

IE2062 – Web Security

Semester 2, 2024

BUB BOUNTY



IT NUMBER: IT22345332

NAME: G.P DINUJAYA THAMARA

WEEKEND BATCH

MALABE CAMPUS

SLIIT Discover Your Future

BSc (Hons) in Information Technology - Year 2

IE2062 – Web Security

Semester 2, 2024

Bug Bounty Platform - Hacker One

Bug Bounty Program - Booking.com

Scope

In Scope Assets

For in Scope Assets please refer to the Scope tab

Out-Of-Scope Applications Any application whether owned by Booking.com or third-party vendor **not included as an in-scope asset** will be mentioned on the scope tab as out of scope.

For Out Of Scope Assets please refer to the Scope tab

In-scope Vulnerabilities

Accepted, in-scope vulnerabilities include, but are not limited to:

- Disclosure of sensitive or personally identifiable information
- Cross-Site Scripting (XSS) Please note, for XSS if the same issue is reported for the different subdomains but with the same root cause, it will be considered duplicate
- Cross-Site Request Forgery (CSRF) for sensitive functions in a privileged context
- Remote code execution (RCE)
- Authentication or authorization flaws, including insecure direct object references and authentication bypass
- Injection vulnerabilities, including SQL and XML injection
- Directory traversal
- Significant security misconfiguration with a verifiable vulnerability
- · Account takeover by exploiting a vulnerability

SLIT Discover Your Future

BSc (Hons) in Information Technology - Year 2

IE2062 - Web Security

Semester 2, 2024

- SSRF
- XXE
- Subdomain takeover in *.booking.com domains

Out-Of-Scope Vulnerabilities Depending on their impact, not all reported issues may qualify for a monetary reward. However, all reports are reviewed on a case-by-case basis and any report that results in a change being made will at a minimum receive recognition. Please note that our **program terms and rules of engagement** still apply.

The following issues are outside the scope of our vulnerability rewards program:

- Any vulnerability which requires access to a compromised email account or Booking.com account for successful exploitation
- Vulnerabilities on Third Party Products
- Attacks requiring physical access to a user's device or network.
- Forms missing CSRF tokens (we require evidence of actual CSRF vulnerability)
- Login/Logout CSRF
- Missing security headers which do not lead directly to a vulnerability
- Use of a known-vulnerable library (without evidence of exploitability)
- · Reports from automated tools or scans
- Social engineering of Booking staff or contractors
- Denial of Service attacks and/or reports on rate limiting issues
- Not enforcing certificate pinning
- Any issues that require a rooted or jailbroken device or a compromised device
- Clickjacking
- Improper session invalidation
- User enumeration
- · Host header injections without a specific, demonstrable impact
- Self-XSS, which includes any payload entered by the victim



IE2062 - Web Security

- Any vulnerabilities requiring significant and unlikely interaction by the victim, such as disabling browser controls
- Content spoofing without embedded HTML or JavaScript
- Hypothetical issues that do not have any practical impact
- Infrastructure vulnerabilities, including:
- · Issues related to SSL certificates
- DNS configuration issues
- Server configuration issues (e.g. open ports, TLS versions, etc.)

Asset name ↑	Туре 🛧	Coverage \uparrow	Max. severity ↓	Bounty \uparrow	Last update ↑
https://iphone-xml.booking.com/json/	URL	In scope	Critical	§ Eligible	Nov 29, 2023
https://secure-iphone-xml.booking.com/json/	URL	In scope	Critical	§ Eligible	Dec 13, 2023
supplier.auth.toag.booking.com	Domain	In scope	Critical	§ Eligible	Jan 24, 2023
metasearch-api.booking.com	Domain	In scope	Critical	§ Eligible	Nov 7, 2023
experiences.booking.com	Domain	In scope	Critical	§ Eligible	Nov 7, 2023
webhooks.booking.com	Domain	In scope	Critical	§ Eligible	Nov 29, 2023
paybridge.booking.com	Domain	In scope	Critical	§ Eligible	Dec 13, 2023
phone-validation.taxi.booking.com	Domain	In scope	Critical	§ Eligible	Dec 13, 2023
autocomplete.booking.com	Domain	In scope	Critical	§ Eligible	Nov 29, 2023
distribution-xml.booking.com	Domain	In scope	Critical	§ Eligible	Nov 29, 2023
paynotifications.booking.com	Domain	In scope	Critical	§ Eligible	Dec 13, 2023
supply-xml.booking.com	Domain	In scope	Critical	§ Eligible	Dec 13, 2023
accommodations.booking.com	Domain	In scope	— Critical	§ Eligible	Nov 29, 2023
portal.taxi.booking.com	Domain	In scope	Critical	§ Eligible	Nov 29, 2023
secure-supply-xml.booking.com	Domain	In scope	Critical	S Eligible	Nov 29, 2023



