

Sri Lanka Institute of Information Technology



# **Path Traversal**

**IE2062 - Web Security**

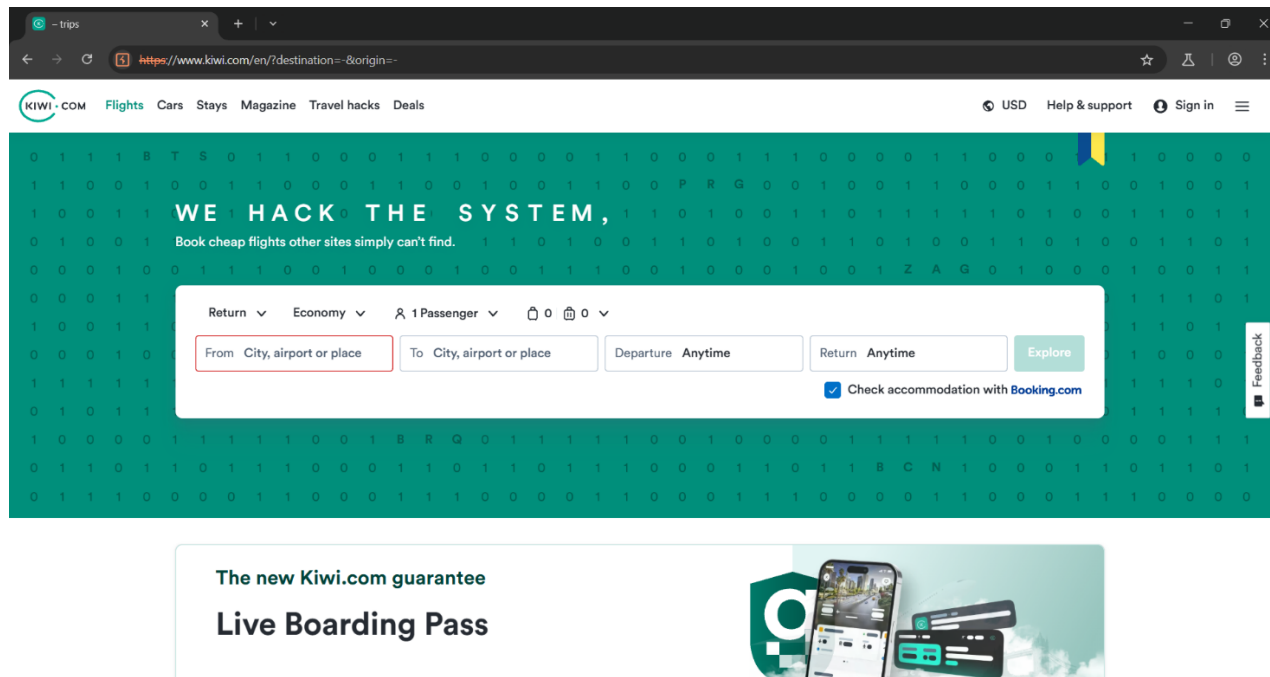
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# Path Traversal Vulnerability in Kiwi.com

## 1. Vulnerability Title

Path Traversal Vulnerability in Kiwi.com Web Application

## 2. Vulnerability Description



## **What is Path Traversal**

Path Traversal, also called Directory Traversal, is a web security vulnerability that lets attackers access files outside a web application's intended folder. Web apps often use user input to decide which files to load, like images or pages. If this input isn't properly checked, attackers can use sequences like `../` (dot-dot-slash) to move up directory levels. For example, changing a URL from `/images/photo.jpg` to `/images/../../etc/passwd` might let an attacker read the `/etc/passwd` file on a Linux server, which contains user account details. This happens because the app doesn't validate the input, and weak server permissions allow access to sensitive files.

## **Path Traversal on Kiwi.com**

Path traversal testing was carried out on <https://www.kiwi.com/en/> to determine whether the application properly handles user input in the URL path. The endpoint: <https://www.kiwi.com/en/origin-colombo-sri-lanka-destination-abu-dhabi-united-arab-emirates-250km> was tested using various path traversal payloads such as `../../etc/passwd`, with tools like Burp Suite. However, none of the test payloads succeeded in accessing restricted files or revealing sensitive data. All responses appeared normal, indicating that the application handled the inputs safely.

