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The TCO (Total Cost of Ownership) Advantage Of GoGrid's Hosted Private Cloud

A Brief Introduction to Infrastructure-as-a-Service

Infrastructure-as-a-Service (IaaS) is a delivery model that enables organizations to outsource the purchase, setup, and most ongoing administration of core infrastructure. It is also the foundational layer of cloud computing. Software-as-a-Service (SaaS) and Platform-as-a-Service (PaaS) solutions are built upon this infrastructure. Because the IaaS layer is so critical to the overall performance and success of a comprehensive cloud solution, it is important to fully understand the benefits and costs associated with the various private cloud delivery models. To that end, this paper will provide an introduction to the various options and demonstrate the total cost of ownership (TCO) advantage associated with hosted private clouds.

Many organizations, in an effort to reduce costs and focus their efforts solely on value-add activities, have decided to outsource parts of their infrastructure to third parties who specialize in setting up and administering IT infrastructure. These cloud infrastructure providers operate their own infrastructure, allowing them to provide more features, services and control than at other layers within the Cloud Pyramid. They can also offer very strong service level agreements (SLAs), both in terms of performance and availability.

Typically, vendors within the Cloud Infrastructure layer provide Windows or Linux servers that are virtualized so that they can be provisioned dynamically and on demand. Billing for these virtual machines (VMs) is typically done based on usage or configuration. Other types of common infrastructure components like hardware-based load balancing, firewalls and storage (frequently scalable on-demand cloud storage) exist within this layer, providing a full assortment of network and infrastructure devices for an end-to-end solution.

GoGrid is an excellent example of an IaaS provider. We provide both public and private cloud hosting services that enable automated provisioning of virtual and physical infrastructure over the internet. Customers can provision and scale virtual and physical servers, storage, networking, load balancing, and security in real time and in multiple data centers using a web interface or API.

Hosted Private Clouds vs. Public Clouds

Until very recently, externally hosted cloud infrastructures were only provisioned as a shared resource. That is to say, a single physical server may host applications and data from multiple companies. Public clouds may not conform to a company's data security and privacy policies due to multi-tenancy, and may cause a general sense of unease for some IT directors. In these instances, a company that could otherwise benefit from utilizing cloud infrastructure would not be allowed to do so.

In a hosted private cloud, physical infrastructure is provisioned and dedicated to a single customer. That means no more comingling of data, applications, user credentials, or other sensitive information. This dedicated infrastructure is secured in state of the art datacenters and is often locked within a cage, further limiting physical access to a select few individuals.

Hosted private clouds have all the benefits of shared clouds that are typically associated with cloud computing. Hosted private clouds also have many additional benefits, mostly in the areas of enhanced security, privacy, control, and configurability.

Benefits	Public Cloud	On-Prem Private Cloud	Hosted Private Cloud
Lower upfront costs – CAPEX to OPEX	✓		✓
Greatly reduced implementation times	✓		✓
Lower ongoing operations costs	✓	?	✓
Highly scalable infrastructure	✓	?	✓
Flexible management tools	✓	?	✓
Clear upgrade paths – hardware and software	✓		✓
High availability and business continuity	✓		✓
Highly virtualized server environment	✓	?	✓
Fast implementation of security patches and updates	✓	?	✓

Alternatives To A Hosted Private Cloud

Until the recent introduction of hosted private clouds, a company that could not take advantage of shared clouds for security or compliance reasons had only two options, and both involved building out their own infrastructure, virtualized or not. The only real difference was location – either in their own, in-house data center or hosted at a co-location (colo) facility. Both alternatives have the drawback of requiring a very large upfront investment in hardware and software.

Hosting infrastructure in-house can also require considerable cost and effort to initially setup a datacenter if one does not exist or there is insufficient space. Both scenarios require extensive training of IT personnel to manage the solution. Additionally, since the infrastructure is owned by the organization, it must bear the cost of new licenses for any upgrades and end-of-life replacement. In return, an IT organization has absolute control of its IT infrastructure, especially if hosted in-house.

The table below shows the major cost category comparison for a hosted private cloud, in-house private cloud, and co-located private cloud. Since most servers are configured as virtualized infrastructure, this scenario will be used as the basis of comparison.

