AWS

Amazon Web Services


The Cloud

Login to AWS

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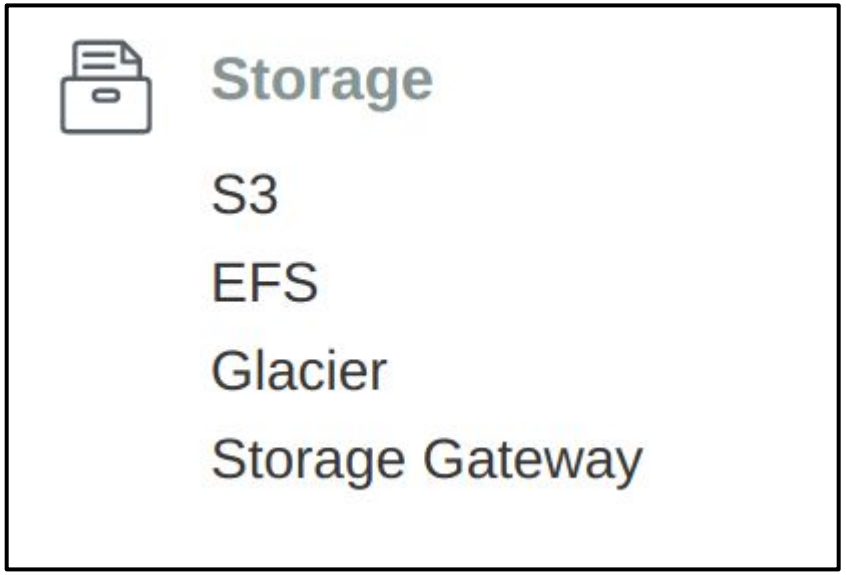
http://aws.amazon.com

S3

S3

- https://s3.console.aws.amazon.com

Amazon Simple Storage Service (Amazon S3) is storage for the Internet. You can use Amazon S3 to store and retrieve any amount of data at any time, from anywhere on the web.



Create a bucket

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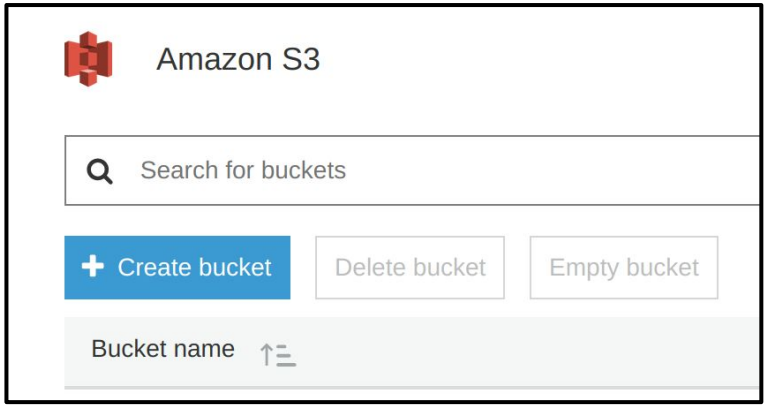
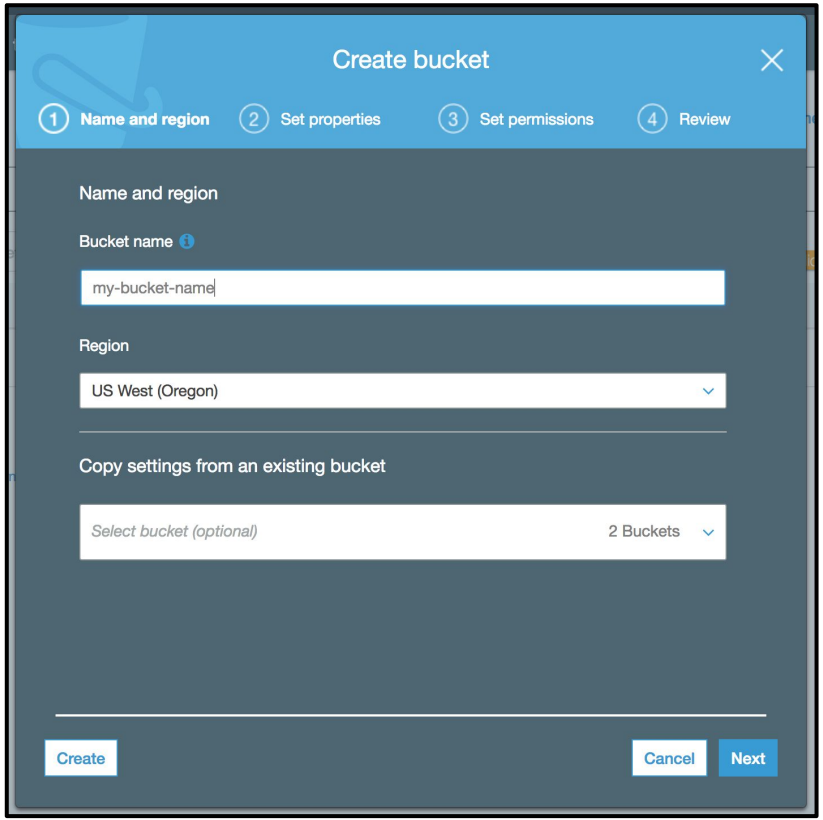
1. Login to AWS
2. Go to S3
3. Click "Create bucket"
4. Enter a "Bucket name"
5. Click "Create"





