You also don't want to overspend and never get the full utilization out of your expenditures. Many factors come into this decision, and it can be a difficult task to predict your usage over a three- to five-year lifecycle of equipment.

Some of the key points in this decision are:

• What workloads will use this infrastructure?
• How long will I be running the workload?
• How variable is the usage pattern?
• What happens if I underprovision or overprovision?

When you make these decisions, what if your assessment is inaccurate? What if you don't yet know your workload well enough to make an accurate assessment of the multiyear consumption? Finding solutions to these questions becomes paramount to controlling the cost of your infrastructure.

2 The New Landscape of IT

IT management deals with the ever-changing landscape of technology and regularly make infrastructure purchase decisions on new and changing products. It can be either major version updates of a previously understood technology or new technology altogether, but what about when options expand to a growing set of external resources? With the advent of cloud, the entire ecosystem of IT infrastructure is rapidly changing – with new opportunities to boost agility and control costs. However these opportunities come with new options to consider and new decisions to make.

2.1   The Cloud Brings Flexibility

The cloud has brought new options for IT deployment, which changes the way that enterprises can use resources. It has turned IT infrastructure from a capital component into a service. Amazon Web Services (AWS) changed the way we look at infrastructure by redefining the data center while creating a management software layer that allows AWS to offer the individual components for purchase. AWS virtualizes the complete hardware environment and then offers those virtualized components to IT users for purchase. These virtual server, network, and storage components can be purchased to the granularity of an hour of use and with the simplicity of a credit card. AWS took that infrastructure, built a catalog of application choices, and created a marketplace for enterprises to choose what they want to run in the AWS cloud

This new hourly access to IT resources has created a very flexible environment from which users of applications can choose when building out their application infrastructure. No longer do they need to reach out to IT to determine their usage needs and to determine the hardware required to support their longer-term requirements, and then wait for the environment to get provisioned or even purchased to get support. Users can go to their cloud provider, swipe a credit card, and within minutes have the necessary infrastructure at hand for their use.

This new deployment model changes the economics of deploying applications and services within an organization. With the new simplicity and flexibility of acquiring resources, users can purchase what they need, when they need it and adjust dynamically. Take, for example, an application development environment. If a team wants to spin up a new environment for their dev/test needs, they can instantly spin up the resources based on their expected usage. If their initial assessment of resources was inaccurate, they can adjust on-the-fly by either purchasing more resources or turning off the resources that they do not need.

This flexibility means they pay only for what they need, when they need it. They no longer have to take the risk of requesting resources and underutilizing that environment if their usage patterns are lower than expected. They also do not have to worry about going through a complete procurement process for new resources if their usage is higher than expected or grows rapidly. They can dynamically add or subtract infrastructure as needed.

Figure 1) Cost-usage comparison between traditional and cloud infrastructures.
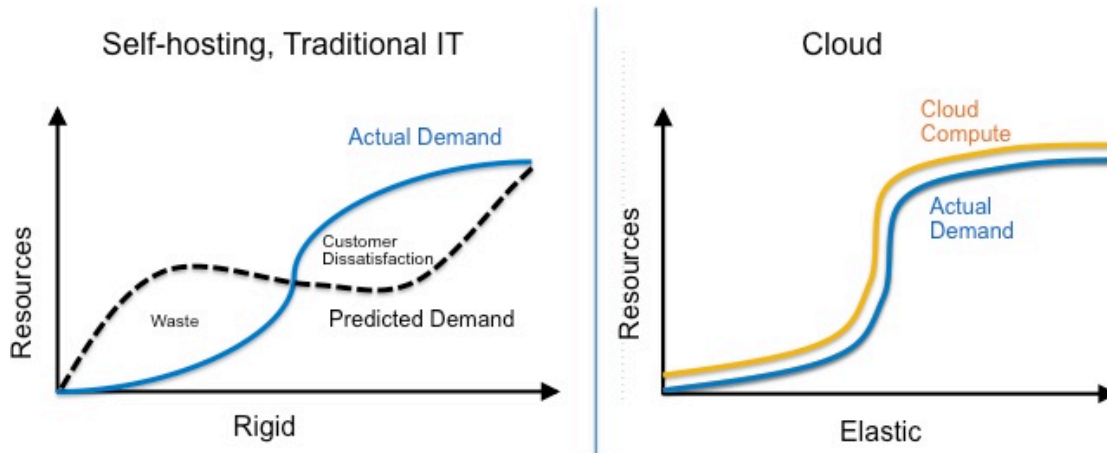

