

Using the AWS command line interface to launch an EC2 server

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1 Introduction

In a separate post ([here](#)) we discuss setting up a virtual server on Amazon Web Services (AWS) using the interactive Elastic cloud Compute (EC2) dashboard. While its instructive to use the EC2 console interface to set up a work environment and launch a custom server, it can become a tedious process after the first two or three times. In this post we'll present a bash shell script to perform the same task making use of the AWS command line interface (CLI).

To get started: on your workstation, configure the aws cli app via the command.



Photo by Nathan Waters on Unsplash

Instructions for installing the AWS CLI can be found ([here](#)).

Alternatively, On MacOS use homebrew:

```
zsh> brew install awscli
```

```
zsh> aws configure
```

The app will open a dialog asking for your IAM credentials. If you don't have an IAM ID Appendix 1 [here](#) has details on obtaining IAM credentials from your AWS account.

2 Scripts

Below we offer four bash scripts.

- 1) The first generates a security group for the virtual server, i.e. a firewall.
- 2) The second creates a key pair to allow encrypted ssh communication between the server and your workstation.
- 3) The third script generates the virtual server taking instance characteristics, firewall, static IP and domain name as parameters.
- 4) The fourth script installs required software following server launch.

2.1 Create security group script

```
#!/usr/bin/env bash
# The script generates a new security group
# the group name is "max_restrict"
# only ports 22 and 443 are open.
# to open other ports replicate the last paragraph and change the port number.
# Will fail if group name "max_restrict" is already in use.
# reads vpc_id from the environment variables set in .zshrc
#
```

```

aws ec2 create-security-group \
  --group-name max_restrict \
  --description "most restrictive: ports 22 and 443 only" \
  --tag-specifications \
    'ResourceType=security-group,Tags=[{Key=Name,Value=max_restrict}]' \
  --vpc-id $vpc_id
wait
export security_grp=`aws ec2 describe-security-groups | \
jq -r '.SecurityGroups[] | select(.GroupName=="max_restrict").GroupId`

aws ec2 authorize-security-group-ingress \
  --group-id $security_grp \
  --protocol tcp \
  --port 22 \
  --cidr "0.0.0.0/0"

aws ec2 authorize-security-group-ingress \
  --group-id $security_grp \
  --protocol tcp \
  --port 443 \
  --cidr "0.0.0.0/0"

```

2.2 Create new key pair with a project name flag

```

#!/usr/bin/env bash
#while getopts n: flag
#do
  #case "${flag}" in
    #n) key_pair_name=${OPTARG};;
  #esac
#done
base=`basename $PWD`
if [ -z "$1" ]
then

```

```

    key_pair_name=$base
else
    key_pair_name="$1"
fi

echo "key_pair_name is $key_pair_name"

read -p "Continue (y/n)?" CONT
if [ "$CONT" = "y" ]; then
    echo "Here we go!";
else
    echo "too bad. bye."; exit;
fi

cd ~/.ssh
rm -f ~/.ssh/$key_pair_name.pem
aws ec2 create-key-pair --key-name $key_pair_name \
    --query 'KeyMaterial' --output text > ~/.ssh/$key_pair_name.pem

wait
chmod 600 ~/.ssh/$key_pair_name.pem

```

start up script. awscli.sh

```

#!/usr/bin/env bash
while getopts s:t:k:p: flag
do
    case "${flag}" in
        s) size=${OPTARG};;
        t) type=${OPTARG};;
        k) key_name=${OPTARG};;
        p) proj_name=${OPTARG};;
    esac
done
base=`basename $PWD`
if [ -z "$proj_name" ]
then
    proj_name=$base

