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Getting Started with AWS as a Student

A Step-by-Step Guide to Cloud Computing with AWS

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A Step-by-Step Guide to Cloud Computing with AWS

Step 1: Sign Up for an AWS Account

- Option 1: AWS Educate
- Option 2: AWS Free Tier

Step 2: Learn the Basics of AWS

Step 3: Access Free Training and Tutorials

Step 4: Start Building Projects

Step 5: Monitor Your Free Tier Usage

Step 6: Apply for AWS Student Credits

Resources and Next Steps

Step 1: Sign Up for an AWS Account

- You can use AWS Educate or AWS Free Tier to create your student account:
- 1. AWS Educate: Free credits and no credit card required.
- 2. AWS Free Tier: 12 months of free access to AWS services, credit card required.

Option 1: AWS Educate

AWS Educate offers free cloud resources specifically for students. You might get credits to use AWS services without needing a credit card.

Follow these steps to sign up for AWS Educate:

1. **Visit aws.amazon.com/education/awseducate/**
2. Fill in your academic information and verify your student status.
3. Receive free AWS Educate credits and acces

Detailed Steps for AWS Educate

1. **Go to AWS Educate**: Visit AWS Educate.
2. **Click "Join AWS Educate"**: Look for the option to sign up as a student.
3. **Create an AWS Educate Account**:
   - Choose the **“Student”** option.
   - Fill in the required details (name, email, school/university name, expected graduation year, etc.).
   - Use your academic institution’s email address if possible for faster approval.
4. **Verification**:
   - AWS Educate will verify your academic status.
   - This can take some time (a few hours to a few days).
5. **Get Your AWS Educate Starter Account**:
   - Once verified, you’ll get access to an **AWS Educate Starter Account**, which doesn't require a credit card and comes with a set amount of AWS credits.
6. **Login and Explore**: Once approved, you can log in to AWS Educate and start using the free credits.

Option 2: AWS Free Tier

AWS Free Tier offers 12 months of free access to various services. You'll need a credit card but won't be charged as long as you stay within the free usage limits. Follow these steps to sign up for the AWS Free Tier:

1. Visit **aws.amazon.com/free/**
2. Create an account and provide a credit card for identity verification.
3. Get 12 months of free access to many AWS services.

Detailed Steps for AWS Free Tier (w/ Credit card)

1. **Go to AWS**: Visit [aws.amazon.com.](aws.amazon.com)
2. **Click "Create a Free Account"**:
   - Click the **"Create an AWS Account"** button at the top of the page.
3. **Sign up**:
   - Enter your email address and choose a strong password.
   - Fill in your contact information (you will need a valid phone number for verification).
4. **Choose the Free Tier**:
   - You'll be automatically enrolled in the Free Tier, which includes services like EC2, S3, RDS, and Lambda for 12 months.
5. **Credit Card Verification**:
   - AWS will ask for a valid credit or debit card to verify your identity (no charges will be made unless you exceed the free tier limits).
6. **Student Credits**:
   - If your institution participates in AWS Educate, you may receive additional credits. AWS also sometimes offers student promotions with credits.
7. **Start Using AWS Services**: Once your account is set up, you can begin using AWS Free Tier services..

Step 2: Learn the Basics of AWS

Familiarize yourself with these core services:

1. AWS EC2: Virtual servers in the cloud.
2. AWS S3: Scalable storage for files and data.
3. Amazon RDS: Managed databases in the cloud.
4. Amazon VPC: Manage networking in the cloud.

Step 3: Access Free Training and Tutorials

Use these platforms to learn more about AWS:

1. AWS Educate: Free courses and career pathways.
    - Introduction to the AWS Management Console
    - Introduction to Cloud 101
    - Getting Started with Storage S3
    - Getting Started with Compute
    - Getting Started with Networking
    - Machine Learning Foundations
    - Introduction to Amazon Developer
2. AWS Skill Builder: Structured learning plans.
3. YouTube: Free tutorials to build hands-on experience.

Step 4: Start Building Projects (beginner-friendly)

You don't learn to walk by following rules. You learn by doing, and by falling over

Running Web Server in EC2 using Flask

1. Creating AWS account
2. Launching EC2 Instance
3. Running a Flask app on AWS EC2
4. Using sqlite3 database on AWS EC2

Launching EC2 Instance (a virtual server) on AWS:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/EC2_GetStarted.html

1. **Log in to AWS Management Console:** AWS Console
2. **Choose an Amazon Machine Image (AMI): Ubuntu**
3. **Choose Instance Type**
   - Select default **t2.micro** instance is free tier
4. **Configure Network Security Group**
   - Set rules to allow SSH (port 22)
   - Allow HTTP traffic from the internet (Port 80 allows HTTP, Port 443 allows HTTPS)
- **Create or select a key pair (login)**
   - .pem for MAC
   - .pkk for Windows
1. **Review, Launch, Connect**
   - Once your instance is running, click on the instance ID, go to **Connect**, and follow the instructions to SSH into your instance.

