Introduction to Cloud-native applications

First, I will try to provide a layman language.

Cloud Native applications are the software applications that are

designed and developed specifically to leverage the cloud computing principles

and

take the full advantage of cloud native technologies and services,

which means these applications

are built and optimized to run inside any cloud environments

by utilizing the cloud advantages like scalability, elasticity, and flexibility.

In simple words, cloud native applications are built for cloud environments

so that

the organizations can take complete advantage of cloud provider services and technologies.

Now let us try to understand the official definition of cloud native applications from the Cloud Native

Computing Foundation (CNCF).

So, if you see here, cloud native technologies empower organizations to build and run scalable applications in modern dynamic environments such as public, private and hybrid clouds.

So, the cloud environment can be anything, it can be it can be your own data centre, it can be GCP,

azure, or it can be a hybrid combination of private cloud and public cloud.

Regardless of what type of cloud computing you are trying to use, your cloud native applications will

work.

So how this is possible is when we are trying to build cloud native applications, we will try to leverage

technologies like containers, service meshes, microservices, immutable infrastructure and declarative

APIs.

So, all these technologies make your applications to run on any cloud so you will not get vendor lock in with any cloud environment.

On top of these cloud advantages.

These techniques also enable developing loosely coupled systems that are resilient, manageable and

observable.

Resilient means they can withstand any failures manageable you already know they are easy to manage and observable means we'll get to know everything about our applications, how it is working, are there any issues?

So, if anyone asks you what is the definition of cloud native application inside an interview or inside

any project, first try to understand whether the opposite person who is asking is a technical person

or a non-technical person.

If he is a non-technical person, please share this layman definition.

Whereas if the person is a technical person, you can share the official definition from the Cloud Native Computing Foundation.

Important characteristics of cloud-native applications

The very first main character of Cloud Native application is **microservice**.

When you are building microservice based applications, which are like loosely coupled and smaller in

nature, then that gives a flexibility to you to develop them parallelly and deploy and scale independently.

After building microservices like separating your business logic, you will obviously **containerize** your

applications with the help of Docker or any other containerization software.

So what are these containers we already discussed?

These are typically packaged and deployed using Docker containers.

These containers provide a lightweight and consistent environment for running applications and making them highly portable across different cloud platforms and infrastructure.

With the help of these containers, only the code will work very similarly regardless of which cloud

environment you are trying to deploy. You take this container, you try to deploy inside your local

system and you deploy inside the AWS, GCP, Azure Cloud in all the places it is going to work in very

similar manner.

Whereas this is not the scenario with a monolithic application.

Your monolithic application won't give such kind of flexibility.

You need to put a lot of efforts to bring that consistency across all the cloud platforms.

The next character of cloud native applications is they provide **scalability and elasticity**.

Since you are building your applications based upon microservices and with the help of containers,

they can be easily scaled horizontally allowing them to handle any kind of traffic that comes towards

your applications.

So adding more instances of services is going to be super easy and this can be achieved automatically

with the help of container orchestration platforms like Kubernetes.

Moving on to the next principle, these cloud native applications, they follow **DevOps practices**, by

embracing all these DevOps principles.

They promote a collaboration culture between the development and operations teams.

Whenever these cloud native applications are being built, they will not be any blame game between the developers and operations team when they are building cloud native application because they are following these DevOps practices and with the help of these DevOps practices, they will incorporate continuous integration, continuous delivery and automated deployment pipelines to streamline the software development and deployment process.

So these cloud native applications, they will give complete flexibility to the organizations, whether

they want to do continuous integration only or whether they want to go with the continuous delivery

or if they want to go with the continuous deployment as well.

The next character of native applications is, they are **resilient and fault tolerance in nature**.

Whatever applications that we are going to develop with the help of cloud native principles, they can

withstand any kind of failures which will make them resilient and they will utilize techniques such

as distributed architecture, load balancing and automated fail recovery to ensure high availability

and fault tolerance.

One example that I can give here is, think like you have a microservice by following the cloud native

application principles, you will deploy this microservice in multiple locations.

Even if one of the location has a downtime due to some power outage or due to some internet issue,

the microservice will continue to work from the other location that you have deployed.

And at the same time, for some reason, if one of your microservice instance is not working platforms

like Kubernetes, they can automatically shut down that microservice instance and bring up a new instance.

This way you are ensuring the failure recovery automatically and bringing fault tolerance inside your

applications.

Moving on to the next character of cloud Native applications, which is they utilize **cloud native services** to a great extent.

Like I said, cloud native applications means they are developed to leverage the cloud environments

to a great extent.

When an organization or an application uses these cloud native services provided they don't have to

focus on infrastructure because all these services will be monitored and maintained by the cloud platform provider itself.

With that, the developers and the organizations they can simply focus more on the application logic and enhancing the business logic with a very less focus on the infrastructure components.

Like you can see these are all the important characters of cloud native applications. Inside this course, we are going to touch all of these characters in the various sections.

Whenever you see a application is following all these characters, then you can simply assume that is

an cloud native application.

Deep dive on 15 factor methodology – Part 1