



Practical Network Defense

Master's degree in Cybersecurity 2024-25

Reverse proxy activity

Angelo Spognardi

spognardi@di.uniroma1.it

*Dipartimento di Informatica
Sapienza Università di Roma*



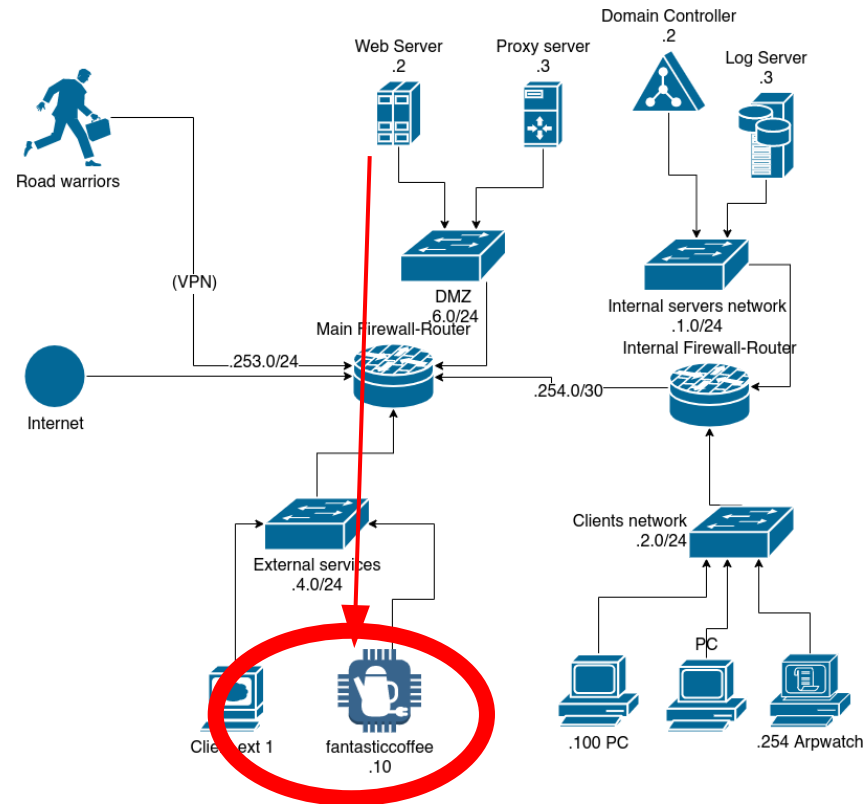
Reverse proxy!



Activity: protect the coffee machine

- You have to create a reverse proxy to give access to the manufacturer of the ACME's coffee machine
- The machine ONLY uses HTTP and is, very likely, prone to security breaches (→ it has vulnerabilities, 100% guarantee!)
- Coffee machine can only be reached via the webserver of the company
- Use the apache mod_proxy module with TLS settings
 - You can generate certificate and keys within opnsense

Coffee machine in ACME co.





Hints

- You should enable the related modules and configure the SSL module

```
root# a2enmod ssl  
root# a2enmod proxy  
root# a2enmod proxy_http
```



Hints

- You should have something like this

```
<VirtualHost *:443>
    # ...default parameters...

    SSLCertificateFile      /etc/ssl/fantasticcoffee.acme-d.test.crt
    SSLCertificateKeyFile   /etc/ssl/fantasticcoffee.acme-d.test.key

    ProxyPreserveHost       On
    ProxyPass                /coffee/ http://100.64.4.10/
    ProxyPassReverse         /coffee/ http://100.64.4.10/
</VirtualHost>
```



One step more

- Configure modsecurity in your webserver so that you can filter the request to be forwarded to the coffee machine
- You should only allow requests with proper parameters
- Hints:
 - reverse engineer the web interface of the machine
 - derive the correct parameters
 - set up modsecurity to check the validity of requests



That's all for today

- Questions?
- See you next lecture!
- References:
 - http://httpd.apache.org/docs/current/mod/mod_proxy.html
 - https://en.wikipedia.org/wiki/Proxy_server
 - Modsecurity handbook
- Google