

# Configuration Manual

MSc Industrial Internship Cyber Security

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#### National College of Ireland Project Submission Sheet School of Computing



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| Module:              | MSc Industrial Internship                                   |
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# Configuration Manual

#### Deven Ahlawat X20214341

#### **1** Prerequisites

This research would require the below mentioned pre-requisites to replicate it which include some installations and credentials as listed below -

- 1. Setup a Kali Linux on AWS EC2 instance with minimum t2.medium specification.
- 2. Install Python3 v3.10 on Kali instance.
- 3. Install RDP on Kali operating system <sup>1</sup>.
- 4. Install Google Chrome browser on Kali Instance.
- 5. Install Java JDK on Kali Instance.
- 6. Email and Password for sending email via SMTP.
- 7. BurpSuite Professional Licence Key.

This research was conducted with the below system specifications and

| Property               | Description | Version   |
|------------------------|-------------|-----------|
| Platform               | AWS         | n/a       |
| Instance Type          | Type T      | t2.medium |
| Operating System       | Kali        | 2022      |
| Programming Language   | Python      | 3.10      |
| RAM                    | 4GB         | n/a       |
| CPU                    | 2vcore      | n/a       |
| BurpSuite Professional | 2022        | n/a       |

Table 1: Preferred configuration for the host

## 2 Sign Up for Akeero Serverless

- 1. Create a free account on Akeero Serverless<sup>2</sup> Fig 1.
- 2. Enter the required details to make an account.

| <b>器AKEERO</b> |  |  |
|----------------|--|--|
|                | Create your free<br>Akeero account   |  |
|                | No credit card is required.  |  |
|                | Enter your first name  |  |
|                | Enter your surname   |  |
|                | Enter your email   |  |
|                | Enter your company name  |  |
|                | <ul> <li>I agree to Akeero <u>Terms</u> and <u>Privacy Policy.</u></li> <li>I agree to receive Akeero news and updates.</li> </ul> |  |
|                | Get started now  |  |

Figure 1: Akeero Serverless Sign Up Page

| no-reply@akeero.com<br>to devenahlawat+nci 👻 | 5:43 PM (0 minutes ago  | ) 🕁 | ¢ |  |
|--|---|-----|---|--|
|  | BAKEERO   |     |   |  |
|  | Hi Deven  |     |   |  |
|  | We just need you to verify that you're a real human by clicking below.                                      |     |   |  |
|  | It's not that we don't believe you, but there's a lot of bots out there!                                    |     |   |  |
|  | I swear I'm not a bot!  |     |   |  |
|  | Once this is done, we'll set up your unique Akeero domain and you can set<br>your password and get started! |     |   |  |
|  | Thanks  |     |   |  |
|  | The Akeero Team   |     |   |  |
|  |   |     |   |  |

Figure 2: Akeero Serverless Email confirmation

3. Check your email inbox for a sign up mail and click on "I swear I'm not a bot!" Fig 2.

<sup>&</sup>lt;sup>1</sup>https://www.kali.org/docs/general-use/xfce-with-rdp/ <sup>2</sup>https://www.akeero.com/sign-up

4. A confirmation page will be shown Fig 3 and a welcome email for setting the password should arrive in your inbox Fig 4.



Figure 3: Akeero Serverless Bot confirmation successful page

| Welcome to Akeero D Interx  |                             | e   | )<br>2 |
|---|-----------------------------|-----|--------|
| no-reply@akeero.com<br>to devratilavat-nd +   | 5:46 PM (2 minutes ago) 🛛 🛣 | · ~ | :      |
| 器AKEERO   |                             |     |        |
| Welcome to Akeero!  |                             |     |        |
| We're delighted you've decided to jump onboard our secure design platform.<br>We've set up your unique domain, and we just need you to set your password<br>by clicking the link below: |                             |     |        |
| Set Password  |                             |     |        |
| Once your password is set, you'll have access to your very own Akeero<br>domain, where you can invite colleagues and start to collaborate.  |                             |     |        |
| Every domain within Akeero is unique, segregated and secured. This means<br>that each domain also has a unique url.   |                             |     |        |
| Your domain url is: https://researchdemos-cultural-penguin-Ide4,free,<br>app.akeero.com/  |                             |     |        |
| We recommend that you save this url as a bookmark in your browser for<br>quick and easy access to Akeero!   |                             |     |        |
| Your username is: devenablawat+ncl@gmail.com  |                             |     |        |
| We hope you enjoy using our platform and we'll be in touch soon to get some<br>feedback!  |                             |     |        |
| Thanks<br>The Akeero Team   |                             |     |        |
| AKEERO 🖌 🖌 in   |                             |     |        |

