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TYPES OF CLOUD

Lilian Thairu, Angaza Center ADL

www.angazacenter.org

Lesson Overview

- **Objectives:**
  - Explore the types of cloud deployment models
  - Learn the different types of private cloud
  - Understand the decision criteria for selecting the cloud models
  - Explore different scenarios and align the best cloud deployment models for them

By Definition

Cloud Deployment models basically refer to how the cloud infrastructure is **organized and controlled**

Cloud Deployment Models (Public, Private, Hybrid)

- **Public Cloud**

Imagine a city's water supply system **managed by a municipal authority**. Everyone in the city has access to the same water network, and they pay based on what they use. The authority owns and maintains the tanks, pipe system and the water treatment process.
This is similar to a public cloud, where you **share** computing, storage, servers, and networking resources with others and rely on the **provider for management and security**.

- **Private Cloud**

Now, imagine an organization like a large university or factory that needs a **dedicated water supply**. They opt not to rely on the city's public water system (public cloud), and instead build a **private system**, giving them more control, security, and customization. It can also be referred to as the **internal** or **corporate** cloud.

Types of Private Cloud

1. On-Premises Private Cloud

Like having a full water treatment plant right on campus or factory grounds.

- The organization **owns and operates** the entire water system on its property.
- They handle **everything themselves**—from drilling the well, to treating the water, to maintaining the pipes.
- Offers the **highest control and customization**, but also the **highest cost and complexity**.

This is a private cloud built and managed on-site using the organization's own infrastructure.

2. Virtual Private Cloud (VPC)

Like using a section of a massive off-site reservoir that's walled off just for you.

- You're using a **shared water facility**, but your supply lines, tanks, and valves are **completely isolated** from others.
- You get the benefits of scale and convenience, but still maintain **strong security and separation**.

This is a logically isolated portion of a public cloud, functioning like a private cloud.

Types of Private Cloud Cont.

3. Hosted Private Cloud

Like renting a private water facility that someone else built, but it's used only by you.

- The water plant is **off-site and fully dedicated** to your needs, but **owned and operated by a provider**.
- You don’t have to build the infrastructure, but you still get a **customized and exclusive** supply.

*This is a private cloud hosted on third-party infrastructure, but **dedicated solely to one organization**.*

4. Managed Private Cloud

Like hiring a water management company to run and maintain your private water system.

- You **still have a private water source**, but now experts are **managing the operations** for you.
- They handle treatment, repairs, upgrades—leaving you to focus on your core business.

*This is a private cloud where **a third-party manages and maintains** the infrastructure and services.*

Cloud Deployment Models (Public, Private, Hybrid)

- **Hybrid Cloud**

A hybrid cloud is like a university or factory that uses both its **own private water treatment system** and the **city's public water supply**. Most of the time, the private system handles the organization’s regular water needs—offering control, customization, and security. But when there’s a sudden surge in demand, like during a major event or emergency, the organization can **tap into the public water supply** to handle the overflow without needing to expand its private infrastructure.

In the same way, **hybrid cloud** combines **private cloud** (for sensitive or critical workloads) with **public cloud** (for extra capacity or less sensitive tasks). This setup offers the **flexibility to scale**, the **cost-efficiency of shared resources**, and the **control and security** of dedicated systems. Just like a smart water strategy, a hybrid cloud lets organizations get the best of both worlds—meeting unique demands without compromising on performance or security.

Brainstorm

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In three groups discuss the pros and cons of each deployment model

Consider these factors: **Cost, Scalability, Security, Control, Compliance, Maintenance and Deployment speed**

Side By Side Comparison

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Feature	Public Cloud	Private Cloud	Hybrid Cloud
Cost	Low upfront cost, pay-as-you-go	High initial cost, ongoing maintenance	Moderate cost, combines public and private expenses
Scalability	Highly scalable and flexible	Limited scalability, depends on physical resources	Scalable with flexibility to use public cloud as needed
Security	Shared environment, less control	High security with dedicated resources	Strong security for sensitive data, public cloud for less sensitive workloads
Control	Limited customization and control	Full control over infrastructure and data	Balanced control over both environments
Compliance	May not meet strict compliance needs	Easier to meet regulatory requirements	Can meet compliance by handling sensitive data privately
Maintenance	Managed entirely by provider	Requires in-house or third-party management	Mixed responsibility; more complex to manage
Deployment Speed	Very fast, ready-to-use infrastructure	Slower, requires setup and configuration	Varies, depends on which part of the system is being deployed
Best For	Startups, general workloads, rapid scaling	Enterprises with sensitive data, strict compliance needs	Organizations needing both flexibility and security

