Deployment Models in Cloud Computing

There are three main deployment models in Cloud Computing.

1. **Public Cloud**:

   - These are the cloud networks which are open for use by general public and they exist beyond the firewall of an organization, fully hosted and managed by cloud service providers.

   - Our data is stored in the provider's data center and the provider is responsible for the management and maintenance of the data center.

   - Because we are sharing computing resources among a network of users, the public cloud offers greater flexibility and cost savings.

   - This is good option if our demand for computing resources fluctuates. We have to purchase the capacity on the basis of usage and can scale up or scale down server capabilities based on traffic and other dynamic requirements.

   - This type of cloud environment is appealing to many companies because it reduces lead times in testing and deploying new products.

   - Cons: They are more vulnerable than private clouds and there is no control of resources used or who shares them. Some organization feel it is less ideal for services using sensitive data to compliance the regulations
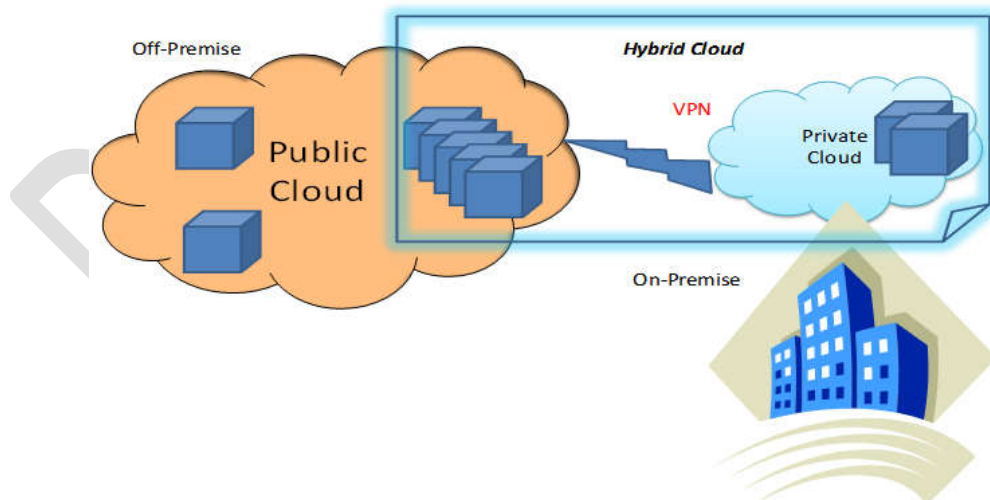
Note: Even though we don't control the security of a public cloud, all of our data remains separate from others and security breaches of public clouds are rare.

2. **Private Cloud**:
    o A private cloud hosting solution, also known as an **internal** or **enterprise** cloud, resides on company's intranet or hosted data center where all of our data is protected behind a firewall.

    o This can be a great option for companies who already have expensive data centers because they can use their current infrastructure.

    o Organizations go for a private cloud when they have strict **security and data privacy** issues.

    o The main purpose is to gain the benefits of cloud architecture without giving up the control of maintaining own data center.

    o Cons: The main drawback people see with a private cloud is that all management, maintenance and updating of data centers is the responsibility of the company.

3. **Hybrid Clouds**:
    o They consist of external and internal providers, namely a mix of public and private clouds.

    o Secure & critical apps are managed by an organization and the not-so-critical & secure apps by the third-party vendor. For example, you can use a public cloud to interact with the clients but keep their data secured within a private cloud. Most companies are now switching to Hybrid clouds.

    o Ideal in situations where you have plans are to migrate to a complete cloud solution as existing hardware expires or you have some applications or hardware that are not ready for the cloud

Public Cloud	Private Cloud	Hybrid Cloud
A cloud computing model in which a third-party provider makes compute resources available to the general public. The benefit is enterprises do not have to set up and maintain their in-house servers	A cloud computing model in which an enterprise uses a proprietary architecture and runs servers within its own data center	A cloud computing model in which includes a mix of on premises private cloud and third party public cloud services which needs proper mix between these two platforms
Multi-tenant architecture, service provider infrastructure	Single-tenant architecture, on-premises hardware	Mix of both and can utilize Cloud bursting capabilities
Pay as use pricing model	Bear entire cost but have direct control of the infrastructure	Benefit of both the environments
Amazon AWS, Microsoft Azure, Google Cloud	VMWare, Dell EMC, IBM, Red Hat	State Bank of India uses this kind of approach

Emerging cloud technologies and services

Cloud providers are quite competitive and they constantly expand their services to differentiate themselves from their competition. This has led public IaaS providers to offer far more than common compute and storage instances.

Traditional cloud deployments require users to create a compute instance (server) and load the code into that instance. The user then decides how long to run and pay for that instance.

Serverless computing or event-driven computing is a cloud service that executes specific functions - such as image processing and database updates.

With serverless computing, developers simply write code in a function and the cloud provider loads and executes that code in response to real-world events, so users do not have to worry about the server or instance aspect of the cloud deployment. Users only pay for the number of transactions that the function executes. AWS Lambda, Google Cloud Functions and Azure Functions are examples of serverless computing services.

FaaS -- > Function as a Service