Unit 15 Project: Web Vulnerabilities and Hardening

Overview

In this homework scenario, you will continue as an application security engineer at Replicants. Replicants created several new web applications and would like you to continue testing them for vulnerabilities. Additionally, your manager would like you to research and test a security tool called **BeEF** in order to understand the impact it could have on the organization if Replicants was targeted with this tool.

Lab Environment

You will continue to use your Vagrant virtual machine for this assignment.

Instructions

In this assignment, you will test three web application vulnerabilities. For each vulnerability you will be provided with the following:

- Steps detailing how to setup and access the application.
- A walkthrough explaining how the application is intended to work.
- A task that will test the application for vulnerabilities.

Your goal is to determine if the application is vulnerable and provide mitigations.

Submission Guidelines

You will submit a document (Word or Google Docs) that contains the following for each web application:

- Screen shots confirming the successful exploit.
- Two to three sentences detailing recommended mitigation strategies.

When complete, submit the file on BCS.

Web Application 1: *Your Wish is My Command Injection*

In order to have a deep understanding of the underlying mechanics behind how web attacks are constructed from both a conceptual and practical standpoint, I Accessed my Vagrant and opened a browser.
Navigated to the following webpage: http://192.168.13.25 and I select the Command Injection option. This page is a new web application built by Replicants in order to enable their customers to ping an IP address. The web page will return the results of the ping command back to the user. Behind the scenes, when you select Submit, the IP you type in the field is injected into a command that is run against the Replicants web server. The specific command that runs on the web server is ping and 8.8.8.8 is the field value that is injected into that command. This process is no different than if we went to the command line and typed that same command. Now that you have determined that Replicants new application is vulnerable to command injection, you are tasked with using the dot-dot-slash method to design two payloads that will display the contents of the following files:
/etc/passwd

/etc/hosts
Command Injection Prevention.
Avoid system calls and user input—to prevent threat actors from inserting characters into the OS command.
Set up input validation—to prevent attacks like XSS and SQL Injection.
Create a white list—of possible inputs, to ensure the system accepts only pre-approved inputs.