This suggests that, based on the findings in the report, the application has proper input validation and directory access controls in place to prevent path traversal vulnerabilities.

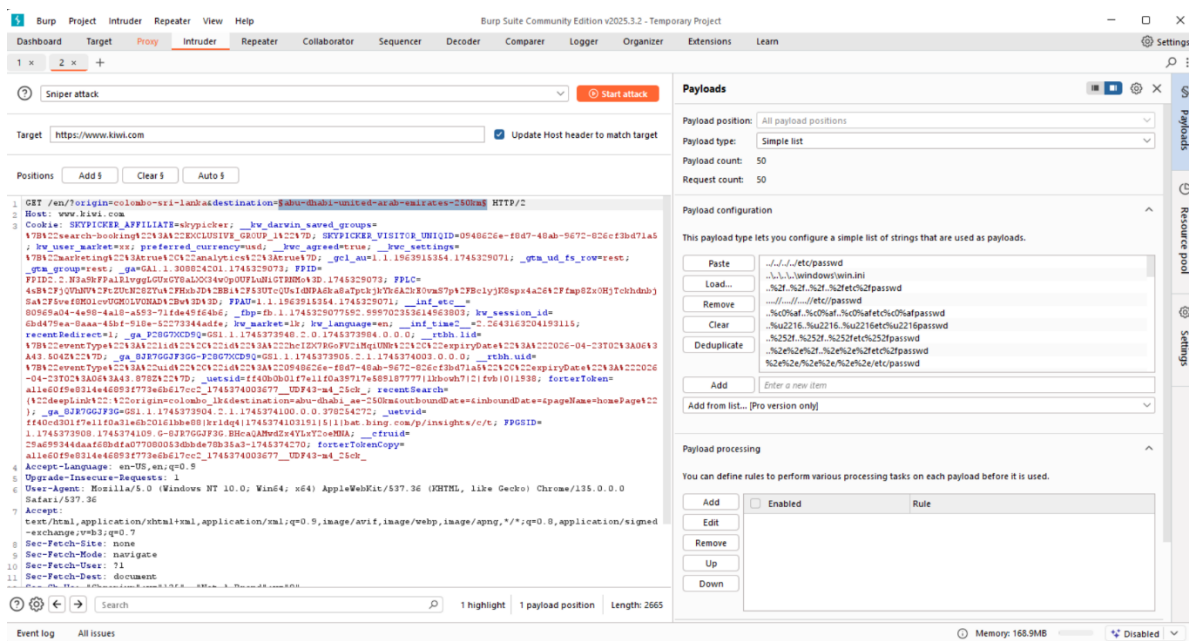
The screenshot displays the Burp Suite interface. The top menu bar includes options like Burp, Project, Intruder, Repeater, View, and Help. Below the menu is a toolbar with various tools. The main window is divided into several panes:

- HTTP History Table:**

#	Host	Method	URL	Params	Edited	Status code	Length	MIME type	Extension	Title	Notes	TLS	IP	Cookies	Time	Listener port	Start response
1	https://www.google.com	GET	/complete/search?client=chrome-o...		✓	302	1385	HTML				✓	64.233.170.103		07:40:02 23 ...	8080	759
2	https://www.kiwi.com	GET	/en/		✓	301	1256	HTML				✓	104.17.91.189	SKYPICKER_AFFILI...	07:41:07 23 ...	8080	402
3	https://www.kiwi.com	GET	/en/searchDeep?origin=colombo...		✓	200	253131	HTML		Kiwi.com   Find Cheap...		✓	104.17.91.189	SKYPICKER_AFFILI...	07:41:08 23 ...	8080	439
4	https://www.kiwi.com	GET	/en/origin=colombo-sri-lanka&d...		✓	200	253131	HTML				✓	104.17.91.189		07:41:09 23 ...	8080	25
5	https://www.kiwi.com	GET	/images/guarantee/guarantee-bad...			200	2147	script	js			✓	104.17.91.189		07:41:09 23 ...	8080	23
6	https://www.kiwi.com	GET	/scripts/en/intl.db7a6eb1.js			200	7897	script	js			✓	104.17.91.189		07:41:09 23 ...	8080	16
7	https://www.kiwi.com	GET	/scripts/runtime.search.ae754cbe.js			200	218946	script	js			✓	104.17.91.189		07:41:09 23 ...	8080	19
8	https://www.kiwi.com	GET	/scripts/en/intl.db7a6eb1.js			200	6633	script	js			✓	104.17.91.189		07:41:09 23 ...	8080	38
9	https://www.kiwi.com	GET	/scripts/en/intl.db7a6eb1.js			200	1671942	script	js			✓	104.17.91.189		07:41:09 23 ...	8080	67
10	https://www.kiwi.com	GET	/scripts/search.9384426f.js			200	385396	script	js			✓	104.17.91.189		07:41:09 23 ...	8080	56
11	https://www.kiwi.com	GET	/scripts/5574.d0928822.js			200	36812	script	js			✓	104.17.91.189		07:41:09 23 ...	8080	38
12	https://www.kiwi.com	GET	/scripts/55642fa224d.js			200											
13	https://www.kiwi.com	GET	/scripts/55642fa224d.js			200											
- Request and Response View:**
  - Request:** Shows the raw HTTP request with headers like Host: www.kiwi.com, Cookie: SKYPICKER\_AFFILIATE=skypicker; \_\_bv\_darwin\_saved\_groups=, and a complex path traversal payload in the URL.
  - Response:** Shows the raw HTTP response (200 OK) with headers including Date, Content-Type, Content-Length, Cache-Control, Expires, Set-Cookie, Vary, Strict-Transport-Security, Pragma, Alt-Svc, Content-Security-Policy, Cross-Origin-Opener-Policy, and another Set-Cookie.
- Inspector:** Displays the selected text from the response, which is the same path traversal payload.
- Request Attributes, Request query parameters, Request cookies, Request headers, Response headers:** These sections provide a structured view of the request and response data.

This shows the Intruder attack results on <https://www.kiwi.com> using path traversal payloads (e.g., `../../../../etc/passwd`).

- Status code 200 means the request succeeded, possibly indicating a vulnerability if sensitive files were accessed.
- Responses with different lengths or response codes (like 400) might indicate filtering or blocked payloads.
- The "Payload" column shows the different path traversal strings tested.
- "Status" column helps identify which payloads succeeded or were blocked.
- A successful `../../../../etc/passwd` attack might return a longer response with UNIX user data.
- If response length is consistent across payloads, the app may return a generic error page could indicate partial mitigation.
- Look for differences in response time, error messages, or unusual content.



This shows the HTTP history tab, listing all requests made through the Burp Proxy.

- The highlighted request includes a path with suspicious parameters (abu-dhabi-united-arab-emirates-250km).
- The response (right pane) is 200 OK, showing that the server accepted the request and included headers like Strict-Transport-Security, Set-Cookie, etc.
- Shows full request and response—useful for analyzing server behavior.
- Useful headers found:
  - Strict-Transport-Security: Prevents man-in-the-middle attacks over HTTP.
  - Set-Cookie: Used for session handling; can be a target for XSS.
  - Content-Security-Policy: Not seen here—may indicate CSP misconfiguration.
- You can right-click → "Send to Repeater" for manual testing of suspicious parameters.
- The URL path might hint at open redirect or file inclusion vectors depending on server behavior.