Figure 4: Akeero Serverless Email for setting password

- 5. Note the domain URL and login username and click on Set Password as shown in Fig 4
- 6. Set a strong password with the mentioned requirements Fig 5.
- 7. After setting the password, open the Welcome Email again and click on the custom akeero domain mentioned in the mail Fig 4.
- 8. Login with your details in the login prompt Fig 6.

| H  |           |
|--|-----------|
| Change Your Passv                            | vord      |
| Enter a new password below to ch password.   | ange your |
| New password                                 | $\odot$   |
| Re-enter new password                        | 0         |
| Your password must contain:                  |           |
| At least 8 characters                        |           |
| At least 3 of the following:                 |           |
| <ul> <li>Lower case letters (a-z)</li> </ul> |           |
| Upper case letters (A-Z)                     |           |
| <ul> <li>Numbers (0-9)</li> </ul>            |           |

Figure 5: Akeero Serverless Password setup page

| Sign In               | 1          |
|-----------------------|------------|
| Akeero app for Akeero | Serverless |
| Email address ————    | ٢٠         |
| Password              | ٢          |
| Forgot password?      |            |
| Login                 |            |
|                       |            |

Figure 6: Akeero Serverless Login Page

- 9. Login page will lead to a page which will ask to set up mandatory multi-factor authentication Fig 7.
- 10. Click on "Trouble Scanning?" and copy the CODE shown from the next prompt



Figure 7: Akeero Serverless Set 2FA prompt

Fig 8.

| Secure Your Account  |  |
|--|--|
| Manually enter the following code into your preferred authenticator app and then enter the provided one-time code below. |  |
| Z3I  |  |
|  |  |
| Copy code  |  |
| Enter your one-time code   |  |
|  |  |
|  |  |
| Continue   |  |
|  |  |

Figure 8: Akeero Serverless 2FA secret code

- 11. Open a new terminal, write python3 and press Enter. Write the below code lineby-line import pyotp totp = pyotp.TOTP("<Paste the copied secret CODE here>") totp.now()
- 12. Enter the generated code into the Input field in Fig 8 and click Continue.
- 13. Save the backup code presented and click Continue.
- 14. Click Accept on the Authorize app prompt Fid 9 and the sign up is complete now.



Figure 9: Akeero Serverless Authorize app prompt



## 3 Burp Installation

BurpSuite Professional was used for this research. BurpSuite is vulnerability scanner that is used to test web applications, this research made use of the Professional version which has Passive Scanner functionality in it. Here are the steps to set it up

1. Download the BurpSuite Professional Jar file from Burp Downloads page <sup>3</sup> as shown in Fig 11

<sup>&</sup>lt;sup>3</sup>https://portswigger.net/burp/releases#professional

| PortSwigger   | LOGIN  |
|---|--|
|   | Products $\checkmark$   Solutions $\checkmark$   Research   Academy   Daily Swig   Support $\checkmark$   $\equiv$   |
|   |  |
|   |  |
| Durn Quita Dala   |  |
| Surp Suite Reie   | eases  |
| ALL EDITIONS PROFESSIONAL CON   | MMUNITY ENTERPRISE CI/CD DRIVER DASTARDLY  |
|   |  |
|   |  |
| Professional / Communit   | v 2022 12 5  |
| Stable  | <u> </u>   |
| Released Wednesday, 21 December 2022  |  |
|   |  |
| Burp Suite Professional   | DOWNLOAD     view checksums  |
| Burp Suite Professional   | DOWNLOAD     view checksums  |
| Burp Suite Professional     JAR       This release contains a bug fix for Burp's diagnored  | S DOWNLOAD     View checksums  Dostics.  |
| Burp Suite Professional     Image: Contains a bug fix for Burp's diagno       This release contains a bug fix for Burp's diagno       Previously, Burp was not returning details of the | DOWNLOAD     view checksums  ostics.  installed extensions in its diagnostics reports. We have fixed this issue, and |