To make your bucket publicly available (optional)

Overview | Properties | Permissions | Management

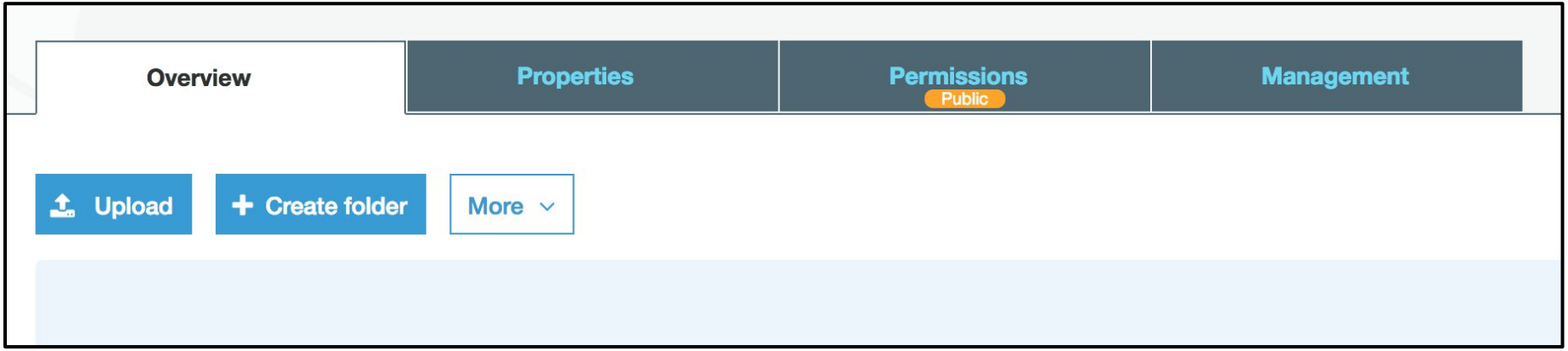
Access Control List | Bucket Policy | CORS configuration