Running a Flask app on AWS EC2

https://www.datasciencebytes.com/bytes/2015/02/24/running-a-flask-app-on-aws-ec2/

Heer are the overrides:

1.1 Launch an EC2 instance: Ubuntu Server 24.04 LTS (HVM)

2.1 Install the apache webserver and mod_wsgi.

```
sudo apt-get update
sudo apt-get install apache2
sudo apt install libapache2-mod-wsgi-py3
```

2.2 Install Flask using the pip tool

```
sudo apt install python3-pip
sudo apt install python3-flask
chmod 755 /home/ubuntu/
```

5. Test configuration.

```
tail /var/log/apache2/error.log
```

Step 5: Monitor Your Free Tier Usage

- Keep track of your usage to stay within free tier limits using:
- 1. AWS Cost Explorer: View and manage your spending.
- 2. AWS Budgets: Set up alerts for when you're nearing limits.

Step 6: Apply for AWS Student Credits

- Check with your institution for additional AWS credits and resources:
- 1. Many universities offer additional AWS credits through partnerships.
- 2. AWS often has student promotions and credits available.

Resources and Next Steps

- Helpful resources to continue your AWS journey:
- 1. AWS Educate: aws.amazon.com/education/awseducate/
- 2. AWS Free Tier: aws.amazon.com/free/
- 3. AWS Tutorials: aws.amazon.com/getting-started/hands-on/

Download “.pem” Key Pair for MAC

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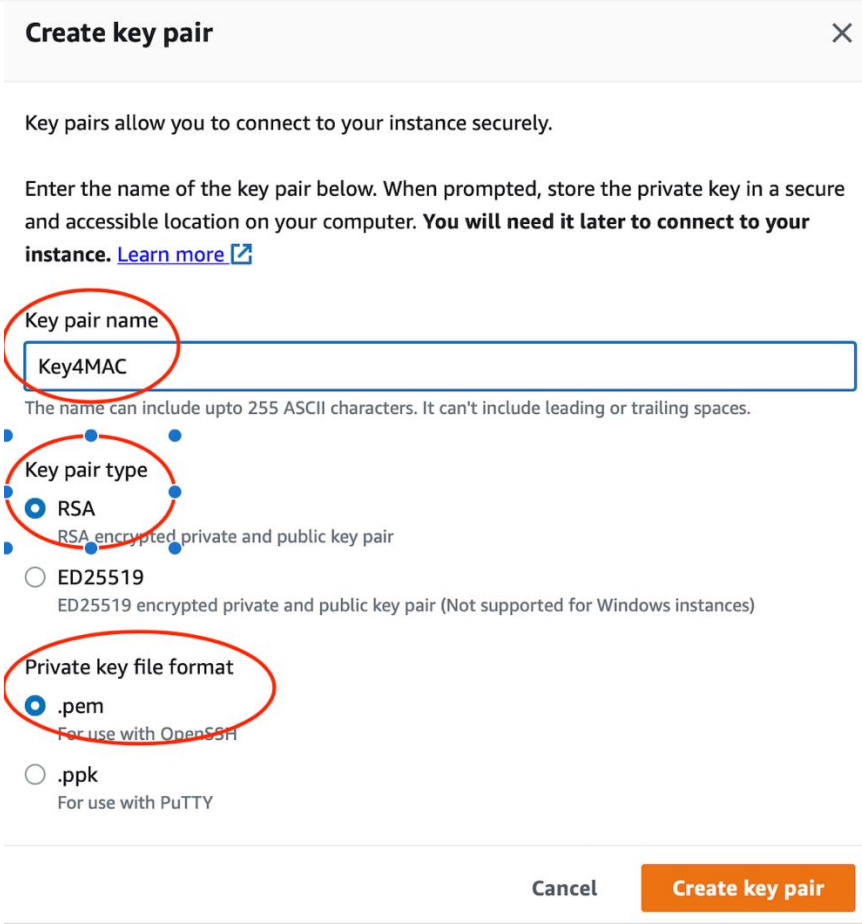

