Web Application Security

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**Group:** TIC21S

**Time management:** Approximately 10 hours

Week 04

Insecure Design:

Juice Shop - Easter

**Title:** Find Easter Egg from Juice Shop.

**Description:** Juice Shop allows html inputs in the search field, which can potentially leak sensitive or unnecessary information. Furthermore, the misconfiguration in the robots.tx file gives attackers an indication of the existence of sensitive directories, leading to further information exposure.

**Steps to produce:**

Use directory scan tool for http:wasdat.fi:3000/. I used dirb.

Using dirb: run command dirb http:wasdat.fi:3000/.

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti

Kuvaus luotu automaattisesti

Open browser and inspect robots.txt for configuration.

Write in browser url: http:wasdat.fi:3000/robots.txt

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti, ohjelmisto

Kuvaus luotu automaattisesti

Running dirb on this directory will result an error because contents of this directory aren't indexed.

Error when trying to run dirb on ftp directory: WARNING: All responses for this directory seem to be CODE = 403..

Let's try to open with browser url: http:wasdat.fi:3000/ftp

Kuva, joka sisältää kohteen teksti, kuvakaappaus, ohjelmisto, Multimediaohjelmisto

Kuvaus luotu automaattisesti

We found file eastere.gg, open it up in browser: http://wasdat.fi:3000/ftp/eastere.gg

We got response, but unfortunately only .md or .pdf is allowed.

Kuva, joka sisältää kohteen teksti, kuvakaappaus, ohjelmisto, Verkkosivusto

Kuvaus luotu automaattisesti

Let's try poison null byte by adding %2500 value in the url.

http://wasdat.fi:3000/ftp/eastere.gg%2500.md

Wolah, we got the egg we were looking for on this challenge:

Kuva, joka sisältää kohteen teksti, Fontti, kuvakaappaus

Kuvaus luotu automaattisesti

* Impact estimation: **Medium Severity**
  + Exposure of non-public files or directories. Potential to be leveraged in conjunction with other vulnerabilities.
  + Leakage of potentially sensitive information. Giving attackers potential targets or hints for further attacks.
* Mitigation:

\*Ensure that all unnecessary files, directories, and endpoints are removed from the production version of the application.

* + Properly configure the robots.txt to avoid leaking sensitive directory or file information. It's important to note that while robots.txt can prevent well-behaving bots from scanning directories, it doesn't prevent malicious users from manually exploring these directories.
  + Use a more robust method for security through obscurity, such as strong access controls and authentication measures.
  + Regularly perform security assessments or vulnerability scans on web applications to identify and fix potential vulnerabilities.
  + Avoid exposing file extensions and instead, provide unique IDs or URLs that do not disclose the nature or purpose of underlying resources.
  + Validate and sanitize all user inputs to prevent potential exploitation.
* Related OWASP CWE:
  + CWE-200: Information Exposure – This vulnerability discloses information to an actor that is not explicitly authorized to have access to that information.
  + CWE-213: Intentional Information Disclosure – This vulnerability means that the software intentionally provides potentially sensitive information to an actor.
  + CWE-538: File and Directory Information Exposure – The software provides an actor with information about the names or other properties of files or directories that are outside of the intended control sphere, providing a point of leverage to conduct further attacks.

Main target - Coupon codes stored in plain text

**Title:** Find and locate sensitive information containing upcoming coupon codes.

**Description:** The application is storing sensitive information, such as coupon codes, in plain text and has made it accessible via the web server. Additionally, the robots.txt file, meant to prevent web crawlers from accessing certain directories, inadvertently discloses sensitive directories.

**Steps to produce:**

Start by directory scanning the http://wasdat.fi/.

dirb <http://wasdat.fi/>

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti

Kuvaus luotu automaattisesti

We found the robots.txt config file.

View the config file in browser:

We found 3 non indexed directories: /private, /intra & /accounts/signup/manager.

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti, ohjelmisto

Kuvaus luotu automaattisesti

Directory /private seems fishy. Let's view that more in depth.

Open in browser: http://wasdat.fi/private.

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti

Kuvaus luotu automaattisesti

We found two files: intra-password.conf and codes.txt. If I would be interested to dig in the intra, I would take a closer look in to the .conf file but this time the target is discount coupons.

Simply opening the file in browser: http:wasdat.fi/private/codes.txt reveals the discount coupon which is the flag in this case.

