Amazon Web Services
AWS Academy
Getting Set Up

• You’ll receive an email invite soon
• From instructure.com
• Click on Get Started
AWS Academy
Getting Set Up

• You’ll likely have to Create My Account
• Select a Password and Time Zone
• Uncheck the AWS Spam
• Agree to Use Policy
• Register
AWS Academy

Getting Set Up

- https://awsacademy.instructure.com/login/canvas
AWS Academy
Getting Set Up

• Go into Modules
• Select “Launch AWS Academy Learner Lab”
• Note: Safari security policy prevents the Vocareum frame from loading
• Use Firefox for this
AWS Academy
Getting Set Up

• Skim through the terms of service
• Scroll down and accept
AWS Academy
Getting Set Up

Lab Account Status
AWS Terminal
Start Lab Button
Enter Full Screen
AWS Academy
Getting Set Up

• Click Start Lab Button
• This takes a good 3-5 minutes the very first time to start
AWS Academy
Getting Set Up

- AWS Account Status Button goes green
- Click the AWS Account Status button to load the AWS Console
- Current Active Lab Session Time Displayed. 4 hours per session
- Total Lab $ Allowance used across all lab sessions. Don’t go over this!
AWS Academy

AWS Console Overview

- AWS Console
- Search for Services
- Pin Favorite Services
- Select Region
AWS Academy
AWS Console Overview

• Can only use regions:
  • N. Virginia (us-east-1)
  • Oregon (us-west-2)
• For simplicity I recommend using N. Virginia (us-east-1)
AWS Credentials
EC2 Security Download SSH Keys

- Click on AWS Details
- Download the PEM file
  - May need the PPK file if you are using Putty on Windows
- You’ll need this for SSH Terminal access and File Transfer
- Save someplace you’ll remember!
AWS VS Code Extension

Not required, but highly recommended. Simplifies many things

- In VS Code go to the Extensions section of the left mode sidebar
- Search for AWS
- Install the “AWS Toolkit” extension from Amazon Web Services

Not required, but highly recommended. Simplifies many things.
AWS VS Code Extension Configuration

• Turn off all of AWS “AI” spam

• Click the little Gear next to the Uninstall button

• Choose “Extension Settings”

• Scroll through and uncheck anything “Code Whisper” related.

• Close Settings
AWS VS Code Extension

Configuration

• Click on the AWS Extension in the left sidebar

• Click on the three “…” menu in the upper pane and uncheck everything except “Explorer"
AWS VS Code Ext Configuration

- At the bottom of the window there should be a section that says “AWS: profile”
  - Restart VS Code if this isn’t showing up
- Click on that to bring up a Getting Started document
- Under AWS Explorer click on the “Or provide IAM Roles Credentials”
  - Click on “Edit file directly”
AWS VS Code Extension Configuration

• A new “credentials” document will open.

• We will paste in credentials we get from AWS Academy
CLI Credentials
Download SSH Keys

- Go back to AWS Academy
- Click on AWS Details
- Click on the “Show” button next to AWS CLI
CLI Credentials

Download SSH Keys

- A text box with credential information including the following is displayed:
  - `aws_access_key_id`
  - `aws_secret_access_key`
  - `aws_session_token`
- Copy all of the text inside the box, including `[default]`
AWS VS Code Extension Configuration

- A new “credentials” document will open.
- We will paste in credentials we get from AWS Academy.
- Save the document.
AWS VS Code Extension Configuration

- A new “credentials” document will open.
- We will paste in credentials we get from AWS Academy
- Save the document

Important!

You will have to get new CLI credentials for each AWS Academy Lab session. Sessions are only valid for 4 hours at a time.

Copy them into this file and replace the old ones each time.
• Click on the “AWS: profile” in the window footer again to open the profile selection.

• You should see your new default profile in the list now.

• Click on that line to activate it.
AWS VS Code Extension Configuration

- Clicking on the AWS Extension in the left sidebar will now bring up the resource browser for the current region (us-east-1)

- There’s probably nothing there yet since this is a new empty account
AWS VS Code Extension Configuration

- Click on the S3 section
- Click on the little +Bucket Icon
- Enter in the name of your bucket
  - Note bucket names must be globally unique among all AWS accounts
- Hit the “Return” key to make it
AWS VS Code Extension Configuration

- You made your first cloud resource!
AWS Academy

End Lab Session

• When you’re done, make a habit of ending your lab session in AWS Academy.