Bucket policy editor ARN: arn:aws:s3:::my-bucket-name1

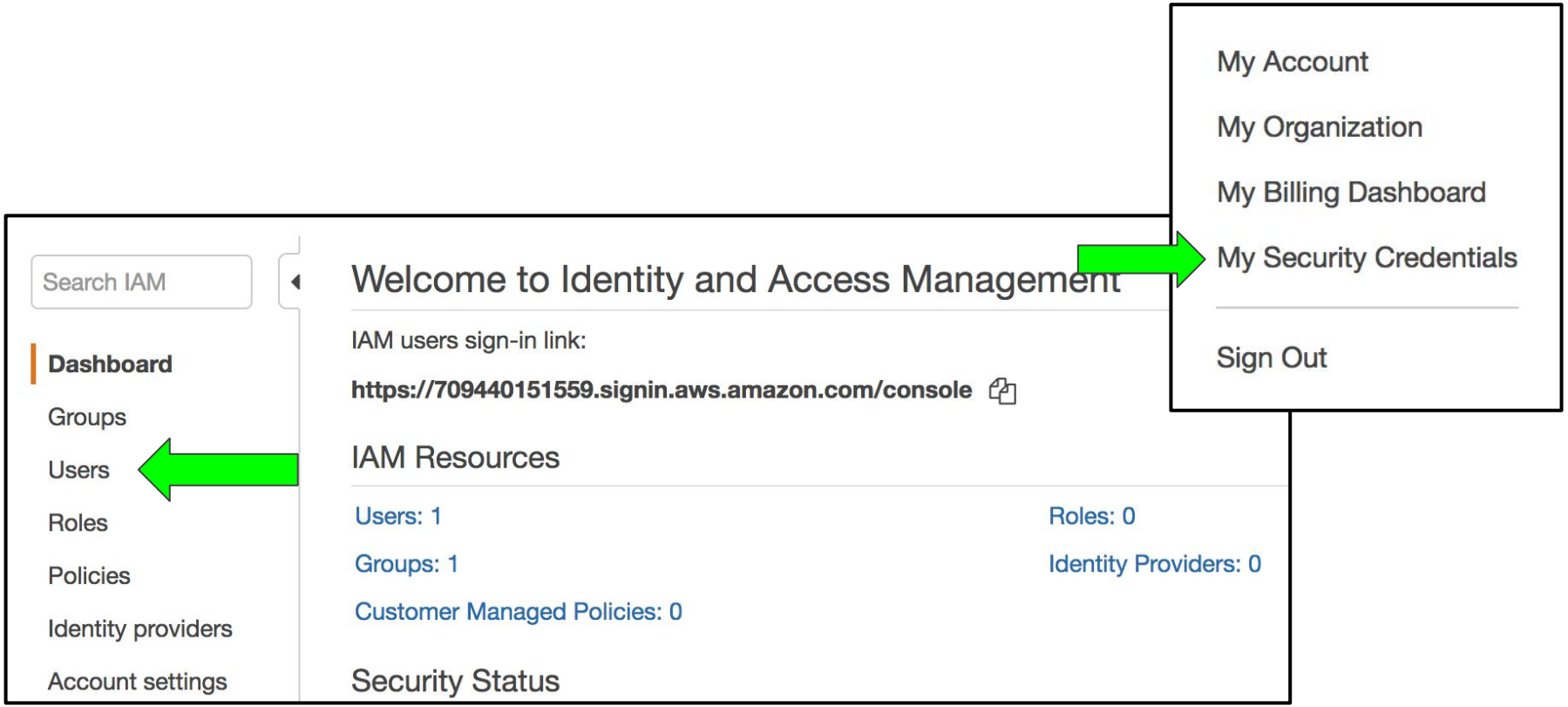
Type to add a new policy or edit an existing policy in the text area below.

```
1  {
2      "Version": "2012-10-17",
3      "Statement": [
4          {
5              "Sid": "PublicReadGetObject",
6              "Effect": "Allow",
7              "Principal": "*",
8              "Action": "s3:GetObject",
9              "Resource": "arn:aws:s3:::my-bucket-name1/*"
10         }
11     ]
12 }
```