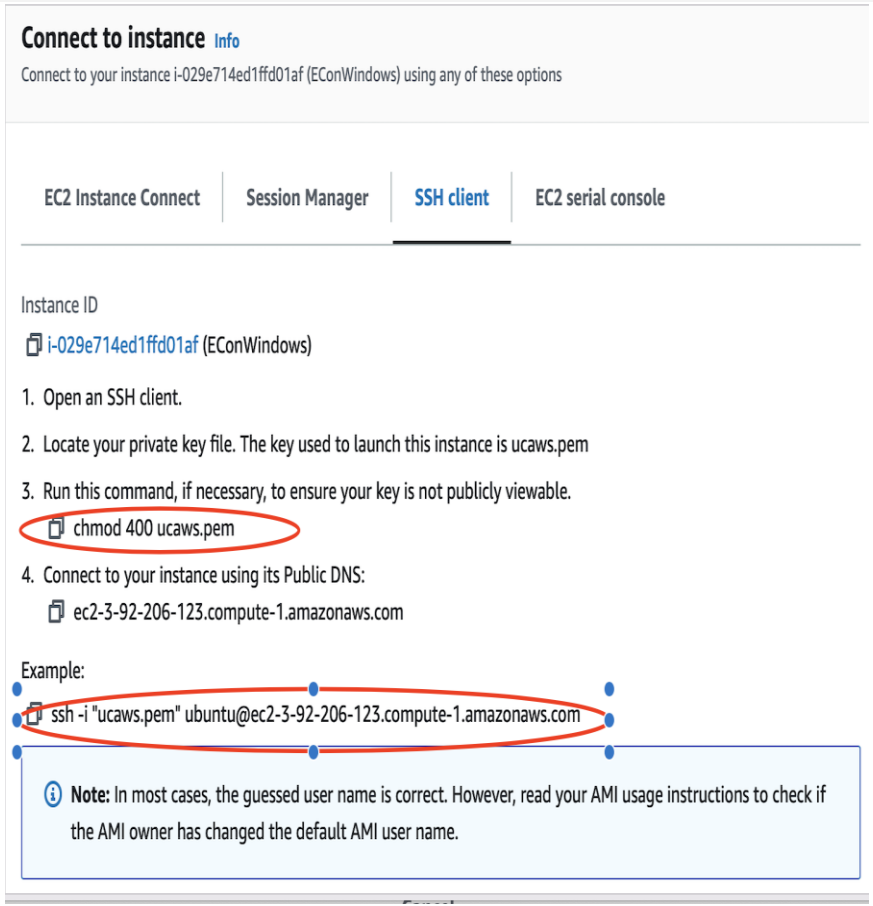

Download “.ppk”: Key Pair for Window

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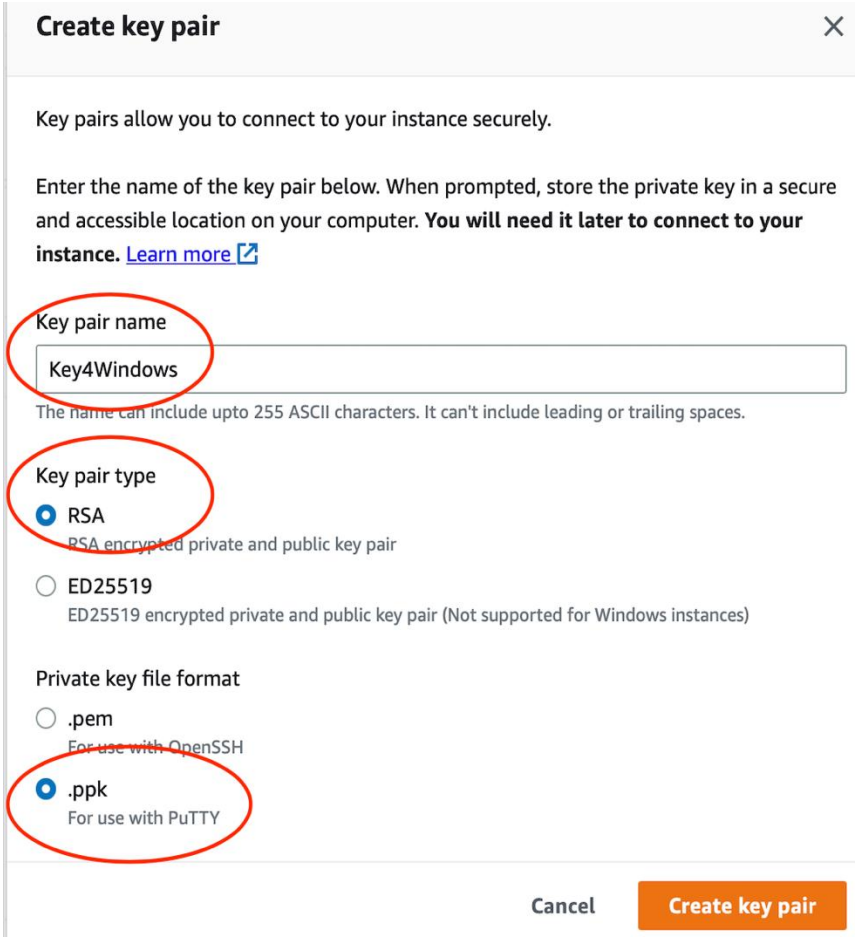

Review :