Figure 1 shows a comparison between deploying infrastructure in a traditional IT model and deployment in a flexible cloud environment. In the traditional model, when infrastructure usage goes as planned, there is a period of waste as the infrastructure is underused. When the usage grows, it meets targets and then starts to become overprovisioned. At a point in time during this curve, a decision is made to add more infrastructure to meet the needs, and the cycle starts again. If we look at the cloud infrastructure, however, we see that because of the dynamic allocation of resources, the deployed infrastructure tracks the need or demand.

2.2   Cloud Infrastructure

To run an IT environment in the cloud, a user needs a number of infrastructure components. The basics are server, network, storage, and potentially software applications. In the process of building out an environment, these resources and the characteristics of each have depicted what applications users are moving into the cloud.

When users choose a cloud infrastructure, the server and network components are ready for application at the time of use and need only to be set up. These items are stateless, or more simply put, you can set them up, turn them on, and use them. When you have finished, you can turn them off. There is nothing more to it. As well, with applications from the cloud provider marketplace, you can turn on a server and have it ready to run any available software applications that your environment requires. Again, you can turn them on and turn them off as needed.

When it comes to data and storage, this is however not the case. Although you can turn on and turn off the use of storage, the data itself is not stateless. Data is likely to change throughout the use of the storage resource. It is something specific when you start and or when you finish. It is your data, and you need to maintain that data throughout the use of the infrastructure. When you kick off a new environment, often you have to choose the necessary resources and then move your environment data there. When you have finished with the resources, you also need to preserve any data that has been generated and potentially move it back to your own data center.

3   Cloud Economics

As we now understand more about the cloud service model, there are broad impacts across how companies can use its flexibility to improve their business. Cloud customers can now choose to consume

their resources in many different ways to best fit their requirements. They can choose to consume by the hour, purchase longer-term subscriptions, or move to a traditional purchase model. This brings us back to the automobile consumption analogy. IT can now be "rented" by the hour, "leased" by subscription, and "bought" with a traditional infrastructure purchase or financing.

3.1   Rent

The option to "rent" resources ties closely to the hourly purchase model offered for infrastructure. When users need the resources for only a short period of time, they can purchase resources by the hour. Renting of resources also can lower risks and satisfy urgent timelines when working with longer term environments. You can get the application running rapidly, validate that it meets your needs and then use that time to determine your longer term resource needs.

This hourly pricing of resources is valuable for short periods, but there is a premium paid for this granularity and flexibility. If you plan to use the resources for several months, then purchasing by the hour can become an expensive proposition.

3.2   Lease

The option to "lease" resources ties closely to a subscription purchase. When a customer must run an environment for a few months or up to a year or two, the hourly pricing models become financially unviable and longer-term subscriptions are available at a reduced price. With an up-front commitment that a customer will purchase the resources for an extended period of time, providers and vendors can offer lower rates for the infrastructure, along with well-defined service levels and commitments.

3.3   Buy

The choice to "buy" infrastructure is ideal for the longer-term use of an item and is best suited for environments that will be used for extended periods of time. This is for applications that will run for years and for which the usage patterns are well understood. For cloud deployments, when an environment reaches a steady state of operation, you may no longer need the flexibility offered by the pay-as-you-go environment and can choose to move to purchased infrastructure. The cost of enterprise equipment, when amortized over several years, regularly becomes the most cost-effective path of operation.

3.4   Consumption Choice

Many factors help determine when to use an hourly or subscription model in the cloud or when to purchase and build an infrastructure environment. These factors can range from cost, to variability of resource use, performance and availability requirements. Figure 2 shows an example cost trend when consuming resources in each of the three models. Over a six-year period, the chart shows the multiple crossover points for hourly and six-month subscriptions and the crossover point for a hardware purchase. An hourly purchase should be only for operation of a few months before users move to a subscription. And a purchase should be made instead of a subscription after just less than two years of use.

