

Building a Serverless Architecture

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About the Speaker

- 20+ years in IT
- 10+ years in dev
- DevOps Live founder
- Long-time advocate for software freedom
- Now I get to teach!



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What exactly is serverless?



**Does serverless mean there
are no more servers?**



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Cloud Computing

EC2



- Managed Virtual Machine
 - Physical hardware is abstracted
- You are responsible for:
 - Virtual resources (CPUs/RAM/HDD)
 - Operating system + patches
 - Port management
 - Availability + uptime
 - Scaling for traffic spikes
 - Preventing over-provisioning
- THAT IS A LOT OF PRE-WORK!

Cloud Computing: Next Gen

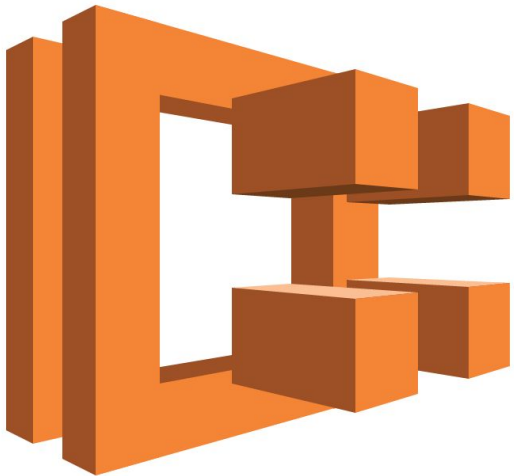
- Falls in the realm of serverless
 - More abstractions than IaaS
 - No operating system management
 - No software patching
 - No shell scripts
 - No port management
- You are responsible for:
 - The necessary RAM to execute code
 - Writing the **handler** that events trigger

Lambda

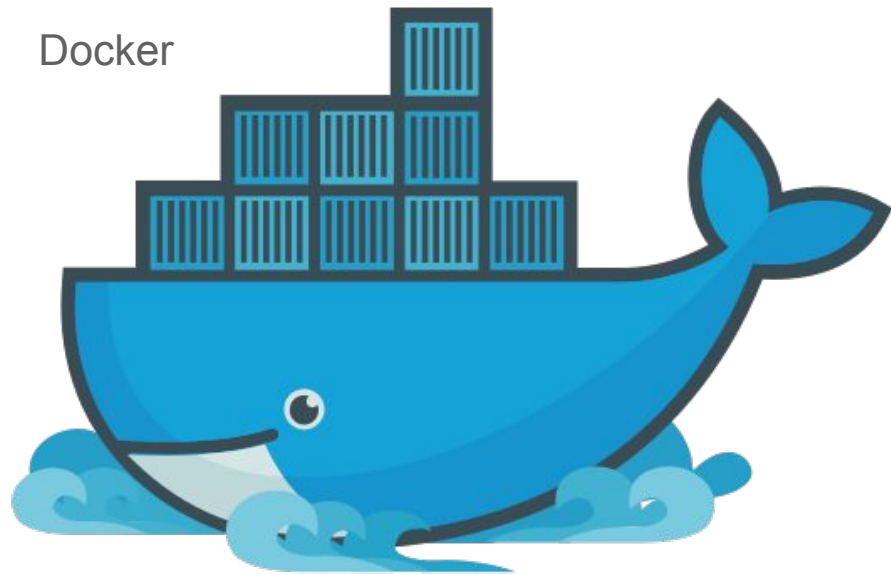


What About Containers?

ECS



Docker



What Falls Into the Realm of Serverless Technology?

- Backend as a Service
 - Commoditized backend
 - Suited for mobile and web apps
 - Developers can focus on their app
 - Easily implement real-time apps
- Examples
 - Firebase
 - Parse
- Function as a Service
 - Customized backend
 - Suited for applications of all types
 - Virtually infinite scale
- Examples
 - Lambda
 - Azure Functions
 - Cloud Functions
 - Bluemix OpenWhisk

Where We're Going

- The Paradigm Shift
- Benefits
- Appropriate Scenarios
- Traditional vs. Serverless Architectures
- Demos:
 - API Gateway
 - Lambda
 - Building a Serverless Application End-to-End

The Paradigm Shift: Provisioning Compute

- Pre-Virtualization Era (1994-2003)
 - Huge up-front investment
 - Inflexibility to change
 - Time required to provision
 - Measured in years
- Virtual Machine Era (2003-2007)
 - Hardware consolidation
 - Better CPU utilization
 - Time required to provision
 - Measured in months
- IaaS Era (2007-2012)
 - Programmatic infrastructure via APIs
 - Virtually infinite access to VMs
 - Time required to provision
 - Measured in hours
- Serverless Era (2012+)
 - Abstracted infrastructure
 - Virtually infinite scale
 - Time required to provision
 - Measured in seconds

The Paradigm Shift

- The focus has changed for developers and operators
 - Used to focus on applications and servers
 - Now focus on tasks and process-flows
- You have reorient how you think about your application
 - Break it up into independent microservices
 - Think about different events that trigger the microservice
- For some enterprises, this is a simple optimization
- For startups, this is a great democratizer

Qualities and Benefits

- Serverless qualities
 - Code is shipped as a deployable unit
 - Logic executes in response to events
 - Types of events with Lambda
 - HTTP requests
 - Kinesis streams
 - DynamoDB stream
 - Event provides context and data
- Serverless Benefits
 - Less code to write
 - Stateless
 - Provides virtually infinite scale
 - Highly available across to globe
 - Billed in increments of 100ms
 - AWS offers a generous free-tier

Appropriate Scenarios

- Best suited for asynchronous tasks
 - Extract, Transform, Load (ETL)
 - Proxy API credentials
 - Database query
 - Dispatch a job
 - Consolidate logic between mobile apps
 - Big data analysis
 - Chatbot Interaction

Architecture Comparisons

- Traditional Multi-Tier Architecture

- Starts off scaling vertically
- Application tier is very monolithic
- Usually tied to specialty hardware
- DevOps disciplines need to be applied
 - Silos must be broken down
 - Infrastructure automation
 - Measurement tooling
 - Visualization tooling

- Serverless Multi-Tier Architecture

- Always horizontally scalable
- Application tier is broken up
- Runs on commodity hardware
- Most DevOps disciplines outsourced
 - Same team develops and ships
 - Infrastructure is abstracted
 - Measurement is out of the box
 - Visualization is out of the box
 - Culture can't be outsourced

Demo Time

[API Gateway Session](#)

Demo Time

[Lambda Session](#)

Demo Time

Let's Build a Serverless Application End-to-End

Wrap-Up

- We're Hiring!
<https://linuxacademy.com/careers>
- Learn More: <http://serverlessacademy.com>
- Shout Out: <https://scaleyourcode.com>

Questions?

You can also find me on IRC on Freenode in:
`#linuxacademy`