CLOUD COMPUTING APPLICATIONS

IaaS Providers: Amazon

Roy Campbell & Reza Farivar

Amazon Web Services (AWS)

- AWS provides a collection of services for building Cloud applications
- Services for
  - Storage: S3, EBS
  - Computation: Elastic Cloud Computing (EC2), scaling/load balancer, Elastic MapReduce, Elastic Beanstalk
  - Database: RDS, DynamoDB, ElastiCache
  - Coordination: Simple notification service, simple workflow framework
- All services are paid depending on use

Amazon Web Services

Amazon EC2

Resizable compute capacity in the Cloud.

Amazon DynamoDB

Fast and flexible NoSQL database with seamless scalability.

AWS Lambda

Compute service that runs your code in response to events and automatically manages the compute resources

Amazon S3

Highly scalable, reliable, and low-latency data storage infrastructure.

Nine Regions

- US East (N. Virginia) (135)
- US West (Oregon) (135)
- US West (N. California) (135)
- EU (Frankfurt) (60)
- EU (Ireland) (135)
- Asia Pacific (Singapore) (134)
- Asia Pacific (Tokyo) (134)
- Asia Pacific (Sydney) (133)
- South America (São Paulo) (130)

Six Types of Instances

- Micro instances (free tier)
- General purpose
- Memory optimized
- Storage optimized
- Compute optimized
- GPU instances

Amazon versus Competition

- Wall Street estimates of AWS revenue are typically in the $4 billion to $5 billion range for 2014, representing a doubling of revenue over a 2-year period, despite continuous decreases in prices
- 10× capacity of its nearest 145 competitors combined (Gartner)

Amazon Technology

- Xen Hypervisor – proprietary
- Micro instances are oversubscribed, but others are not
- Storage and local area networks are shared – multi-tenant
- Billed by hour
- Provisional Amazon machine image instances – licenses are a user problem
- Operating system is a customer problem
- Can use third-party consoles to control Cloud VMWare, Microsoft

Storage

- Transient, instance-specific storage
- Persistent, instance-independent Elastic Block Store (EBS) storage (SSD and encryption options)
- Object-based Simple Storage Service (S3)
- Data restricted to region

Networking

- Virtual Private Cloud (=VPN)
- Private routing between VPCs
- VPN tunnels can connect your enterprise to Amazon
- DirectConnect allows a customer to use a carrier for private WAN services

Gain free, hands-on experience with AWS for 12 months

Learn more about the AWS Free Tier »

Get Started with AWS for Free

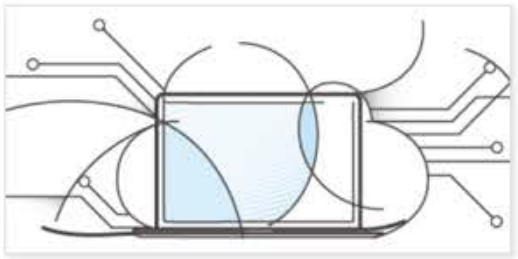
Create a Free Account

Amazon S3
5GB storage, 20k Get requests and 2k Put requests

View AWS Free Tier Details »

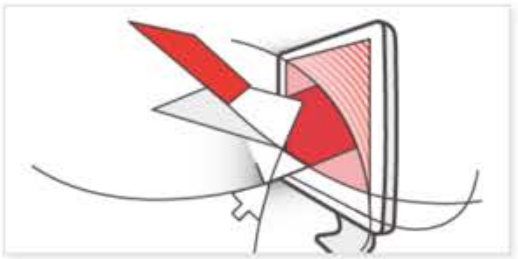
AWS RE:INVENT 2015

Registration is now open. Full conference pass $1299



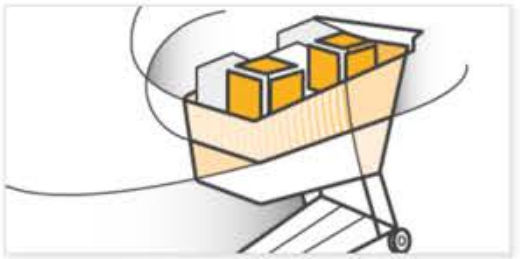
WHAT IS CLOUD COMPUTING?

Learn about the benefits of on-demand IT resources and pay-as-you-go pricing



GET STARTED WITH AWS

Learn how to start using AWS in minutes



SOFTWARE FREE TRIALS

Try top software products from AWS Marketplace for free

Amazon Web Services

Compute

- **EC2** — Virtual Servers in the Cloud
- **Lambda** — Run Code in Response to Events
- **EC2 Container Service** — Run and Manage Docker Containers

Storage & Content Delivery

- **S3** — Scalable Storage in the Cloud
- **Elastic File System** PREVIEW — Fully Managed File System for EC2
- **Storage Gateway** — Integrates On-Premises IT Environments with Cloud Storage
- **Glacier** — Archive Storage in the Cloud
- **CloudFront** — Global Content Delivery Network

Database

- **RDS** — MySQL, Postgres, Oracle, SQL Server, and Amazon Aurora
- **DynamoDB** — Predictable and Scalable NoSQL Data Store
- **ElastiCache** — In-Memory Cache
- **Redshift** — Managed Petabyte-Scale Data Warehouse Service

Networking

- **VPC** — Isolated Cloud Resources
- **Direct Connect** — Dedicated Network Connection to AWS
- **Route 53** — Scalable DNS and Domain Name Registration

