Assignment 3

Due:5 December 2023 @ 23:59:59 UTC-5*[1]
Grade: 5% of final mark

Description:

In this assignment you will set up an instant messaging service using Mattermost. The rationale for using it is that it is Open Source, has a large user and developer base, and the documentation is very comprehensive. It also supports multiple database backends, which will help familiarize you with MySQL as an RDBMS (as opposed to Assignment 1 that uses PostgreSQL with OpenProject).

This assignment will also demonstrate that you do not need to sacrifice your data or privacy in order to have secure communications with friends, colleagues, and family. You can set up your own tools and avoid getting locked into proprietary platforms, and avoid advertising.

The instructions to install Mattermost are available here:
https://docs.mattermost.com/install/installing-ubuntu-2004-LTS.html

Package download here:
https://releases.mattermost.com/7.8.1/mattermost-7.8.1-linux-amd64.tar.gz

DO NOT PROCEED UNTIL READING THROUGH ALL OF THIS ASSIGNMENT.

Requirements:

There are five main requirements that must be met to achieve full marks on this assignment:

1. MySQL is installed, with a 'mattermost' database, and 'mmuser' user. To install MySQL run the following command: `sudo apt install mysql-server`. **DO NOT RUN THE sudo mysql_secure_installation step.**
2. Mattermost is installed and running, with a 'mattermost' system user and group on your VM. Mattermost should be configured with systemd to run automatically on server startup.

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[1] Last date for term work is Dec. 5, but if you want to submit after that I won't tell anyone 🙂

3. nginx will be used to proxy requests to Mattermost. You will need to stop and disable Apache, and then install and configure nginx to forward traffic to Mattermost.

4. All traffic to/from Mattmost will be encrypted using TLS. You will need to procure, install, and configure nginx with a Let's Encrypt issued certificate.

Let's Encrypt has been selected as the CA because it is free and is trusted by all major browsers and TLS clients. Their mission is to make encryption ubiquitous and usable for the majority of sites on the web.

5. A [Personal Access Token](#) is generated and submitted, along with the URL to your Mattermost instance for grading.

Submit your completed assignment using https://assignment3.itec2210.ca

Evaluation Criteria:

Requirement	Test case	Grade

MySQL is installed and an mmuser and mattermost database are setup	`ps -e |grep mysql`
	
	`mysql -h 127.0.0.1 -u mmuser -p`
		1

Mattermost is installed and can connect to MySQL. Your VM has a mattermost user and group	`ps -e |grep mattermost`
	`getent passwd mattermost`
	`getent group mattermost`
	`systemctl list-unit-files |grep mattermost`
		1

Nginx is installed and proxying request to Mattermost on your VM	`ps -e |grep nginx`
	`sudo lsof -i :80`
	`sudo lsof -i :443`
	`grep 'proxy_pass http://backend' /etc/nginx/sites-enabled/mattermost`
		1

TLS/SSL encryption*	`https://###.itec2210.ca/` is usable with a web browser (where ### is your student number)	1
PAT Token	`curl -si -H 'Authorization: Bearer ...' -H "Content-type: application/json" https://###.itec2210.ca/api/v4/users/me`	1

* Those who are up for a challenge may opt to use your own root CA from assignment 2 and install your own self-signed TLS certificate.

Errata (read these before proceeding):

0. Your Virtual Machine has a firewall running that only allows SSH and HTTP traffic in. You will need to allow incoming TCP traffic on port 8065 to reach Mattermost. You will also need to allow incoming HTTPS traffic on port 443. Run `sudo ufw allow 8065/tcp` to open the Mattermost port. Run `sudo ufw allow 443/tcp` to open the HTTPS port.

1. You will need to stop and disable Apache, Openproject, Memcached, and PostgreSQL systemd units on your VM. Use `sudo systemctl stop …` and `sudo systemctl disable …` for each service. Recall the commands that you used with Openproject to start/restart. There may be two PostgreSQL unit files: `postgresql@13-main.service` and `postgresql.service` - be sure to stop and disable both if applicable.

2. Ensure that you follow the **MySQL** specific instructions if you come to a section with different options for the database. When you install MySQL, **DO NOT RUN THE sudo mysql_secure_installation step**.

3. When you reach the **Configuring Mattermost Server** section, set your Site URL to the DNS name that points to your VM. For example, if your student number is 123456, then your Site URL will be 123456.itec2210.ca.

Under the 'Listen Address' field, set the address to 127.0.0.1:8065. You will need to restart Mattermost after doing that using the systemctl command from the documentation.

Once you restart Mattermost, it will be unavailable until you finish the Nginx steps.

4. You do not need to complete the SMTP portion of the documentation.

5. When you are instructed to use an IP address like 10.10.10.2 or '%' or '{ip}' in **nginx or MySQL *only***, use the localhost IP, 127.0.0.1. This will ensure Mattermost, MySQL and nginx are all communicating locally instead of via the public interface for your VM.

6. Your *domain_name* (in nginx) or Site URL in Mattermost will be something like 12345.itec2210.ca, where you substitute your student number for 12345. This ensures that DNS points to your VM.

7. When you are editing config.json (use the `sudo nano /opt/mattermost/config/config.json`) to configure MySQL, the DataSource line will look like this (copy and paste <mark style="background-color: red">INCLUDING THE FINAL COMMA!!!</mark>). Ensure everything is all on one line:

<mark style="background-color: yellow">`"DataSource":"mmuser:mmuser-password@tcp(127.0.0.1:3306)/mattermost?charset=utf8mb4,utf8\u0026writeTimeout=30s",`</mark>

8. Once you finish the **Configuring Mattermost Server** section, skip to **Install NGINX Server**. Install and configure it, then stop at Step 3 as instructed and follow the note to the **Configuring NGINX with SSL and HTTP/2** page to finish the installation. When you get to the certbot commands, you will need to install `snapd` first with this command: sudo apt install snapd

9. There undoubtedly are other issues. Please reach out via Mattermost and I'll be happy to help.

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