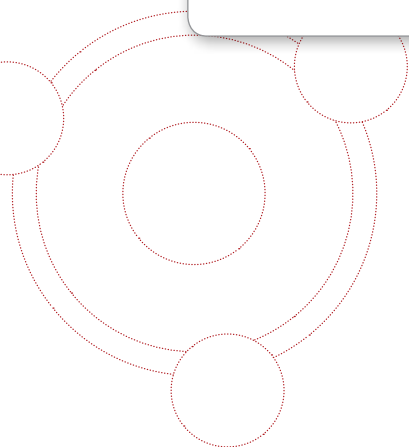


Elastic Private Clouds

Agile, Efficient and Under Your Control



INTRODUCTION

Most businesses want to spend less time and money building and managing IT infrastructure to focus resources on directly adding value to the business. Elastic private clouds built on OpenStack technology hold the promise for IT and business to collaboratively meet this challenge in an environment that enables greater business agility, greater cost efficiency and rapid innovation — all without compromising security or control.

Having been designed to deliver highly optimized elastic infrastructure at unparalleled scale, leading public cloud computing services such as Amazon Web Services (AWS) and Google Compute Engine (GCE) are driving the shift towards on-demand cloud computing models. These public cloud vendors have fundamentally redefined enterprise IT agility by delivering access to nearly unlimited compute resources in minutes versus days, weeks or months. For years now, application teams have increasingly engaged in 'shadow IT' by sidestepping internal (or central) IT to get their projects delivered. Computing resources for scalable web apps, PaaS implementations, Big Data analytics and agile development iterations are being efficiently procured with credit cards via self-service portals with perfect chargeback transparency.

For most enterprises however, moving completely to the public cloud or allowing users to procure any computing resource they want on personal credit cards is not a viable option. Performance optimization, regulatory compliance, data security, governance and control are all reasons to leverage private clouds. So how do you marry the agility and economic advantages of elastic public clouds with the control and IT governance of private clouds?

Enter the elastic private cloud, an approach which employs public cloud architecture behind the firewall in support of modern application architectures. Private elastic clouds are typically deployed alongside existing virtualized infrastructure in data centers to provide a cost-effective home for today's increasingly dynamic applications and a pragmatic path forward for agile, self-service IT delivery.

The Cloudscaling Open Cloud System (OCS) is architecturally and behaviorally consistent with leading public clouds like AWS or GCE, but lives in the enterprise data center under IT's control.

While enterprise virtualization made it easy to encapsulate and preserve physical data center complexity to enable server consolidation, the cloud model is about wiping the slate clean and, over time, replacing legacy complexity with cloud simplicity. Why? Simplicity scales.

Elastic private clouds enable IT services to be agile, efficient and abundant in support of rapid business innovation, with dynamic apps being deployed and refreshed in hours or days rather than weeks or months. Additionally, providing elastic private cloud infrastructure helps bring shadow IT projects back into the light where they belong.

Why Private Cloud Computing?

In the traditional IT model, business applications are typically bound to a specific hardware stack or silo, resulting in low efficiency, utilization and flexibility. In contrast, the cloud computing model allows applications to be dynamically deployed and scaled at runtime on non-proprietary hardware. The elastic, scale-out nature of cloud computing allows applications to easily scale up and down to lower costs while removing the need for hardware silo capacity upgrades.

IT departments are under continuous pressure to deliver computing services at the lowest possible cost. While they can elect to use any combination of public and private infrastructure to meet demand, most choose to deploy internal private clouds for security, regulatory compliance, control over quality of service, and capitalization of long-term costs. Private clouds allow IT departments to better secure data and address regulatory and governance requirements.

Private clouds should be interoperable with public clouds to enable common IT processes and faster innovation.

Moving Beyond Virtualization with Elastic Private Clouds

Enterprise virtualization is focused on server consolidation to increase hardware utilization rates. It is different from elastic clouds exactly because it seeks to encapsulate and preserve the complexity of existing enterprise stovepipes — all the silos of hardware, software, network and storage rather than the application, and in doing so, it requires expensive and often redundant hardware / software and a high level of effort to deploy and maintain.

In contrast, the elastic cloud model focuses on agility. It throws legacy complexity out the window in favor of simple, modular services. The cloud model reverses the paradigm by making applications responsible for their own fault tolerance to enable extremely scalable and reliable applications that run on industry standard hardware with simplified operations.