Administration & Security

- **Directory Service** — Managed Directories in the Cloud
- **Identity & Access Management** — Access Control and Key Management
- **Trusted Advisor** — AWS Cloud Optimization Expert
- **CloudTrail** — User Activity and Change Tracking
- **Config** — Resource Configurations and Inventory
- **CloudWatch** — Resource and Application Monitoring

Deployment & Management

- **Elastic Beanstalk** — AWS Application Container
- **OpsWorks** — DevOps Application Management Service
- **CloudFormation** — Templated AWS Resource Creation
- **CodeDeploy** — Automated Deployments

Analytics

- **EMR** — Managed Hadoop Framework
- **Kinesis** — Real-time Processing of Streaming Big Data
- **Data Pipeline** — Orchestration for Data-Driven Workflows
- **Machine Learning** — Build Smart Applications Quickly and Easily

Application Services

- **SQS** — Message Queue Service
- **SWF** — Workflow Service for Coordinating Application Components
- **AppStream** — Low Latency Application Streaming
- **Elastic Transcoder** — Easy-to-use Scalable Media Transcoding
- **SES** — Email Sending Service
- **CloudSearch** — Managed Search Service

Mobile Services

- **Cognito** — User Identity and App Data Synchronization
- **Mobile Analytics** — Understand App Usage Data at Scale
- **SNS** — Push Notification Service

Enterprise Applications

- **WorkSpaces** — Desktops in the Cloud
- **WorkDocs** — Secure Enterprise Storage and Sharing Service
- **WorkMail** PREVIEW — Secure Email and Calendaring Service

Resource Groups

A resource group is a collection of resources that share one or more tags. Create a group for each project, application, or environment in your account.

Create a Group | Tag Editor

Additional Resources

Getting Started

See our documentation to get started and learn more about how to use our services.

AWS Console Mobile App

View your resources on the go with our AWS Console mobile app, available from Amazon Appstore, Google Play, or iTunes.

AWS Marketplace

Find and buy software, launch with 1-Click and pay by the hour.

AWS re:Invent - Register Now

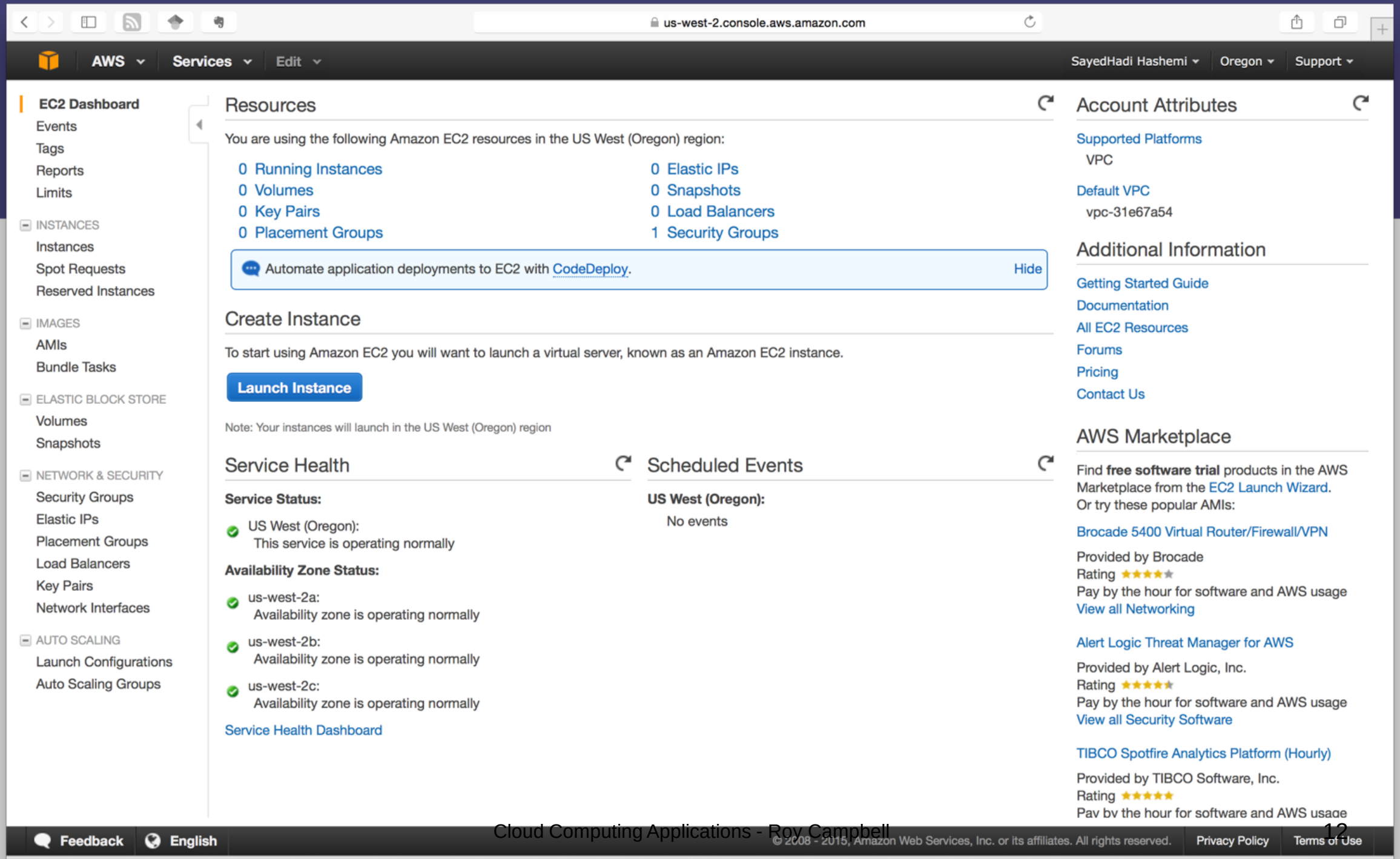
Join us for keynote announcements, technical sessions, bootcamps and more.

