Guided Lab: Exploring Instance Metadata

Description

Instance metadata is a service provided by AWS that allows EC2 instances to access data about themselves. This data can be used to configure or manage the running instance. It's divided into categories, such as host name, events, and security groups.

You can also use instance metadata to access user data that you specified when launching your instance. For example, you can specify parameters for configuring your instance, or include a simple script. You can build generic Amazon Machine Images (AMIs) and use user data to modify the configuration files supplied at launch time.

Although you can only access instance metadata and user data from within the instance itself, the data is not protected by authentication or cryptographic methods. Therefore, you should not store sensitive data, such as passwords or long-lived encryption keys, as user data.

Prerequisites

This lab assumes you have experience creating EC2 instances and are familiar with its basic components.

If you find any gaps in your knowledge, consider taking the following labs:

- Creating an Amazon EC2 instance (Linux)

Objectives

In this lab, you will:

- Understand the concept of instance metadata
- Learn how to retrieve instance metadata.

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Lab Steps

### Creating a Launch template

Create two EC2 instances using the following configurations:

1. **Name**:
2. **Instance type**: t2.micro
3. **AMI**: Ubuntu
4. **Key pair**: Create a new Key Pair
   - **Key Pair name**: MyKeyPair
   - **Key Pair Type:** RSA
   - **Private key file format:** .pem
   - Click **Create key pair**

5. **Network settings;**
   - **Allow SSh traffic from:** My IP

Review your instance configurations and click the "**Launch Instance**" button.

Connect to the Instance

1. After launching an instance, it may take a few minutes for it to be ready for connection.

2. Find the public DNS name or IP address of your instance to connect to it.
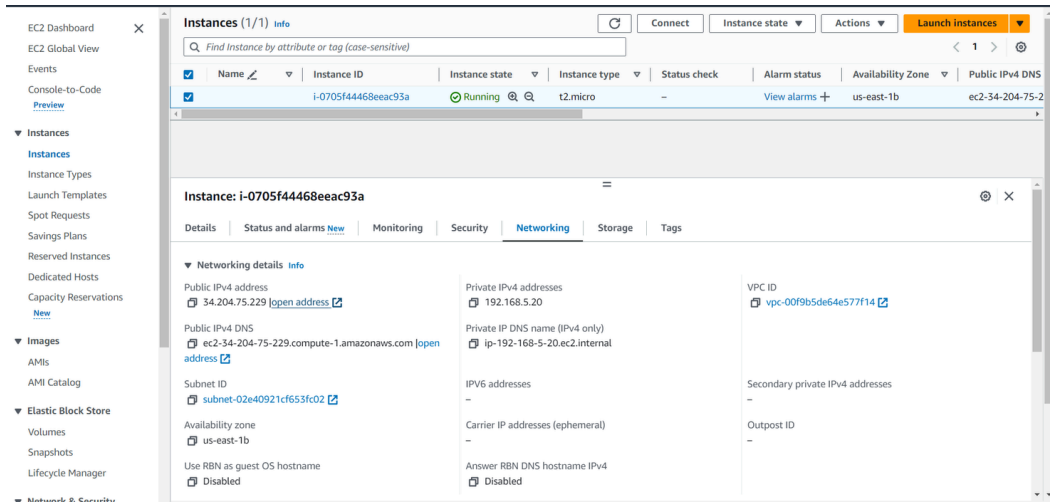
3. Ensure that an SSH client is installed on your local computer by typing "**SSH**" in the command line. If the command is not recognized, install an SSH client.

4. To connect to your instance using SSH, open a terminal and use the SSH command. Specify the path and file name of the private key (.pem), the username for your instance, and the public DNS name or IPv6 address for your instance.

```
ssh -i "path_toyour_key.pem" ec2-user@your-instance-public-dns
```


Access Instance Metadata

Once you're connected to the instance, you can access the instance metadata. Most cloud providers make this available at a specific IP address. For example, on AWS, you can use the following command:

```
TOKEN=`curl -X PUT
"http://169.254.169.254/latest/api/token" -H "X-aws-
ec2-metadata-token-ttl-seconds: 21600"` \
&& curl -H "X-aws-ec2-metadata-token: $TOKEN" -v
http://169.254.169.254/latest/meta-data/
```