An elastic private cloud is not an enterprise server virtualization platform with cloud management layered on top. It's a purpose-built, hypervisor-neutral solution designed to help IT deploy clouds the way the world's largest and most successful public clouds are built. Elastic private clouds are open, flexible and deliver compelling price / performance for deploying and managing cloud applications as well as efficiently scaling services up and down based on demand. By designing this capability into the services that are deployed, IT no longer needs to over-provision infrastructure capacity to accommodate spikes in load.

To better understand this, think about what the Internet giants have been doing. Instead of building custom stovepipes, they build commodity layer cakes, where they have a whole stack of services that support each other from the concrete up to the software layer. Their portfolio of applications then leverages the entire commodity stack. This approach caters to greater scalability for both the apps and the infrastructure. Instead of managing large numbers of heterogeneous stovepipes, operators manage scalable apps deployed on homogenous infrastructure spread across the entire load. Elastic private clouds mirror these design principles.

People commonly want to create 'clouds' by sprinkling automation into virtualized datacenters. The problem is that if it was just an automation issue, IT would have cracked the code on cloud a long time ago. Automation has consistently failed unless it is combined with homogeneity. The homogeneous infrastructures at Google, Amazon, Twitter, etc. allow automation to finally work. With a layer cake, automation actually works. With silos you are back in element management and hardware/software complexity hell which cannot be automated.

Below is a summary comparison of enterprise virtualization and elastic cloud computing:

	ENTERPRISE VIRTUALIZATION	ELASTIC CLOUD
Applications	Traditional & Legacy	Dynamic
Scaling Architecture	Managed silos (Scale-up)	Horizontal (Scale-out)
Technology Stack	Heavy & Proprietary	Distributed, open components
Performance/Price	Low	High (4-7x better)
Failure Domains	Large	Small
Provisioning	Slower/manual	On-demand/100% API
Best For	Consolidating dedicated physical servers to lower data center management costs through virtual server pooling.	Newer cloud-ready and scale-out applications that request and consume virtual infrastructure on-demand.

The Cloudscaling Open Cloud System (OCS) is built on OpenStack — an open and scalable operating system for building public and private clouds that is now the standard Infrastructure as a Service cloud choice amongst leading IT vendors. It provides organizations an alternative to closed cloud environments, reducing the risks of lock-in associated with proprietary platforms. With a foundation built on OpenStack, OCS is designed to be rapidly deployable, readily scalable, fully supported and operationalized with hundreds of production-grade enhancements.

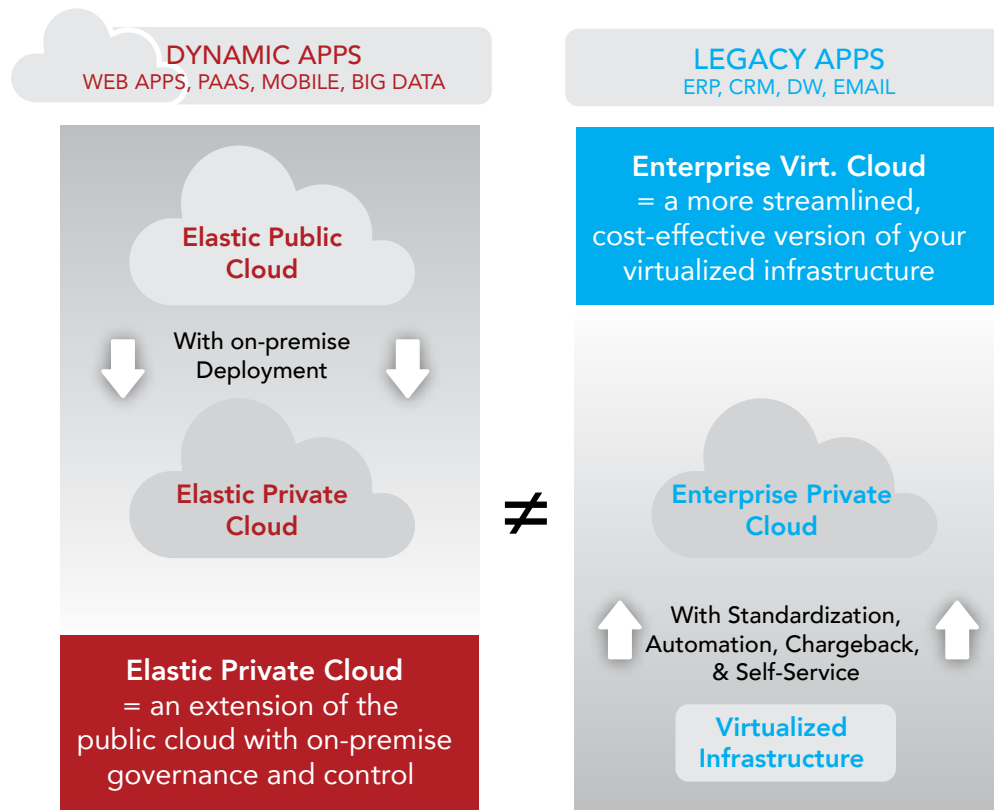
Similar to the openness, scalability and innovation Linux offered developers and users over the “walled garden” approach of early vendors like Microsoft, OpenStack is bringing more flexibility and a larger community together to innovate and improve cloud technology in a collaborative fashion. The impressive, broad level of support for OpenStack includes 190+ companies including leading enterprise vendors such as EMC, IBM, Dell, Cisco, HP, Intel, NetApp, Brocade as well as Linux distributors such as RedHat, SUSE and Canonical.