Service Health

All services operating normally.

Updated: Jul 06 2015 14:41:00 GMT-0500

Service Health Dashboard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Reserved Instances
IMAGES
AMIs
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ELASTIC BLOCK STORE
Volumes
Snapshots
NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces
AUTO SCALING
Launch Configurations
Auto Scaling Groups
Resources
You are using the following Amazon EC2 resources in the US West (Oregon) region:
0 Running Instances
0 Volumes
0 Key Pairs
0 Placement Groups
0 Elastic IPs
0 Snapshots
0 Load Balancers
1 Security Groups
Automate application deployments to EC2 with CodeDeploy.
Hide
Create Instance
To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.
Launch Instance
Note: Your instances will launch in the US West (Oregon) region
Service Health
Service Status:
US West (Oregon):
This service is operating normally
Availability Zone Status:
us-west-2a:
Availability zone is operating normally
us-west-2b:
Availability zone is operating normally
us-west-2c:
Availability zone is operating normally
Service Health Dashboard
Scheduled Events
US West (Oregon):
No events
Account Attributes
Supported Platforms
VPC
Default VPC
vpc-31e67a54
Additional Information
Getting Started Guide
Documentation
All EC2 Resources
Forums
Pricing
Contact Us
AWS Marketplace
Find free software trial products in the AWS Marketplace from the EC2 Launch Wizard.
Or try these popular AMIs:
Brocade 5400 Virtual Router/Firewall/VPN
Provided by Brocade
Rating