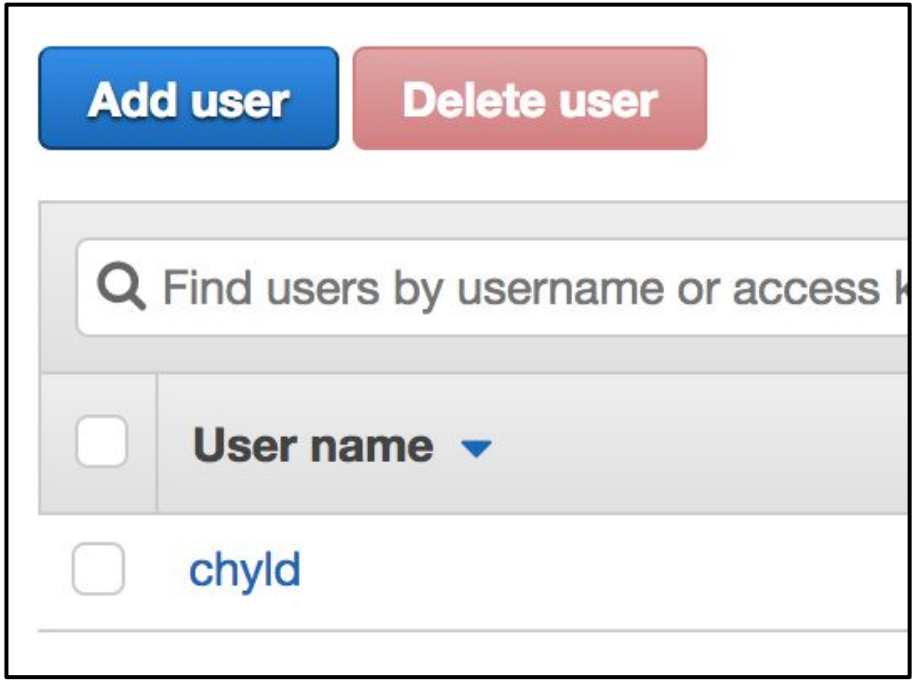
Manually create folders and upload files



Create Credentials - 1 (IAM page)



Create Credentials - 2 (add user)



Create Credentials - 3 (add user with api access)

Set user details

You can add multiple users at once with the same access type and permissions. Learn more

User name* my-user

Add another user

Select AWS access type

Select how these users will access AWS. Access keys and autogenerated passwords are provided in the last step. Learn more

Access type* [x] **Programmatic access**
Enables an **access key ID** and **secret access key** for the AWS API, CLI, SDK, and other development tools.

[ ] **AWS Management Console access**
Enables a **password** that allows users to sign-in to the AWS Management Console.

*** Required**

Cancel **Next: Permissions**

Create Credentials - 4 (create an admin group)

Create group

Create a group and select the policies to be attached to the group. Using groups is a best-practice way to manage users' permissions by job functions, AWS service access, or your custom permissions. Learn more

Group name full-access

Create policy | Refresh

Filter: Policy type | Search | Showing 325 results

	Policy name	Type	Attachments	Description
☑	AdministratorAccess	Job function	1	Provides full access to AWS services and resources.
☐	AlexaForBusinessDeviceSetup	AWS managed	0	Provide device setup access to AlexaForBusiness services
☐	AlexaForBusinessFullAccess	AWS managed	0	Grants full access to AlexaForBusiness resources and access to related AWS Servi…
☐	AlexaForBusinessGatewayExecution	AWS managed	0	Provide gateway execution access to AlexaForBusiness services
☐	AlexaForBusinessReadOnlyAccess	AWS managed	0	Provide read only access to AlexaForBusiness services

Cancel | Create group

Create Credentials - 5 (view public and secret user key)

Download .csv

		User	Access key ID	Secret access key
▸	✔	user3	AKIAJB5CD53XIP4VE7CQ	********* Show

Create Credentials - 6 (add keys to file)

---

1. Create ~/.aws directory
2. Create config file
3. Create credentials file

```
#-----------------------------------------:::
~/.aws  // 2 // chyld@Chylds-MacBook-Pro
[47]: l
total 16
drwxr-xr-x   4 chyld  staff   128B Mar 26 10:52 .
drwxr-xr-x+ 35 chyld  staff   1.1K Mar 26 11:20 ..
-rw-r--r--   1 chyld  staff    28B Mar 26 10:51 config
-rw-r--r--   1 chyld  staff   117B Mar 26 10:50 credentials
```