Figure 2) Cost of resource purchase models over time, assuming hourly, six-month subscription, and a hardware refresh at three years.
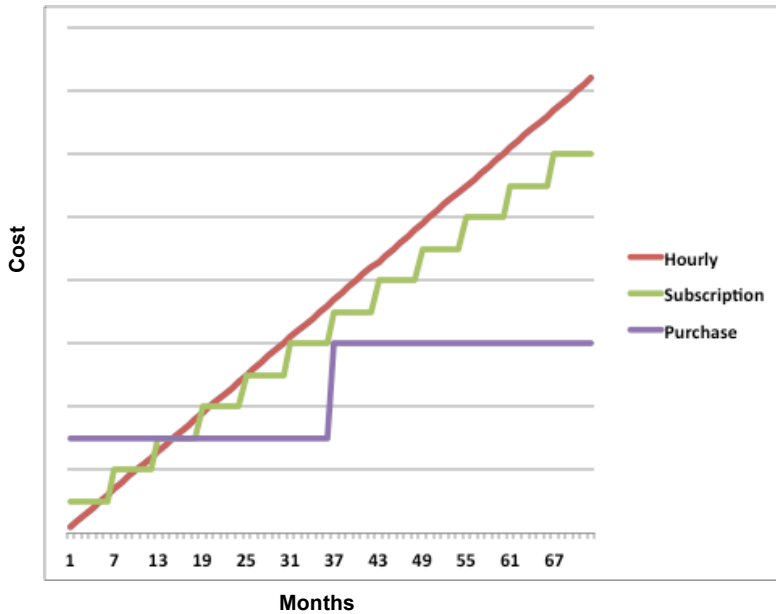
4   Data in the Cloud

Moving to the cloud offers agility when deploying services or running flexible applications, but the challenge for enterprises is how to take advantage of these flexible compute options while still maintaining control of their data. NetApp helps customers take advantage of the cloud by offering control of the entire data fabric, from data center premises to the cloud. NetApp offers high-value, traditional storage platforms for the data center as well as solutions for the cloud that provide true enterprise-class data management. Solutions based on the NetApp Data ONTAP operating system interoperate providing a uniform data management environment with simple data mobility that allow you the flexibility to move from one location to another as your business needs change.

NetApp has two solutions that operate in or near the cloud and that give customers a choice when they decide how they want to consume cloud storage. With the introduction of Cloud ONTAP, NetApp now has a software-based storage management solution based on the NetApp clustered Data ONTAP operating system that can run on top of AWS compute resources and manage EBS block storage. If customers want to take advantage of cloud compute resources but want to own their entire storage environment, they have the choice to go with NetApp Private Storage (NPS) for Cloud. NPS for Cloud is a solution that takes NetApp FAS storage and runs it in a colocation facility near the cloud provider data center. Customers get a fast connection from storage to cloud compute allowing them to use NetApp storage as though it is within the cloud provider data center. These solutions allow customers to choose whether they want to "rent," "lease," or "buy" their storage management, offering the flexibility that fits their requirements.

## 4.1   NetApp Cloud Storage Details

NetApp Cloud ONTAP

NetApp Cloud ONTAP is a software-only storage appliance that runs the NetApp clustered Data ONTAP storage operating system. It offers control of your data with the power of an enterprise storage software

solution. By building your cloud storage environment on Cloud ONTAP, you get enterprise-class features for your cloud storage. You can:

- Provision both NAS and SAN storage with NFS, CIFS, and iSCSI support.

- Minimize your storage footprint with efficiency features such as data deduplication, thin provisioning, and data compression.

- Create zero-impact NetApp Snapshot® copies with near-instantaneous point-in-time backups of your data without taking additional storage resources.

- Use NetApp SnapMirror® technology to bring your hybrid cloud environment together by tying on-premises FAS storage to your Cloud ONTAP environment.

- Get advanced data management features with the NetApp OnCommand® management suite of tools. Features range from in-depth monitoring and tracking of storage with OnCommand Insight to detailed storage instance control with OnCommand System Manager.

- Replicate data across availability zones to promote application availability.

Cloud ONTAP is deployed and managed from OnCommand Cloud Manager. You get a simple point-and-click environment to manage the software and underlying AWS infrastructure for your cloud storage solution.