Cost Category	GoGrid Hosted Private Cloud	Private Cloud, In-House	Private Cloud, Colo Facility
Completely outfit a datacenter – physical security, climate control, redundant power, bandwidth, etc.		$	
Racking and cabling for housing servers		$	$
Computing hardware – Servers, SAN, routers and switches		$	$
Software licenses – VMWare suite, Oracle database, Microsoft SQL Server		$	$
Hardware and software maintenance contracts		$	$
Implementation services – professional services and internal resources		$	$
Administrator training		$	$
Electricity and space		$	
Ongoing internal support/administration	$	$	$
Third party setup fees	$		$
Monthly service fees	$		$
$ = cost incurred			

This table clearly shows the relative simplicity of the hosted private cloud model, both in terms of cost and level of effort. It also demonstrates that a private cloud in which the hardware and software is owned by the organization is NOT a true cloud environment and does not deliver most of the benefits associated with cloud computing. In this case, it is simply a virtualized, traditional IT infrastructure implementation project.

A TCO Comparison Case Study

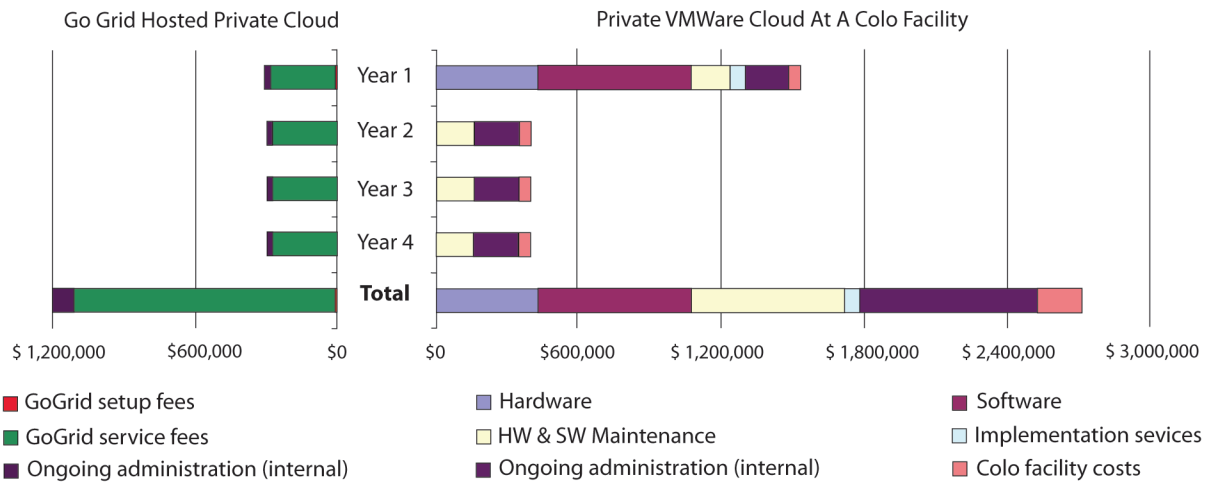
We have now looked at what a hosted private cloud is, how it differs from a shared cloud, its benefits, and the costs buckets associated with the various private alternatives. We now turn our attention to a specific example that clearly illustrates the cost advantages of utilizing a hosted private cloud.

In order to make this an apple-to-apple comparison, the scenarios involve implementing a full rack that consists of 9 highly virtualized servers. Scenario 1 is outsourcing the infrastructure to GoGrid. Scenario 2 is building out a VMWare based infrastructure hosted at a co-location facility. Actual pricing, as gathered from various vendors' websites, was used in creating this real world example.