Create Credentials - 7 (config file)

```
#-----------------------------------------:::
~/.aws  // 2 // chyld@Chylds-MacBook-Pro
[49]: cat config
[default]
region=us-west-1
```

Create Credentials - 8 (credentials file)

```
#-----------------------------------------:::
~/.aws  // 2 // chyld@Chylds-MacBook-Pro
[51]: cat credentials
[default]
aws_access_key_id = AKIAIG5Y2ORJQI4UFBLA
aws_secret_access_key = lqeT2vnpQbYu4VkAsUJ1CDUhn2WI8L
```

Access your bucket from Python

- `$ conda install boto3`
- https://boto3.readthedocs.io/en/latest/
- https://boto3.readthedocs.io/en/latest/guide/quickstart.html

Reading and Writing to S3 from Python

```python
import boto3
```

```python
s3 = boto3.resource('s3')
```

```python
# get all buckets
for bucket in s3.buckets.all():
    print(bucket.name)
```

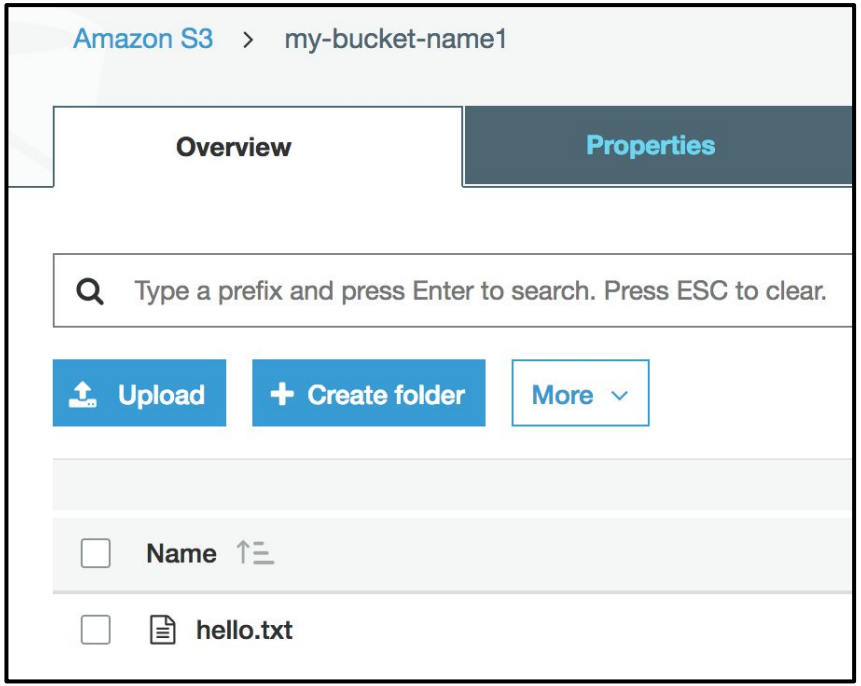
```
chyld-hdd-01
chyld-temp1
my-bucket-name1
```

```python
# upload file
data = open('hello.txt', 'rb')
s3.Bucket('my-bucket-name1').put_object(Key='hello.txt', Body=data)
```

```
s3.Object(bucket_name='my-bucket-name1', key='hello.txt')
```

```python
# download file
s3.Bucket('my-bucket-name1').download_file('hello.txt', 'new-hello.txt')
```

