Cloud 101 and Building a Career in Cloud

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2/4/2022
Agenda

• Introduction to Cloud
• Why Cloud
• What is Amazon Cloud
• Planning your Career in Cloud/High Tech
• Jobs at Amazon
What is Cloud?

• Imaginative
• Inspiring
• Always there!
  • On Demand Delivery
  • Over the Internet
  • No need to buy Physical Hardware and Infrastructure
  • Access on As-Needed Basis from any Cloud provider
Why Cloud?

• Agility – Ease of Access and Use of Broad Range Technology

• Elasticity – No longer need to worry about Provisioning

• Saves you Money Honey! – No Capital Expenses/ Economies of Scale

• Deploy Globally in Minutes

• Innovation – Focus more on faster Innovation
What is AWS?

AWS provides a highly reliable, scalable, low-cost infrastructure platform in the cloud that powers millions of businesses in over 190 countries around the world.

Benefits

- Low Cost
- Elasticity & Agility
- Open & Flexible
- Secure
- Global Reach
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td>Fine-grained control</td>
</tr>
<tr>
<td>Service Breadth &amp; Depth; pace of innovation</td>
<td>200 + services to support any cloud workload; rapid customer driven releases</td>
</tr>
<tr>
<td>Experience: 1M+ customers</td>
<td>Building and managing cloud since 2006</td>
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<tr>
<td>Global Footprint</td>
<td>81+ Availability Zones within 25 geographic Regions, 1 Local Zone, 216 Points of Presence (205 Edge Locations and 11 Regional Edge Caches) in 84 cities across 42 countries.</td>
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<tr>
<td>Ecosystem</td>
<td>Tens of thousands of APN partners. The AWS Marketplace offers 50 categories, and more than 8,000 software listings</td>
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<tr>
<td>Enterprise leader</td>
<td>AWS positioned as a Leader in the Gartner Magic Quadrant for Cloud Infrastructure as a Service, Worldwide</td>
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## Pricing Philosophy

**High volume / low margin businesses are in our core DNA**

<table>
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<tr>
<th>Trade CapEX for variable expense</th>
<th>Our economies of scale provide us with lower costs</th>
<th>Pricing model choice to support variable and stable workloads</th>
<th>Save more money as you grow bigger</th>
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</thead>
<tbody>
<tr>
<td>Pay for what you use</td>
<td>85 price reductions since 2006</td>
<td>On-demand Reserved Instances Spot</td>
<td>Tiered pricing Volume discounts Custom pricing</td>
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</table>
Customer obsessed

90% of roadmap originates with customer requests and are designed to meet specific needs.

“Performance, reliability, and responsiveness are fundamental to our customer experience, and T3 instances help us to deliver on that customer promise while also controlling our costs.”

—Heroku
AWS Global Reach
Availability Zones

- A region is comprised of multiple Availability Zones (typically 3)
- An Availability Zone (AZ) is one or more discrete data centers with redundant power, networking, and connectivity in an AWS Region
- High throughput, low latency (<10mS) network between Availability Zones
- All traffic between AZ’s is encrypted
- Physical Separation < 100km
Intra & inter-AZ connectivity

- Dark fiber “spans”
  - Optimized for low-latency & physical diversity
- Amazon controlled infrastructure
- Geospatial coordinates
- Dense wavelength division multiplexing (DWDM)
Choices for Compute

Amazon EC2
Virtual server instances in the cloud

Amazon ECS, EKS, and Fargate
Container management service for running Docker on a managed cluster of EC2

AWS Lambda
Serverless compute for stateless code execution in response to triggers
Amazon EC2

- Linux | Windows | Mac
- Arm and x86 architectures
- General purpose and workload optimized
- Bare metal, disk, networking capabilities
- Packaged | Custom | Community AMIs
- Multiple purchase options: On-demand, RI, Spot
What’s a virtual CPU? (vCPU)

- A vCPU is typically a hyper-threaded physical core*
- Divide vCPU count by 2 to get core count
- On Linux, “A” threads enumerated before “B” threads
- On Windows, threads are interleaved

- Cores by Amazon EC2 & RDS DB Instance type: https://aws.amazon.com/ec2/virtualcores/

* CPU Optimizing options allow disabling hyperthreading and reduce number of cores
Memory and Storage

What’s a GiB?