Connect to EC2 instance from Windows using PuTTY

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html

ubuntu@ec2-3-92-206-123.compute-1.amazonaws.com

Putty connection to AWS EC2

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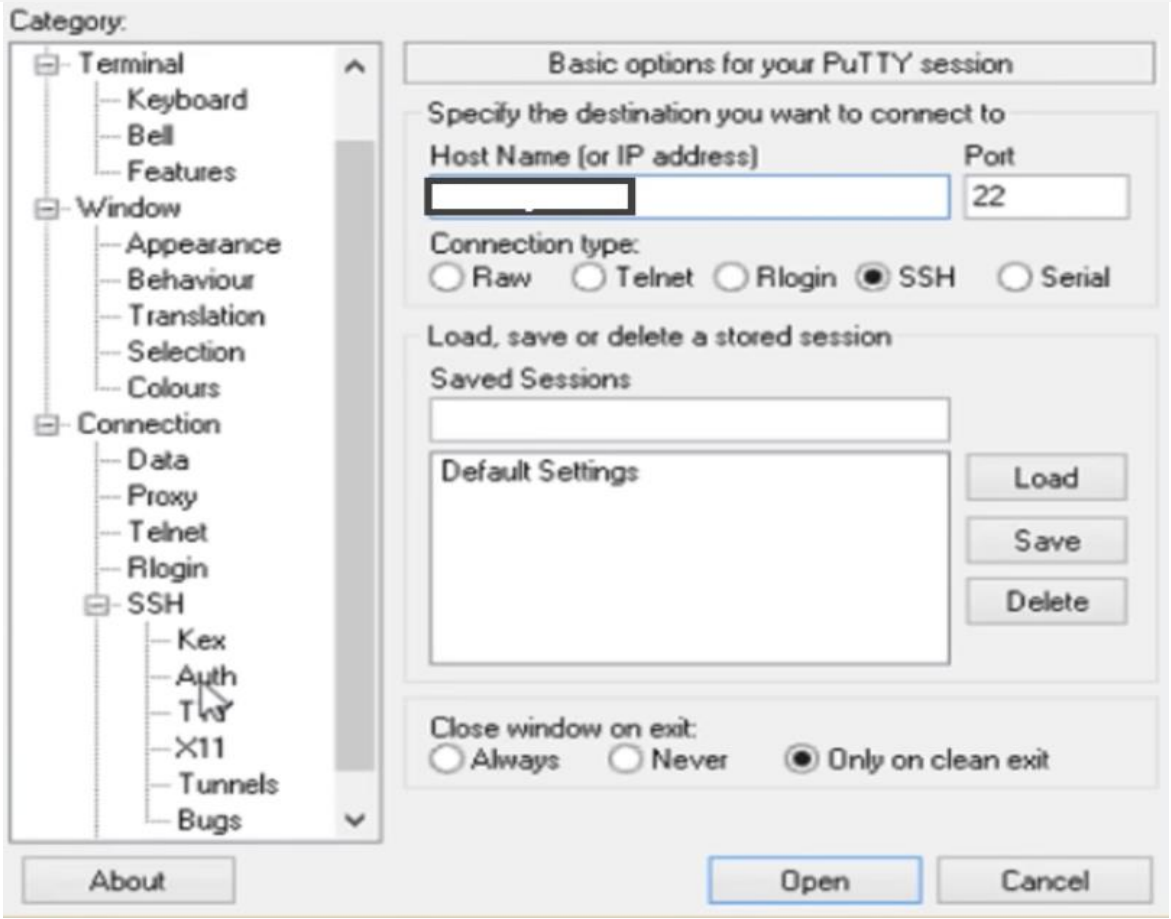
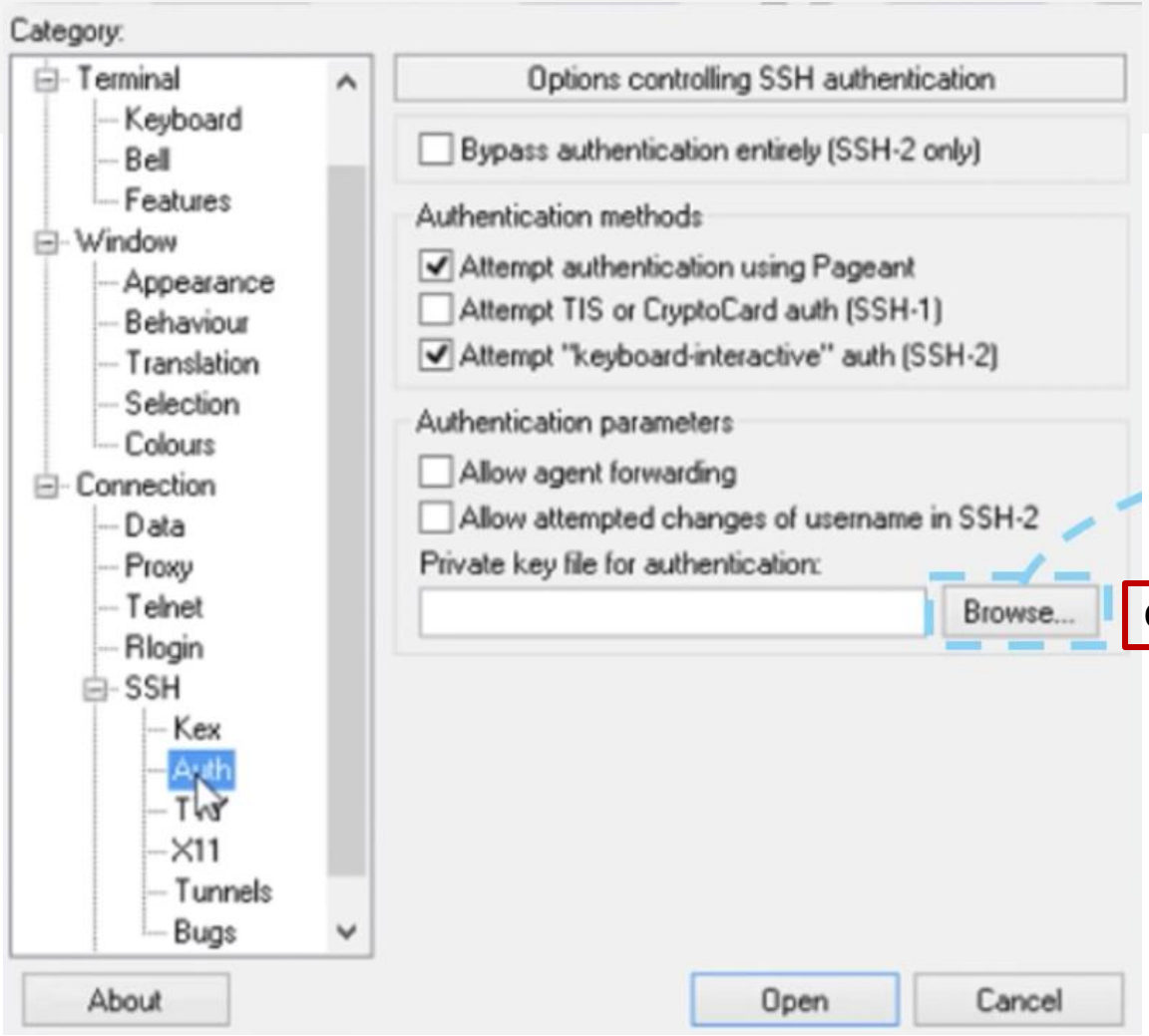