IE2062 – Web Security

taxis.booking.com	Domain	In scope	Critical	S Eligible	Dec 13, 2023
demo.fareharbor.com	Domain	In scope	— Critical	§ Eligible	Apr 16, 2024
sites.fareharbor.com	Domain	In scope	— Critical	§ Eligible	Apr 16, 2024
chat.booking.com	Domain	In scope	Critical	§ Eligible	Nov 29, 2023
widget.rentalcars.com	Domain	In scope	Critical	§ Eligible	Nov 15, 2023
cars.booking.com	Domain	In scope	Critical	S Eligible	Jul 13, 2023
careers.booking.com	Domain	In scope	Critical	S Eligible	Nov 6, 2023
accommodations.booking.com	Domain	In scope	Critical	§ Eligible	Nov 29, 2023
www.fareharbor.com	Domain	In scope	Critical	§ Eligible	Mar 5, 2024
New compass.fareharbor.com	Domain	In scope	— Critical	§ Eligible	Updated Apr 30, 2024
New fhdn.fareharbor.com	Domain	In scope	Critical	§ Eligible	Updated Apr 30, 2024
*.booking.com if there's any vulnerabilities raised on this asset that are owned by a third party we will not be accepting those reports	Wildcard	In scope	C ritical	§ Eligible	Feb 29, 2024
annual basilian annu llabarran (1) a 14					
www.booking.com/bbmanage/data/*	Wildcard	Out of scope	None	S Ineligible	e Mar 19, 2024
www.booking.com/bbmanage/data/* spadmin.booking.com/	Wildcard	Out of scope Out of scope	None None	S Ineligible S Ineligible	
					e Mar 19, 2024
spadmin.booking.com/	Domain	Out of scope	None	S Ineligible	Mar 19, 2024 Mar 19, 2024
spadmin.booking.com/ www.booking.com/bbmanage/*	Domain Wildcard	Out of scope Out of scope	None None	⑤ Ineligible ⑥ Ineligible	Mar 19, 2024 Mar 19, 2024 Mar 19, 2024
spadmin.booking.com/ www.booking.com/bbmanage/* secure.booking.com/company/*	Domain Wildcard Wildcard	Out of scope Out of scope Out of scope	None None None	\$\square\$ Ineligible\$\square\$ Ineligible	Mar 19, 2024 Mar 19, 2024 Mar 19, 2024 Mar 19, 2024
spadmin.booking.com/ www.booking.com/bbmanage/* secure.booking.com/company/* secure.booking.com/orgnode/*	Domain Wildcard Wildcard Wildcard	Out of scope Out of scope Out of scope	None None None None	\$\square\$ Ineligible\$\square\$ Ineligible\$\square\$ Ineligible	Mar 19, 2024
spadmin.booking.com/ www.booking.com/bbmanage/* secure.booking.com/company/* secure.booking.com/orgnode/* business.booking.com/	Domain Wildcard Wildcard Wildcard	Out of scope	None None None None None	\$\square\$ Ineligible\$\square\$ Ineligible\$\square\$ Ineligible\$\square\$ Ineligible	Mar 19, 2024 Mar 19, 2024



IE2062 – Web Security

Semester 2, 2024

https://widget.rentalcars.com/

result obtain from nikto

```
+ /: Cookie AURUM_BI2 created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /: Cookie ; path created without the secure flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ /: Cookie ; path created without the httponly flag. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Cookies
+ No CGI Directories found (use '-C all' to force check all possible dirs)
+ /crossdomain.xml: Server may leak inodes via ETags, header found with file /crossdomain.xml, inode: W/b0, size: 4eb101a2cf280, mt
ime: gzip. See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2003-1418
+ /crossdomain.xml: The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site
in a different fashion to the MIME type. See: https://www.netsparker.com/web-vulnerability-scanner/vulnerabilities/missing-content
-type-header/
+ /: The Content-Encoding header is set to "deflate" which may mean that the server is vulnerable to the BREACH attack. See: http://breachattack.com/
+ Server is using a wildcard certificate: *.rentalcars.com. See: https://en.wikipedia.org/wiki/Wildcard_certificate
+ OPTIONS: Allowed HTTP Methods: GET, HEAD, POST, TRACE, OPTIONS .
+ 701 requests: 0 error(s) and 18 item(s) reported on remote host
+ End Time: 2024-05-01 19:15:29 (GMT5.5) (114 seconds)

+ 1 host(s) tested
```

According to the nikto The content-Encoding header is set to "deflate" where it may mean the server is vulnerable to breach attacks.