Figure 11: BurpSuite Professional Download page

- 2. Save the JAR file to a location on your Kali instance.
- 3. Download the Jython Standalone JAR file from the Jython website<sup>4</sup>.
- 4. Save the JAR file to a location on your Kali instance.
- 5. Open BurpSuite Professional JAR file from the saved location using the command "java -jar burpsuite\_pro\_v2022.12.5.jar"
- 6. Activate BurpSuite Professional by entering the Licence Key.
- 7. Select "Temporary project" and Click Next Fig 12.
- 8. Select "Use Burp defaults" on the configuration page and click Continue Fig 13
- 9. Go to the "Extensions" tab and then to the "Options" tab.
- 10. Click on the "Select file ..." button in the "Python Environment" section.
- 11. Browse to and select the Jython Standalone JAR file as shown in Fig 14.
- 12. Browse to "Installed" tab within Extensions tab and click on "Add".
- 13. Select the "Python" option in the "Extension type" dropdown menu and locate the "burp\_ext.py" file from Research Artifacts as shown in Fig 15.
- 14. Select the "Save to file" option in the "Standard Output" section and create a file name "Passive-Scan-Output.txt" in the downloaded Research Artifacts folder 15.

<sup>&</sup>lt;sup>4</sup>https://www.jython.org/downloads.html

|                            | Bu   | rp Suite Professional v2022.12.5 - licer | nsed to trial user [2 user license]   | $\bigcirc \bigcirc \bigcirc$ |  |  |  |  |  |
|----------------------------|--|--|---------------------------------------|------------------------------|--|--|--|--|--|
| Welcome to Burp Suite Prof | ome to Burp Suite Professional. Use the options below to create or open a project. |  |                                       |                              |  |  |  |  |  |
| O Temporary project        |  |  |                                       |                              |  |  |  |  |  |
| O New project on disk      | Name:  |  |                                       |                              |  |  |  |  |  |
|                            | File:  |  |                                       | Choose file                  |  |  |  |  |  |
| Open existing project      |  | Name                                     | File                                  |                              |  |  |  |  |  |
|                            |  | testproj1.burp                           | /home/deven-new/Desktop/burp_automati | on/testproj1.burp            |  |  |  |  |  |
|                            |  |  |                                       |                              |  |  |  |  |  |
|                            |  |  |                                       |                              |  |  |  |  |  |
|                            |  |  |                                       |                              |  |  |  |  |  |
|                            |  |  |                                       |                              |  |  |  |  |  |
|                            |  |  |                                       |                              |  |  |  |  |  |
|                            | File:  | Pause Automated Tasks                    |                                       | Choose file                  |  |  |  |  |  |
|                            |  |  |                                       |                              |  |  |  |  |  |
|                            |  |  |                                       | Cancel Next                  |  |  |  |  |  |



| 4 | Burp S                                       | uite Professional v2022.12.5 - licensed to trial user [2 user license] | $\bigcirc \bigcirc \bigotimes$ |
|---|--|--|--------------------------------|
| ? | Select the configuration that you would like | to load for this project.  | Burp Suite                     |
|   | O Use Burp defaults                          |  |                                |
|   | OUse settings saved with project             |  |                                |
|   | O Load from configuration file               | File   |                                |
|   |  |  |                                |
|   |  |  |                                |
|   |  |  |                                |
|   | File:  |  | Choose file                    |
|   | Default to the above in future               |  |                                |
|   |  |  |                                |
|   |  |  | Cancel Back Start Burp         |