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Running the etc/passowrd
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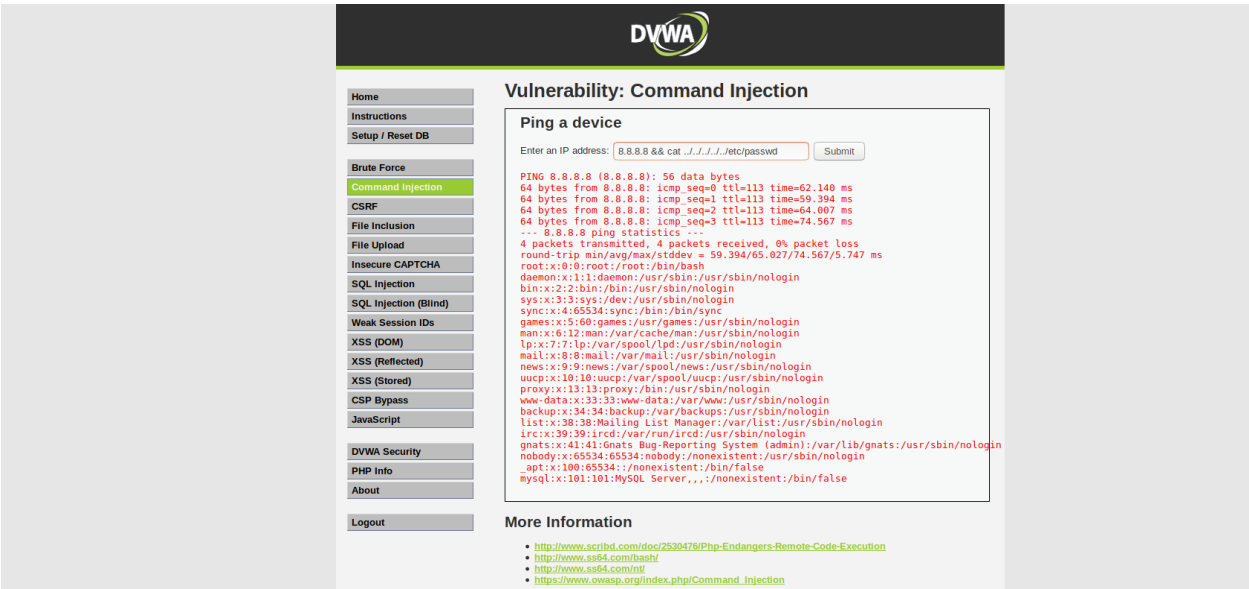
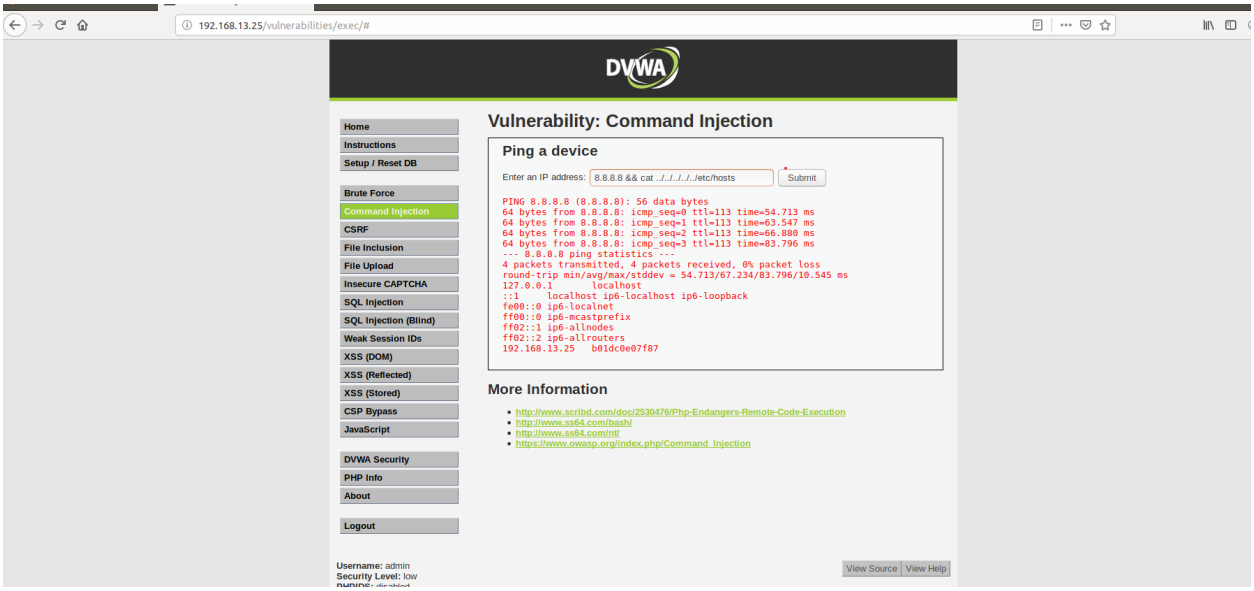


