Six Secrets Of Successful Cloud Infrastructure Adoption

Learn how cloud experts approach building a cloud platform that utilizes the cloud’s capabilities for efficiency and flexibility.
The cloud’s benefits are well understood: infrastructure can be deployed instantly and scaled at will, organizations have complete control over their servers in near real time, and, perhaps most importantly, they don’t have to invest in, manage, and maintain data centers to leverage IT infrastructure.

IT infrastructure is a crucial component of every enterprise organization, but that doesn’t mean every organization should build and manage data centers. IT infrastructure outsourcing offers greater flexibility and scalability, while relieving businesses of the financial and operational burden of maintaining and managing a data center, buying and replacing hardware, and hiring world-class network and server administrators — all that comes as part of the package when infrastructure is outsourced to a cloud vendor.

Cloud technology like OpenStack has changed the way organizations think about IT infrastructure management — empowering them with capabilities that would have been unthinkable just a few years ago.

But having access to those capabilities is only part of the journey towards cloud mastery and optimal infrastructure ROI. The cloud is a platform and a tool. It can be used well or poorly.

In this white paper, we’ll show you how experienced cloud experts approach building a cloud platform that fully utilizes the cloud’s capabilities for efficiency and flexibility.
Why OpenStack?

OpenStack is a cutting-edge open source cloud infrastructure management solution used by many of the world’s largest organizations.

OpenStack offers powerful compute, storage, and network management tools with an intuitive interface and flexible API.

OpenStack and its thriving developer ecosystem empower businesses to innovate faster while optimizing their infrastructure investment.
Choose the Right Cloud

While the underlying technology of public, private, and hybrid clouds is the same, each has particular strengths which make it ideal for specific roles within an organization’s infrastructure strategy. Both public and private OpenStack cloud deployments will empower your business with elastic, flexible, and scalable IT infrastructure, but choosing the right type of cloud platform will help your business to achieve its goals more easily.

Public Cloud

When people say cloud, public cloud is usually what they have in mind. A public cloud is a shared infrastructure hosting platform on which many organizations may deploy virtual servers. Each virtual server is isolated from others on the same hardware, and only its owner has access to the server’s resources and data, but the underlying physical hardware is shared between several organizations.

Servers on a public cloud can be used for anything a dedicated server is used for, but they’re especially well-suited for applications where rapid scaling or fast server deployment and decommissioning is a priority.

Typical uses of a public cloud include web servers, server clusters, SaaS application hosting, and development, testing, staging, version control, and continuous integration servers.
Choose the Right Cloud

Private Cloud
A single organization can deploy virtual servers on the physical host servers of a private cloud. Private clouds allow enterprise organizations with substantial infrastructure requirements to deploy cloud resources on dedicated infrastructure. Because the underlying hardware is at the disposal of a single client, all of its compute and I/O resources are available for that client's workloads.

From the perspective of users within an organization, a private cloud is functionally indistinguishable from a public cloud, but private clouds offer organizations comprehensive control, isolation, and privacy. Private clouds can be quickly scaled by adding additional physical nodes — a process ServerMania makes painless, transparent and, most importantly, free of downtime.

Organizations choose a private cloud when they require dedicated high-performance infrastructure for business critical workloads, while benefiting from the flexibility of a virtual platform. They’re well suited to high-performance workloads with stringent IOPS requirements.

Build The Cloud Your Business Needs
Public clouds and private clouds have unique advantages, but many organizations benefit from both. Often organizations will use private infrastructure for mission-critical or sensitive applications, while turning to the public cloud for transient workloads or those that require scaling that would not be economical on private cloud infrastructure.

OpenStack makes it easy to integrate private and public cloud components, and to migrate workloads between the two.
Understand Your Infrastructure Needs
And Plan Ahead

Cloud platforms bring with them an unprecedented degree of freedom. Servers can be deployed on an ad hoc basis, combined into clusters and networks, and shut down just as quickly. But that freedom can become chaos if the organization has no overarching vision for its cloud deployments — chaotic infrastructure deployment is a recipe for poor utilization and inefficient spending.

Before choosing a cloud platform, an organization should assess its current infrastructure portfolio, how it’s being used, and how a cloud platform could replace or augment the status quo.

Because the cloud is so flexible, it’s not necessary to develop low-level plans that predict requirements and applications that encompass the entirety of a deployment for several years, as would be necessary for a physical deployment. Plans and markets evolve and the major benefit of the cloud is that it can easily evolve with them.

Nevertheless, it’s important to have a clear idea of the workloads the organization intends to run in the cloud, whether they’re best suited for a public or private cloud platform, which security measures should be in place to protect data that will be placed in cloud storage, and who is responsible for implementing infrastructure planning and rollout.

1. **Identify opportunities** for business process changes that a more flexible and elastic infrastructure platform could support.

2. **Identify workloads** that are well-suited to cloud deployments.

3. **Consider what you’ll need to do** to efficiently implement new systems, processes, and applications in the cloud.
Understand Your Infrastructure Needs
And Plan Ahead

Does your organization intend to move legacy applications into the cloud, or will it take advantage of the cloud’s capabilities to explore new applications and business goals?