This will return a list of available metadata categories.

```
ubuntu@ip-192-168-5-20:~$ TOKEN=`curl -X PUT "http://169.254.169.254/latest/api/token" -H "X-aws-ec2-metadata-token-ttl-seconds: 21600"` \
&& curl -H "X-aws-ec2-metadata-token: $TOKEN" -v http://169.254.169.254/latest/meta-data/
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100    56  100    56    0     0   8928      0 --:--:-- --:--:-- --:--:--  9333
*   Trying 169.254.169.254:80...
* Connected to 169.254.169.254 (169.254.169.254) port 80 (#0)
> GET /latest/meta-data/ HTTP/1.1
> Host: 169.254.169.254
> User-Agent: curl/7.81.0
> Accept: */*
> X-aws-ec2-metadata-token: AQAAAIyTBw-DY21XOV2UGEBWbFgO986owyra_VK2h8jC2J53BHuFKg==
>
* Mark bundle as not supporting multiuse
* HTTP 1.0, assume close after body
< HTTP/1.0 200 OK
< Accept-Ranges: bytes
< Content-Length: 320
< Content-Type: text/plain
< Date: Mon, 18 Dec 2023 08:18:50 GMT
< Last-Modified: Mon, 18 Dec 2023 08:12:30 GMT
< X-Aws-Ec2-Metadata-Token-Ttl-Seconds: 21600
< Connection: close
< Server: EC2ws
<
ami-id
ami-launch-index
ami-manifest-path
block-device-mapping/
events/
hostname
identity-credentials/
instance-action
instance-id
instance-life-cycle
instance-type
local-hostname
local-ipv4
mac
metrics/
network/
placement/
profile
public-hostname
public-ipv4
public-keys/
reservation-id
security-groups
services/
* Closing connection 0
systemubuntu@ip-192-168-5-20:~$
```

Explore Different Metadata Categories

You can explore different metadata categories, such as `ami-id`, `hostname`, `public-keys`, etc., by appending the category name to the end of the URL. For example, to get the instance's public hostname on AWS, you can use:

```
TOKEN=`curl -X PUT
"http://169.254.169.254/latest/api/token" -H "X-aws-
ec2-metadata-token-ttl-seconds: 21600"` && curl -H "X-
aws-ec2-metadata-token: $TOKEN" -v
http://169.254.169.254/latest/meta-data/public-hostname
```

ubuntu@ip-192-168-5-20:~$ TOKEN=`curl -X PUT "http://169.254.169.254/latest/api/token" -H "X-aws-ec2-metadata-token-ttl-seconds: 21600"` && curl -H "X-aws-ec2-metadata-token: $TOKEN" -v http://169.254.169.254/l
atest/meta-data/public-hostname
  % Total   % Received % Xferd Average Speed   Time   Time   Time Current
                                 Dload Upload   Total   Spent   Left Speed
100   56 100   56   0   0   9403   0 --:--:-- --:--:-- --:--:-- 11200
*   Trying 169.254.169.254:80...
* Connected to 169.254.169.254 (169.254.169.254) port 80 (#0)
> GET /latest/meta-data/public-hostname HTTP/1.1
> Host: 169.254.169.254
> User-Agent: curl/7.81.0
> Accept: */*
> X-aws-ec2-metadata-token: AQAAAIyTBw_ndD24PFZMUuJak8M8G1fXoSIBDA-7UVDeZuNMhPAddA==
>
* Mark bundle as not supporting multiuse
* HTTP 1.0, assume close after body
< HTTP/1.0 200 OK
< Accept-Ranges: bytes
< Content-Length: 41
< Content-Type: text/plain
< Date: Mon, 18 Dec 2023 08:21:51 GMT
< Last-Modified: Mon, 18 Dec 2023 08:12:30 GMT
< X-Aws-Ec2-Metadata-Token-Ttl-Seconds: 21600
< Connection: close
< Server: EC2ws
<
* Closing connection 0
ec2-34-204-75-229.compute-1.amazonaws.comubuntu@ip-192-168-5-20:~$ ^C

Congratulations! You've successfully explored Instance Metadata.

You can explore more about Instance Metadata from here as you like.

Happy exploring!