ubuntu@ec2-3-92-206-123.compute-1.amazonaws.com

https://docs.aws.amazon.com/quickstarts/latest/vmlaunch/step-2-connect-to-instance.html



Insert the file path for:

C:\Users\kansakri\Key4Windows.pkk

```
-r--------@ 1 r188694  8451AD\Domain Users  1692 Jan 10 18:03 kansakri.pem
(base) CINMAC11673:awsrk2 r188694$ ls -ltr
total 8
-r--------@ 1 r188694  8451AD\Domain Users  1692 Jan 10 18:03 kansakri.pem
(base) CINMAC11673:awsrk2 r188694$ chmod 400 kansakri.pem
(base) CINMAC11673:awsrk2 r188694$ ssh -i "kansakri.pem" ubuntu@ec2-18-222-255-139.us-east-2.compute.amazonaws.com
ssh: connect to host ec2-18-222-255-139.us-east-2.compute.amazonaws.com port 22: Operation timed out
(base) CINMAC11673:awsrk2 r188694$ ssh -i "kansakri.pem" ubuntu@ec2-3-19-141-72.us-east-2.compute.amazonaws.com
The authenticity of host 'ec2-3-19-141-72.us-east-2.compute.amazonaws.com (3.19.141.72)' can't be established.
ECDSA key fingerprint is SHA256:6AxNx3wYLmvO1dKnoUaE2u8CmOq/1Bzhbn9I/GUHcYI.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-3-19-141-72.us-east-2.compute.amazonaws.com,3.19.141.72' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 14.04.6 LTS (GNU/Linux 3.13.0-170-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

  System information as of Mon Jan 13 15:12:34 UTC 2020

  System load: 0.0               Memory usage: 5%   Processes:       81
  Usage of /:  10.3% of 7.74GB   Swap usage:   0%   Users logged in: 0

  Graph this data and manage this system at:
    https://landscape.canonical.com/

0 updates can be installed immediately.
0 of these updates are security updates.



The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

ubuntu@ip-172-31-42-9:~$
```

```
ubuntu@ip-172-31-42-9:~$ sudo apt-get update
Get:1 http://security.ubuntu.com trusty-security InRelease [65.9 kB]
Ign http://us-east-2.ec2.archive.ubuntu.com trusty InRelease
Get:2 http://us-east-2.ec2.archive.ubuntu.com trusty-updates InRelease [65.9 kB]
Hit http://us-east-2.ec2.archive.ubuntu.com trusty-backports InRelease
Hit http://us-east-2.ec2.archive.ubuntu.com trusty Release.gpg
Hit http://us-east-2.ec2.archive.ubuntu.com trusty Release
Get:3 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/main Sources [431 kB]
Get:4 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/restricted Sources [6,313 B]
Get:5 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/universe Sources [231 kB]
Get:6 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/multiverse Sources [7,535 B]
Get:7 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/main amd64 Packages [1,177 kB]
Get:8 http://security.ubuntu.com trusty-security/main Sources [172 kB]
Get:9 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/restricted amd64 Packages [17.2 kB]
Get:10 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/universe amd64 Packages [525 kB]
Get:11 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/multiverse amd64 Packages [14.6 kB]
Get:12 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/main Translation-en [582 kB]
Get:13 http://security.ubuntu.com trusty-security/universe Sources [102 kB]
Get:14 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/multiverse Translation-en [7,616 B]
Get:15 http://security.ubuntu.com trusty-security/main amd64 Packages [835 kB]
Get:16 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/restricted Translation-en [4,028 B]
Get:17 http://us-east-2.ec2.archive.ubuntu.com trusty-updates/universe Translation-en [281 kB]
Get:18 http://us-east-2.ec2.archive.ubuntu.com trusty-backports/main Sources [9,709 B]
Get:19 http://us-east-2.ec2.archive.ubuntu.com trusty-backports/restricted Sources [28 B]
Get:20 http://us-east-2.ec2.archive.ubuntu.com trusty-backports/universe Sources [35.4 kB]
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Hit http://us-east-2.ec2.archive.ubuntu.com trusty-backports/restricted Translation-en
Hit http://us-east-2.ec2.archive.ubuntu.com trusty-backports/universe Translation-en
Get:22 http://us-east-2.ec2.archive.ubuntu.com trusty/main Sources [1,064 kB]
Get:23 http://security.ubuntu.com trusty-security/universe amd64 Packages [294 kB]
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Hit http://us-east-2.ec2.archive.ubuntu.com trusty/multiverse Translation-en
Hit http://us-east-2.ec2.archive.ubuntu.com trusty/restricted Translation-en
Hit http://us-east-2.ec2.archive.ubuntu.com trusty/universe Translation-en
Ign http://us-east-2.ec2.archive.ubuntu.com trusty/main Translation-en_US
Ign http://us-east-2.ec2.archive.ubuntu.com trusty/multiverse Translation-en_US
Ign http://us-east-2.ec2.archive.ubuntu.com trusty/restricted Translation-en_US
Ign http://us-east-2.ec2.archive.ubuntu.com trusty/universe Translation-en_US
Fetched 13.1 MB in 5s (2,466 kB/s)
Reading package lists... Done
```
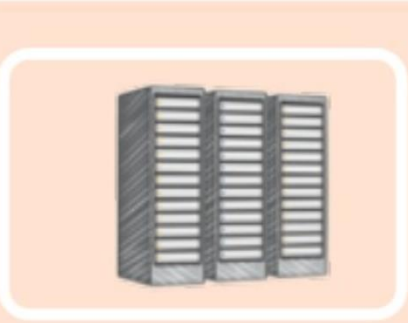
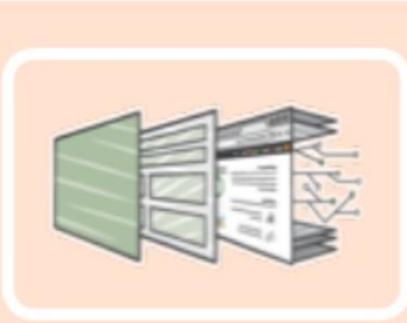
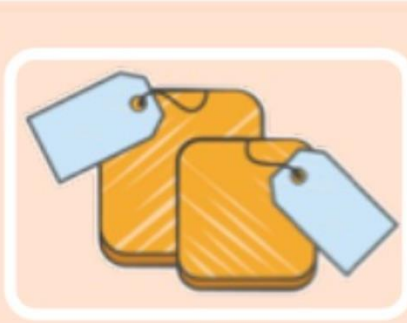