Figure 13: BurpSuite Professional load configuration page

15. Click on "BApp Store" Tab within the Extensions tab and search for "software"

| 5       |   |                |               |               | Burp              | Suite Professional | v2022.12.5 - Tem  | porary Project   | - licensed to tria | l user [2 user | license]           |                      | $\bigcirc \bigcirc \bigcirc \bigotimes$ |
|---------|---|----------------|---------------|---------------|-------------------|--------------------|-------------------|------------------|--------------------|----------------|--------------------|----------------------|---|
| Burp    | Project   | Intruder       | Repeater      | Window        | Help              |                    |                   |                  |                    |                |                    |                      |   |
| Das     | nboard  | Target         | Proxy         | Intruder      | Repeater          | Collaborator       | Sequencer         | Decoder          | Comparer           | Logger         | Extensions         | Learn                | Settings                                |
| Insta   | lled  | BApp Store     | APIs          | Options       |                   |                    |                   |                  |                    |                |                    |                      |   |
| (?)     | Setting   | s              |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
| 63      | -<br>These se                                     | ttings contro  | l how Burp    | handles exte  | ensions on start  | Jp.                |                   |                  |                    |                |                    |                      |   |
| -0-     | <b>2</b> • • • • •                                |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
|         | 🖬 Automatically upoate installed BApps on startup |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
| (?)     | Java En   | vironment      | I             |               |                   |                    |                   |                  |                    |                |                    |                      |   |
| <u></u> | These se  | ttings let yo  | u configure   | the environm  | nent for executir | ig extensions that | are written in Ja | va. If your exte | ensions use any l  | ibraries, you  | can specify a folo | der from which libr  | aries will be loaded.                   |
|         | Folder fo   | r loading libi | rary JAR file | s (optional): |                   |                    |                   |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    | Select folder     |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
| ?       | Python  | Environm       | ent           |               |                   |                    |                   |                  |                    |                |                    |                      |   |
| 63      | These se  | ttings let yo  | u configure   | the environm  | nent for executir | ng extensions that | are written in Py | /thon. To use P  | ython extension    | s, you will ne | ed to download     | Jython, which is a I | Python interpreter implemented in Java. |
|         | Location  | of Jython sta  | andalone JA   | R file:       |                   |                    |                   |                  |                    |                |                    |                      |   |
|         | /home/o   | deven-new/D    | esktop/bur    | p_automatic   | on/jython-standa  | lone-2.7.3.jar     | Select file       |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
|         | Folder fo   | r loading mo   | odules (opti  | onal):        |                   |                    |                   |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    | Select folder     |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |
| ?       | Ruby E  | nvironmen      | ıt            |               |                   |                    |                   |                  |                    |                |                    |                      |   |
| 63      | These se  | ttings let yo  | u configure   | the environm  | nent for executir | ng extensions that | are written in Ru | uby. To use Rub  | oy extensions, yo  | ou will need t | o download JRub    | oy, which is a Ruby  | interpreter implemented in Java. Note   |
|         | that you  | can either co  | onfigure the  | location of t | he JRuby JAR file | e here, or you can | load the JAR file | on startup via   | the Java classpa   | ath.           |                    |                      |   |
|         | Location  | of JRuby JAR   | t file:       |               |                   |                    |                   |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    | Select file       |                  |                    |                |                    |                      |   |
|         |   |                |               |               |                   |                    |                   |                  |                    |                |                    |                      |   |

Figure 14: Load Jython standalone in BurpSuite Professional

- 16. Select Software Version Reporter and Click Install as shown in Fig 16.
- 17. Select Software Vulnerability Scanner and Click Install as shown in Fig 16
- 18. Click on the Proxy Tab
- 19. Select Options Tab within Proxy and check if Proxy is running on interface "127.0.0.1:8080" as shown in Fig 17
- 20. Select "Burp>User Settings>Save user settings" and save it to a file as shown in Fig 18
- 21. Select "Project>Project Settings>Save project settings" and save it to a file as shown in Fig 19
- 22. Close BurpSuite Professional

BurpSuite Professional is now installed and fully configured with necessary settings and extensions. Please close the burp suite window before proceeding to the next step.

