DevOps Exercises

Session 2: Managing Flask Applications with systemd

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Running Multiple Instances of a Flask Application with systemd

/opt/myapp/app.py

```
from flask import Flask, jsonify
import sys
app=Flask(__name__)
@app.route('/api/hello')
def hello():
    response={'message': 'Hello, this is your Flask API!'}
    return jsonify(response)
if __name__ == '__main__':
    port=int(sys.argv[1] if len(sys.argv)>1 else 5000)
    app.run(host='0.0.0.0',port=port)
```

This file defines a basic Flask application that listens on a specified port and responds with a JSON message.

/etc/systemd/system/myapp@.service

```
[Unit]
Description=my flask app
After=network.target

[Service]
Restart=always
User=myapp
Group=myapp
WorkingDirectory=/opt/myapp
ExecStart=/usr/bin/python3 app.py %i

[Install]
WantedBy=default.target
```

This systemd unit file allows running multiple instances of the Flask application. `%i` in `ExecStart` is a placeholder for the instance identifier, typically used to pass the port number.

Steps to Run Multiple Instances

1. **Create the `myapp` User**
   Ensure the `myapp` user exists to run the service securely:

   ```
   sudo useradd -r -s /bin/false myapp
   ```

2. **Start Services**
   Run multiple instances of the application by specifying different ports:

   ```
   systemctl start myapp@8080
   systemctl start myapp@8081
   systemctl start myapp@8082
   systemctl start myapp@8083
   ```

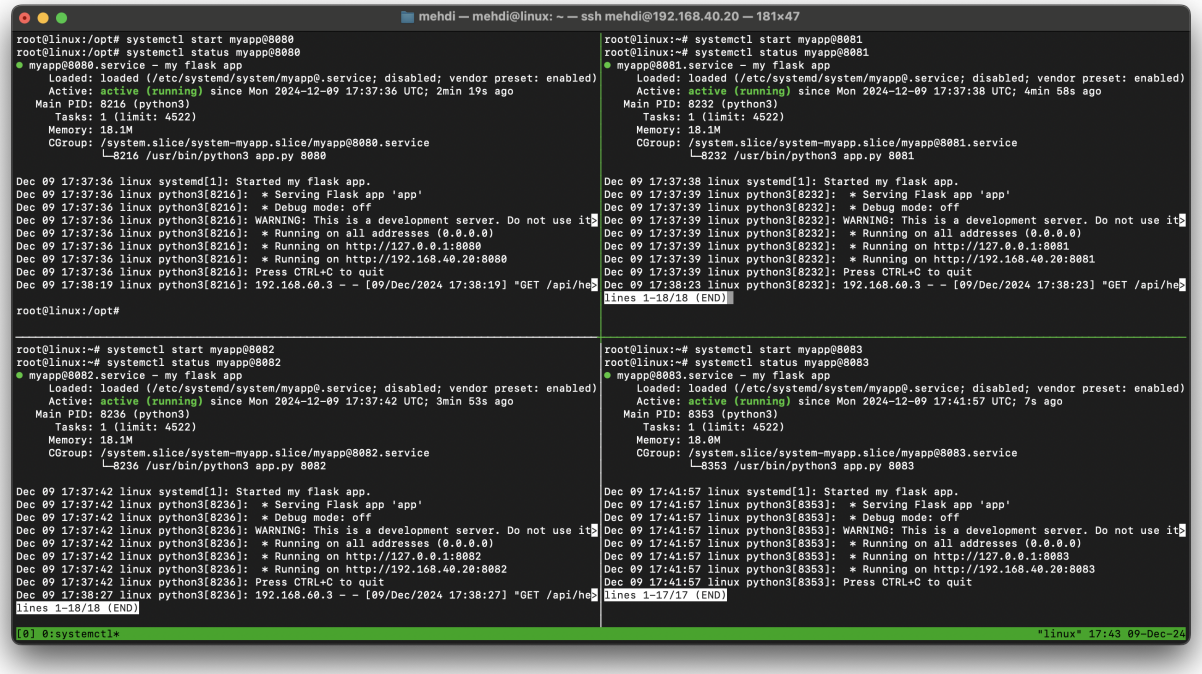
3. **Enable Services at Boot**
   Ensure the services start automatically after a reboot:

   ```
   systemctl enable myapp@8080
   systemctl enable myapp@8081
   systemctl enable myapp@8082
   systemctl enable myapp@8083
   ```

4. **Check Service Status**
   Verify that the services are running properly:

   ```
   systemctl status myapp@8080
   systemctl status myapp@8081
   systemctl status myapp@8082
   systemctl status myapp@8083
   ```

Example output:

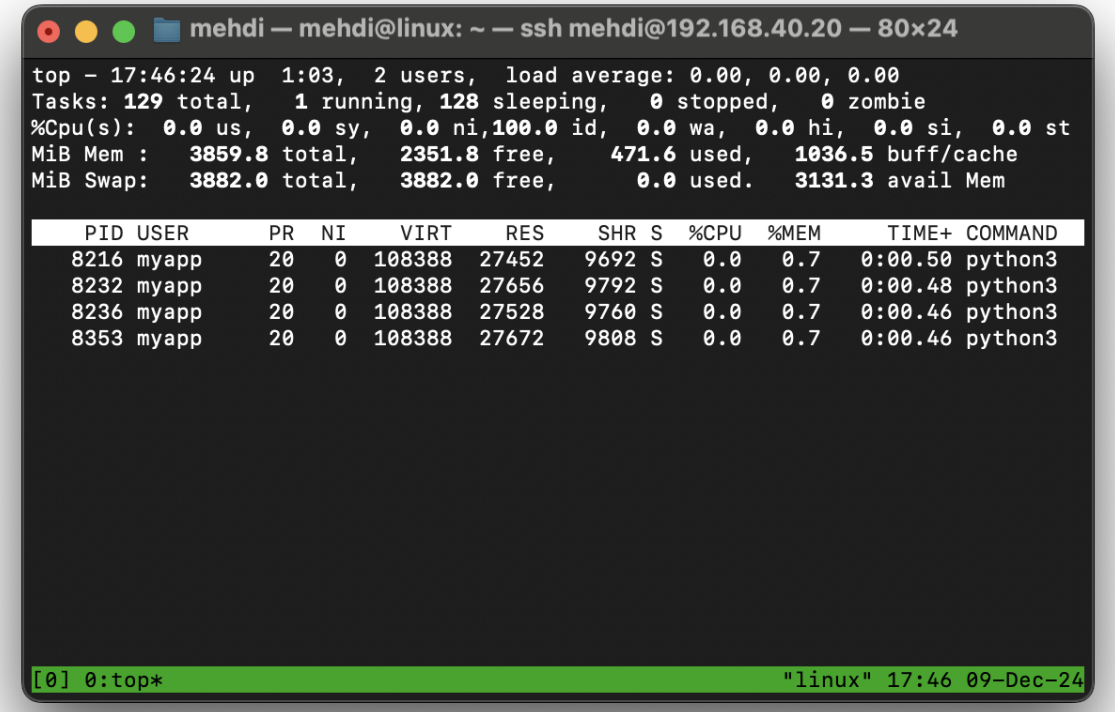


Verify Running Services

- Use `top` to check running processes under the `myapp` user:

```
top -u myapp
```

Example output:



- Test the API for each instance:

```
curl http://localhost:8080/api/hello
curl http://localhost:8081/api/hello
curl http://localhost:8082/api/hello
curl http://localhost:8083/api/hello
```

Example output: