



# Identifying the Right Solution for Your Business

Considerations and challenges of a hybrid, managed  
and DIY cloud

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# Benefits and use cases of public cloud, DIY cloud and hybrid cloud

A challenge when adopting a cloud model is ascertaining which model will work best for your organization. Determining which model works best for your organization means understanding the following requirements:

- Technical requirements: Can the workload actually be hosted in the cloud? Some organizations have specific workloads that involve custom equipment which will always need to remain on-premises and will require supporting network infrastructure to run.
- Compliance requirements: While it may be technically possible to run a specific workload in the cloud, it might not be legally possible to do so. An increasing number of organizations are subject to regulation that determines where and how their data and workloads can be run and stored.
- Security requirements: Each workload has separate security requirements. For example, some workloads must be kept on networks isolated from the Internet, which would make them challenging to run in the public cloud.

## MOVING AT THE SPEED OF LEGISLATION

There is a growing amount of legislation that dictates whether certain data and workloads can be run on servers in other countries or even in local data centers owned by multinational companies. For example, is it legal to run patient medical records or government business workloads in the public cloud, or must these run on-premises?

Adding to this complexity is the disparity in speeds at which the industry and legislation move. Microsoft introduces new features and functionality to Azure at an aggressive pace compared to the pace of regulation. This poses a challenge in that the legislation used to regulate technologies often addresses technologies that are out-of-date.

It's also important to note that decisions made by courts can alter the definition of the types of workloads and data that can be stored in data centers owned by multinational corporations such as Microsoft. Recent court cases have challenged the definition of which governments have the right to regulate and access data stored in data centers around the world.

## ELASTICITY

One of the selling points of the public cloud is that it's possible to quickly scale up or scale back capacity when required. This is because with the public cloud, you pay only for what you use. For example, during a busy period, it's simply a matter of purchasing more resources to handle the increased traffic. When the traffic returns to normal levels, then the amount of resources purchased is reduced.

This saves money compared to organizations hosting the workloads themselves where scaling up would require purchasing new hardware that would then sit idle when the workload requirements returned to normal levels. With public clouds like Azure, if you aren't using capacity, then you don't have to pay for it. With on-premises deployments, you're stuck with the capital expenditure required to purchase and maintain the infrastructure needed to handle the peak loads, even during lulls when you don't need it.

Support for elasticity is most useful when organizations are in a strong growth phase and the demands on workloads are increasing. Rather than attempting to guess which resources are required and then purchasing hardware accordingly, organizations can use public cloud infrastructure to scale as required.

Mature workloads are predictable and less likely to require elasticity simply because they've been in place for some time and are unlikely to experience unexpected surges or lulls in resource requirements.

## **PUBLIC CLOUD**

The vast majority of organizations that have all their workloads running in the public cloud today are start ups. These companies are often "born in the cloud" and either never had or only initially had workloads hosted using on-premises infrastructure.

As Azure has become more mature, an increasing number of organizations have looked at moving some or all of their workloads to a cloud environment. Many are experimenting with public cloud by having new workloads deployed to the cloud first. This gives the organizations the ability to "dip their toe in the water" without having to fully commit to moving to the cloud.

Public clouds such as Azure host workloads from tens of millions of customers across tens of millions of servers. Although the workloads are isolated from each other, it's possible that workloads from multiple organizations could be running on virtual machines hosted on the same rack and even the same server.

## **DIY CLOUD**

DIY cloud, also termed private cloud, is almost always hosted on-premises. DIY clouds are built specifically for or by organizations to host their workloads, and their workloads only. It's important to note that a DIY cloud requires more than just some virtualization host clusters. It must also provide scalability and include self-service functionality.

Over the years Microsoft has provided several strategies for organizations that wanted to build their own DIY cloud, from a product named Azure Pack, to the more recent Azure Stack. With hardware partners, Microsoft also has a "cloud in a box" solution named Cloud Platform System.

The biggest challenge around DIY cloud is finding and retaining the expertise needed to manage and maintain the it. Rather than training existing staff across a variety of technologies and then enduring the learning curve necessary to implement these technologies effectively, it's usually easier to look outside for expertise and talent.

## **HYBRID CLOUD**

The hybrid cloud involves a mix of DIY on-premises cloud and public cloud infrastructure. Workloads that need to be kept on-premises can stay local and workloads that can be run in Azure are run there. When the hybrid cloud is done well, a single set of tools can be used to manage both the on-premises and the public cloud. With the proper configuration, it is even possible to migrate workloads between the DIY and public clouds with minimal disruption to service.

## Security

Microsoft and other cloud providers discuss security as being one of the primary benefits to having workloads run in hosted clouds.

There are two big arguments made to support this position:

- Cloud providers are better at detecting attacks
- Experienced security teams

### **CLOUD PROVIDERS ARE BETTER AT DETECTING ATTACKS**

The vast majority of attacks follow certain detectable patterns. Because hosted clouds run so many workloads at scale, it becomes possible to detect and recognize attack patterns more readily than would otherwise be possible when hosting a workload on premises.

### **EXPERIENCED SECURITY TEAMS**

Hosted cloud providers have dedicated security teams monitoring all aspects of the cloud fabric. While these security teams can't ensure that the application an organization is running or the contents of the virtual machine are secure, these security teams can identify anomalies in the fabric.

## How to leverage and maximize your Microsoft investment

A recent study by the Anthesis Group found that 30% of workloads in datacenters are comatose. A comatose server or virtual machine is one that is running, but is functionally idle. The only resources the comatose server or virtual machine uses are the ones that keep it online. Comatose servers exist because deployed workloads are no longer being utilized. What this 30% figure suggests is that many organizations don't have effective ways of monitoring the utilization of workloads within their environment. If an effective monitoring solution isn't present, then virtual machines and servers deployed may remain active for weeks, months, even years without anyone actually using the resources they are supposed to provide.