BREACH is a category of vulnerabilities and not a specific instance affecting a specific piece of software. To be vulnerable, a web application must:



IE2062 - Web Security

Semester 2, 2024

- Be served from a server that uses HTTP-level compression
- Reflect user-input in HTTP response bodies
- Reflect a secret (such as a CSRF token) in HTTP response bodies.

Additionally, while not strictly a requirement, the attack is helped greatly by responses that remain mostly the same (modulo the attacker's guess). This is because the difference in size of the responses measured by the attacker can be quite small. Any noise in the side-channel makes the attack more difficult (though not impossible).

It is important to note that the attack is agnostic to the version of TLS/SSL, and does not require TLS-layer compression. Additionally, the attack works against any cipher suite. Against a stream cipher, the attack is simpler; the difference in sizes across response bodies is much more granular in this case. If a block cipher is used, additional work must be done to align the output to the cipher text blocks.

https://www.breachattack.com/

And also it shows that the server may leak inodes via ETags, header found with file /crossdomain.xml, inode: W/b0, size: 4eb101a2cf280, mtime: gzip.

Apache HTTP Server 1.3.22 through 1.3.27 on OpenBSD allows remote attackers to obtain sensitive information via (1) the ETag header, which reveals the inode number, or (2) multipart MIME boundary, which reveals child process IDs (PID).

https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2003-1418



IE2062 - Web Security

Semester 2, 2024

The automated scan through the OWSAP ZAP gives the following results

- Alerts (21)
 - > Place Absence of Anti-CSRF Tokens (24)
 - Pu Content Security Policy (CSP) Header Not Set (23)
 - Pu Cross-Domain Misconfiguration (4)
 - > Missing Anti-clickjacking Header (10)
 - Vulnerable JS Library (2)
 - Cookie No HttpOnly Flag (76)

 - > P Cookie with SameSite Attribute None
 - Cookie without SameSite Attribute (77)
 - > P Cross-Domain JavaScript Source File Inclusion (14)
 - Server Leaks Version Information via "Server" HTTP Response Header Field (2)
 - Strict-Transport-Security Header Not Set (193)
 - X-Content-Type-Options Header Missing (193)

 - Information Disclosure Suspicious Comments (268)
 - Loosely Scoped Cookie (149)
 - > Nodern Web Application (9)
 - > Retrieved from Cache (1460)
 - Session Management Response Identified (235)
 - User Agent Fuzzer (12)
 - > Number Controllable HTML Element Attribute (Potential XSS) (4)



IE2062 – Web Security

Absence of Anti-CSRF Tokens (24)	
GET: https://widget.rentalcars.com/	
GET: https://widget.rentalcars.com/AboutUs.do	
GET: https://widget.rentalcars.com/AboutUs.do	
GET: https://widget.rentalcars.com/AboutUs.do?cor=lk	
GET: https://widget.rentalcars.com/AboutUs.do?cor=lk	
GET: https://widget.rentalcars.com/ContactUs.do	
GET: https://widget.rentalcars.com/ContactUs.do	
GET: https://widget.rentalcars.com/ContactUs.do	
GET: https://widget.rentalcars.com/ContactUs.do?cor=lk	
GET: https://widget.rentalcars.com/ContactUs.do?cor=lk	
GET: https://widget.rentalcars.com/ContactUs.do?cor=lk	
GET: https://widget.rentalcars.com/Help.do	
GET: https://widget.rentalcars.com/Help.do	
GET: https://widget.rentalcars.com/Help.do?cor=lk	
GET: https://widget.rentalcars.com/Help.do?cor=Ik	
GET: https://widget.rentalcars.com/OfferSubscription.do	
GET: https://widget.rentalcars.com/OfferSubscription.do	