- Memory is presented as GibiBytes (GiB) and not Gigabytes (GB)
- 256 GiB = 275 GB

What about storage?

- Storage is independent of compute
- You allocate drives known as EBS volumes
- Max 16 TiB per volume
- Some instance types provide physically attached (ephemeral) storage
Instance sizing

8xlarge ≈ 4 - c4.2xlarge ≈ 8 - c4.xlarge

≈

c4.8xlarge

2 - c4.4xlarge

4xlarge

2xlarge

2xlarge

2xlarge

2xlarge

2xlarge

xlarge

xlarge

xlarge

xlarge

xlarge

xlarge

EC2 Naming Explained

Instance generation

c5n.xlarge

Instance family  Attribute  Instance size
## Instance Types

<table>
<thead>
<tr>
<th>General Purpose</th>
<th>Compute Optimized</th>
<th>Memory Optimized</th>
<th>Accelerated Computing</th>
<th>Storage Optimized</th>
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</thead>
<tbody>
<tr>
<td>Burstable performance</td>
<td>Compute Intensive</td>
<td>Compute +memory up to 100 Gbps</td>
<td>Memory Optimized</td>
<td>Graphics Intensive</td>
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<tr>
<td>General Purpose</td>
<td>Compute Intensive</td>
<td>Memory Optimized</td>
<td>In-memory</td>
<td>General Purpose GPU</td>
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<td></td>
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<td>Memory Intensive</td>
<td>Memory Intensive</td>
<td>FPGA</td>
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<td>Compute and Memory Intensive</td>
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<tr>
<td>Intel</td>
<td>T3</td>
<td>M5</td>
<td>C5</td>
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<td>H1</td>
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<tr>
<td>AMD</td>
<td>T3a</td>
<td>M5a</td>
<td>C5d</td>
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<td>H1</td>
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<tr>
<td>Metal</td>
<td>M5m</td>
<td>c5m</td>
<td>R5m</td>
<td>u-12tb1</td>
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<tr>
<td>Others</td>
<td>A1</td>
<td>M6g</td>
<td>C6g</td>
<td>R6g</td>
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### Local storage (NVMe SSD)
- M5d
- M5m
- c5m
- R5m
- u-12tb1
- Z1dm

### Other
- A1
- M6g
- C6g
- R6g
- P3dn
- I3m
- I3en

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Planning your Career in High Tech/Cloud
What Kind of Jobs can I do?

• Any – Don’t let anyone tell you what you can do
• What kind of Jobs are there in companies like Amazon
  • SDE jobs – AI/ML/ XR and Evolving Technologies/ Alexa, Java/Json Developers/ UI Interface
  • Product Development/ Program Management
  • Sales- Account Management/ Pre Sales
  • Solution Architects/ Technical Account Management
  • Big Data and Analytics
  • Customer Support Engineering
  • Technical Operations
How to Plan and Prepare

• My Journey
• Get Internships - where and How big or small
• Real Life Experiences matter
• Pick an idea to explore or build
• All Cloud Providers offer free Cloud Accounts – Go Play
• Written, Oral communication, Collaboration
Jobs at Amazon
How to prepare for Amazon

- What is like working at Amazon?
  - Day1, Ambiguity, Working Backwards, Outcome Based, Challenging

- Leadership Principles matter
  https://www.amazon.jobs/en/principles
  - Customer Obsession, Ownership
  - Bias for Action, Learn and Be Curious

- Problem Management, Dealing with Ambiguity

- Be Yourself, Be Compassionate, Empathy
Interviewing at Amazon

- **Behavioral based, Be yourself, Ingenuity at its Best**
- **Share your Thinking and Communicate (STAR)**
- **How do you handle conflict, Overcome Challenge**
- **Interview at Amazon – Assessments, Phone Screens, Onsite Interview**
- **No Requirement for specific Programming language, familiarity is, Nuances matter**
- **Coding syntactically correct code—no pseudo code**