Pay by the hour for software and AWS usage
View all Networking
Alert Logic Threat Manager for AWS
Provided by Alert Logic, Inc.
Rating
Pay by the hour for software and AWS usage
View all Security Software
TIBCO Spotfire Analytics Platform (Hourly)
Provided by TIBCO Software, Inc.
Rating
Pay by the hour for software and AWS usage
Feedback
English
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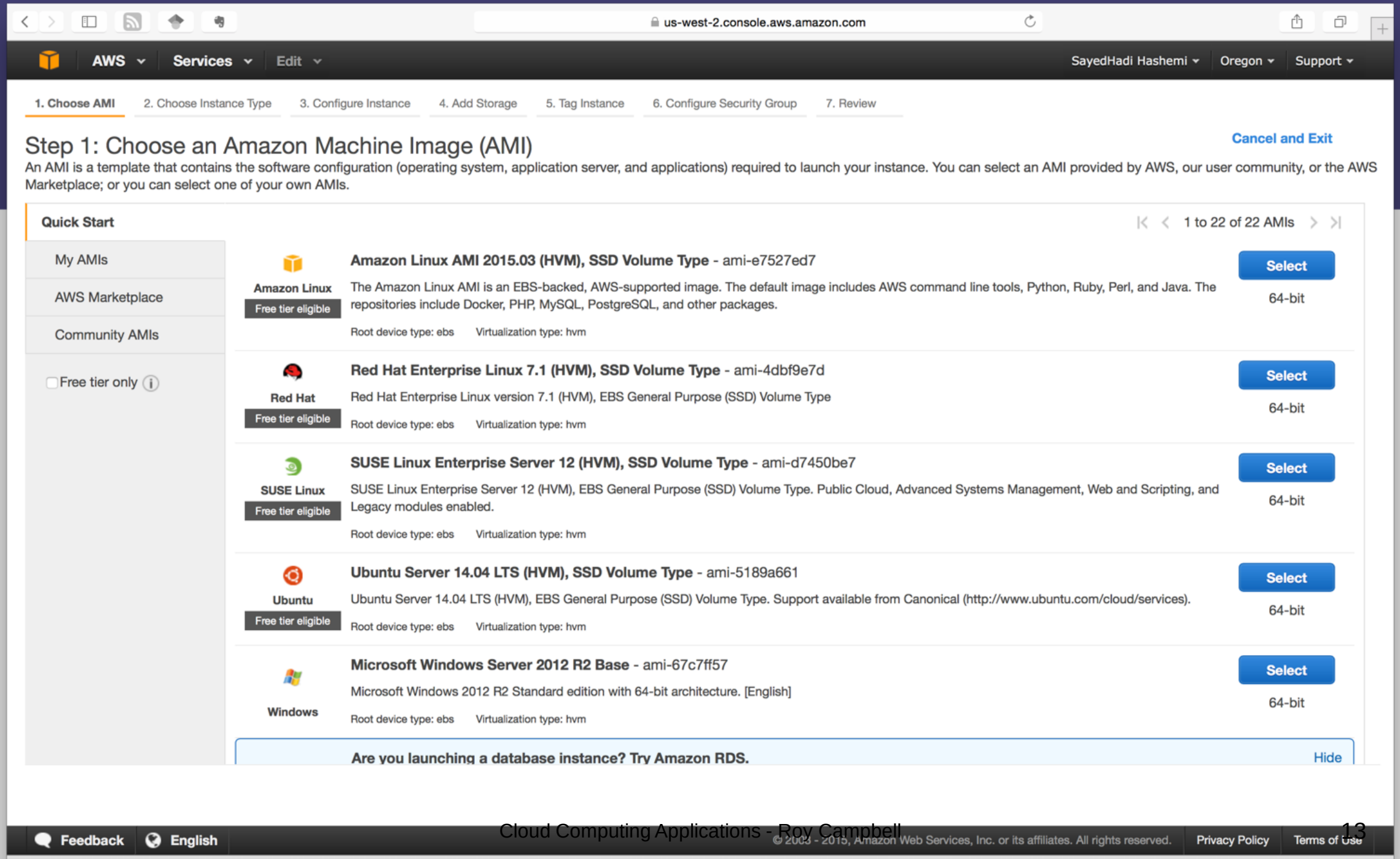
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AWS
Services
Edit
SayedHadi Hashemi
Oregon
Support
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Tag Instance
6. Configure Security Group
7. Review
Step 1: Choose an Amazon Machine Image (AMI)
Cancel and Exit
An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.
Quick Start
1 to 22 of 22 AMIs
My AMIs
AWS Marketplace
Community AMIs
Free tier only
Amazon Linux
Free tier eligible
Amazon Linux AMI 2015.03 (HVM), SSD Volume Type - ami-e7527ed7
The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.
Root device type: ebs
Virtualization type: hvm
Select
64-bit
Red Hat
Free tier eligible
Red Hat Enterprise Linux 7.1 (HVM), SSD Volume Type - ami-4dbf9e7d
Red Hat Enterprise Linux version 7.1 (HVM), EBS General Purpose (SSD) Volume Type
Root device type: ebs
Virtualization type: hvm
Select
64-bit
SUSE Linux
Free tier eligible
SUSE Linux Enterprise Server 12 (HVM), SSD Volume Type - ami-d7450be7
SUSE Linux Enterprise Server 12 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.
Root device type: ebs
Virtualization type: hvm
Select
64-bit
Ubuntu