Absence of Anti-CSRF Toke	ens en service de la companya de la
JRL: https://widget.r	entalcars.com/
Risk: 🏴 Medium	
Confidence: Low	
Parameter:	
Attack:	
Evidence: <form action="</td><td>https://secure.rentalcars.com/Home.do" id="langCurrencyForm" method="post" name="langCurrencyForm"></form>	
CWE ID: 352	
WASC ID: 9	
Source: Passive (1020	2 - Absence of Anti-CSRF Tokens)
nput Vector:	
Description:	
No Anti-CSRF tokens wer	e found in a HTML submission form.
	ry is an attack that involves forcing a victim to send an HTTP request to a target destination without their knowledge or intent in order to perform an action as the victim. The underlying cause is application functionality using predictable
URL/form actions in a rep	eatable way. The nature of the attack is that CSRF exploits the trust that a web site has for a user. By contrast, cross-site scripting (XSS) exploits the trust that a user has for a web site. Like XSS, CSRF attacks are not necessarily
Other Info:	
No known Anti-CSRF toke	in lanticsrf, CSRFToken, RequestVerificationToken, csrfmiddlewaretoken, authenticity token, OWASP CSRFTOKEN, anoncsrf, csrf token, csrf, csrfSecret, csrf magic, CSRF, token, csrf, token) was found in the following HTML
	try "crmActionType" crmCreateEmail" "crmCreatePsw "crmEmail" "crmOrigin" "crmPsw "dropCity" "dropCountry "dropLocation" "dropLocationName" email" "lang "langCurrencyActionType" locationName" prefource control to the
"preflang" "tmp_email" "tn	
Solution:	
Phase: Architecture and D	No.
	resigni mework that does not allow this weakness to occur or provides constructs that make this weakness easier to avoid.
	Remarkation and was as warnings or occur of produce constitutes that have this wearness caster to avoid. RF packages such as the OWASP CSRF Guard.
Reference:	



IE2062 - Web Security

Semester 2, 2024

Absence of Anti-	
	s//widget rentalcars.com/AboutUs.do
Risk: No. 1	Medium
Parameter:	
Attack:	
	m name="ViewMyBookingListForm" method="POST" action="/MyReservation.do" id="subscribeForm" accept-charset="UTF-8">
CWE ID: 352	
WASC ID: 9	sive (10202 - Absence of Anti-CSRF Tokens)
Source: Pas Input Vector:	Sine (TUZUZ - AUSERICE OF ATTIFICACINE)
Description:	
No Anti-CSRF t	okens were found in a HTML submission form.
	quest forgery is an attack that involves forcing a victim to send an HTTP request to a target destination without their knowledge or intent in order to perform an action as the victim. The underlying cause is application functionality using predictable ns in a repeatable way. The nature of the attack is that CSRF exploits the trust that a web site. Like XSS, CSRF attacks are not necessarily
Other Info:	
	CSRF token [anticsrf, CSRFToken,RequestVerificationToken, csrf_token, csrf_token, authenticity_token, OWASP_CSRFTOKEN, anoncsrf, csrf_token, _csrf, _csrfSecret,csrf_magic, CSRF, _token, _csrf_token] was found in the following HTML [affiliateCode" booking contact email" "booking reference" org.apache.struts.taglib.html.TOKEN" "serverName"].
Solution:	the state of the s
	cture and Design orary or framework that does not allow this weakness to occur or provides constructs that make this weakness easier to avoid.
	se anti-CSRF packages such as the OWASP CSRFGuard.
Reference:	
Absence of Anti-C	CSRF Tokens
	:://widgetrentalcars.com/AboutUs.do?cor=lk
	ledium
Confidence: Low Parameter:	
Attack:	
	m action="https://secure.rentalcars.com/AboutUs.do" method="POST" acceptCharset="UTF-8" id="langCurrencyForm" name="langCurrencyForm">
CWE ID: 352	
WASC ID: 9	
	sive (10202 - Absence of Anti-CSRF Tokens)
Input Vector: Description:	
	okens were found in a HTML submission form.
	uses foregry is an attack that involves foreing a victim to send an HTTP request to a target destination without their knowledge or intent in order to perform an action as the victim. The underlying cause is application functionality using predictable
URL/form action	ns in a repeatable way. The nature of the attack is that CSRF exploits the trust that a web site has for a user. By contrast, cross-site scripting (XSS) exploits the trust that a user has for a web site. Like XSS, CSRF attacks are not necessarily
Other Info:	
	CSRF token [anticsrf, CSRFToken,RequestVerificationToken, csrfmiddlewaretoken, authenticity_token, OWASP_CSRFTOKEN, anoncsrf, csrf_token, _csrfcsrf_Secret,csrf_magic, CSRF, _token, _csrf_token) was found in the following HTML
	city" "corg" "country" "crmActionType" "crmCreateEmail" "crmCreatePsw" "crmEmail" "crmCrigin" "crmPsw" "dropCity" "dropCountry" "dropLocation" "dropLocationName" "email" "langCurrencyActionType" "location" "locationName" "prefourrency"
	email*tmp_ref*).
Solution:	
Phase: Architect	ture and Design ture and Desig
	lary or indirevors rule dues not anow this wearness to occur or provides constitutes that make this wearness easier to avoid, se se anti-CSRF packages such as the OWASP CSRFGuard.
Content Secur	ity Policy (CSP) Header Not Set
URL:	https://widget.rentalcars.com/
Risk:	Medium
Confidence:	High
Parameter:	
Attack:	
Evidence:	
CWE ID:	693
WASC ID:	995 15
Source:	Passive (10038 - Content Security Policy (CSP) Header Not Set)
Alert Reference	2:10038-1
Input Vector:	
Description:	