**Figure 3) NetApp Cloud ONTAP for AWS.**
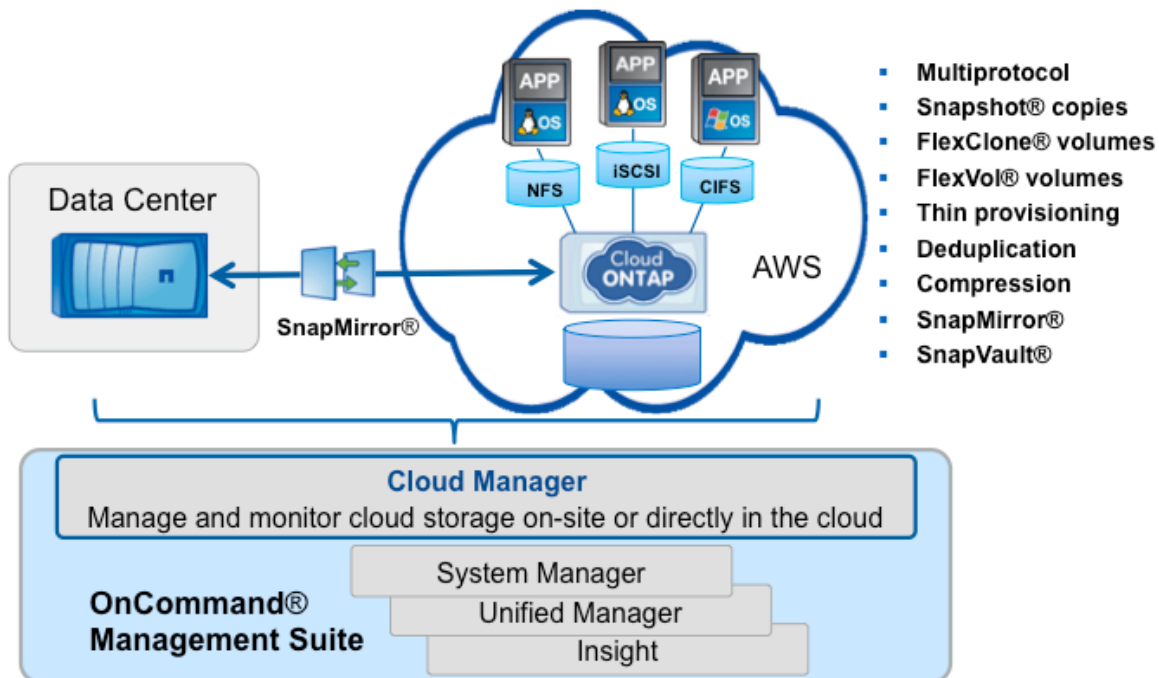
NetApp Private Storage for Cloud

NPS for Cloud is a hybrid cloud solution that gives you public cloud benefits without the usual trade-offs. For workloads that require high performance, capacity, and/or availability or for those times when you want to maintain control of your data while using the cloud compute, NPS for Cloud is an ideal choice.

By combining public cloud compute resources with proven enterprise storage, you get the elasticity and savings of cloud compute resources together with the performance, security, availability, and control that even our Fortune 100® customers rely on.

Figure 4) NetApp Private Storage for AWS.
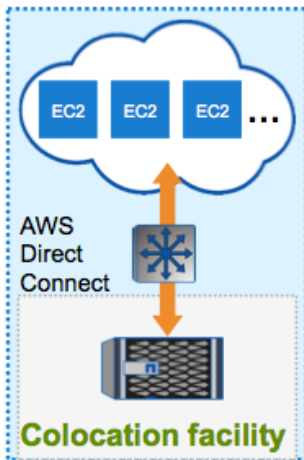
Your organization can dynamically utilize cloud compute resources while your data resides within secure private storage, maximizing security, availability, and compliance.

In the AWS case, the NetApp Private Storage for AWS approach lets you keep your data near the AWS cloud on NetApp storage in select data centers. Your NetApp storage is connected directly to AWS compute with AWS Direct Connect, a secure, dedicated, high-speed network connection that does not go over the Internet. By putting your data near the AWS cloud with a dedicated connection, AWS compute feels local while data remains secure and protected in a colocation facility.