### 4 Install Dependencies

Install Python dependencies using the following commands

pip3 install selenium pip3 install pyotp pip3 install smtplib pip3 install datetime

| 5             |                  |              |               |                | Burp             | Suite Professional | v2022.12.5 - Tem | porary Project | - licensed to tria | l user [2 user | license]                    |
|---------------|------------------|--------------|---------------|----------------|------------------|--------------------|------------------|----------------|--------------------|----------------|-----------------------------|
| Burp          | Project          | Intruder     | Repeater      | Window         | Help             |                    |                  |                |                    |                |                             |
| Dashb         | oard             | Target       | Proxy         | Intruder       | Repeater         | Collaborator       | Sequencer        | Decoder        | Comparer           | Logger         | Extension                   |
| Install       | .ed              | BApp Store   | APIs          | Options        |                  |                    |                  |                |                    |                |                             |
| л т           | otal est         | timated syst | em impact:    | Low 🧲          | -                |                    |                  |                | -                  |                |                             |
| Burp l        | Extens           | 5            |               |                |                  | Load Burp Ex       | tension          |                |                    |                | $\bigcirc \bigcirc \otimes$ |
| Extens        | ions let         | Please e     | nter the det  | ails of the ex | ctension, and ho | w you would like t | o handle standar | d output and   | error.             |                |                             |
| Ad            | bl               | Extensi      | on Details    | ;              |                  |                    |                  |                |                    |                |                             |
| Rem           | iove             | Extensio     | n type:       | Python 🗸       |                  |                    |                  |                |                    |                |                             |
| Do            | p<br>wn          | Extensio     | n file (.py): | w/Desktop/     | burp_automatio   | on/burp_ext.py     | Select file      |                |                    |                |                             |
| Deta          | aile             | Standa       | rd Output     |                |                  |                    |                  |                |                    |                |                             |
|               |                  | Ou           | tput to syste | m console      |                  |                    |                  |                |                    |                |                             |
| E E           | xtensio          | 🔿 Sav        | ve to file: u | rp_automat     | ion/Passive-Sca  | n-Output.txt       | Select file      |                |                    |                |                             |
| Nam           | e: Pas           | 🔵 Sho        | ow in UI      |                |                  |                    |                  |                |                    |                |                             |
|               |                  |              |               |                |                  |                    |                  |                |                    |                |                             |
| Exte<br>Filer | nsion ty<br>name | Standa       | rd Error      |                |                  |                    |                  |                |                    |                |                             |
| Meth          | hod              | Ou           | tput to syste | m console      |                  |                    |                  |                |                    |                |                             |
| Audi          | t issue i        | 🔵 Sav        | /e to file:   |                |                  |                    | Select file      |                |                    |                |                             |
|               |                  | O Sho        | ow in UI      |                |                  |                    |                  |                |                    |                |                             |
|               |                  |              |               |                |                  |                    |                  |                |                    |                |                             |
|               |                  |              |               |                |                  |                    |                  |                |                    |                |                             |
|               |                  |              |               |                |                  |                    |                  |                |                    |                |                             |
|               |                  |              |               |                |                  |                    |                  |                | C                  | ancel          | Next                        |

Figure 15: Load custom extension in BurpSuite Professional

```
pip3 install email
pip3 install csv
```

It is assumed that the artifacts have been downloaded and extracted into a folder. File Structure overview is listed below -

- 1. main.py Core file which performs all the operation, appropriate comments are present to explain each block of code.
  - Edit Line 26 with <br/>burp jar file location>, <project file location>, <project config file location> and <user config file location>
  - Edit Line 23 with <br/>burp project file location>and <Report output file in artifacts folder>
  - Edit Line 42 with your MFA code.
  - Edit Line 47,62,82,92 and 109 with your custom Akeero domain without changing the rest of the URL.
  - Edit Line 119 with a keero-test-di.json file fome artifacts with absolute path location.
  - Edit Line 216 to configure recipient email address to receive the report.