Content Security Policy (CSP) is an added layer of security that helps to detect and mitigate certain types of attacks, including Cross Site Scripting (XSS) and data injection attacks. These attacks are used for everything from distribution of malware. CSP provides a set of standard HTTP headers that allow website owners to declare approved sources of content that browsers should be allowed to load on that page — covered types are JavaScr and embeddable objects such as Java applets, ActiveX, audio and video files.

Other Info:

Solution:

Ensure that your web server, application server, load balancer, etc. is configured to set the Content-Security-Policy header.



IE2062 – Web Security

	n Misconfiguration
	nttps://cdn.cookielaw.org/scripttemplates/otSDKStub.js
	Neddum Lordium
Confidence: I Parameter:	wedulii
Attack	
Evidence: /	Access-Control-Allow-Origin: *
	264
WASC ID:	14
Source: I	Passive (10098 - Cross-Domain Misconfiguration)
Input Vector:	
Description:	
Web brows	er data loading may be possible, due to a Cross Origin Resource Sharing (CORS) misconfiguration on the web server
Other Info:	
	misconfiguration on the web server permits cross-domain read requests from arbitrary third party domains, using unauthenticated APIs on this domain. Web browser implementations do not permit arbitrary third parties to read the response freed APIs, however. This reduces the risk somewhat. This misconfiguration could be used by an attacker to access data that is available in an unauthenticated manner, but which uses some other form of security, such as IP address white-listing
Solution:	
Ensure that Configure t	sensitive data is not available in an unauthenticated manner (using IP address white-listing, for instance). The "Access-Control-Allow-Origin" HTTP header to a more restrictive set of domains, or remove all CORS headers entirely, to allow the web browser to enforce the Same Origin Policy (SOP) in a more restrictive manner.
Reference:	
Missing Anti- URL:	Cilickjackideland
Risk:	https://widget.rentalcars.com/
Confidence:	re neumi
Parameter	weuum x-fame-odions
Attack:	A Hallic Options
Evidence:	
CWE ID:	1021
WASC ID:	15
Source:	Passive (10020 - Anti-clickjacking Header)
Alert Reference	ze:10020-1
Input Vector: Description:	
Other Info:	
Solution:	
If you expec	b browsers support the Content-Security-Policy and X-Frame-Options HTTP headers. Ensure one of them is set on all web pages returned by your site/app. It the page to be framed only by pages on your server (e.g. it's part of a FRAMESET) then you'll want to use SAMEORIGIN, otherwise if you never expect the page to be framed, you should use DENY. Alternatively consider implementing Content Security mean-costors' directive.
Vuinerable J	SLibrary
	nttps://widget.rentalcars.com/js/tj-min.js
Risk:	[™] Medium
Confidence: I	Medium
Parameter:	
Attack:	
	query"1.4.2"
	329
WASC ID: Source: F	Passive (10003 - Vulnerable JS Library (Powered by Retire.js))
Input Vector:	assire (1990) - railiniating so clinially (1 orrects by realisps))
Description:	
	ed library jquery, version 1.4.2 is vulnerable.
Other Info:	
CVE-2011-4	1969
CVE-2020-	11023
Solution:	
	rade to the latest version of jquery.
- Pafaranca:	
- Aninianca: -	