View uploaded files

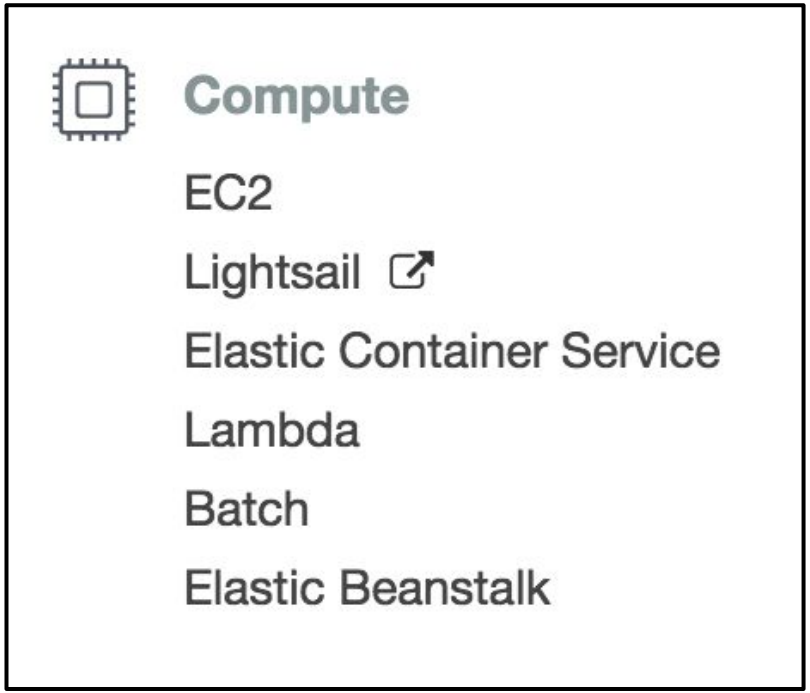


EC2

EC2

- https://console.aws.amazon.com/ec2

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.



Check your region

- Use N. California as the region to start your EC2 instance.
- Create an Instance.

Choose a Machine Image

Step 1: Choose an Amazon Machine Image (AMI)

Cancel and Exit

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-07585467

Ubuntu Server 16.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).

Free tier eligible

Root device type: ebs Virtualization type: hvm

Select

64-bit

Choose Memory, # CPUs

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
☐	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
☑	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
☐	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
☐	General purpose	m5.large	2	8	EBS only	Yes	Up to 10 Gigabit	Yes
☐	General purpose	m5.xlarge	4	16	EBS only	Yes	Up to 10 Gigabit	Yes

Cancel | Previous | Review and Launch | Next: Configure Instance Details

Set HDD size

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. Learn more about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-0fc155f7d651fba81	8	General Purpose SSD (GP2)	100 / 3000	N/A	☑	Not Encrypted

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. Learn more about free usage tier eligibility and usage restrictions.

Cancel | Previous | Review and Launch | Next: Add Tags

Create Security Group

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. Learn more about Amazon EC2 security groups.

Assign a security group: Create a **new** security group

Select an **existing** security group

Security group name: launch-wizard-1

Description: launch-wizard-1 created 2018-03-26T12:14:06.599-07:00

Type	Protocol	Port Range	Source		Description
SSH	TCP	22	Custom	0.0.0.0/0	e.g. SSH for Admin Desktop
Custom TCP I	TCP	8888	Custom	0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Previous Review and Launch

Launch Instance

Step 7: Review Instance Launch

AMI Details

Edit AMI

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-07585467

Free tier eligible

Ubuntu Server 16.04 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

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 2018-03-26T12:14:06.599-07:00

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	0.0.0.0/0	
Custom TCP Rule	TCP	8888	0.0.0.0/0	

Instance Details

Edit instance details

Cancel Previous Launch

Download keys and launch instance

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about removing existing key pairs from a public AMI.