| 2             |                |              |               | Burp         | Suite Profes   | sional v2022.12.  | 5 - Temporary P | roject - licensed to t | rial user [2 u                | ser licensej         |                   |                                       | 000        |
|---------------|----------------|--------------|---------------|--------------|----------------|-------------------|-----------------|------------------------|-------------------------------|----------------------|-------------------|---------------------------------------|------------|
| Burp Projec   | t Intruder     | Repeater     | Window        | Help         |                |                   |                 |                        |                               |                      |                   |                                       |            |
| Dashboard     | Target         | Proxy        | Intruder      | Repeater     | Collabor       | ator Seque        | encer Deco      | oder Comparer          | Logge                         | r Extensions         | Learn             | {                                     | 🔅 Settings |
| Installed     | BApp Store     | e APIs       | Options       |              |                |                   |                 |                        |                               |                      |                   |                                       |            |
| -             |                |              |               |              |                |                   |                 |                        |                               |                      |                   |                                       |            |
| Total es      | stimated syst  | tem impact:  | Low 🧲         |              |                |                   |                 |                        |                               |                      |                   |                                       |            |
| BApp Store    | •              |              |               |              |                |                   |                 |                        |                               |                      |                   |                                       | ?          |
| The BApp Stor | re contains B  | urp extensio | ons that have | been written | by users of Bu | Irp Suite, to ext | end Burp's capa | bilities.              |                               |                      | ې                 | O software                            |            |
|               | Name           |              | Installed     | Rating       | Popularity     | Last updated      | System impa     | Detail                 |                               |                      |                   |                                       |            |
| Software Ver  | sion Reporte   | r            |               | <u>ት</u>     |                | 22 Apr 2021       | Low             | Pro extension          | Software                      | e Vulnerability      | Scanner           |                                       |            |
| Software Vul  | nerability Sci | anner        |               | ជជជជជ        |                | 09 Apr 2019       | Low             | Pro extension          | This exten                    | sion scans for vuln  | erabilities in d  | letected software versions using the  |            |
| BugPoC        |                |              |               | <u> </u>     |                | 22 Jun 2020       | Low             |                        | Vulners.co                    | m API                | er abilities in a | eccecca solution e tensions asing the |            |
| Code Dx       |                |              |               | <b>ፚፚፚፚ</b>  | +              | 06 Jun 2018       | Low             | Pro extension          | It has two                    | main features        |                   |                                       |            |
| CSTC, Modula  | ar HTTP Man    | ipulator     |               | ជជជជជ        | · +            | 10 Jul 2020       | Low             |                        | it has two                    | main leatures.       |                   |                                       |            |
| HeartBleed    |                |              |               | ជជជជជ        | -              | 01 Jul 2014       | Low             |                        | <ul> <li>Detection</li> </ul> | t vulnerable softw   | are by fingerp    | rints or CPE                          |            |
| Image Locati  | on and Priva   | cy Scanner   |               | ជាជាជាជាជ    | -              | 26 Feb 2020       | Low             | Pro extension          | - Dotor                       | t possible vulporal  | alo pathe whic    | h appeared in any exploits            |            |
| LightBulb W/  | AF Auditing F  | ramework     |               |              | -              | 21 Feb 2022       | Low             |                        | • Delet                       | t possible vullierai | ote patris white  | in appeared in any exploits           |            |
| InreadFix     |                |              |               | тилин        | 1              | 25 Jan 2017       | Low             | Pro extension          | <u>Tutorial vi</u>            | <u>deo</u>           |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        | Estimate                      | d system impa        | +                 |                                       | 0          |
|               |                |              |               |              |                |                   |                 |                        | Lotinate                      | a system input       |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        | Overall:                      | Low 🕥                |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        | Memory                        | CPU                  | Time              | Scanner                               |            |
|               |                |              |               |              |                |                   |                 |                        | E Low                         | Di Low               | C Low             | 30 Low                                |            |
|               |                |              |               |              |                |                   |                 |                        |                               |                      | •                 | 17                                    |            |
|               |                |              |               |              |                |                   |                 |                        | Author:                       | Vulners.com          |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        | Version:                      | 1.2                  |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        | Source:                       | https://github.co    | m/portswing       | er/software-vulnerability-scapper     |            |
|               |                |              |               |              |                |                   |                 |                        | Undated                       | 00 Apr 2010          | in porcorrigge    | static realized backy scatter         |            |
|               |                |              |               |              |                |                   |                 |                        | opuateu.                      | 09 Apr 2019          |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        | Rating:                       | ជជជជា                | Submi             | it rating                             |            |
|               |                |              |               |              |                |                   |                 |                        | Popularity                    | /:                   |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        | Install                       |                      |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        |                               | -                    |                   |                                       |            |
|               |                |              |               |              |                |                   |                 |                        |                               |                      |                   |                                       |            |