IE2062 - Web Security

Semester 2, 2024

HTTP/1.1 200 OK

Date: Wed, 01 May 2024 13:27:58 GMT Content-Type: application/javascript

Connection: keep-alive

last-modified: Wed, 31 Aug 2022 07:09:42 GMT

etag: W/"64e65-5e7842e4c3980-gzip" vary: Accept-Encoding,User-Agent

CF-Cache-Status: HIT

Age: 1393

function isScrolledIntoView(elemTop,left,height,width){var docViewTop=\$(window).scrollTop();var docViewBottom=docV:
var tooltip=function(){var id="tt";var top=3;var left=3;var maxw=250;var speed=10;var timer=20;var endalpha=95;var
tt.appendChild(c);tt.appendChild(b);document.body.appendChild(tt);tt.style.opacity=0;tt.style.filter="alpha(opacity
tt.style.width=maxw+"px"}};x.open("GET",v,1);x.send(null)}else c.innerHTML=d;if(!w&&ie){t.style.display="none";b.style.yior_leftPos=1+left;var myLeftPos=0;if(isScrolledIntoView(topPos,leftPos,\$("#tt").height(),\$("#tt").width())).
else \$("#tt").css("top",topPos-\$("#tt").height()-10)},100)},fade:function(d){var a=alpha;if(a!=endalpha&&d==1||a!=0||0;function(window,undefined){var jQuery=function(selector,context){return new jQuery.fn.init(selector,context)},_jQupush=Array.prototype.push,slice=Array.prototype.slice,indexOf=Array.prototype.indexOf;jQuery.fn=jQuery.prototype={context}context.ownerDocument||context:document;ret=rsingleTag.exec(selector);if(ret)if(jQuery.isPlainObject(context)).slength=1;this[0]=elem}this.context=document;this.selector=selector;return this}else if(!context&&/^\w+\$/.testothis.context=selector.context).prototype.makeArray(selector,this)},selector:",jquery:"1.4.2",length:0,size:function(callback).slice.call(arguments).join(","))},map:function(callback).freturn this.pushStack(jQuery.map(this,function(elem,i).fretliouery.isFunction(target)).target={}:if(length==i).ftarget=this:--i}for(:i<length:i++)if((options=arguments[i])!=n</pre>

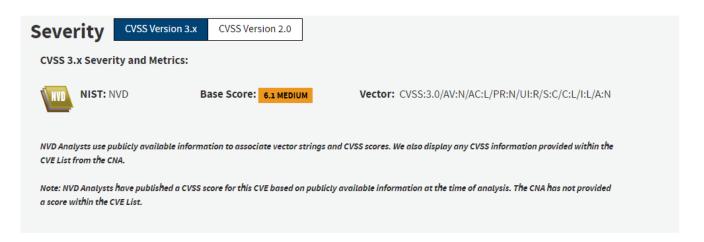
The js library they are using is jquery 1.4.2

jQuery 1.4.2 allows remote attackers to conduct cross-site scripting (XSS) attacks via vectors related to use of the text method inside after.

CVE-2014-6071 Detail

Description

jQuery 1.4.2 allows remote attackers to conduct cross-site scripting (XSS) attacks via vectors related to use of the text method inside after.





IE2062 – Web Security

Semester 2, 2024

The results given from amass enum scan

From the above amass **enum** command output for **widget.rentalcars.com**, here's what we can derive:

1. Domain Name and IP Addresses:

- The domain widget.rentalcars.com resolves to two IP addresses:
 - 104.19.165.108
 - 104.19.164.108

2. Netblock Information:

 Both IP addresses (104.19.165.108 and 104.19.164.108) belong to the netblock 104.16.0.0/14, which is managed by Cloudflare (13335 ASN).

3. Autonomous System Number (ASN):

- The Autonomous System Number (13335) is managed by Cloudflare (CLOUDFLARENET - Cloudflare, Inc.).
- Cloudflare announces the IP range 104.16.0.0/14.

4. Interpretation:



IE2062 – Web Security

Semester 2, 2024

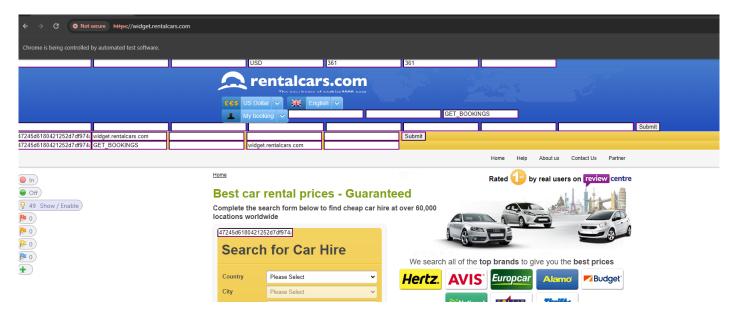
- The domain widget.rentalcars.com is hosted on Cloudflare's infrastructure (104.16.0.0/14 netblock).
- Cloudflare manages the DNS resolution and serves as a proxy for incoming traffic to the domain.