```

```

fi

if [ -z "$type" ]
then
    type="t2.micro"
fi

if [ -z "$size" ]
then
    size=30
fi

echo "Review parameters: "
echo "----"
echo "proj_name is $proj_name"
echo "key_name is $key_name"
echo "vpc_id: $vpc_id";
echo "subnet_id: $subnet_id";
echo "ami_id: $ami_id";
echo "security_grp: $security_grp";
echo "static_ip: $static_ip";
echo "type: $type";
echo "size: $size";

read -p "Review Notes (y/n)?" NOTES
if [ "$NOTES" = "y" ]; then
    echo "Notes on current parameters:"
    echo "security group should be in place already. check on EC2."
    echo "If not, run ./awscli_create_security.sh."
    echo "Key pair should be in place. check in ~/.ssh."
    echo "If not run ./create_keypair.sh."
    echo "ami id is for ubuntu linux 22.04 LTS."
    echo "If not what is desired check EC2 list of instances. ";
else
    echo "I guess you know what you're doing";
fi

```

```

read -p "Continue (y/n)?" CONT
if [ "$CONT" = "y" ]; then
    echo "Here we go!";
else
    echo "too bad. bye."; exit;
fi

#cd ~/.ssh
#rm -f ~/.ssh/$proj_name.pem
#aws ec2 create-key-pair --key-name $proj_name \
# --query 'KeyMaterial' --output text > ~/.ssh/$proj_name.pem
#
#wait
#chmod 600 ~/.ssh/$proj_name.pem

aws ec2 run-instances \
  --image-id $ami_id \
  --count 1 \
  --instance-type $type \
  --key-name $proj_name \
  --security-group-ids $security_grp \
  --subnet-id $subnet_id \
  --block-device-mappings "[{\"DeviceName\":\"/dev/sda1\", \"Ebs\":{\"VolumeSize\":$size}}]" \
  --tag-specifications "ResourceType=instance,Tags=[{Key=Name,Value=$proj_name}]" \
  --user-data file:///~/Dropbox/prj/c060/aws_startup.sh
wait
iid=`aws ec2 describe-instances --filters "Name=tag:Name,Values=$proj_name" | \
jq -r '.Reservations[].Instances[].InstanceId'`

aws ec2 associate-address --public-ip $static_ip --instance-id $iid
wait
ssh -o "StrictHostKeyChecking no" rgtlab.org \
  'cd docker_compose_power1_app; sudo docker compose up -d'

```

aws_startup.sh

```
#!/bin/bash
sudo apt update
sudo apt install docker.io -y
sudo apt install -y curl debian-keyring debian-archive-keyring apt-transport-https
curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/gpg.key' | \
sudo gpg --dearmor -o /usr/share/keyrings/caddy-stable-archive-keyring.gpg
curl -1sLf 'https://dl.cloudsmith.io/public/caddy/stable/debian.deb.txt' | \
sudo tee /etc/apt/sources.list.d/caddy-stable.list
sudo apt update
sudo apt install caddy -y
```

Tip 1.

For convenience, construct a config file in ~/.ssh as:

```
Host rgtlab.org
HostName 13.57.139.31 # static IP
User ubuntu # default user on ubuntu server
Port 22 # the default port ssh uses
IdentityFile ~/.ssh/power1_app_ssh.rsa
```

then we can ssh into the new server with

```
sh> ssh rgtlab.org
```

Change the access permissions: `sudo chmod 600 power1ssh.pem` to be more restrictive.

2.3 Appendix 1 Set up AWS IAM

To initiate batch processing via the AWS cli app. Set up `aws` access via the `aws configure` program.

To get the needed credentials to configure command line `aws` use the AWS IAM service.

Details follow:

Log into AWS console.

Search for **IAM service**. Navigate to IAM dashboard.

Select **Users** in left hand panel.

Then select **Add Users** button (in upper right).

Then enter a **User name** in the form. Click **Next** (lower right)

Then **Create User**.

Click on the user name

In the page that comes up. Select **Security Credentials** tab (center of page).

Under **Access Keys** panel click **Create access key** (right side or bottom of panel).

Click **Command Line Interface CLI**

and at the bottom of the page click the checkbox “I understand...”.

Finally select **Create access key** and

choose **Download .csv file** (lower right).

Navigate Download screen to local `~/.aws` directory.

Click **Done**

Now in the terminal on your workstation, configure the aws cli app via the command.

```
aws configure
```

Enter info from the credentials file just downloaded. After entering the **AWS Access Key ID** and **AWS Secret Access Key** information you are asked for a **Region**, (my region is **us-west-1**), and an output format (suggested output format is **JSON**).