EC2 Foundations







Resources

Instances
Storage
Networking

Availability

Regions and AZs
Placement Groups
Load Balancing
Auto Scaling

Management

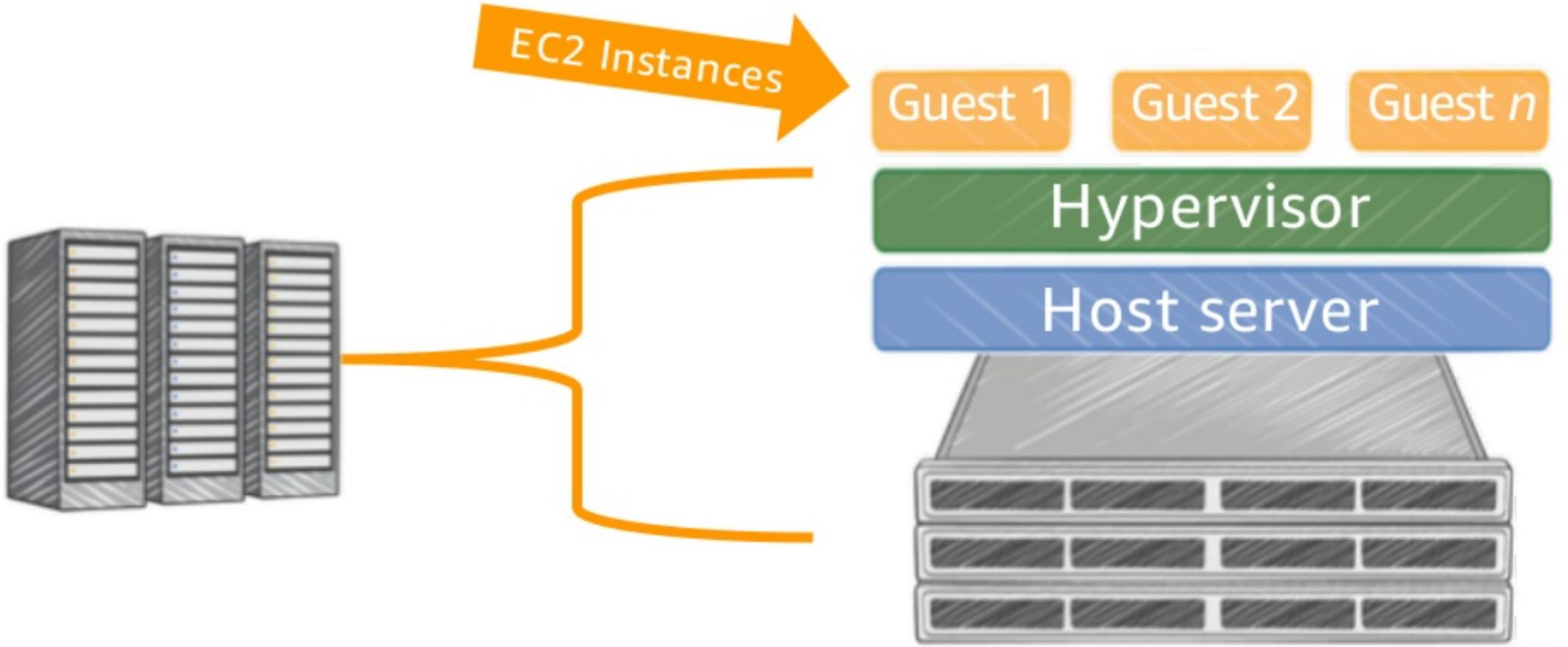
Deployment
Monitoring
Administration

Purchase Options

On Demand
Reserved
Spot

aws

Amazon Elastic Compute Cloud (EC2): Virtual servers in the cloud



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Amazon EC2 11+ years ago...