5. Additional Context:

- The presence of multiple IP addresses (104.19.165.108 and 104.19.164.108) might indicate load balancing or redundancy for the domain.
- Cloudflare's management of the domain suggests that security features like DDoS protection, SSL termination, and content caching are likely employed.

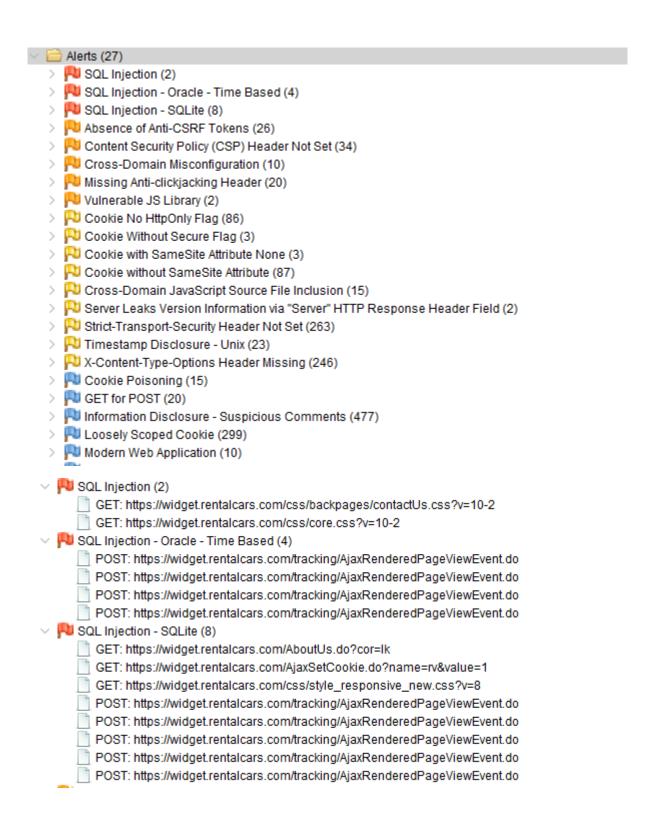
Results which were obtain by manual exploration of the site.

This has 49 hidden fields they have been shown in the screenshot





IE2062 - Web Security





IE2062 - Web Security

Semester 2, 2024

SQL Injection

URL: https://widget.rentalcars.com/css/backpages/contactUs.css?v=10-2

Risk: Nedium

Confidence: Medium

Parameter: v Attack: 10-2

Evidence: CWE ID: 89 WASC ID: 19

Source: Active (40018 - SQL Injection)

Input Vector: URL Query String

Description:

SQL injection may be possible.

Other Info:

The original page results were successfully replicated using the expression [10-2] as the parameter value. The parameter value being modified was stripped from the HTML output for the purposes of the comparison.

Solution:

Do not trust client side input, even if there is client side validation in place.

In general, type check all data on the server side.

If the application uses JDBC, use PreparedStatement or CallableStatement, with parameters passed by '?'

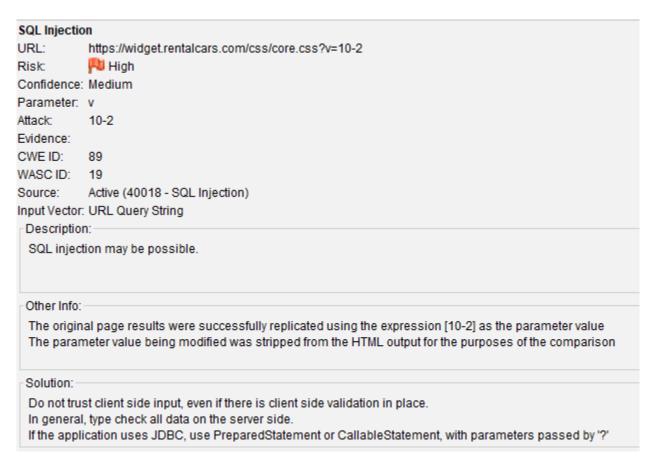
Reference

https://chaatshaatsarias.owasp.org/chaatshaats/SOL_Injection_Prevention_Chaat_Shaat.html

