Cloud Deployment Models

This article will introduce some ways to understand cloud access and control.

Last month, the CEO made a surprise announcement that the whole company was moving to the cloud. Since then, Diane's entire team has been developing a strategy to make that happen. The infrastructure team can see the cost benefits of cloud migration. But some of the data experts have security concerns. Diane needs to get her team to come to a consensus.

Cloud deployment models are useful for discussions of cloud strategy. A *cloud deployment model* describes:

- Who has access to the cloud?
- The degree to which the organization has control over the cloud.

Organizations might choose between deployment models based on:

- Controlling who uses the same cloud as them.
- The degree to which the cloud needs to be specialized to fit their needs.
- The cost of using a particular deployment model.

In this article, we will describe the main types of deployment models used in the cloud today:

- Public clouds
- Private Clouds
- Community Clouds
- Hybrid Clouds

We will begin with a description of the public cloud, the most common deployment model.

Public cloud

A video game company deploys its multiplayer services using a major cloud provider. As new players connect to games, server instances spin up in the provider's data centers. The provider automatically removes instances when no one is playing. This gaming company is one of many customers using the data center. Applications from many different organizations move in and out of the server racks.

A *public cloud* makes its computing services available to anyone. When we use a public cloud provider, their servers are processing our requests and those of millions of other customers. Public cloud providers offer a huge variety of cloud-based services for their customers to use, applicable to almost any business.

Benefits

A public cloud offers:

- Pay-per-usage models, which means customers only pay for what they use.
- The ability to handle large amounts of traffic across many customers.
- Not having to worry about the hardware, that's all taken care of by the cloud provider.
- Simple replication of information and services across machines and data centers. Replication ensures that if a component fails, another contains the lost data.

Challenges

Some challenges of utilizing a public cloud include:

- We are limited to what the provider offers
- No direct access to hardware
- Trusting the provider with data and processes

For those seeking control over their infrastructure, a private cloud may be appropriate.

Private cloud

A government in Europe owns a data center for the storage of its most secretive information. Only developers with the highest clearance levels can access its services. No outsiders may access these storage APIs.

A *private cloud* is a set of cloud computing resources dedicated to a single organization. Either a customer or a third party can own a private cloud's infrastructure. No other customers work with the same machines as those

used by the private cloud. The services offered by a private cloud are up to the maintainers of the private cloud.

Companies needing a private cloud usually have strict data storage and access requirements. Common private cloud owners include governments, financial institutions, and medical organizations.

Benefits

The primary benefit of a private cloud is the increased control that the customer has over its usage:

- All the cloud's capacity is available for use for one organization. The amount of infrastructure capacity available is up to the private cloud owner.
- Sometimes, companies must not share infrastructure to comply with regulations. Having a private cloud can allow companies to use the cloud while staying in compliance.
- The owners can tailor the cloud infrastructure to their needs.

Challenges

Some of the challenges of using a private cloud include:

- Using a private cloud eliminates some of the benefits that a public cloud provides. The cost of private cloud provider infrastructure is much higher than similar public infrastructure. The user owning the infrastructure is even more costly!
- Because of the price tag that a private cloud entails, private cloud users may consider whether some services can run on shared infrastructure.

Community Cloud

Several biotech companies have decided to share ownership of a data center. The center has state-of-the-art hardware specialized for medical research. Each company can request the computing capabilities of the center's servers.

A *community cloud* describes organizations with similar needs sharing ownership of a cloud. Community clouds are an intermediate option between public and private clouds. This model is an excellent option for organizations who share hardware specialization needs.

Benefits

A community cloud offers:

- Only the organization group may access the cloud, increasing security.
- The group can customize the cloud to meet their shared needs.
- The ability to divide the management work and costs between the organizations.

Challenges

Some issues that can arise with a community cloud include:

- Requires making decisions as a group of organizations.
- Each organization must make sensitive data secure.
- Infrastructure needs to be able to meet the needs of all organizations at the same time.

What about organizations whose needs are more complex? Next, let's discuss an option for combining different cloud models into one solution.

Hybrid cloud

A medical center has both internal and customer-facing applications. The center deploys its customer-facing web applications in the public cloud. A private data center stores its sensitive customer information. The center's public and private infrastructures communicate using a secure private network.

A *hybrid cloud* describes a company utilizing more than one deployment model. A company uses a hybrid model if it relies on a combination of public, private, or community clouds.

Benefits

This model allows companies to deploy their sensitive services in a private cloud and others in public or community models. The benefits of using a hybrid cloud include:

- Each service using a public cloud costs less than a private one.
- The organization can use deployment models according to their best fit.

Challenges

Some challenges of using a hybrid cloud include:

- The hybrid organization will have to pay for both private and public cloud usage.
- Using multiple cloud systems can increase the complexity of managing their services.

The hybrid model allows companies to combine deployment models to fit their needs. This model is an excellent option for any company where no single option meets their needs.

Multicloud

Jakhil has learned of a service that is exclusive to GCP which is exactly what his business needs. But, Jakhil's whole business infrastructure is deployed on AWS. How can he use this service without having to move all his existing services to a new provider?

A multicloud is a system that uses multiple clouds of the same deployment type. This model differs from hybrid clouds, which use multiple cloud systems of different deployment types.

A system using a private cloud and a public cloud would then be a hybrid cloud system. A system using two public clouds would be a multicloud system.

Hybrid multiclouds are systems that meet the definition of both hybrid clouds and multiclouds. A system using a private cloud and two public clouds would be a hybrid multicloud.

But why would someone want to use these types of systems?

Benefits

A multicloud or hybrid multicloud allows for flexibility in choosing cloud service providers. There are many reasons why we choose one provider over another:

- Providers compete with each other on cost, and often have different prices
- Some providers specialize in providing certain types of services
- Sometimes only one provider will have a certain service

A multicloud would be helpful in Jakhil's situation. He would only need to:

- Send the necessary information to GCP
- Use the desired service to produce results
- Send the results to AWS

Multicloud does have its challenges though.

Challenges

Challenges of using a multicloud system include:

- Training teams to use multiple cloud systems
- The complexity of dealing with many different services and multiple platforms.

With that, we have a handle on the most common types of cloud deployment models. Let's review what we've learned.

Free response

Regen Corp is deciding how it can incorporate the cloud into its business model. As the business has grown, Regen struggles to maintain the servers to keep its web app available.

The company's leadership wants to move to the cloud, but has sensitive consumer data. Regulations won't allow the company to store this data within a public cloud.

Can you describe a strategy for incorporating cloud services for this company?

Your response

A good strategy could be the implementeation of a Hybrid cloud. Running the code and other information in a public cloud, and keeping the sensitive data of the consumers in a private cloud.

Our answer

Not every aspect of the company needs to move into the public cloud. We can take a hybrid approach. Regen can move its web infrastructure into the public cloud and manage its data in a private cloud. This hybrid approach balances Regen's infrastructure needs and data requirements.

Why This Answer?

This answer balances the two primary requests of the organization. The company can scale its infrastructure while keeping its data private.

Review

This article introduced cloud deployment models. Deployment models describe who has access to the cloud and the amount of control they have. We went into detail on the benefits and drawbacks of several popular deployment models:

- Public clouds: accessible to any customer over the internet
- Private clouds: accessible to only one organization
- Community clouds: accessed by a select group of organizations
- Hybrid clouds: a deployment model consisting of combinations of other deployment models
- Multi-clouds: combinations of multiple of the same deployment model

We are now aware of the benefits, challenges, and use cases for these deployment models. This knowledge can assist in understanding different cloud approaches.