Types of Cloud

Decision Criteria for Selecting a Cloud Model

Decision criteria for selecting a cloud model

Security & Compliance: Industries handling sensitive data or subject to regulations like HIPAA or GDPR often prefer private or hybrid clouds for tighter control and compliance.

Scalability & Performance: Public clouds offer flexible, on-demand scaling—ideal for unpredictable workloads. Private clouds suit more stable workloads but may require manual scaling.

Existing IT Infrastructure: Organizations with strong in-house IT may leverage private clouds, while those with limited expertise often benefit from public or managed cloud services.

Cost: Public clouds reduce upfront costs with pay-as-you-go pricing. Private clouds involve higher initial investment but offer more control and customization.

Decision criteria for selecting a cloud model Cont.

Workload Type: Specialized or resource-heavy tasks (e.g., AI, big data) may benefit from public cloud services due to their broad toolsets and scalability.

Geography & Latency: Data residency needs and latency concerns make the physical location of data centers an important consideration.

Vendor Lock-In: To avoid dependency on one provider, many organizations adopt multicloud strategies for flexibility and resilience.

Management & Control: Private clouds offer deeper control and customization—ideal for organizations with strict governance needs.

Integration: Seamless compatibility with existing systems is crucial for smooth cloud adoption and ongoing operations.

Types of Cloud

Introduction To Community Cloud

Introduction to Community Cloud

Imagine a group of organizations—like several hospitals, research labs, or universities—located in the same area and serving similar purposes. Instead of each building its own water treatment plant, or relying on the city's general water supply, they come together to **build and share a private water facility** designed specifically to meet their **common requirements**—like extra-pure water, special filtration, or high-security access.

They **jointly own and govern** this water system, tailoring it to their shared needs while splitting the costs and responsibilities. Each member benefits from improved control, better compliance with health regulations, and cost savings compared to going it alone.

In cloud terms, a **community cloud** works the same way. It's a **shared infrastructure used by organizations with similar security, compliance, or business requirements**—such as government agencies, healthcare providers, or financial institutions. It offers more control and customization than a public cloud, and is **jointly managed and used** by the community it serves.

Characteristics of a community cloud

- **Shared by Similar Organizations**: Used by a group with common goals (e.g., healthcare, education, government).
- **Collaborative Ownership**: Managed and owned by the community or a third party on their behalf.
- **Custom Security & Compliance**: Tailored to meet shared regulatory or security needs.
- **Cost Sharing**: Infrastructure and costs are shared among the community members.
- **Moderate Scalability**: More scalable than private cloud, but less than public cloud.
- **Greater Control**: More control than public cloud, but shared among the group.

What is the best cloud deployment Model for…

- Healthcare Data Management
  - Best Fit: Private or Hybrid Cloud
- Startup E-Commerce Platform
  - Best Fit: Public Cloud
- Government Records and Citizen Services
  - Best Fit: Private or Community Cloud
- University Research Collaboration
  - Best Fit: Community Cloud

What is the best cloud deployment Model for…

- Large Enterprise with Global Operations
  - Best Fit: Hybrid Cloud
- Gaming App with Rapid User Growth
  - Best Fit: Public Cloud
- Financial Services Firm
  - Best Fit: Private or Hybrid Cloud
- Media Streaming Company
  - Best Fit: Public or Hybrid Cloud

Recap

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- Cloud deployment models refer to how cloud services are offered
- Different needs and scenarios influences the best type of cloud deployment of an institution
- Community cloud benefits institutions with similar requirements

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Thank You!

www.angazacenter.org

+254 11 3630966

ADL@angazacenter.org