**Cloud computing overview**

Cloud computing = delivery of on-demand computing resources

NIST Definition = model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction

5 Essential Characteristics

1. On-demand self service
   1. Access to cloud resources you need using a simple interface, without the need for human interaction
2. Broad network access
   1. Cloud computing resources can be accessed via network through standard mechanisms (phones, laptops, etc)
3. Resource pooling
   1. What gives cloud providers economies of scale, which they pass on to their customers, making cloud cost-efficient
   2. Resources dynamically assigned based on demand
4. Rapid elasticity
   1. Can access more resources when you need them, and scale back when you don’t
5. Measured serviced
   1. Only pay for what you use/reserve as you go

3 Deployment models

1. Public
   1. Open internet, hardware owned by provider
2. Private
   1. Provisioned for exclusive use by a single org
3. Hybrid
   1. Mix of both, working together seamlessly

3 service models

1. Infrastructure – as a service
   1. Servers, networking, storage, data center space
2. Platform – as a service
   1. Hardware and software tools to dev and deploy apps
3. Application – as a service
   1. Software licensing and delivery model in which software and apps are centrally hosted and licensed on a subscription basis. (on-demand software)

**Cloud Native Applications**

Consists of microservices, packaged in containers

Cloud native stack

1. Cloud infrastructure – defines the environment
2. Scheduling and orchestration – Kubernetes, istio, native
3. Application and data services – backing services
4. Application runtime – middleware
5. Application code – cloud native apps

Use cases – everything that lives in the cloud should have a cloud native design and approach

Application code needs to be instrumented with:

1. Standardized logging
2. Standardized events
3. Standard catalog that multiple microservices and cloud native apps can use
4. Standardized tracing for microservices

**CNCF - Cloud native computing foundation**

What is it?

-A neutral body that critical components of the global technology infrastructure

-Create guidance for developing cloud native computing technologies

Purpose: Cloud native technologies empower organizations to build and run scalable apps in modern, dynamic environments such as public, private, and hybrid clouds. Containers, services meshes, microservices, immutable infrastructure, and declarative APIs exemplify this approach.

Responsibilities:

1. Stewardship of projects – ensuring technologies are available
2. Fostering growth and evolution of the ecosystem
3. Promoting technologies
4. Making technologies accessible and reliable

Services provided by CNCF

1. Member companies submit project assets
2. Technical Oversight Committee reviews submissions
3. Accepted projects progress through stages
   1. Sandbox
   2. Incubated
   3. Graduated

Trail map:

1. Containerization
2. CI/CD
3. Orchestration and application definition
4. Observability and analysis
5. Service Proxy, Discovery, and Mesh,
6. Networking, policy, and security,
7. Distributed database and storage,
8. Streaming and messaging,
9. Container registry and runtime
10. Software distribution

**Hybrid Cloud**

Combination public and private cloud(s)