Figure 16: Install BurpPro extensions

| 2                   |                    |                 |              |               | Burp Suite Pr      | bressional v2022.12.5 | - Temporary Project  | t - licensed to t | riat user [2 user tie | ensej           |                       |               |                 |          |
|---------------------|--------------------|-----------------|--------------|---------------|--------------------|-----------------------|----------------------|-------------------|-----------------------|-----------------|-----------------------|---------------|-----------------|----------|
| Burp P              | Project li         | ntruder Rep     | eater W      | indow Help    | )                  |                       |                      |                   |                       |                 |                       |               |                 |          |
| Dashb               | oard               | Target          | Proxy        | Intruder      | Repeater           | Collaborator          | Sequencer            | Decoder           | Comparer              | Logger          | Extensions            | Learn         | Versions        | Settings |
| Softwa              | re Vulnera         | bility Scanner  |              |               |                    |                       |                      |                   |                       |                 |                       |               |                 |          |
| Interce             | pt HT              | TP history      | WebSoc       | kets history  | Options            |                       |                      |                   |                       |                 |                       |               |                 |          |
| ② Pr                | ? Proxy Listeners  |                 |              |               |                    |                       |                      |                   |                       |                 |                       |               |                 |          |
| Bu Bu               | rn Provu           | ses listeners t | n receive i  | ncoming HTT   | P requests from vo | ur browser. You will  | need to configure w  | our browser to    | use one of the lis    | teners as its n | rovy server           |               |                 |          |
| τ <del>ζ</del> , ου | i p Fi Oxy u       | ses uscellers t | o receive ii | iconing HTH   | - requests nonn yc | or prowser, rou with  | need to conligure y  | our prowser to    | use one of the us     | ceners as its p | TONY SETVEL.          |               |                 |          |
|                     | Add                | Running         | In           | nterface      | Invisible          | Redirect              | Certific             | ate               | TLS F                 | rotocols        |                       |               |                 |          |
|                     | Edit               |                 | 127.0.0.     | 1:8080        |                    |                       | Per-host             | C                 | efault                |                 |                       |               |                 |          |
|                     | Remove             |                 |              |               |                    |                       |                      |                   |                       |                 |                       |               |                 |          |
|                     |                    |                 |              |               |                    |                       |                      |                   |                       |                 | •                     |               |                 |          |
|                     |                    |                 |              |               |                    |                       |                      |                   |                       |                 |                       |               |                 |          |
|                     |                    |                 |              |               |                    |                       |                      |                   |                       |                 |                       |               |                 |          |
| 5-                  | -h !h-11-          |                 |              |               |                    |                       |                      |                   |                       |                 | 16                    |               |                 | - No 6   |
| Ea<br>Bu            | cn installa<br>rp. | tion of Burp g  | eneratës it  | ts own CA cer | tincate that Proxy | usteners can use wh   | en negotiating TLS o | connections. Ye   | ou can import or e    | xport this cert | ifficate for use in o | ther tools or | anotner install | ation of |
|                     |                    |                 |              |               |                    |                       |                      |                   |                       |                 |                       |               |                 |          |
|                     | Import / e         | oport CA certif | icate        | Regenerate    | CA certificate     |                       |                      |                   |                       |                 |                       |               |                 |          |

Figure 17: BurpSuite Proxy settings

- 2. config.py Contains configuration used in the main but must be protected. Please replace username and password with your Akeero Login credentials as well as SMTP\_USERNAME and SMTP\_PASSWORD. Check the SMTP\_SERVER and SMTP\_PORT, please make the necessary changes as per your environment and system.
- 3. burp\_ext.py Custom Jython based burp suite extension which is used to log issues logged by burp scanner and output it to a file.
- 4. payloads.txt Text file contains all the payloads that are to executed in different inpput fields present in the app.