Running the etc/hosts

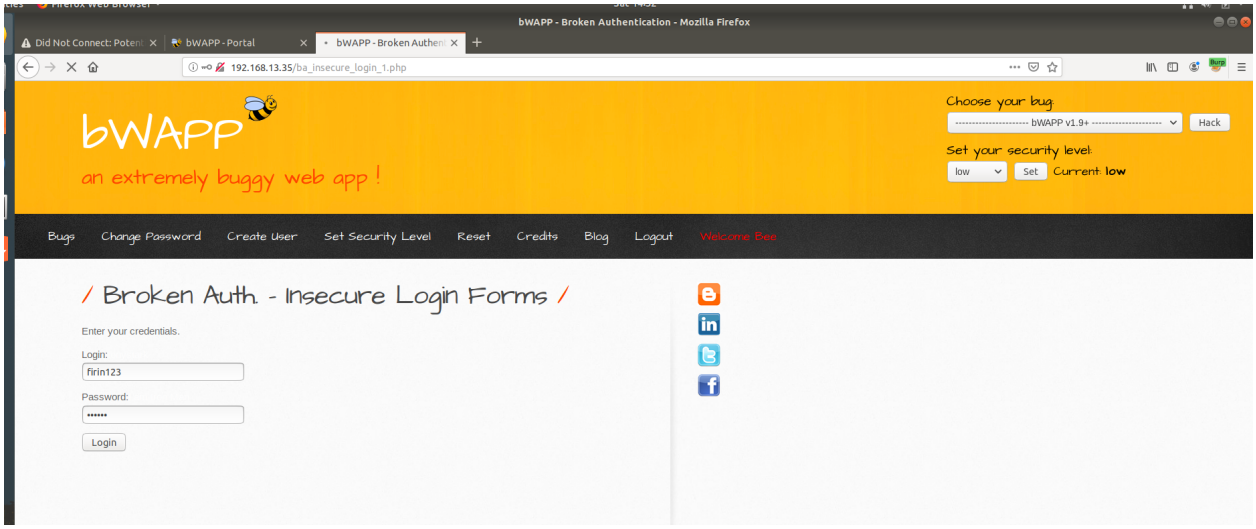


Web Application 2: *A Brute Force to Be Reckoned With*

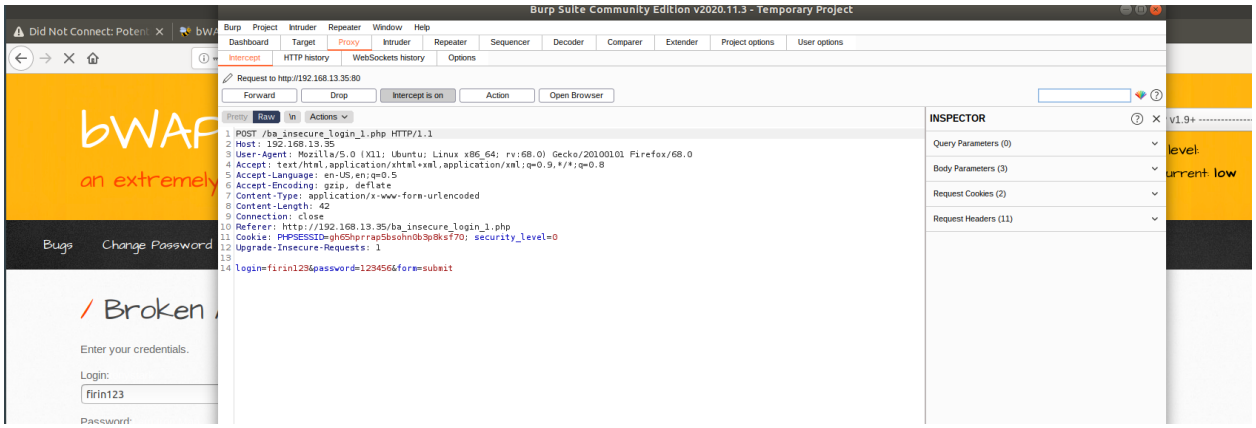
Opened a browser on Vagrant and navigated to the webpage http://192.168.13.35/ This page is an administrative web application that serves as a simple login page. An administrator enters their username and password and selects Login

- If the user/password combination is correct, it will return a successful message.

