Summer 2025 Training #1

Linux Fundamentals

Outline

Environment Setup

- What is Docker, and how do we run the “lab” for today’s training?

Basic Linux Navigation

- How do you use the terminal, and how can we modify it?
- What utilities are included with Linux?

Linux Administration

- What are servers and services?
- How do we set up and troubleshoot services on Linux?

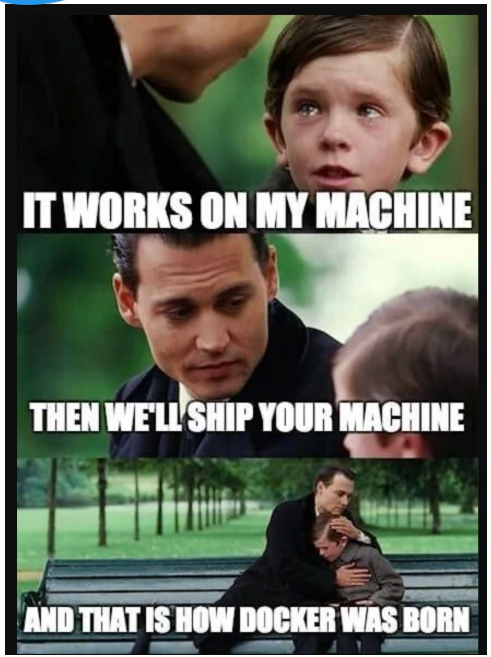
1. Environment Setup

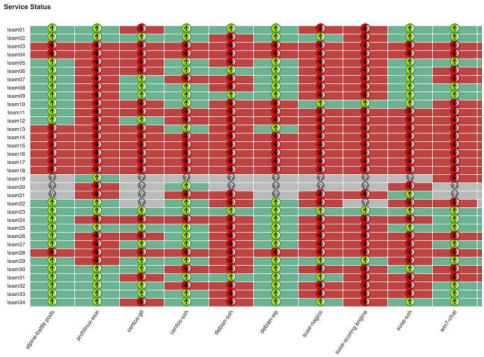
What do we need to configure our “lab” to practice?

What Does The Lab Look Like?

2 new pieces of software that make up the lab

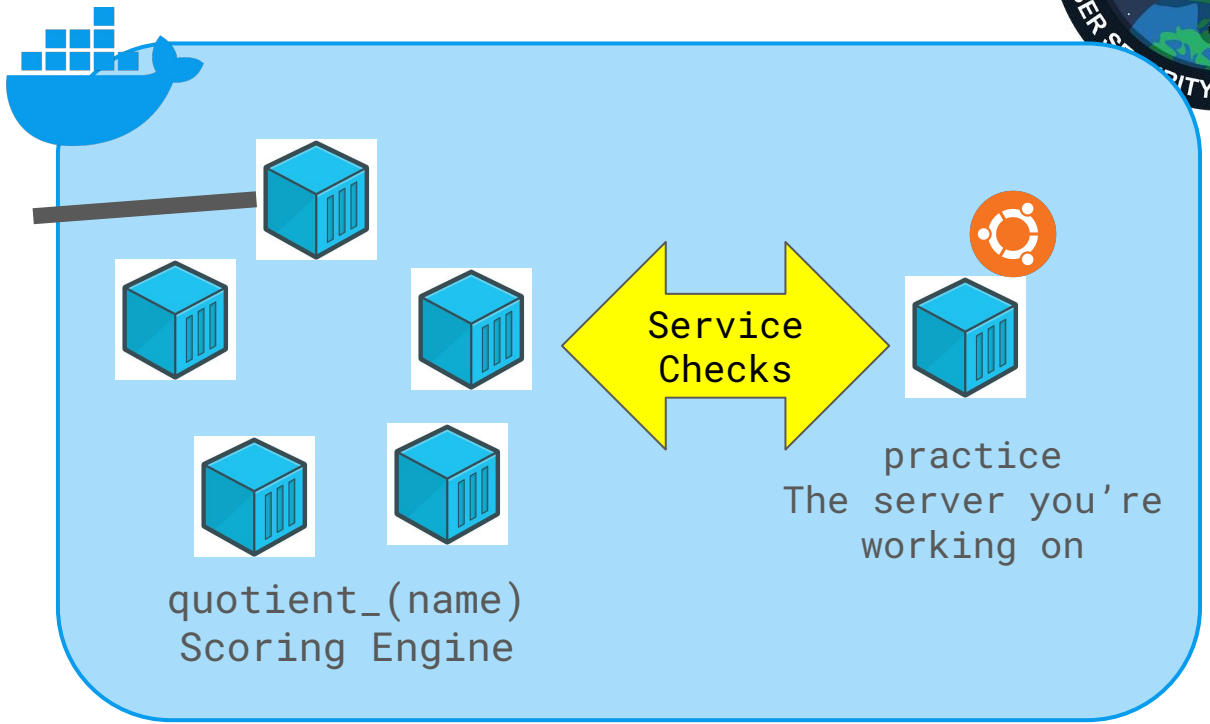
- Docker - A way to deploy complex applications with their dependencies
- Quotient - The official scoring engine of WRCCDC