| 4    |                    |      |                    |         |          |       | Burp Suite       | e Professional v2022. | 12.5 - Temporary Project - |
|------|--------------------|------|--------------------|---------|----------|-------|------------------|-----------------------|----------------------------|
| Burp | Project Intru      | uder | Repeat             | er W    | indow    | He    | lp               |                       |                            |
| Se   | arch               |      | Pr                 | оху     | Intr     | uder  | Repeater         | Collaborator          | Sequencer                  |
| Se   | ettings            |      | nner               |         |          |       |                  |                       |                            |
| Co   | onfiguration libra | ary  | y V                | /ebSocl | kets his | story | Options          |                       |                            |
| Us   | ser settings       | >    | Res                | tore de | faults   |       |                  |                       |                            |
| В    | urp Infiltrator    |      | Load user settings |         |          | 5     |                  |                       |                            |
| В    | urp Clickbandit    |      | Save user settings |         |          | 5     | TP requests fron | n your browser. You v | will need to configure you |
| E)   | kit                |      | ning               | In      | terface  | 2     | Invisible        | Redirect              | Certifica                  |
|      | Edit<br>Remove     |      | 1                  | 27.0.0. | 1:8080   |       |                  |                       | Per-host                   |

Figure 18: Save BurpSuite User settings



Figure 19: Save BurpSuite Project settings

- 5. akeero-test-di.json Template file to create projects in the Akeero serverless application.
- 6. burp-files Directory that contains all the config files used during the research and were required by burp to load with the desired extensions and configurations. These files shall be replaced with the saved user and project configuration files in the above section 3.

## 5 Running the Code

Before running the code please ensure that all artifacts are downloaded and all the necessary changes are made as highlighted in the above section  $\frac{4}{4}$  and all the dependencies are installed. To run the code

- 1. Open a new terminal
- 2. Browse to the updated artifacts folder with main.py file in it.
- 3. Enter command <python3 main.py>.
- 4. Press Enter

- 5. Check Terminal for console logs
- 6. Check Email for Testing Report.

### **Appendix H – Monthly Internship Activity Report**

The Internship Activity Report is a 1-page monthly summary of the activities performed by you and what you have learned during that month. The Internship Activity Report must be signed off by your Company and included in the configuration manual as part of the portfolio submission.

| Student Name: | Deven Ahlawat               | Student number:   | <u>x20214341</u> |
|---------------|-----------------------------|-------------------|------------------|
| Company:      | Akeero Technologies Limited | Month Commencina: | October 2022     |

This month was spent on performing the Literature review on the WebSocket, serverless implementation and automation of security test cases on application based on these technology.

This was followed by identifying methodology to be employed for this research. Multiple models were analyzed before finalizing Waterfall model which was very in-line given the time-frame of research and steps.

Employer comments

Student Signature: Deven Ahlawat\_\_\_\_\_Date: <u>4 Jan 2023</u>

Industry Supervisor Signature: Anthi Gilligan\_\_\_\_\_Date: <u>4 Jan 2023</u>

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The Internship Activity Report is a 1-page monthly summary of the activities performed by you and what you have learned during that month. The Internship Activity Report must be signed off by your Company and included in the configuration manual as part of the portfolio submission.

| Student Name: | Deven Ahlawat               | Student number:   | <u>x20214341</u> |
|---------------|-----------------------------|-------------------|------------------|
| Company:      | Akeero Technologies Limited | Month Commencing: | November 2022    |

Manual Penetration testing of the Akkero Serverless application was carried out in this month with the help of BurpSuite Professional and Kali linux installed on AWS EC2 instance.

This was followed by exploring multiple automation frameworks to automate the testcases from the Manual penetration testing. Selenium was chosen because of its vast resources available online along with its cross-browser implementation and greater flexibility with to choose element with multiple identifiers using Python.

Employer comments

Student Signature: Deven Ahlawat\_\_\_\_\_Date: <u>4 Jan 2023</u>

Industry Supervisor Signature: Anthi Gilligan\_\_\_\_\_Date: <u>4 Jan 2023</u>

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| Student Name: | Deven Ahlawat               | Student number:   | x20214341     |
|---------------|-----------------------------|-------------------|---------------|
| Company:      | Akeero Technologies Limited | Month Commencing: | December 2022 |

Automation of test-cases was done in this month using Selenium and BurpSuite Professional. This was followed by writing the burp extension to generate report and deliver it to the respective stakeholders.

Employer comments

| Student Signature: Deven Ahlawat | Date: | 4 Jan 2023 |
|----------------------------------|-------|------------|
| 5                                |       |            |

Industry Supervisor Signature: Anthi Gilligan\_\_\_\_\_Date: <u>4 Jan 2023</u>

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