#### AWS Microservices – Hosted vs Managed vs Cloud

#### Hosted Solutions

A traditional option where one server is reserved for your use only. Usually located on-site, or it could be off-site in a data center; either way, this server is yours and yours alone.

#### Critical elements of hosted solutions:

- You must acquire the hardware upfront costs.
- You must setup the equipment knowledge + expertiese.
- You are responsible for managing and monitoring.
- You must troubleshoot / counter cyberthreats.



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# Introductory course to AWS Lambda

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Lecture 4

## AWS Microservices – Hosted vs Managed vs Cloud

## Managed Hosting

A dedicated server in a remote location, very similar to a hosted solution, which means the server(s) are solely available to your business.

Critical elements of managed hosting:

- Reduced costs for hardware acquisition.
- Customizable configurations and solutions.
- No platform management and maintenance.
- No need for dedicated IT staff.
- Support and help desk availability.

#### AWS Microservices – Hosted vs Managed vs Cloud

#### Cloud Native

Disperses resources between and across multiple servers. You do not worry about hardware dependencies, downtime and load spikes, because the heavy lifting is spread across a cluster of servers working together.

Critical elements of cloud hosting:

- Cost-effective because you only pay for services used.
- Scalable because bandwidth and hardware can be adjusted to align with use or needs.





## Virtual Machine

Software that imitates a complete computer system. It is isolated from the rest of the machine that hosts it and behaves as if it were the only operating system on it, including having its own kernel.



- A common way of hosting multiple environments on one server.
- Require processing power for the virtualization of the resources.



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## Container

A container 'contains' both an application and all the elements the application needs to run properly, including system libraries, system settings, and other dependencies.



- Any kind of application can be run in a container.
- A containerized application will run the same way no matter where it is hosted.
- A container can be run in any operating system.
- Can easily be moved around and deployed wherever needed.



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#### AWS Microservices – Monolithic vs Microservices

## What is Monolithic?

An architectural approach where software is composed of a single service where all processes are tightly.

Benefits of Microservices for Application:

- Simpler and faster to develop.
- Flexible and easier to scale.
- Easier to update code and introduce new features.
- Each service can use different technologies.
- Reusable code.
- Service independence increases an application's resistance to failure.



#### What are Microservices?

An architectural approach where software is composed of small independent services that communicate over well-defined APIs.

Benefits of Microservices for Application:

- Simpler and faster to develop.
- Flexible and easier to scale.
- Easier to update code and introduce new features.
- Each service can use different technologies.
- Reusable code.
- Service independence increases an application's resistance to failure.

A monolithic application puts all its functionality into a single process...

A microservices architecture puts each element of functionality into a separate service...



... and scales by replicating the monolith on multiple servers





... and scales by distributing these services

across servers, replicating as needed.



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AWS Microservices - Monolithic vs Microservices







monolith - multiple modules in the same process

microservices - modules running in different processes





AWS Microservices - Monolithic vs Microservices



#### What is an API?

A defined set of rules, commands, permissions, or protocols that allow users and applications to interact with – and access data from – a specific application or microservice.

- API = application programming interface.
- The API is an interface, through which many developers interact with the data.
- REST API is a popular standard among developers because it uses HTTP commands.
- Relies on HTTP coding which is familiar to web developers.
- Uses SSL (Secure Sockets Layer) encryption.
- Language agnostic connect apps and microservices written in different programming languages.



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#### AWS Microservices - REST API





An event-driven computing execution model where developers write logic that is deployed in containers fully managed by a platform, then executed on demand.

Benefits of Function-as-a-Service for Application:

- Data integration is simpler.
- Event-triggered run automatically when needed.
- Ephimeral run for a very short time.
- Fully managed by a cloud provider.
- You only pay for what is needed, not always-on apps and servers.

Monolithic

Application

# Microservice Function

Function

Function

Function

Function



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AWS Microservices – Function-as-a-Service



Microservice

Microservice



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Servers

Deploy in months

Serverless and container-based applications deploy the fastest

Containers

Deploy in seconds

Virtual Machines

Deploy in minutes





Scale of Infrastructure Increases



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Serverless

Deploys in milliseconds

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