Create a new key pair

Key pair name

my-keys

Download Key Pair

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Cancel Launch Instances

View your instance; Get IP address

EC2 Dashboard
Events
Tags
Reports
Limits

INSTANCES
- Instances
- Launch Templates
- Spot Requests
- Reserved Instances
- Dedicated Hosts

IMAGES
- AMIs
- Bundle Tasks

ELASTIC BLOCK STORE
- Volumes
- Snapshots

NETWORK & SECURITY
- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

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 (IPv4)	IPv4 Public IP
	i-0148f5eb64b9e659e	t2.micro	us-west-1a	running	Initializing	None		54.193.64.42

Instance: i-0148f5eb64b9e659e **Public IP: 54.193.64.42**

Description | Status Checks | Monitoring | Tags

Instance ID	i-0148f5eb64b9e659e
Instance state	running
Instance type	t2.micro
Elastic IPs	
Availability zone	us-west-1a
Security groups	launch-wizard-1 . view inbound rules
Scheduled events	No scheduled events
AMI ID	ubuntu/images/hvm-ssd/ubuntu-xenial-16.04-amd64-server-20180126 (ami-07585467)
Platform	-
IAM role	-
Key pair name	my-keys
ClassicLink	-

Public DNS (IPv4)	-
IPv4 Public IP	54.193.64.42
IPv6 IPs	-
Private DNS	ip-172-30-0-90.us-west-1.compute.internal
Private IPs	172.30.0.90
Secondary private IPs	
VPC ID	vpc-24149643
Subnet ID	subnet-fdc7a7a6
Network interfaces	eth0
Source/dest. check	True
T2 Unlimited	Disabled
Owner	709440151559

Change permissions of keys file

```
#-----------------------------------------:::
~/Downloads  // 5 // chyld@Chylds-MacBook-Pro
[7]: chmod 400 my-keys.pem

#-----------------------------------------:::
~/Downloads  // 5 // chyld@Chylds-MacBook-Pro
[8]: ls -al my-keys.pem
-r--------@ 1 chyld  staff  1692 Mar 26 12:16 my-keys.pem
```

Login to AWS

```
#-----------------------------------------:::
~/Downloads  // 5 // chyld@Chylds-MacBook-Pro
[10]: ssh -i my-keys.pem ubuntu@54.193.64.42
The authenticity of host '54.193.64.42 (54.193.64.42)' can't be established.
ECDSA key fingerprint is SHA256:MWdEZ291SWbWU1s0juojogY0LyaegQ2jDzXz6O+fzHI.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '54.193.64.42' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 16.04.3 LTS (GNU/Linux 4.4.0-1049-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 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.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-30-0-90:~$
```

Download miniconda

- https://conda.io/miniconda.html
- $ wget https://repo.continuum.io/miniconda/Miniconda3-latest-Linux-x86_64.sh

```
ubuntu@ip-172-30-0-90:~$ wget https://repo.continuum.io/miniconda/Miniconda3-latest-Linux-x86_64.sh
--2018-03-26 19:28:05--  https://repo.continuum.io/miniconda/Miniconda3-latest-Linux-x86_64.sh
Resolving repo.continuum.io (repo.continuum.io)... 104.16.18.10, 104.16.19.10, 2400:cb00:2048:1::6810:130a, ...
Connecting to repo.continuum.io (repo.continuum.io)|104.16.18.10|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 58304693 (56M) [application/x-sh]
Saving to: ‘Miniconda3-latest-Linux-x86_64.sh’

Miniconda3-latest-Linux-x86_64.sh               100%[===================================================================================================>]  55.60M  2.76MB/s    in 20s

2018-03-26 19:28:25 (2.74 MB/s) - ‘Miniconda3-latest-Linux-x86_64.sh’ saved [58304693/58304693]
```

Install miniconda

- $ bash Miniconda3-latest-Linux-x86_64.sh
- <use default path>
- yes, add to PATH

```
ubuntu@ip-172-30-0-90:~$ conda --version
conda 4.4.10
ubuntu@ip-172-30-0-90:~$
```

Install Python libraries

```
$ conda install pandas numpy matplotlib scikit-learn scipy

$ conda install -c conda-forge jupyterlab

# start jupyter

$ jupyter lab --no-browser --ip=0.0.0.0 --port=8888 --NotebookApp.token=''
```