Free tier eligible
Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-5189a661
Ubuntu Server 14.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).
Root device type: ebs
Virtualization type: hvm
Select
64-bit
Windows
Microsoft Windows Server 2012 R2 Base - ami-67c7ff57
Microsoft Windows 2012 R2 Standard edition with 64-bit architecture. [English]
Root device type: ebs
Virtualization type: hvm
Select
64-bit
Are you launching a database instance? Try Amazon RDS.
Hide
Feedback
English
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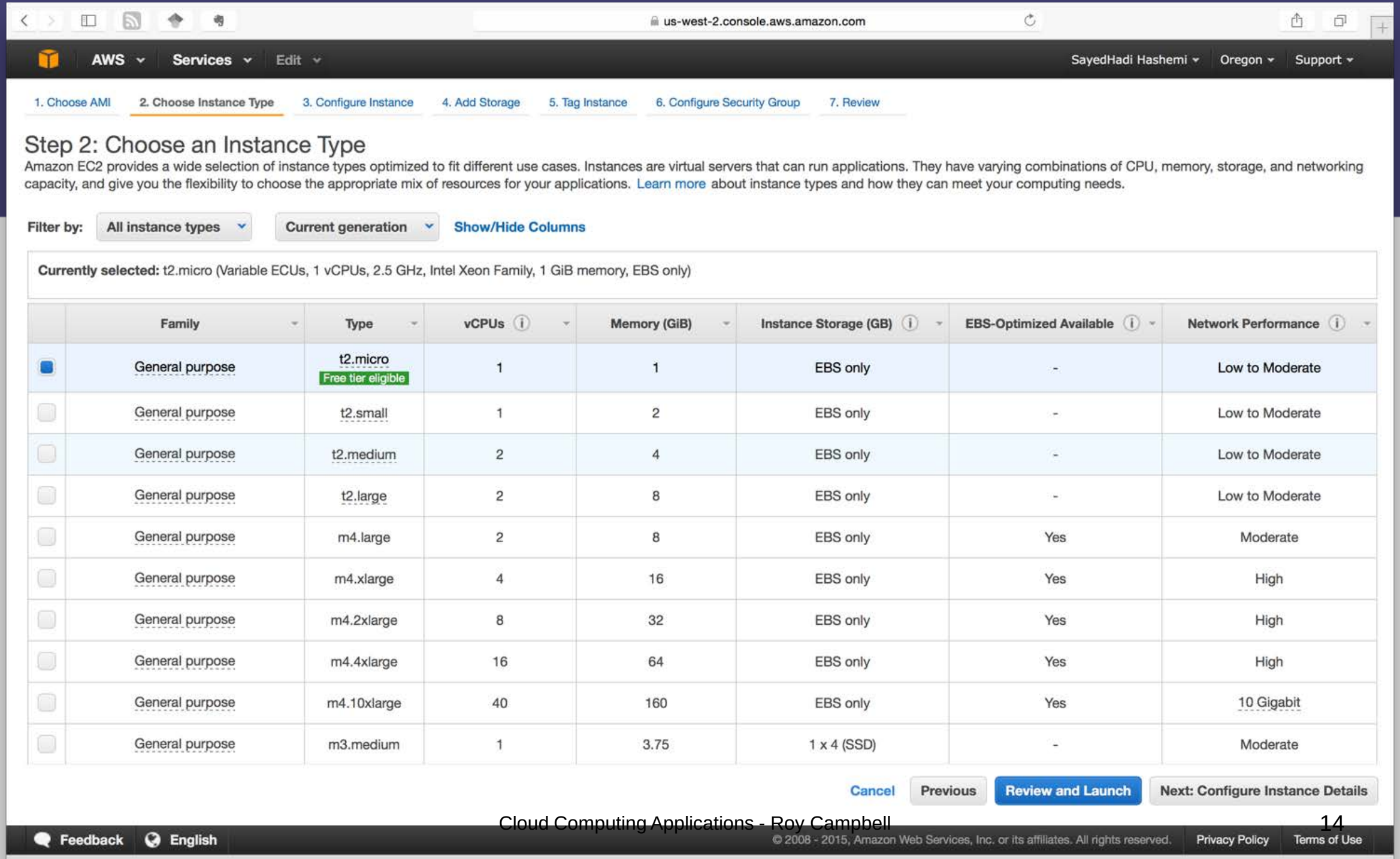
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Step 2: Choose an Instance Type
Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. Learn more about instance types and how they can meet your computing needs.
Filter by:
All instance types
Current generation
Show/Hide Columns
Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)
Family
Type
vCPUs
Memory (GiB)
Instance Storage (GB)
EBS-Optimized Available
Network Performance
General purpose
t2.micro
Free tier eligible
1
1
EBS only
-
Low to Moderate
General purpose
t2.small
1
2
EBS only
-
Low to Moderate
General purpose
t2.medium
2
4
EBS only
-
Low to Moderate
General purpose
t2.large
2
8
EBS only
-
Low to Moderate
General purpose
m4.large
2
8
EBS only
Yes
Moderate
General purpose
m4.xlarge
4
16
EBS only
Yes
High
General purpose
m4.2xlarge
8
32
EBS only
Yes
High
General purpose
m4.4xlarge
16
64
EBS only
Yes
High
General purpose
m4.10xlarge
40
160
EBS only
Yes
10 Gigabit
General purpose