Attack Save 2. Intruder attack of https://www.kiwi.com

2. Intruder attack of https://www.kiwi.com Attack Save

Results Positions

Capture filter: Capturing all items Apply capture filter

View filter: Showing all items

Request	Payload	Status code	Response received	Error	Timeout	Length	Comment
0		200	365			253131	
1	../../../../etc/passwd	200	787			239400	
2	../../../../windows/win.ini	200	485			239385	
3	../../../../etc/passwd	200	770			239400	
4	../../../../etc/passwd	200	895			239422	
5	../../../../etc/passwd	400	410			694	
6	../../../../etc/passwd	400	443			694	
7	../../../../etc/passwd	200	523			239380	
8	../../../../etc/passwd	200	442			239388	
9	../../../../etc/passwd	200	512			239392	
10	../../../../etc/passwd	200	458			239408	
11	../../../../etc/passwd	200	437			239377	
12	../../../../etc/passwd	200	584			239381	
13	../../../../etc/passwd	200	613			239409	
14	../../../../etc/passwd	200	546			239438	
15	../../../../etc/passwd	200	447			239385	
16	../../../../etc/passwd	200	859			239400	
17	../../../../etc/passwd	200	571			239387	
18	../../../../etc/passwd	200	508			239398	
19	../../../../etc/passwd	200	491			239388	
20	../../../../etc/passwd	200	465			239398	
21	../../../../etc/passwd	200	470			239396	
22	../../../../etc/passwd	200	431			239382	
23	../../../../etc/passwd	200	369			239444	
24	../../../../etc/passwd	200	692			239391	
25	../../../../etc/passwd	200	436			239391	
26	../../../../etc/passwd	200	487			239405	
27	../../../../etc/passwd	200	656			239381	
28	../../../../etc/passwd	200	745			239372	
29	../../../../etc/passwd	200	510			239418	
30	../../../../etc/passwd	200	650			239415	
31	../../../../etc/passwd	200	539			239428	
32	../../../../etc/passwd	200	468			239417	

Request Response

Finished

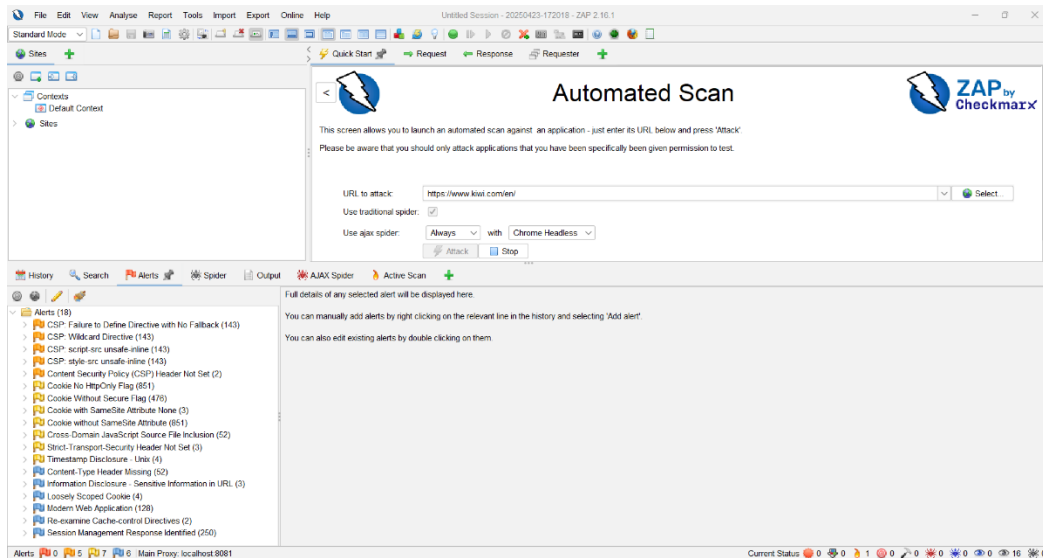
This shows the Intruder configuration screen:

- Attack type: Sniper
- Target: <https://www.kiwi.com>
- One injection point in the query parameter destination
- A list of path traversal payloads is set to test the vulnerability in the selected parameter.
- Sniper attack: Good for single-parameter testing each payload is tested one at a time.
- If multiple inputs need to be tested together (e.g., username and password), use Cluster Bomb.
- The destination parameter is likely user-controlled, making it a good injection point.
- You can add custom payloads or use Burp's built-in Payload Sets for traversal, XSS, LFI, etc.
- Consider enabling grep match for keywords like root:x, Warning, or server errors to flag interesting responses.