• If you forget, it will automatically time out after 4 hours, but you’re charged for any running resources during that whole time.
AWS Overview
Infrastructure as a Service
Platform as a Service
Software as a Service
IaaS

PaaS

SaaS

Box

AWS RDS

AWS EC2
IaaS

Less Maintenance

Less $$

More Time

PaaS

More $$

Less Time

SaaS

More Control

Less $$

More Time

IaaS
AWS Services
## Three Main Categories

<table>
<thead>
<tr>
<th>Compute</th>
<th>Storage</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC2</td>
<td>S3</td>
<td>S3</td>
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<td>RDS</td>
<td>RDS</td>
<td>VPC</td>
</tr>
<tr>
<td>Lambda</td>
<td>EBS</td>
<td>VPN</td>
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</tbody>
</table>
## Compare On-Prem to Cloud

<table>
<thead>
<tr>
<th>On-Prem</th>
<th>AWS</th>
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<tbody>
<tr>
<td>VMWare</td>
<td>EC2</td>
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<td>Isilon / Synology / NAS</td>
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<tr>
<td>F5 bigIP</td>
<td>ELB / ALB</td>
</tr>
<tr>
<td>Firewalls</td>
<td>Security Groups</td>
</tr>
</tbody>
</table>
EC2

- Elastic Cloud Compute
- Virtual Machines (VMs)
- Linux or Windows
- Basic Server Building Block
- Provision, log in, configure as you like
EBS

- Elastic Block Storage
- Standard block storage attached to EC2 instances
- Multiple volumes can be attached to an instance
- Snapshots
EFS

• Elastic File System

• Amazon's Managed NFS Service

• Unix-centric shared file system
  • Mount a single file system across many application hosts
  • Store application files that need to be shared
S3

- Simple Storage System
- Basic Object Storage
  - Key/Value Pairs
  - NOT Block Storage! Cannot directly attach to EC2 Instances
- Good for storing lots of data independent of a single server
- Access through APIs and HTTP
- Much cheaper than EBS
RDS

- Relational Database Service
- PaaS for Databases
  - Oracle, MSSQL, MySQL, PostgresSQL, Aurora
  - AWS manages the servers, minor patching
  - Less management on your part, also less configurability
ELB / ALB

- Elastic Load Balancer / Application Load Balancer
- Simpler, dumber versions of an F5
- Accepts incoming traffic on some port, balances to $n$ backend servers
- Usually public-facing, in public subnets
- SSL/TLS Termination
Regions

- Geographic location of AWS data centers
- Oregon, Virginia, London, etc.
- Each Region contains multiple physical data centers, each with independent power and networking
- Resources must be specified in a particular Region
  - We use Oregon (us-west-2) for almost everything
Availability Zone

- Within a region, there are multiple Availability Zones
- Each AZ has separate power and networking
- Designed for physical redundancy
- High Availability is achieved by deploying resources into multiple AZs
- Many services (RDS, ELBs, etc) are Multi-AZ capable
VPC

- Virtual Private Cloud
- AWS's Network Construct
- Subnets, Route Table, ACLs, VPNs, etc.
- Almost all compute resources must be assigned to a subnet in a VPC
  - (EC2, RDS, ELBs, EFS, etc)
AWS Shared Responsibility Model
https://aws.amazon.com/compliance/shared-responsibility-model/
Permissions Model

Can I push this button?
Permissions in 3 parts

Someone

ec2:RunInstance

Does something

To something
Permissions in 3 parts

Principal: ec2:RunInstance

Action

Resource
IAM

- Identity & Access Management
- Controls who can do which actions to what resources
IAM User

- A user entity
- Could be configured with web console access (or not)
- Could be configured with API access keys (or not)
- Can have Roles assigned to it, and belong to groups
IAM Role

- A collection of 0 or more Policies
- Roles can be attached to users and services
IAM Policy

- A set of instructions allowing or denying an action to be performed on some resource
- Policies are assigned to Users or Roles
- JSON Document
IAM Policy

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "logs:DescribeLogGroups"
            ],
            "Resource": "*",
            "Effect": "Allow"
        },
        {
            "Action": [
                "logs:Describe*",
                "logs:FilterLogEvents",
                "logs:GetLogEvents"
            ],
            "Resource": "arn:aws:logs:*:123412341234:log-group:kf*",
            "Effect": "Allow"
        }
    ]
}
```

This Action
Is allowed on ALL resources

These Actions
Are allowed ONLY on these resources
There Are Lots of Actions
Demo