One of the advantages of cloud deployments, as opposed to simply running highly available virtual machines in clusters, is that cloud solutions include monitoring tools that allow you to have a much better idea about how resources are being utilized. Comatose servers and virtual machines are less likely to proliferate in cloud environments simply because properly constituted cloud environments provide the tools and resources to identify workloads that are not being utilized.

These tools also allow you to ensure that you are using your current capacity in the most efficient manner. Organizations that don't have a DIY cloud deployed have to expend more effort to determine where capacity exists when deploying new workloads. Organizations that do have a DIY cloud deployed or who are utilizing a public cloud can have their workload automatically deployed to a location that has the capacity to run that workload, perhaps even by automatically shifting around other workloads so that the necessary capacity becomes available.

# Challenges in migrating some or all of your organization's workload to Microsoft® Azure™

Migrating to the cloud isn't something that is done on a whim. There are a variety of challenges that organizations face when migrating to Azure. And all successful migrations occur only after a substantial period of painstaking and detailed planning. The primary challenges involved in migrating some or all of an organization's workload to Azure include determining what needs to run in the cloud, the skills required to make the transition and toolkit challenges.

## DETERMINING WHAT WILL RUN IN THE CLOUD

Some workloads will not run in the cloud for technical reasons. It might be that they utilize specialized hardware or they may require software that is not supported in a cloud environment. Other workloads cannot be run in the cloud for regulatory reasons. Before organizations plan to migrate to a public cloud provider such as Azure, they need to determine whether the workload can run in the cloud and whether they are allowed to run the workload in the cloud.

## PETS OR CATTLE

A common industry phrase suggests that workloads be treated as cattle rather than pets. Cattle versus pets is rhetorical shorthand for describing the amount of administrative attention a workload requires. A pet requires a substantial amount of attention. Individual cattle do not require as much attention and are managed instead as a herd.

Some workloads are unique to an organization and require substantial attention from IT professionals in the way that pets often do. Given improvements in automation and management technologies, the majority of workloads can have almost all tasks related to their administration automated. Put another way, servers running common workloads can be managed more like herds of cattle rather than as individual pets.

The key to understanding why this analogy is important is that workloads where the majority of administrative processes can be automated are far more suited to deployment in the cloud than workloads that require constant attention. To return to the analogy, you can manage a herd of cattle in the cloud, but you should keep your pets on-premises.

## THE SKILLS CHALLENGE

One of the biggest challenges that organizations will face migrating some or all of their workloads to Azure is ensuring that the IT professionals in the organization have the required skills. While an organization's IT professionals will have strong skills when it comes to managing the on-premises workloads, simply because that has been their role up to this point, it's unlikely that they have experience running workloads in the cloud, or experience migrating workloads to the cloud.

Many organizations seek outside assistance in migrating to the cloud simply because the complexities involved in performing such a migration require a skill set that is almost impossible to find in-house.

### **TOOLKIT CHALLENGES**

An increasing number of tools are available to migrate workloads from an on-premises environment to Azure. For example, with Azure Site Recovery you can place an agent on the computer that hosts the on-premises workload. This agent works with another on-premises server to create a replica of the computer in Azure. When the replica is functioning properly in Azure, it's possible to perform switchover and to decommission the on-premises server.

While tools such as Azure Site Recovery or Hyper-V replica can assist in moving workloads to the cloud, organizations may need to implement alternate solutions when it comes to more complex workloads. This is another scenario where organizations may need to leverage outside help to move workloads from an existing on-premises environment to Azure.

## DIY versus managed hosted clouds

Organizations that want to use the cloud but keep things out of the public cloud like Azure have the option of either building their own cloud, or using a managed hosted cloud.

### DIY CLOUDS

An old truism is that the biggest expense in IT isn't the hardware or software, but the IT professionals that manage it. Hardware is generally fairly easy to purchase from vendors and most of them will ship the servers, racks, switches and other necessary components right to your door. If you're building a Microsoft based cloud solution, the software components are all readily available. So, indeed, the biggest challenge of an on-premises DIY solution is hiring the expertise needed to build and maintain a solution that works for your company.

### MANAGED HOSTED CLOUDS

A managed hosted cloud is an on-premises private cloud that is built and managed by a team outside your organization. Rather than relying on people within your organization to have the required skills, or on contractors who move on once the initial DIY cloud environment is built, in a managed hosted cloud, a team of outside experts builds and manages your private cloud.

This expertise can come to configuring federation between the on-premises cloud environment and Azure, allowing for a managed hosted hybrid cloud. Workloads that need to remain on-premises for technical, security, or regulatory reasons remain in the on-premises managed hosted hybrid cloud. Workloads that can be safely moved to Azure are migrated by a team of experts experienced in migration.

## Conclusion

Some of the biggest challenges around cloud adoption lie in finding the people that can effectively leverage cloud technologies to provide the best outcome for your organization. While it's certainly possible for your IT team to train and develop the skillset necessary to build a DIY cloud, it's often cheaper and faster to have a managed cloud provider assist with the process. Managed cloud providers such as Rackspace have the necessary experience to ensure that from planning and migration to implementation, your cloud experience is beneficial to your business.

# About Rackspace

Rackspace (NYSE: RAX), the #1 managed cloud company, helps businesses tap the power of cloud computing without the challenge and expense of managing complex IT infrastructure and application platforms on their own. Rackspace engineers deliver specialized expertise on top of leading technologies developed by OpenStack®, Microsoft®, VMware® and others, through a results-obsessed service known as Fanatical Support®.

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