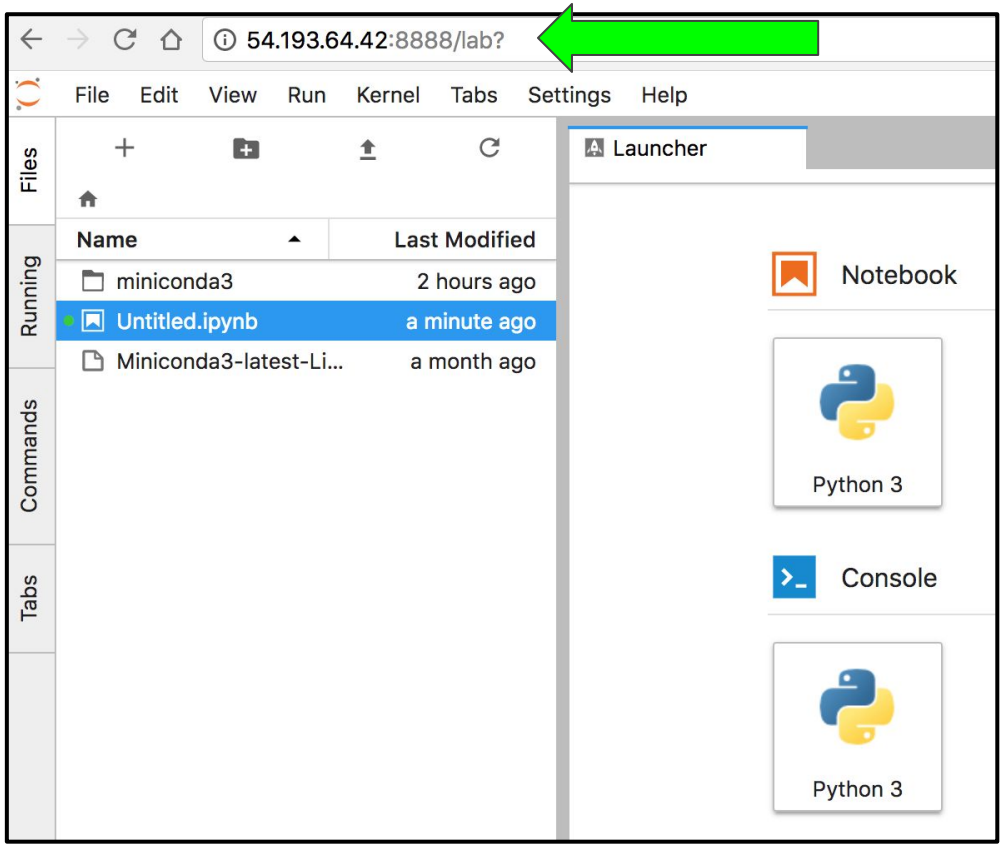
Start Jupyter Lab

```
ubuntu@ip-172-30-0-90:~$ jupyter lab --no-browser --ip=0.0.0.0 --port=8888 --NotebookApp.token=''
[W 21:40:22.579 LabApp] All authentication is disabled.  Anyone who can connect to this server will be able to run code.
[I 21:40:22.589 LabApp] JupyterLab beta preview extension loaded from /home/ubuntu/miniconda3/lib/python3.6/site-packages/jupyterlab
[I 21:40:22.589 LabApp] JupyterLab application directory is /home/ubuntu/miniconda3/share/jupyter/lab
[I 21:40:22.593 LabApp] Serving notebooks from local directory: /home/ubuntu
[I 21:40:22.593 LabApp] 0 active kernels
[I 21:40:22.594 LabApp] The Jupyter Notebook is running at:
[I 21:40:22.594 LabApp] http://0.0.0.0:8888/
[I 21:40:22.594 LabApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
```

Use Jupyter Notebook on AWS EC2

---

1. Open browser
2. Use IP address of EC2
3. Use 8888 for port number
4. Enjoy!



Finished with your EC2 instance?

- Terminate if you don't need it anymore
- Stop if you only want to pause the use of the machine - and not get charged (disk space usage costs still apply)