Moving legacy applications to the cloud can be problematic, particularly if they’re critical to existing processes and continuity. Organizations should be aware that cloud adoption is not an all or nothing process. Cloud platforms can be combined with existing legacy infrastructure, but a business may choose to play to the strengths of the cloud for specific applications and workloads, keeping existing systems entirely separate — a scenario that has been dubbed Bimodal IT.
Understand The Capabilities Of Your Cloud Platform

Cloud platforms use variations on the same technology to create a virtual infrastructure environment, but there are enormous differences between the services offered by particular vendors. Understanding the capabilities of a cloud platform ensures that an organization can properly map its requirements to those capabilities. Cloud platforms are complex and feature-rich — it benefits an organization to understand the best way to efficiently pursue its goals. Otherwise, cloud costs and infrastructure efficiency will suffer. Think about the following:

- Which compute, storage, networking, and security features does the platform offer?
- How flexible and customizable is the platform? — it’s important that a cloud can be configured to meet the organization’s needs, rather than the organization having to conform to the limitations of its cloud.
- Which capabilities does the cloud platform expose via its API? What opportunities does that present for an organization to build tools that integrate with the platform.
- Is the underlying hardware suitable for your organization’s needs? You don’t want to launch a critical low-latency application onto a platform with slow data throughput and network contention, but those considerations are less important for an application long-term archival data storage.
- Is it easy to get data and workloads out of the cloud platform? Does it utilize a popular platform with wide industry adoption like OpenStack that makes it easy to move workloads to alternative clouds. Vendor lock-in can substantially increase the total cost of cloud use.
- What Service Level Agreements does the cloud vendor offer?
Understand The Capabilities Of
Your Cloud Platform

Once your organization understands its needs and the capabilities of its cloud platform, it can form a clear idea of
the most efficient way to implement cloud-based networks, server deployments, and tooling.

It’s important to note that reputable cloud vendors will be more than happy to help your organization through
the process of designing an optimal cloud deployment.
Optimize For
Maximum Utilization

Cloud platforms are inherently elastic. They can grow and shrink with demand, but optimizing utilization is something many organizations neglect. With physical infrastructure, utilization optimization is difficult to the point of being almost impossible. A physical server in a rack is likely to be there for at least three years, costing money whether it’s being properly utilized or not. Many data centers have utilization rates of less than ten percent. That never has to be the case with a cloud platform.

Utilization optimization is more feasible in the cloud, but it requires planning, monitoring, and action. Without proactive utilization management, a cloud deployment will not be maximally cost effective. It’s all too easy to spin up server resource and neglect to discard them once they’re no longer being used.

OpenStack’s API exposes the data and control mechanisms organizations need to build tools that integrate with existing systems, enabling monitoring and control of server deployments to maximize utilization.
Automate For Consistency & Predictability

OpenStack clouds let us think of infrastructure as if it were code. We can build tools that deploy, manage, connect, orchestrate, install, configure, and tear down cloud servers. OpenStack's web interfaces provide an excellent and intuitive point of control, but the real strength of OpenStack is its API, which allows for the building of tools to programmatically control server deployments.

Organizations that embrace the capacity for programmatic control are able to maximize the potential of the cloud. This is one of the ways the cloud is fundamentally different to physical infrastructure, and why construing cloud platforms as simply a faster-to-deploy version of bare metal is limiting.

Using an OpenStack cloud, it’s perfectly possible to build an end-to-end automated application deployment process that provisions virtual servers and their operating system environments, before orchestrating the building and setup of preconfigured Docker containers — perhaps using Kubernetes — that host an organization’s applications or microservices.

The most successful cloud users take full advantage of the capacity to automate cloud server deployments.

Automation of this nature has multiple benefits:

1. **It’s fast.** Scaling in the cloud is fast, but it’s even faster when you can run a script that orchestrates a new application server in seconds.

2. **It’s verifiable.** Deploying and configuring servers manually is prone to error. Automated deployment relies on processes that can be verified over time.

3. **It’s repeatable and predictable.** With automation, there’s never any doubt about what's running on your servers and it’s always the same. Predictability is vitally important in a complex application hosting environment.
Embrace Change

Businesses are shaped by the tools they use. Traditional IT infrastructure shaped organizations, and cloud infrastructure’s unique qualities call for a different shape.

Anyone working in the IT industry a decade ago experienced the seemingly interminable lead-times of projects that involved the IT department. Infrastructure procurement cycles were measured in months. There was a strict separation between the IT department, who were naturally conservative because it was their job to keep everything running, and the development teams tasked with building software. The division was so thorough that each department viewed the other with suspicion.

With the cloud, there’s essentially no lead-time for infrastructure deployment. A server can be up and running in a couple of minutes after a developer has conceived a need for it. It’s a new environment and one that requires a new organizational approach. An approach that embraces agile development, continuous integration and deployment, and an erosion of the barriers between development teams and operations / IT departments.

DevOps is much hyped, but that’s a reflection of the real need for companies to reconsider the old way of doing things. It’s possible to manage the cloud using the same processes and within the same organizational structure as traditional IT, but it’s not the optimal approach.
Embrace Change

Companies who have the most success with cloud deployments tend to fall into two categories:

| Start-ups with no pre-existing organizational biases. Their organizational structures are influenced from the start by the cloud. | Organizations that recognize that to maximize the potential of the cloud, they must approach development and operations from a new perspective. |

The latter group almost never embrace a DevOps approach across their organization. They test the waters with specific projects that embrace a different organizational structure — one that's better suited to an environment of experimentation, continuous integration, and instant infrastructure availability.
In Conclusion

Every organization that relies on IT infrastructure is likely to benefit from cloud adoption, but the capabilities of the cloud require a new way of thinking about infrastructure and application development. Organizations that adopt that approach outlined in this white paper will unlock the full value of the cloud.
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