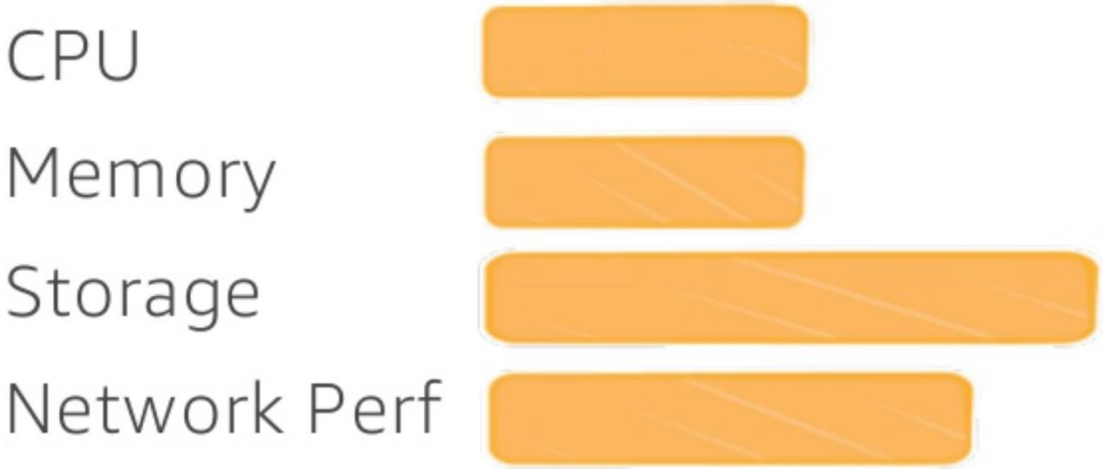
Scale up or down quickly, as needed

Pay for what you use

"One size fits all"

aws

EC2 instance characteristics



Instance generation

i3.xlarge

Instance family

Instance size

Instance type

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Amazon Machine Images (AMIs)