With NPS for Cloud, you own your storage and you know where your data lives at all times. You maintain complete control of your data on NetApp while you use the cloud, and you can still meet the strictest compliance and sovereignty requirements. Maintaining control of your data outside the cloud provider environment offers you added flexibility and piece-of-mind when deciding if another cloud provider better fits your needs.

By placing NetApp Private Storage in tier 1 data centers, such as Equinix, enterprises get superior physical and environmental security, above and beyond what most could otherwise afford. The patented Equinix five-layer security system was created by the architects of the U.S. Federal Reserve security system. The Equinix system includes appointment-only access, 24/7 security staffing, biometric hand geometry readers, 24-hour video surveillance, and the ability to track all visitors throughout the data center.

4.2   Choice for Cloud Storage

When choosing the environment that best fits your individual requirements, you should understand the characteristics and issues involved. Highlighted in Table 1 are some of these application or environment characteristics to help you.

When looking at the option to "rent" your storage resources, NetApp Cloud ONTAP offers an hourly purchase model from the Amazon Marketplace. For a "lease" option, Cloud ONTAP can be purchased from NetApp as a six-month subscription. If you decide to "buy" your storage, you can purchase NetApp Private Storage for Cloud.

When buying your storage, there are further options that fit more with the traditional data center approach (Those options are not covered in this paper, however). NetApp offers a host of solutions to build out a private cloud environment. These range from OpenStack solutions, to object storage solutions with NetApp StorageGRID® technology, to Microsoft® Private Cloud and VMware® Private Cloud solutions.

Table 1) Cloud type descriptions.

Data Location	Solution	Purchase Models	Application Properties and Environment Needs
In the cloud	NetApp Cloud ONTAP for AWS	• Hourly • Subscription (6 months)	• Limit risk for new and/or unknown application requirements • Rapid deployment necessary for application and data environment • Customer controls data environment
Near the cloud	NetApp Private Storage for Cloud, including: • NPS for AWS • NPS for Microsoft Azure • NPS for SoftLayer	• Purchase	• Data remains for extended periods of time • High performance and capacity required • Variable application usage patterns • Customer fully owns and controls data environment • Data not tied to single cloud provider

5 Summary

When opting to take advantage of the cloud, it is important for customers to have a choice in how they deploy their services. Achieving the flexibility and agility of a cloud environment while still having control of your data is a challenging task. The cloud is now becoming an extension of the data center, so why not use the same enterprise data fabric that you use on premises when you tie into the cloud? With NetApp Cloud ONTAP and NetApp Private Storage, you can achieve that with the flexibility and choice of a solution that fits your needs.

References

The following references were used in this paper:

- NetApp Cloud ONTAP Solution Brief
  http://www.netapp.com/us/system/pdf-reader.aspx?pdfuri=tcm:3-127470&m=ds-3618.pdf
- NetApp Cloud Manager Datasheet
  http://www.netapp.com/us/system/pdf-reader.aspx?pdfuri=tcm:3-127474&m=ds-3621.pdf
- NetApp Storage Solutions for Amazon Web Services
  http://www.netapp.com/us/system/pdf-reader.aspx?pdfuri=tcm:3-127480&m=ds-3623.pdf
- NetApp Cloud Solutions website
  http://www.netapp.com/us/solutions/cloud/index.aspx

Version History

Version	Date	Document Version History
Version 1.0	October 2014	Initial release of document.

Refer to the Interoperability Matrix Tool (IMT) on the NetApp Support site to validate that the exact product and feature versions described in this document are supported for your specific environment. The NetApp IMT defines the product components and versions that can be used to construct configurations that are supported by NetApp. Specific results depend on each customer's installation in accordance with published specifications.

NetApp provides no representations or warranties regarding the accuracy, reliability, or serviceability of any information or recommendations provided in this publication, or with respect to any results that may be obtained by the use of the information or observance of any recommendations provided herein. The information in this document is distributed AS IS, and the use of this information or the implementation of any recommendations or techniques herein is a customer's responsibility and depends on the customer's ability to evaluate and integrate them into the customer's operational environment. This document and the information contained herein may be used solely in connection with the NetApp products discussed in this document.

NetApp®