## 3. Additional Scans

### OWASP ZAP Scan

An OWASP ZAP scan was performed to identify vulnerabilities:



**ZAP found:**

**No path traversal vulnerabilities either.**

### Nikto Scan

```
(kali@kali)-[~]
$ nikto -h https://www.kiwi.com/en/
- Nikto v2.5.0

+ Multiple IPs found: 104.17.92.189, 104.17.91.189
+ Target IP: 104.17.92.189
+ Target Hostname: www.kiwi.com
+ Target Port: 443

+ SSL Info:
  Subject: /CN=kiwi.com
  Ciphers: TLS_AES_256_GCM_SHA384
  Issuer: /C=US/O=Let's Encrypt/CN=E5
+ Start Time: 2025-04-23 18:18:10 (GMT5.5)

+ Server: cloudflare
+ /en/: Retrieved via header: 1.1 google.
+ /en/: The anti-clickjacking X-Frame-Options header is not present. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options
+ /en/: An alt-svc header was found which is advertising HTTP/3. The endpoint is: ':443'. Nikto cannot test HTTP/3 over QUIC. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/alt-svc
+ /en/: Cookie SKYPICKER_AFFILIATE created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie ; Path created without the secure flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie ; Path created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie __kw_darwin_saved_groups created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_session_id created without the secure flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_session_id created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie SKYPICKER_VISITOR_UNIQID created without the secure flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie SKYPICKER_VISITOR_UNIQID created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_user_market created without the secure flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_user_market created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_market created without the secure flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_market created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_language created without the secure flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /en/: Cookie kw_language created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ ERROR: Error limit (20) reached for host, giving up. Last error: opening stream: can't connect: Connect failed: ; Connection timed out at /var/lib/nikt
o/plugins/LW2.pm line 5254.
: Connection timed out
+ Scan terminated: 8 error(s) and 17 item(s) reported on remote host
+ End Time: 2025-04-23 18:34:29 (GMT5.5) (979 seconds)

+ 1 host(s) tested
```

- Scans for dangerous files, directories, and misconfigurations.
- Can show potential file disclosures or backup files (e.g., /etc/passwd, .bak, .old).
- Checks for HTTP methods like PUT/DELETE, which could aid exploitation.

If Nikto reports:

- “/etc/passwd” found → clear sign of path traversal.
- “Directory indexing enabled” → might allow manual traversal testing.
- Suspicious file extensions or backup files → exploitation may be possible.

**Nikto identified:**

- **No evidence of path traversal vulnerabilities.**

## 4. Mitigation Techniques

### 1. Validate input

- Allow only expected characters (e.g., filenames, IDs).
- Block ../, ..\\, %2e%2e%2f, etc.

### 2. Sanitize user input

- Remove or escape dangerous sequences like ../.

### 3. Use safe functions

- Use realpath() (PHP), os.path.abspath() (Python), getCanonicalPath() (Java).

### 4. Restrict to a base directory

- Only allow access inside a specific folder (e.g., /uploads).

### 5. Avoid direct file access from user input

- Map user input to filenames instead of using raw input.

### 6. Set proper file permissions

- Prevent web apps from accessing sensitive system directories.

### 7. Keep software updated

- Patch web frameworks and libraries regularly.

### 8. Use a Web Application Firewall (WAF)

- Helps detect and block path traversal attempts



## 5. Conclusion

After testing the Kiwi.com website using Burp Suite and running automated scans with OWASP ZAP and Nikto, no Path Traversal vulnerability was found. Many test inputs (payloads) were used to try and access hidden or sensitive files, but none of them worked.

The website always responded in a normal way and didn't show any signs of being tricked or hacked. The scanners also didn't find any problems related to path traversal.

This means the website is handling user input well and is protecting its files from this type of attack. Still, it's a good idea to keep checking the website regularly, follow good security practices, and improve input checks to stay safe from future risks.