Amazon maintained

Set of Linux and Windows images

Kept up-to-date by Amazon in each region

Community maintained

Images published by other AWS users

Managed and maintained by Marketplace partners

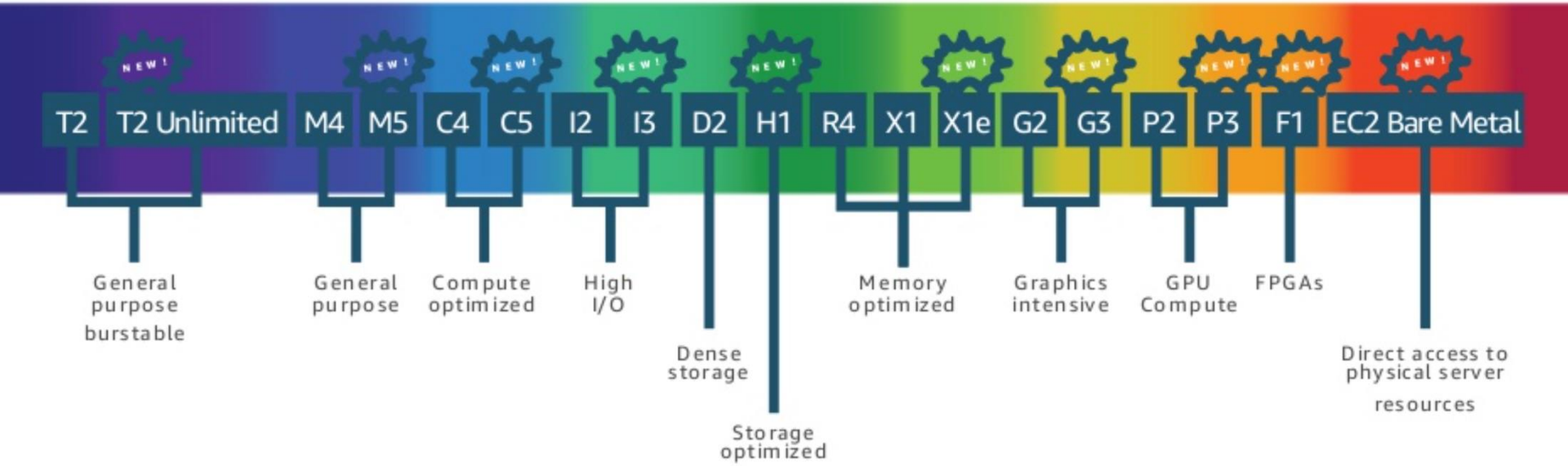
Your machine images

AMIs you have created from EC2 instances

Can be kept private or shared with other accounts

aws

EC2 instances



General Purpose instance workloads

Web/app servers

Enterprise apps

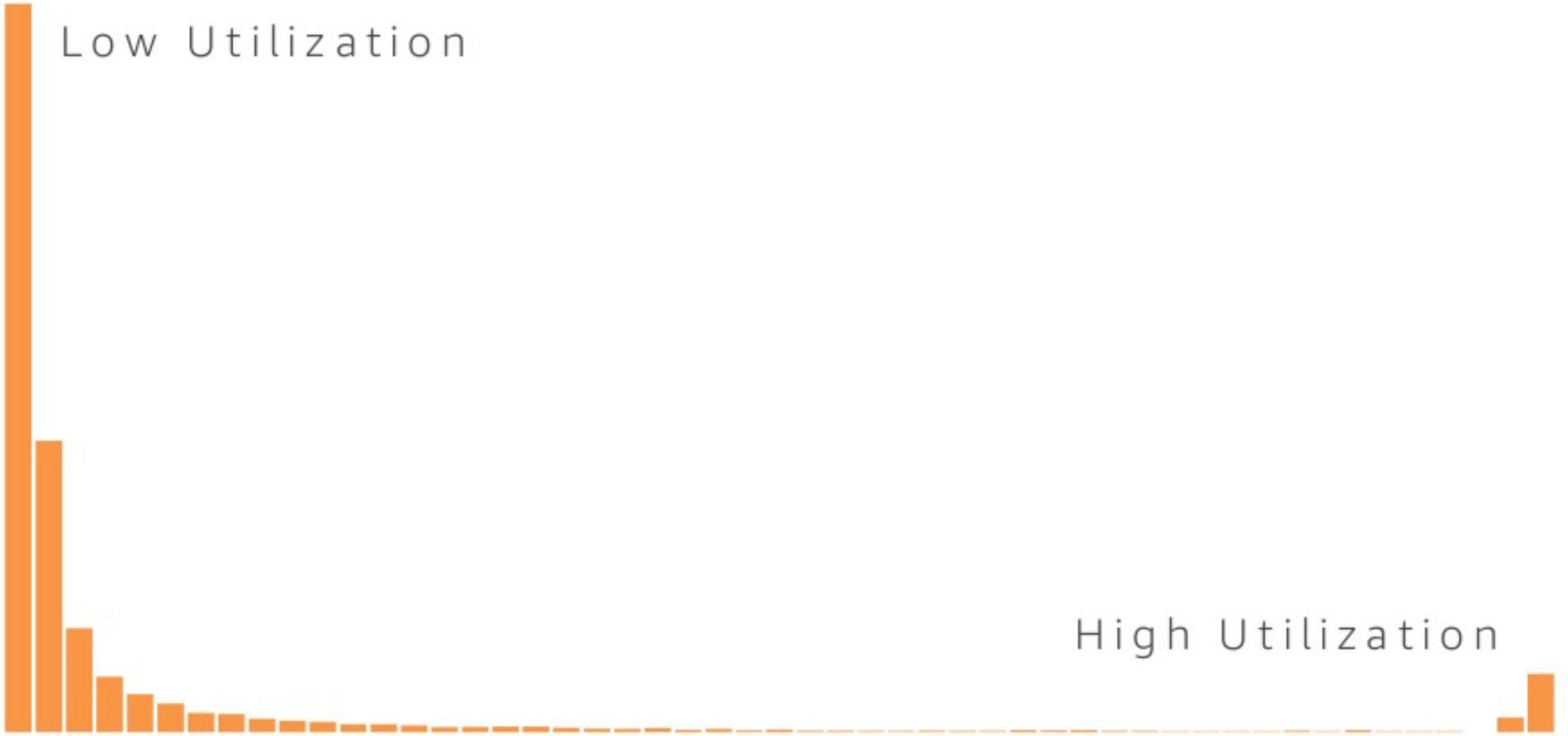
Gaming servers

Caching fleets

Analytics applications

Dev/test environments

Opportunity: Most instances aren't very busy



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EC2 Purchasing Options

On-Demand

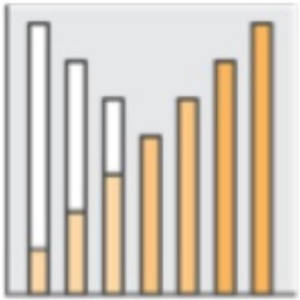
Pay for compute capacity **by the second** with no long-term commitments

Spiky workloads, to define needs

Reserved

Make a 1- or 3-year commitment and receive a **significant discount** off of On-Demand prices

Committed, steady-state usage



Spot

Spare EC2 capacity at a **savings of up to 90%** off of On-Demand prices

Fault-tolerant, dev/test, time-flexible, stateless workloads

NEW! *Per Second Billing for EC2 Linux instances & EBS volumes* NEW!

aws

EC2 Reserved Pricing

Discount up to 75% off of the On-Demand price

Steady state and committed usage

1- and 3-year terms

Reserve Capacity or opt for flexibility across AZs and instance sizes

Convertible RIs
Change instance family, OS, tenancy, and payment

1-Year Convertible RIs NEW!

Payment flexibility with 3 upfront payment options *(all, partial, none)*