

CSE423 CLOUD COMPUTING

LAB1

Exercise 1: Describe the type of virtualization is used by the EC2 instance launched?

AWS supports two different types of virtualization for EC2 instances:

- Paravirtual (PV)
- Hardware Virtual Machine (HVM)

AWS supports Hardware Virtual Machine (HVM) for Windows instances as well as Paravirtualization (PV) for Linux instances.

HVM guests are fully virtualized. It means that the VMs running on top of their hypervisors are not aware that they are sharing processing time with other clients on the same hardware. The host should have the capability to emulate underlying hardware for each of its guest machines. This virtualization type provides the ability to run an operating system directly on top of a virtual machine without any modification — as if it were run on the bare-metal hardware. The advantage of this is that HVMs can use hardware extensions that provide very fast access to underlying hardware on the host system. Paravirtualization, on the other hand, is a lighter form of virtualization. This technique is fast and provides near-native speed in comparison to full virtualization. With Paravirtualization, the guest operating system requires some modification before everything can work. These modifications allow the hypervisor to export a modified version of the underlying hardware to the VMs, allowing them near-native performance. All PV machines running on a hypervisor are basically modified operating systems like Solaris or various Linux distributions.

Exercise 2: Create a flask web application that displays the instance meta-data.

*******lab01.py*******

```
from ec2_metadata import ec2_metadata
from flask import Flask, render_template
app = Flask(__name__, template_folder='template')

@app.route('/')
def home():

    data = (
        ('instance_id', ec2_metadata.instance_id),
        ('ami_launch_index', ec2_metadata.ami_launch_index),
        ('public_hostname', ec2_metadata.public_hostname),
        ('public_ipv4', ec2_metadata.public_ipv4),
        ('private_hostname', ec2_metadata.private_hostname),
        ('private_ipv4', ec2_metadata.private_ipv4)
    )
    return render_template('index.html', data=data)

if __name__ == '__main__':
    app.run(host = '0.0.0.0')
```

*******index.html*******

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset='UTF-8' />
    <meta name='viewport' content='width=device-width, initial-scale=1.0' />
    <title>LAB01</title>
    <link rel='stylesheet' href='/static/style.css' />
  </head>
  <body>
    <table class='table'>
      <tr class='border header'>
```

```
<th class='border cell'>Metadata</th>
<th class='border cell'>Value</th>
</tr class='border'>
{% for row in data %}
<tr>
{% for cell in row %}
<td class='border cell'>{{ cell }}</td>
{% endfor %}
</tr>
{% endfor %}
</table>
</body>
</html>
```

Screenshot of Web Page :

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Metadata	Value
instance_id	i-053fa5aec68773207
ami_launch_index	0
public_hostname	ec2-3-83-239-241.compute-1.amazonaws.com
public_ipvp4	3.83.239.241
private_hostname	ip-172-31-90-109.ec2.internal
private_ipvp4	172.31.90.109