m3.medium
1
3.75
1 x 4 (SSD)
-
Moderate
Cancel
Previous
Review and Launch
Next: Configure Instance Details
Feedback
English
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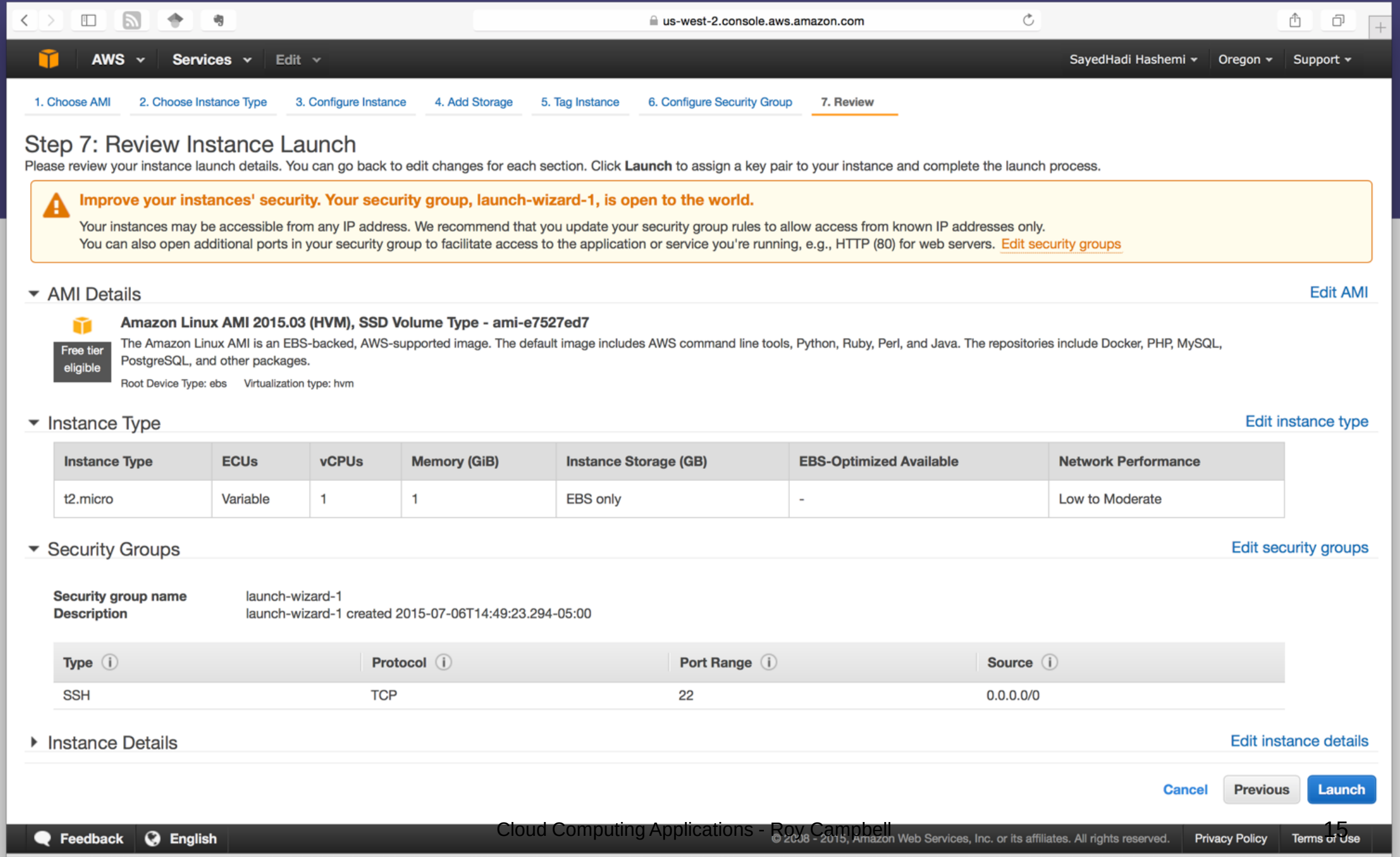
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6. Configure Security Group
7. Review
Step 7: Review Instance Launch
Please review your instance launch details. You can go back to edit changes for each section. Click Launch to assign a key pair to your instance and complete the launch process.
Improve your instances' security. Your security group, launch-wizard-1, is open to the world.
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.
You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. Edit security groups
AMI Details
Edit AMI
Amazon Linux AMI 2015.03 (HVM), SSD Volume Type - ami-e7527ed7
Free tier eligible
The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.
Root Device Type: ebs Virtualization type: hvm
Instance Type
Edit instance type
Instance Type | ECUs | vCPUs | Memory (GiB) | Instance Storage (GB) | EBS-Optimized Available | Network Performance
t2.micro | Variable | 1 | 1 | EBS only | - | Low to Moderate
Security Groups
Edit security groups
Security group name launch-wizard-1
Description launch-wizard-1 created 2015-07-06T14:49:23.294-05:00
Type | Protocol | Port Range | Source
SSH | TCP | 22 | 0.0.0.0/0
Instance Details
Edit instance details
Cancel
Previous
Launch
Feedback
English
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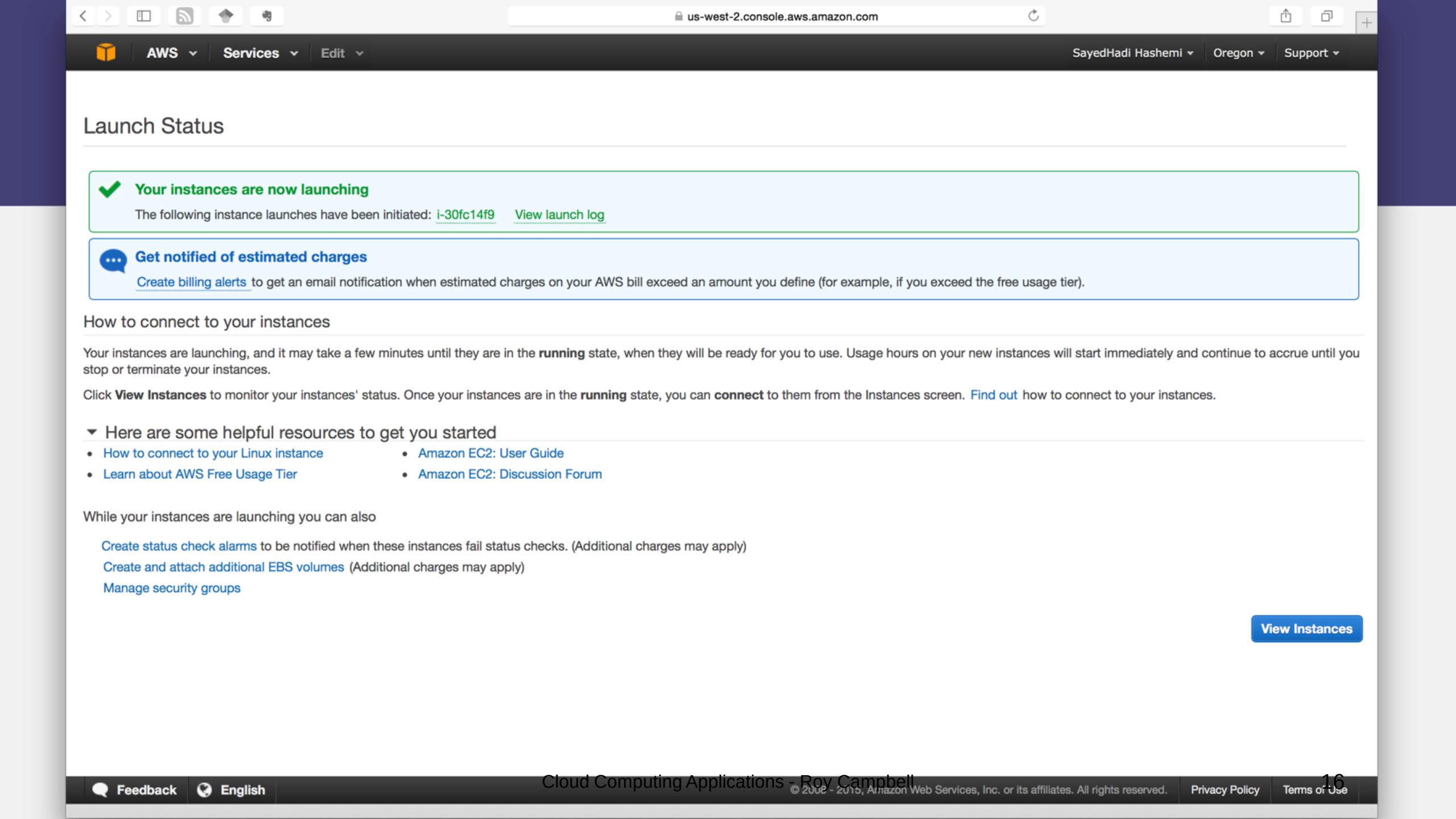