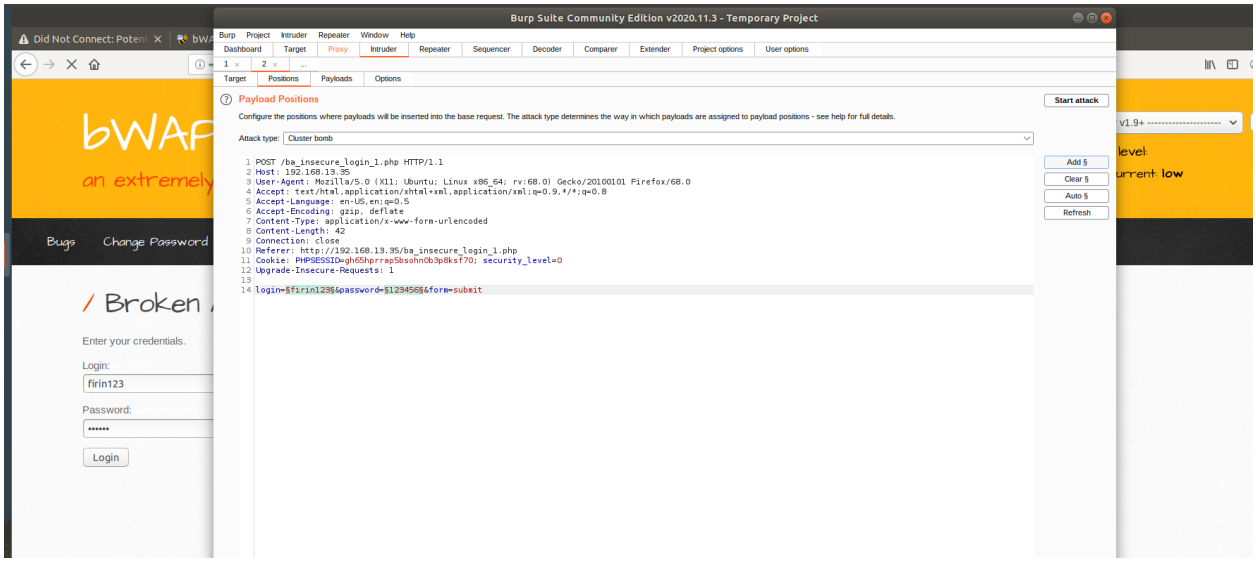
- If the user/password combination is incorrect, it will return the message, "Invalid credential



Capturing traffic on proxy



Sending capturing traffic to intruder on proxy

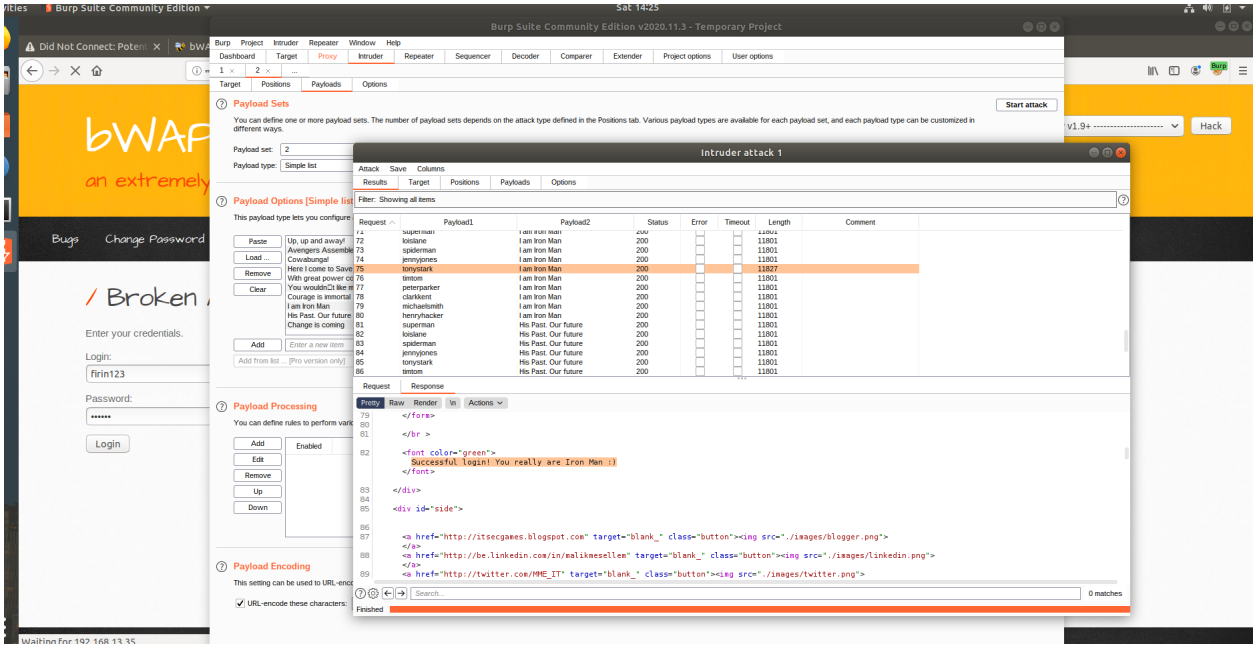


The web application tool Burp Suite was used, specifically the Burp Suite Intruder feature, to determine if any of the administrator accounts are vulnerable to a brute force attack on this web application. You've been provided with a list of administrators and the breached passwords.