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti, ohjelmisto

Kuvaus luotu automaattisesti

* Impact estimation: **Medium Severity**
  + Unauthorized access to coupon codes leading to potential financial loss for the company.
  + Disclosure of other potential confidential files or directories.
  + Erosion of trust among users or partners if they come to know that sensitive data is insecurely managed.
* Mitigation:
  + Never store sensitive information, especially in plain text, in publicly accessible directories on the web server.
  + Consider using encryption for sensitive data even if it is stored in a non-publicly accessible location.
  + Remove or limit access to non-essential directories and files on the web server.
  + Rather than relying solely on robots.txt to prevent directory listing, enforce proper access controls on sensitive directories and files.
  + Regularly review server configurations and content to ensure no sensitive data is unintentionally exposed.
  + Consider using a web application firewall (WAF) to further protect against unauthorized access and other web-based threats. Regularly conduct security assessments to ensure no misconfigurations or vulnerabilities are present.
* Related OWASP CWE:
  + CWE-200: Information Exposure – This vulnerability discloses information to an actor not explicitly authorized to have access to that information.
  + CWE-209: Information Exposure Through an Error Message – The application reveals sensitive information through error messages.
  + CWE-522: Insufficiently Protected Credentials – The system does not sufficiently defend the actor's stored credentials.

Main target - Login intra

**Title:** Unauthorized Intranet Access via Information Disclosure

**Description:** The application inadvertently exposes critical configuration files, which reveals login credentials. An attacker can exploit this to gain unauthorized access to restricted parts of the application.

**Steps to produce:**

Start by directory scanning the http://wasdat.fi/.

dirb <http://wasdat.fi/>

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti

Kuvaus luotu automaattisesti

We found the robots.txt config file.

View the config file in browser:

We found 3 non indexed directories: /private, /intra & /accounts/signup/manager.

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti, ohjelmisto

Kuvaus luotu automaattisesti

Directory /intra is in our target. Let's see if we can access that.

Open in browser: http://wasdat.fi/intra.

Unfortunately we faced password login.

Let's seek for secrets from /private repository.

We found two files: intra-password.conf and codes.txt.

Open up in browser: http://wasdat.fi/intra-password.conf.

Unfortunately only .txt files are allowed, maybe poison null byte will do the trick by adding the %2500.txt in the url.

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti, Multimediaohjelmisto

Kuvaus luotu automaattisesti

Yay, we have the password. Head back to /intra and fill in the password we just recived.

Flags just keeps popping up from doors and windows!

Kuva, joka sisältää kohteen teksti, kuvakaappaus, Fontti, numero

Kuvaus luotu automaattisesti

Simply opening the file in browser: http:wasdat.fi/private/codes.txt reveals the discount coupon which is the flag in this case.

* Impact Estimation: **Medium Severity**
  + Unauthorized access to the intranet, which might host sensitive company data, leading to data breaches.
  + Potential manipulation or alteration of data inside the intranet, leading to data integrity issues.
  + Reputation damage for the company due to poor security practices. Potential further attacks if the intranet hosts other critical systems or applications.
  + Possible legal repercussions due to data protection laws and regulations.
* Mitigation:
  + Critical configuration files or any sensitive files should never be stored in publicly accessible directories on the web server.
  + Always enforce strict access controls on sensitive directories and files. This includes configuring server permissions and using .htaccess rules (or equivalent) to restrict access.
  + Use encryption for sensitive files and data, even if stored in non-public directories.
  + Maintain a clear inventory of sensitive files and regularly review them for their security posture.
  + Utilize intrusion detection systems to monitor and alert on unauthorized access attempts.
  + Regularly update and patch the server and all running applications to ensure they are free from known vulnerabilities.
  + Consider using multifactor authentication for critical applications or systems.
  + Regularly conduct penetration testing and vulnerability assessments to identify and mitigate potential vulnerabilities.
* Related OWASP CWE:
  + CWE-200: Information Exposure – This vulnerability reveals information to an actor not explicitly authorized to access that information.
  + CWE-213: Intentional Information Disclosure – The product exposes information to actors not explicitly authorized to receive it.
  + CWE-522: Insufficiently Protected Credentials – The product does not adequately protect sensitive data from being read by unauthorized actors.
  + CWE-548: Exposure of Information Through Directory Listing – A product does not prevent directory listing, which allows attackers to exploit it by accessing directory listings.
  + CWE-640: Weak Password Recovery Mechanism for Forgotten Password – The product has a password recovery mechanism for forgotten passwords, but the mechanism is weak.