us-west-2.console.aws.amazon.com
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Launch Status
Your instances are now launching
The following instance launches have been initiated: i-30fc14f9
View launch log
Get notified of estimated charges
Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).
How to connect to your instances
Your instances are launching, and it may take a few minutes until they are in the running state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.
Click View Instances to monitor your instances' status. Once your instances are in the running state, you can connect to them from the Instances screen. Find out how to connect to your instances.
Here are some helpful resources to get you started
How to connect to your Linux instance
Learn about AWS Free Usage Tier
Amazon EC2: User Guide
Amazon EC2: Discussion Forum
While your instances are launching you can also
Create status check alarms to be notified when these instances fail status checks. (Additional charges may apply)
Create and attach additional EBS volumes (Additional charges may apply)
Manage security groups
View Instances
Feedback
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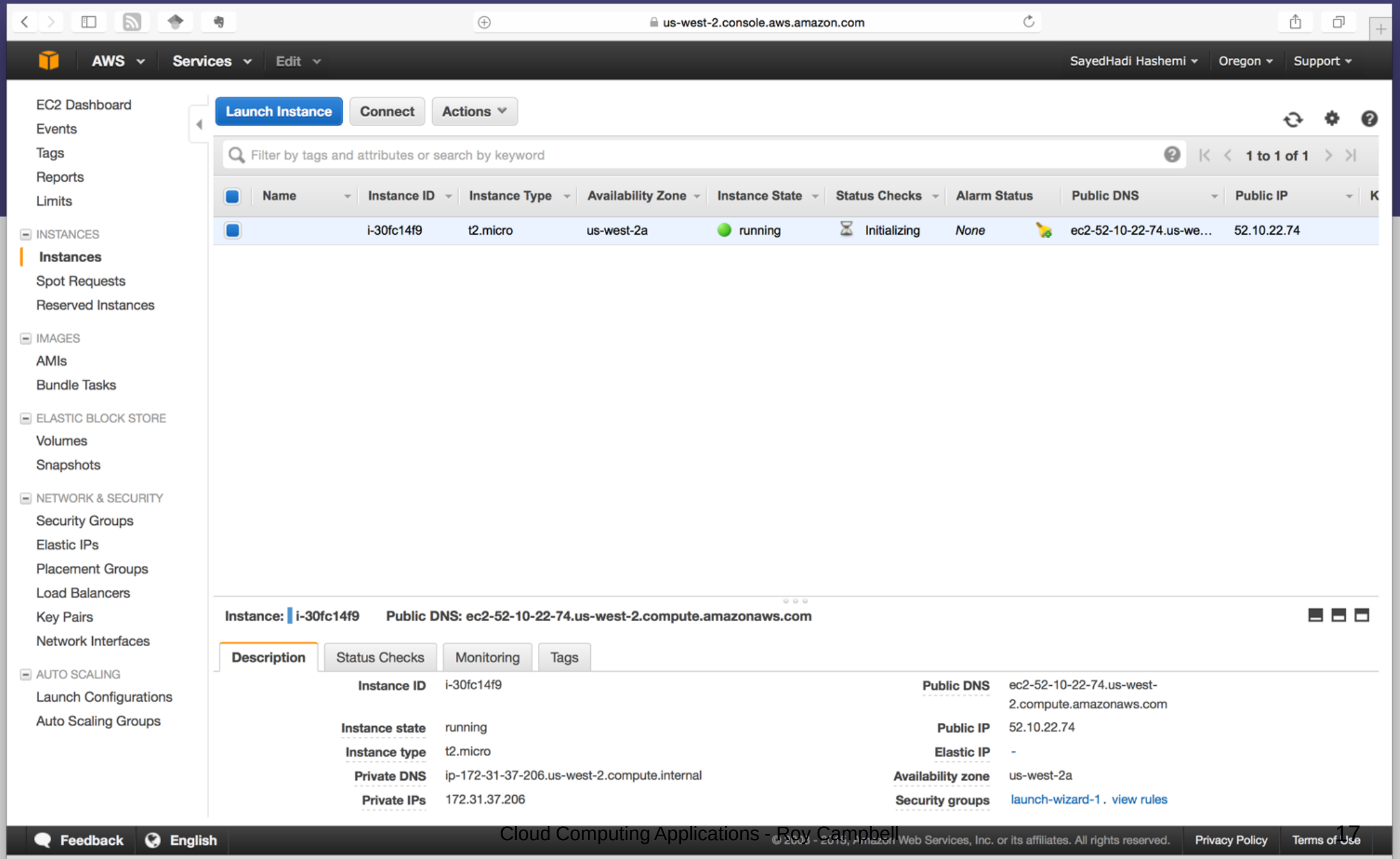
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Spot Requests
Reserved Instances
IMAGES
AMIs
Bundle Tasks
ELASTIC BLOCK STORE
Volumes
Snapshots
NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Load Balancers
Key Pairs
Network Interfaces
AUTO SCALING
Launch Configurations
Auto Scaling Groups
Launch Instance
Connect
