Lab 5 Guide:

**Objective 1: Building the Automation Framework for IaC**

**IP Address Management (IPAM)**

I used Netbox for the IPAM utility. To install this, I followed step by step on the documentation website: <https://netboxlabs.com/docs/netbox/en/stable/installation/>

Specifically, I used Gunicorn instead of uWSGI as it is ok to use on or the other.

Here’s a screenshot of NetBox running:

A screenshot of a computer

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**Permissions**

For permissions, I have a passwords.py that utilizes a pass\_file.csv with device information that creates a random username and password for each device, updates all the device configs, and then writes the new information to the csv. To be changed on a regular basis, I have a cron job running that executes this py file every week. Explanation and code shown in the video.

**Objective 2: Building the DevOps Pipeline**

For the DevOps Pipeline, I used GitHub Actions.

First, I created a runner that would run locally on the VM:

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After these commands, I then went into the same directory and ran sudo svc.sh install to create this runner as a service.

I then created a .yml file that checks for a host of things:

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First, it checks for required pip3 libraries to make sure they are installed. Then I use pylint on my main playbookCreation.py file that contains all backend code for my website. Finally, I have a python testing framework in github\_actions.py that checks for whether the loopback for R1 is 10.40.1.1/32, makes sure that R2 has only one area (area 0), and does a ping test of R1 to the Web Server.

**Objective 3: Network Automation**

1. **Develop the necessary Network Automation Applications**

Did a complete UI overhaul of my website. New menu with new options: (IPAM, Health Check, Troubleshooting):

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IPAM:

Explained in objective 1.

Health Checks:

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Now contains health checks for all things shown above. Checks information for these things on any device in the network with the click of a button.

Troubleshooting:

\*To be added in a future lab.