Secure Programming

Week 5

Path Traversal Attack

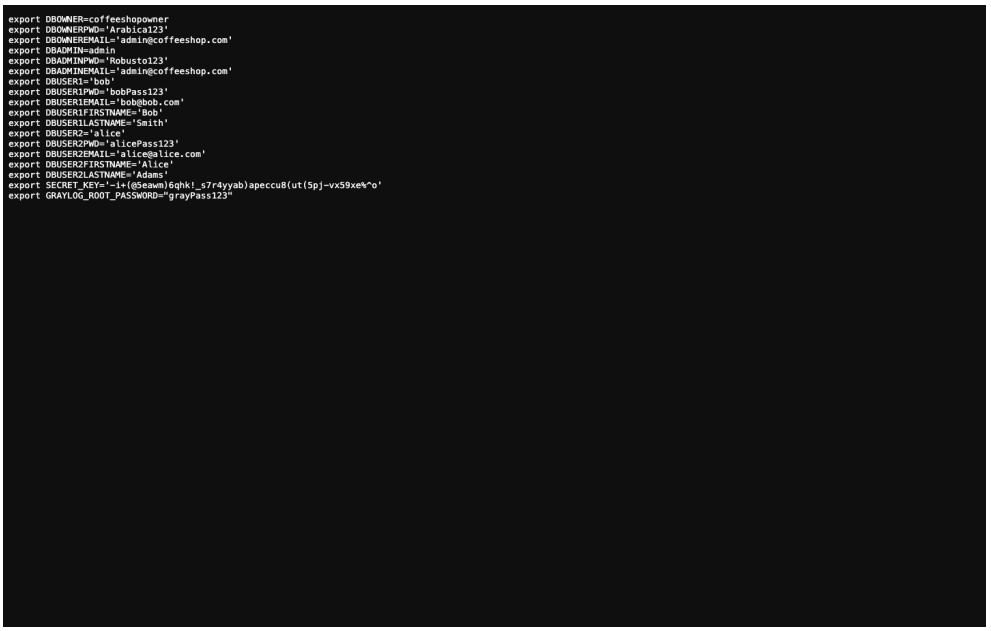
Performing the Attack

We are going to try to gain unauthorised access to the config.env folder because it contains all the username/ passwords for the site. Realistically, such a file should not exist, but if it did, it should have strict access controls set. The config.env file is located in the secrets folder (outside the vagrant folder on your host):
`\django-coffeeshop\coffeeshop\secrets`

When you accessed the secrets.txt file, the application fetched the file from: `\coffeeshop\vagrant\coffeeshopsite\coffeeshop\files`. The objective is to now traverse out of the folder and up to the config.env file. We do this using the dot-dot-slash notation (`../`).

1. What happens when you try to access the config.env file using this URL?

   When to try to access the config.env file using the ../ traversal, the application downloads the config.env file (username and password).



2. What was the final URL that successfully carried out the dot-dot-slash attack?

   Used 4 dot-dot-slash notation (`../`) to get to the `secrets/config.env`:
   http://localhost:8080/download_file/?file=../../../../secrets/config.env

Fixing the Path Traversal Vulnerability

To fix this vulnerability, we need to fix the code so that a user cannot force browse out of the location using the `../` notation. The first security fix we will apply involves normalising the path to the secrets.txt file. We do this first by replacing the line of code:

```
file_path = os.path.join(base_directory, file_name)
```

with:

```
file_path = os.path.normpath(os.path.join(base_directory, file_name))
```

After normalisation, the line:

```
if not file_path.startswith(base_directory):
    return HttpResponse("Access denied")
```

3. What is the result?

   After the fix, when attempting the same dot-dot-slash attack (e.g. `?file=../../../../secrets/config.env`), the application returns “Access denied” instead of exposing the sensitive file.
   The normalization ensures that any traversal attempts using ../ are resolved, keeping the path restricted to the /files/ directory.

Fixing the Vulnerability (link to the commit)

DanyilT/django-coffeeshop repo forked from stephen-oshaughnessy/django-coffeeshop

Prepare the vulnerability in code for Path Traversal Attack (download_file):
DanyilT/django-coffeeshop/commit/e0e318dbc928365c8f614c49b7a15614198eb07d

Fixing Path Traversal Attack vulnerability (download_file):
DanyilT/django-coffeeshop/commit/1d0a1614c56b6c41e949737e8a0ffcbd54e20317