GoGrid Hosted Private Cloud	Private VMWare Cloud
Setup fee	Purchase hardware : 9 high-end servers; Storage Area Network (SAN); Routers and switches; Separate, high availability server for Microsoft SQL Server (required for vSphere); Separate, high availability server for Oracle database (required for vCloud Director); Racking and cabling
Monthly service fee for each of the 9 nodes* on the rack	VMWare licenses – vCloud Director, vSphere, vCenter Chargeback, and vShield Edge
Ongoing internal administration – 10 hours / week	Licenses for Oracle Standard Edition 10.6 or 11.6 (SE1) with clustering and Microsoft SQL Server Standard Edition
	Hardware maintenance at 12% and software maintenance at 17%
	Eight week implementation project requiring one full-time consultant and half of an internal resource – solution design, network configuration and setup, hardware/software installation configuration, testing, and training
	Ongoing internal administration – 2 full-time equivalent resources. Data Center Technician, System Administrator and Network Engineer
	Colo facility service charge for one entire rack

*Each GoGrid node is a physical server with 16 cores, 144 GB RAM, and 5.2 TB of storage. This can be virtualized in any configuration up to 288 .5 GB RAM servers. GoGrid service begins at $2,500 per month with an annual contract. This was the price used in this TCO analysis.

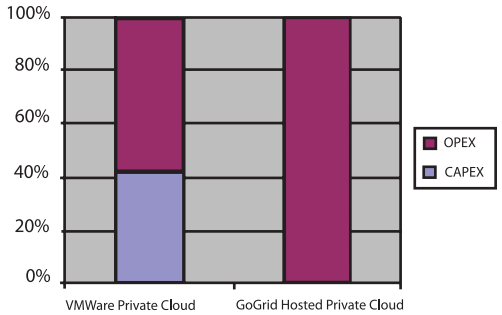
Four Year TCO Comparison



Over the 4 year period of this TCO study, the colocated Private VMWare Cloud solution costs 2.25x more to implement and administer. The annual, ongoing cost to manage the solution was 30% higher with the VMWare Cloud alternative. Furthermore, in year 5 most of the hardware would need to be replaced as part of a regular refresh cycle.

The OPEX Advantage

In the TCO example given, using GoGrid's Hosted Private Cloud IaaS solution reduced the 4 year total CAPEX expenditure from 42% to 0%.



About GoGrid

GoGrid is the world's largest pure-play Infrastructure-as-a-Service (IaaS) provider specializing in Cloud Infrastructure solutions. Currently powering over ten thousand customers globally, we make complex infrastructure easy by enabling businesses to revolutionize their IT environments with the Cloud. In just minutes, GoGrid customers can deploy and begin managing existing or new applications and workloads on our proven, secure and reliable hosted cloud platform.

GoGrid has a long history of managing IT infrastructure and introduced one of the world's first cloud computing platforms in March of 2008. With a proven track record of innovation, GoGrid offers one of the highest performing, standards-based, flexible and robust cloud solutions in the market. The GoGrid Hosted Private Cloud solution builds upon our experiences and strengths in delivering public cloud solutions.

The GoGrid Hosted Private Cloud solution delivers:

- Dedicated infrastructure – GoGrid's highly-secure private cloud solution (hardware, software, and networking) is dedicated to each customer. There is no sharing of compute, storage or local (Layer 2) networking resources.
- True cloud computing characteristics – GoGrid's private cloud adheres to the critical characteristics of cloud computing including no capital expenditure, complete self-service and control, a pay-as-you-go model, and vertical and horizontal scalability of on-demand infrastructure.
- No hefty hardware or software costs –GoGrid private cloud has no purchasing requirements and upgrades and enhancements automatically come with the service offering.
- Near real-time Implementation–Unlike other private cloud or software virtualization offerings, the GoGrid Private Cloud can be delivered in a dramatically reduced timeline.
- High Performance Cloud Technology – GoGrid's award-winning Cloud technology has been benchmarked by numerous 3rd parties as a top performer in numerous measurement tests including I/O, CPU and other metrics.

- Flexible Management tools – GoGrid Private Cloud customers benefit from an easy to use web-based management portal and API, allowing the provisioning of virtual machines, cloud storage, load balancing and private VLANs.
- Role based access Control & Charge-backs - The sub account and chargeback capabilities provide usage transparency and controls preventing "server sprawl," holding users accountable for infrastructure consumption within their organization.
- Excellent service and support – GoGrid provides 24x7 support, and each customer is assigned a dedicated account representative/team. This is backed up with strong SLAs in terms of performance and availability.

Based in Silicon Valley with operations globally, GoGrid is 100% dedicated to leading the advancement of the Infrastructure-as-a-Service marketplace. Our commitment to our customers and partners is to continue developing infrastructure technology and solutions that substantially benefit the IT community.