- List of Administrators

- Breached list of Passwords

Cracking all usernames and passwords using brute force attacks



Blocking Brute Force Attacks

The most obvious way to block brute-force attacks is to simply lock out accounts after a defined number of incorrect password attempts. Account lockouts can last a specific duration, such as one hour, or the accounts could remain locked until manually unlocked by an administrator.

Web Application 3: *Where's the BeEF?*

In Vagrant, the following command was run: sudo beef .This will kick off the BeEF application and return many details about the application to my terminal. Along with these details are several URLs that can be used to access BeEF's User Interface (UI). For example: UI_URL: http://127.0.0.1:3000/ui/panel. The Browser Exploitation Framework (BeEF) is a practical client-side attack tool that exploits vulnerabilities of web browsers to assess the security posture of a target. An attacker takes a small snippet of code, called a BeEF Hook, and determines a way to add this code into a target website. This is commonly done by cross-site scripting. When subsequent users access the infected website, the users' browsers become hooked. Once a browser is hooked, it is referred to as a zombie. A zombie is an infected browser *that awaits*

instructions from the BeEF control panel. The BeEF control panel has hundreds of exploits that can be launch against the hooked victims, including:

- Social engineering attacks

- Stealing confidential data from the victim's machine

- Accessing system and network information from the victim's machine

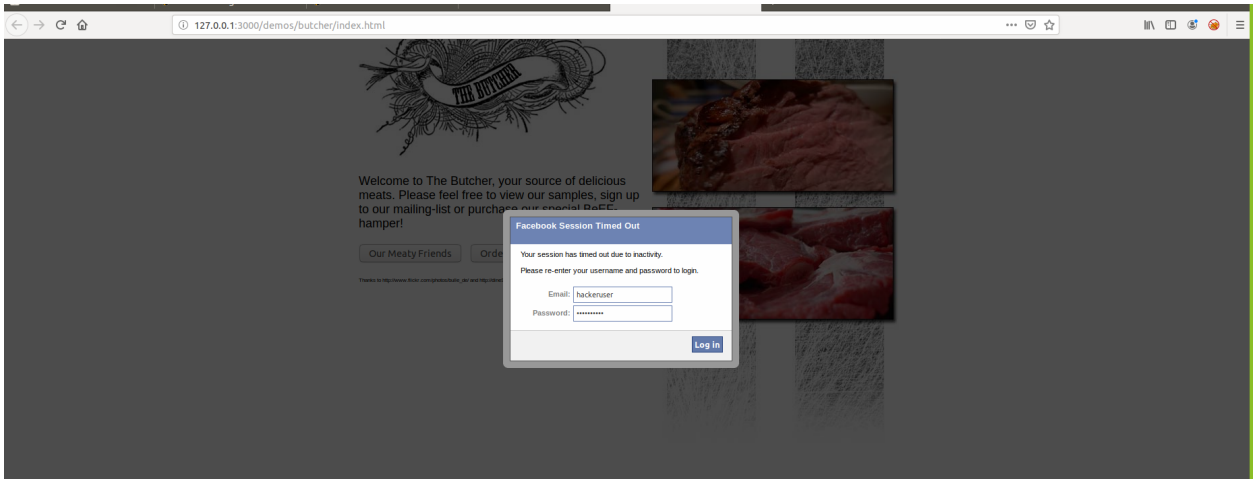
To access this simulated infected website, I open the website, which has been infected with a BeEF hook. This will list folders of hundreds of exploits that can be run against the hooked browser. First, I attempted a social engineering phishing exploit to create a fake Google login pop up. Were i can use this to capture user credentials like user name and password. the victim could easily mistake this for a real login prompt. I was able to hook into Replicants website, attempt a couple BeEF exploits. Some that work well include:

- Social Engineering >> Pretty Theft

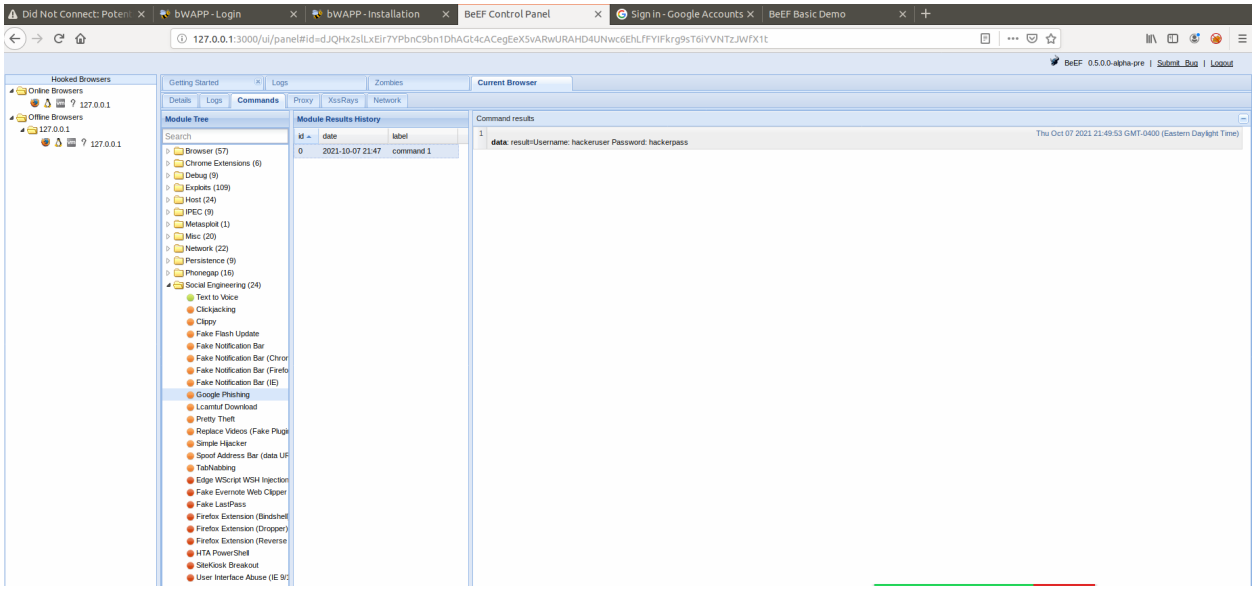
- Social Engineering >> Fake Notification Bar

- Host >> Get Geolocation (Third Party)