Actions
Filter by tags and attributes or search by keyword
1 to 1 of 1
Name
Instance ID
Instance Type
Availability Zone
Instance State
Status Checks
Alarm Status
Public DNS
Public IP
i-30fc14f9
t2.micro
us-west-2a
running
Initializing
None
ec2-52-10-22-74.us-we...
52.10.22.74
Instance: i-30fc14f9
Public DNS: ec2-52-10-22-74.us-west-2.compute.amazonaws.com
Description
Status Checks
Monitoring
Tags
Instance ID
i-30fc14f9
Instance state
running
Instance type
t2.micro
Private DNS
ip-172-31-37-206.us-west-2.compute.internal
Private IPs
172.31.37.206
Public DNS
ec2-52-10-22-74.us-west-2.compute.amazonaws.com
Public IP
52.10.22.74
Elastic IP
-
Availability zone
us-west-2a
Security groups
launch-wizard-1. view rules
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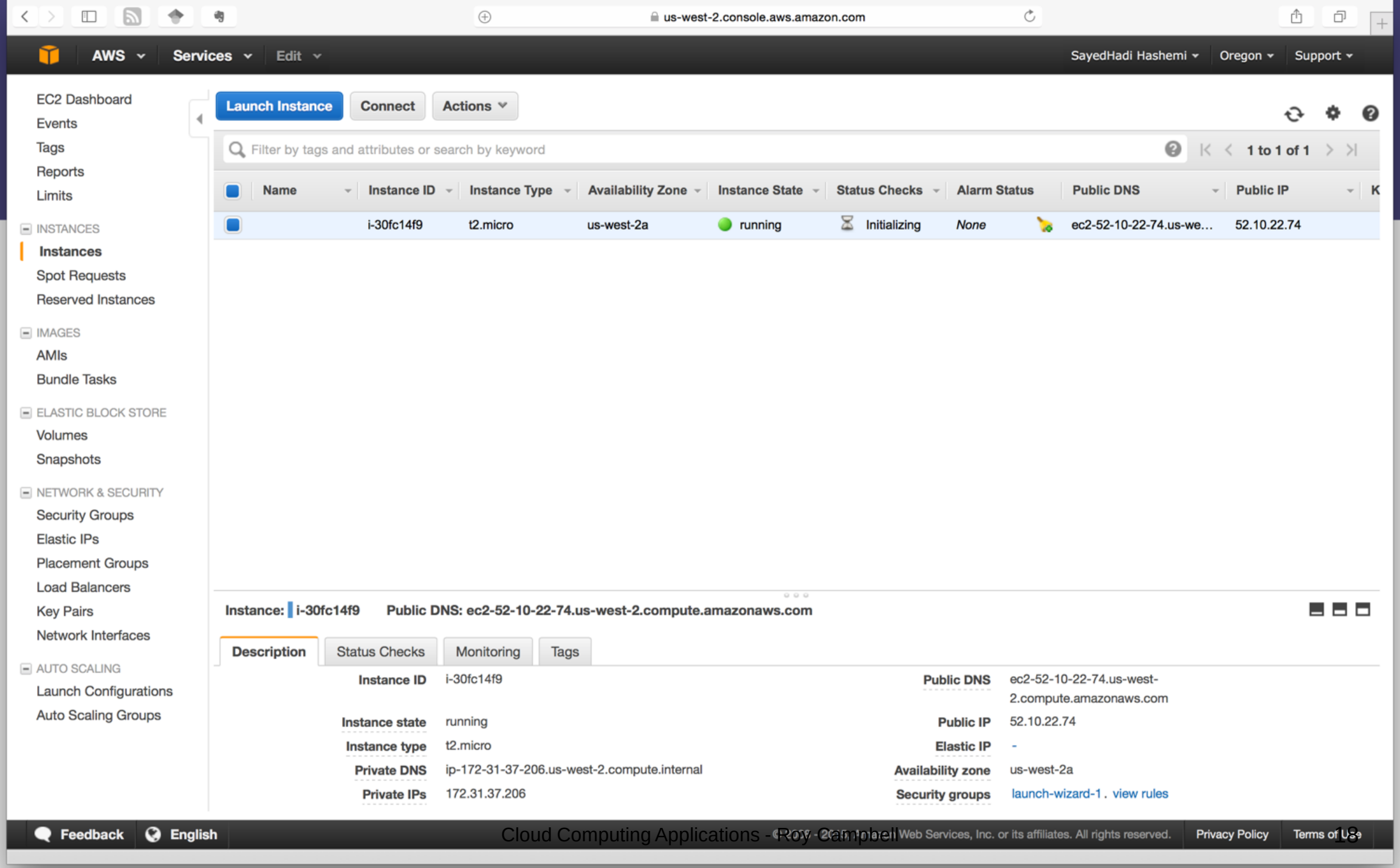
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Instance Type
Availability Zone
Instance State
Status Checks
Alarm Status
Public DNS
Public IP
i-30fc14f9
t2.micro
us-west-2a
running
Initializing
None
ec2-52-10-22-74.us-we...
52.10.22.74
Instance: i-30fc14f9
Public DNS: ec2-52-10-22-74.us-west-2.compute.amazonaws.com
Description
Status Checks
Monitoring
Tags
Instance ID
i-30fc14f9
Instance state
running
Instance type
t2.micro
Private DNS
ip-172-31-37-206.us-west-2.compute.internal
Private IPs
172.31.37.206
Public DNS
ec2-52-10-22-74.us-west-2.compute.amazonaws.com
Public IP
52.10.22.74
Elastic IP
-
Availability zone
us-west-2a
Security groups
launch-wizard-1. view rules
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