Lab “Diagram”

http://localhost



Setup Instructions

1. Install Docker Desktop (hopefully you've done that)

2. Clone the Lab Repo
    a. https://github.com/NuclearFizzler/Quotient-Lab

Setup Instructions

3. Open the Lab Repo Directory
4. Rename *config/event.conf.example* to *event.conf*
5. Create a file called *users.credlist* in *config/credlists/* and make a comma-separated list of usernames and passwords.
6. Navigate to the Lab Repo directory in a terminal, then issue:
    a. *docker-compose up --build --detach*

Setup Instructions

7. Log into the Quotient Console on *http://localhost*
    a. Credentials: *admin:admin*

8. Enable Scoring Engine
    a. Admin > Team Configurations > Set team01 to “Active”
    b. Admin > Engine/Scoring Data > “Resume Engine”

Enter The Practice Server

9. Enter the command prompt on the container
    a. *docker exec -it practice /bin/bash*

10. You should now be in a root prompt!

2. Basic Linux Navigation

How do we get around the Linux terminal, and how can we change how it works?

My “Main” Resource:

https://linuxjourney.com/

“Scored” Tasks

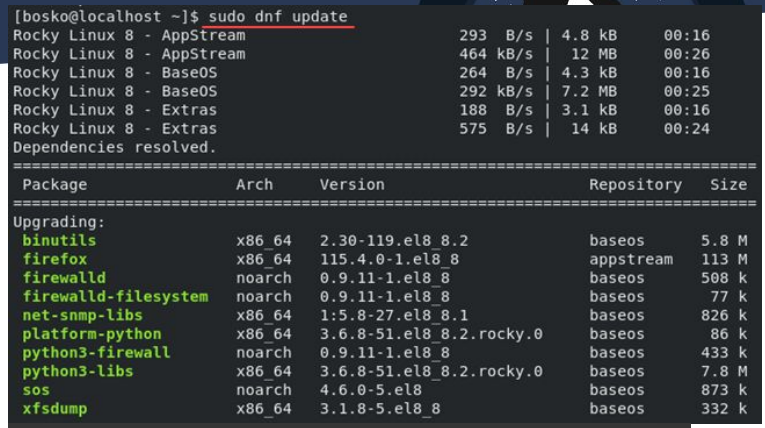
1. Create a file called *example.txt*
2. Create the folder /var/ftp/
3. Fill *example.txt* with the following sentence:
    - This example file teaches me to use a text editor!
4. Move *example.txt* into /var/ftp

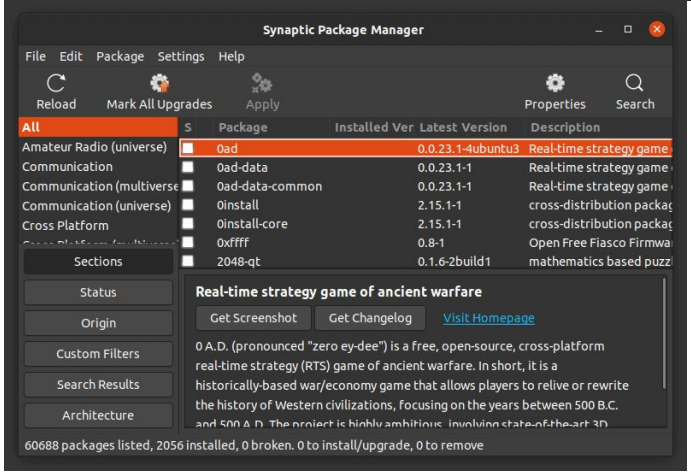
3. Linux Administration

How do you administer a Linux Server?

Add and Removing Software

- Docker Images don’t come with a lot
- We’ll need to install a lot of utilities to make it work
- To install stuff, you’ll need a **package manager**





How Package Managers Work

1) Package Managers retrieve up-to-date information about packages from **sources** (/etc/apt/sources.list)
    a) Command: *apt update*
2) If asked to install something, checks if package is installed or can be updated
    a) Command: *apt install* (or *apt upgrade* to update everything)
    b) Command: *apt remove* to uninstall stuff

How to Add Users

- “Adding a User” actually involves several steps!
  - Creating a home directory, allowing login, etc.
  - Have to modify many different config files to work!
- Fortunately, it’s been automated…
  - Install *adduser* to deal with all those steps
  - Add the users!

User Controls

OS User Configuration Files

- /etc/shadow
- /etc/passwd
- /etc/group

User Permissions

- Numbers / bits representing the level of access users have to files
- chmod (number)
- Also there are more attributes with lsattr!

User Authentication Modules

- PAM - Pluggable Authentication Modules, responsible for authenticating users and the rules associated with them

“Services”

- **Service** - Some kind of software running in the background that your computer needs
  - Is “brought up” at specific times, may talk to other computers, etc.
- Configured with more files, but when you install stuff it should work for you
- Controlled via “service” or “systemd”

“Scored Tasks”

1) Set up SSH Server
    a) Make sure the users are there as well!
2) Set up FTP Server
    a) Configure it to look for *example.txt*
3) “Repair” the Web Server
    a) Change the port it works on