Dynamic Applications: Enabling A New Kind of Agility

Cloud computing is upending traditional application development processes and infrastructure. A new generation of dynamic, cloud-based applications is driving the need for an elastic private infrastructure optimized to handle them. By definition, dynamic cloud-based applications are highly scalable and highly distributed with rapid release cycles to accelerate innovation. Applications built natively in the cloud are not tied to any single hardware stack. Because they are built independently of the hardware that run them, they can be enabled and spun up to meet scaling challenges and demands on the fly in real time. Unlike legacy applications, they manage their own availability by detecting failures, replacing virtual servers and replicating data as needed. The workloads most likely to benefit from elastic cloud infrastructure include:

- Scale-out web applications: social, mobile, gaming & collaboration
- PaaS running packaged and custom business applications
- Big Data Processing and Analytics
- Agile Development & DevOps
- Hybrid Cloud applications
- Backup / Disaster Recovery

These workloads are also top candidates for the “shadow IT” issues so prevalent in businesses today. Elastic private clouds present an opportunity for an enterprise to really change the dynamics of how IT gets delivered to satisfy both technical and business user requirements. With a strategy that embraces elastic private clouds that are also interoperable with leading public clouds, IT can enable a new kind of agility by making it easier to move workloads securely between public and private clouds.



Elastic and virtualized clouds are different on every level (e.g. workloads, economics, architecture, skills required) and deliver very different benefits to the business.

When the architecture of a company's on-premise private cloud is compatible with AWS or GCE, it doesn't require massive re-engineering to redeploy applications in either direction. Elastic private clouds reduce that friction. For example, a company can test and develop new features and products on a private cloud. When they're ready to go into production, the company can deploy them in a public cloud like AWS or GCE in a matter of minutes. For developers who start in AWS or GCE then want to run the production version in-house for security, reliability or cost reasons, an elastic private cloud can provide an AWS and GCE-like cloud in their own data center.

Moving to elastic clouds is not a rip and replace proposition, but rather a pragmatic and parallel enterprise path forward that provides a cost-effective home for today's increasingly dynamic applications. The path and pace of each organization's cloud journey depends on individual business circumstances, competitive pressures and strategic priorities.

A new wave of dynamic cloud applications is empowering companies to drive new revenue streams, deliver greater business agility and create competitive advantage.

Forward looking IT executives are embracing private elastic clouds in order to support the evolution towards a dynamic computing environment which doesn't compromise security, reliability, control or cloud economics. The challenge is to develop the right mix of private and public cloud solutions — one that will work today and into the future.

Key Takeaways

- 1 **The industry is shifting and moving away from IT that is largely manually operated, slow and tightly coupled with physical infrastructure,** to one which is highly automated, software driven and rapidly responds to user self-service requests.
- 2 **Elastic clouds push IT's value beyond delivering the benefits of virtualization** (cost and consolidation) towards achieving faster time to delivery of applications, better IT business alignment, less shadow IT, reduced infrastructure cost & complexity and greater enterprise agility.
- 3 **Modern, dynamic cloud-based applications require elastic cloud infrastructure.** Elastic private clouds deliver the agility and efficiency gains of elastic public clouds coupled with the security, control and governance inherent to your own private cloud.

ABOUT CLOUDSCALING

Cloudscaling is the leader in elastic cloud infrastructure. Our core product, Open Cloud System (OCS), is the world's most advanced OpenStack cloud infrastructure system. OCS is designed to meet the requirements of next-generation dynamic applications, delivering the agility, performance and economic benefits of leading cloud providers, but deployable in the customer's data center and under the IT team's control. Cloudscaling is backed by Trinity Ventures and headquartered in San Francisco. For more information, please visit www.cloudscaling.com.



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Cloudscaling is the trusted source for information on OpenStack and together with the community is making OpenStack more production-grade. For more information, please visit www.openstack.org.