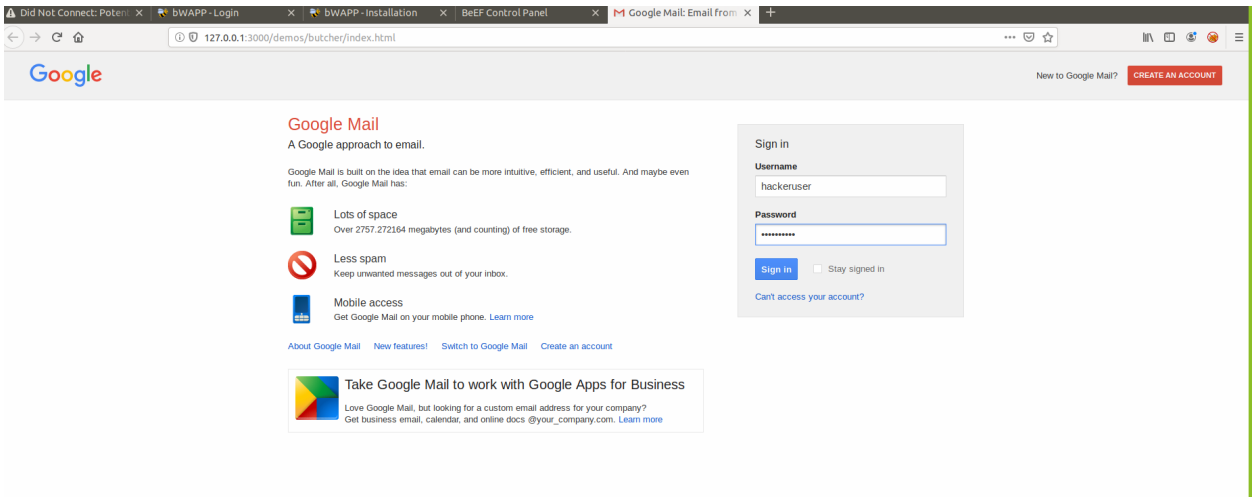
Setting up fake facebook loging page



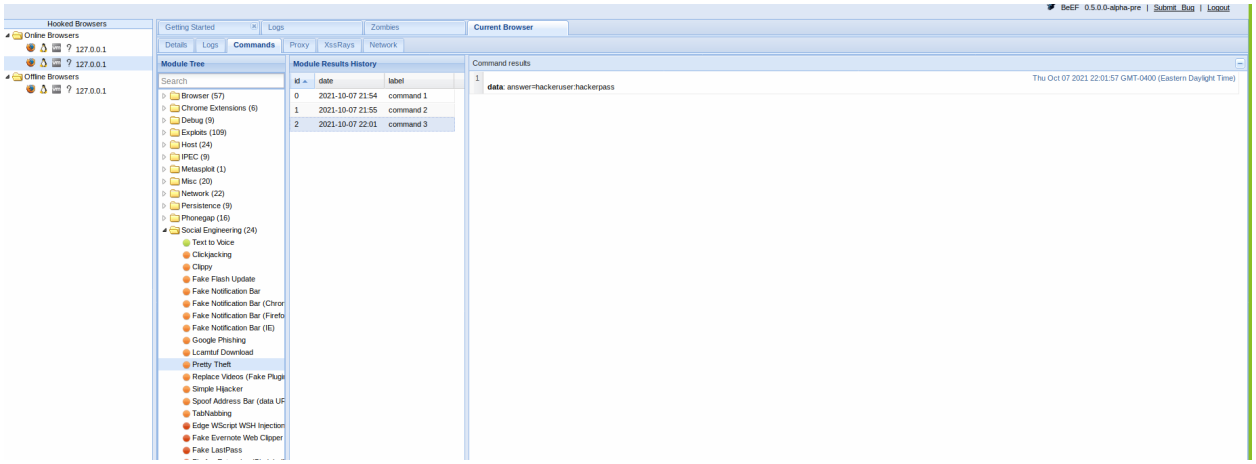
The captured username and the passwor



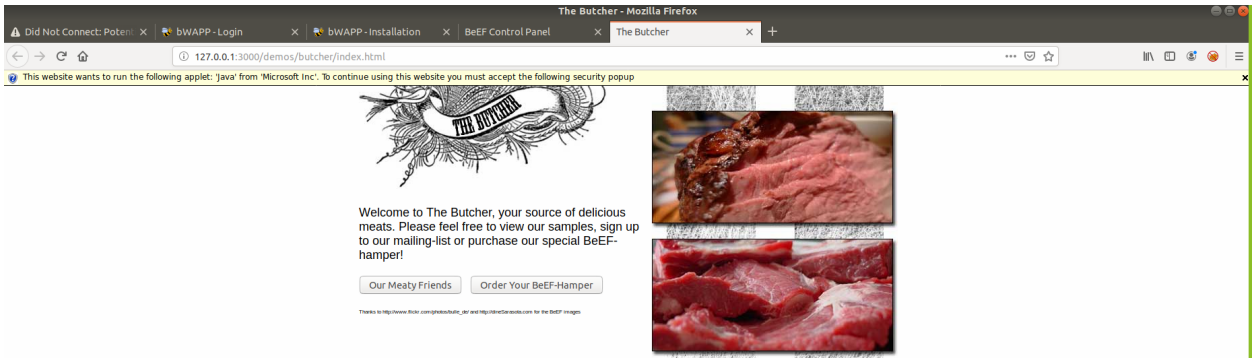
Setting up fake google loging website



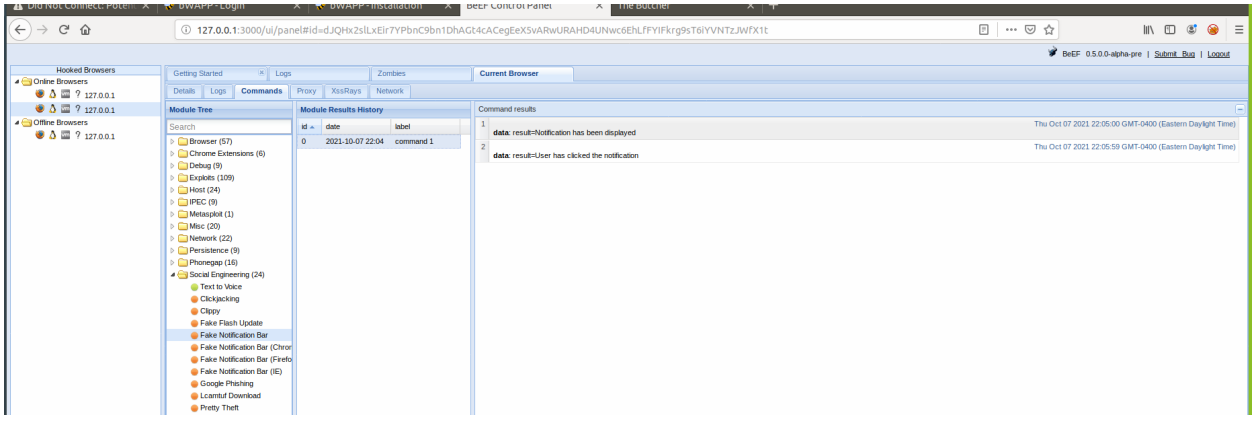
Captured the username and passowrd they used



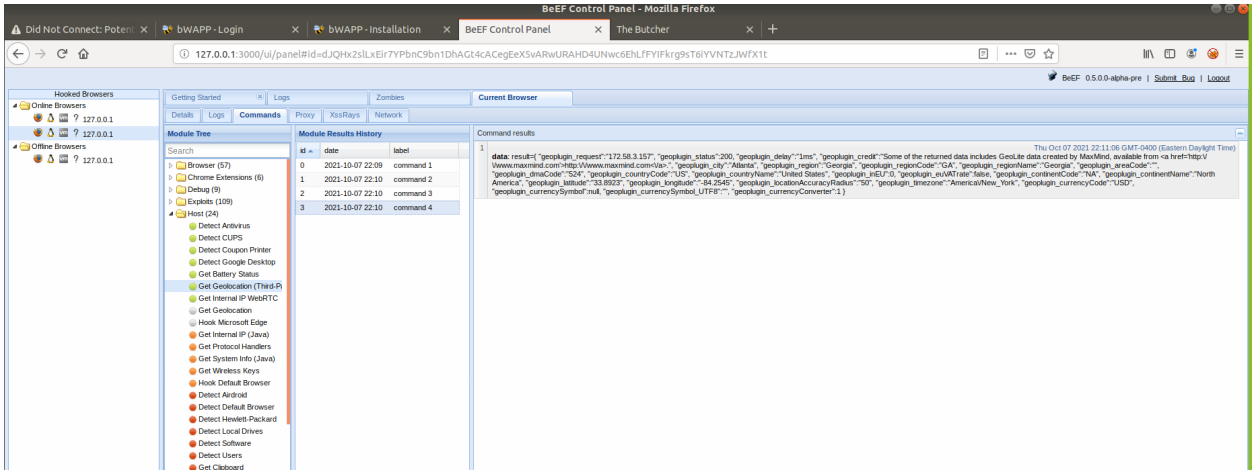
Setting up fake notifaction bar



The fake notifavtion bar clicked



Setting up fake Geolocatio



Outlining mitigation strategies against this kind of attack.

Keep your system up to date, but that is obvious and wouldn't help you with the IE 0-day last month.The majority of browser based exploits require JavaScript in some capacity. NoScript helps mitigate these attacks.The Google Safe browsing API is used by Firefox and Chrome by default to prevent you from reaching a site that is known to be leveraging browser based attacks. However this does nothing for a targeted BeEF attack.Some Anti-Viruses will plug into your browser and prevent an exploit from loading. This could prevent a targeted BeEF attack. But AV's aren't perfect and can be fooled.Plan on failure, consider doing most of your day to day browsing inside a VM. Restore this VM to a virgin state on a regular basis (once a week, or once a month). Assume that you have been compromised and change your passwords regularly.Reference page for my mitigation strategies

https://security.stackexchange.com/questions/22828/what-are-methods-for-preventing-browser-hooking-drive-by-downloads