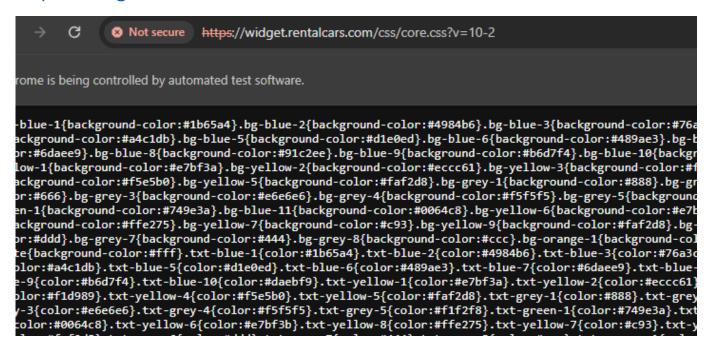


IE2062 - Web Security

Semester 2, 2024



https://widget.rentalcars.com/css/core.css?v=10-2





IE2062 – Web Security

```
-(dinu_mrx® kali)-[~]
-$ sqlmap -u https://widget.rentalcars.com/css/core.css?v=10-2 -a -f
                         1.8.3#stable
                         https://sqlmap.org
!] legal disclaimer: Usage of sqlmap for attacking targets without prio
 mutual consent is illegal. It is the end user's responsibility to obey
all applicable local, state and federal laws. Developers assume no liab
lity and are not responsible for any misuse or damage caused by this pr
ogram
*] starting @ 22:20:20 /2024-05-01/
22:20:20] [INFO] testing connection to the target URL
22:20:20] [INFO] checking if the target is protected by some kind of WA
/IPS
22:20:20] [CRITICAL] WAF/IPS identified as 'CloudFlare'
are you sure that you want to continue with further target testing? [Y/n
22:20:25] [WARNING] please consider usage of tamper scripts (option '--
amper')
22:20:25] [INFO] testing if the target URL content is stable
[22:20:25] [INFO] target URL content is stable
22:20:25] [INFO] testing if GET parameter 'v' is dynamic
22:20:25] [INFO] GET parameter 'v' appears to be dynamic
22:20:26] [WARNING] heuristic (basic) test shows that GET parameter 'v'
might not be injectable
22:20:26] [INFO] testing for SQL injection on GET parameter 'v'
22:20:26] [INFO] testing 'AND boolean-based blind - WHERE or HAVING cla
```



IE2062 – Web Security

Semester 2, 2024

```
23:00:10] [INFO] testing 'SQLite > 2.0 stacked queries (heavy query)'
23:00:19] [INFO] testing 'Firebird stacked queries (heavy query - comment)' 23:00:21] [INFO] testing 'Firebird stacked queries (heavy query)'
23:00:30] [INFO] testing 'SAP MaxDB stacked queries (heavy query - comment)'
23:00:32] [INFO] testing 'SAP MaxDB stacked queries (heavy query)'
23:00:38] [INFO] testing 'HSQLDB ≥ 1.7.2 stacked queries (heavy query - comment)
23:00:39] [INFO] testing 'HSQLDB ≥ 1.7.2 stacked queries (heavy query)'
23:00:42] [INFO] testing 'HSQLDB ≥ 2.0 stacked queries (heavy query - comment)'
23:00:44] [INFO] testing 'HSQLDB ≥ 2.0 stacked queries (heavy query)
23:00:51] [INFO] testing 'MySQL ≥ 5.0.12 AND time-based blind (query SLEEP)'
23:00:56] [INFO] testing 'MySQL ≥ 5.0.12 AND time-based blind (SLEEP)'
23:01:01] [INFO] testing 'MySQL ≥ 5.0.12 AND time-based blind (SLEEP - comment)
23:01:04] [INFO] testing 'MySQL ≥ 5.0.12 AND time-based blind (query SLEEP - com
23:01:08] [INFO] testing 'MySQL < 5.0.12 AND time-based blind (BENCHMARK)'
23:44:36] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (heavy query)'
23:44:38] [INFO] testing 'MySQL < 5.0.12 AND time-based blind (BENCHMARK - commen
23:44:41] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (heavy query - comm
23:44:44] [INFO] testing 'MySQL ≥ 5.0.12 RLIKE time-based blind'
23:44:47] [INFO] testing 'MySQL ≥ 5.0.12 RLIKE time-based blind (comment)'
23:44:49] [INFO] testing 'MySQL ≥ 5.0.12 RLIKE time-based blind (query SLEEP)'
23:44:53] [INFO] testing 'MySQL ≥ 5.0.12 RLIKE time-based blind (query SLEEP - c
23:44:57] [INFO] testing 'MySQL AND time-based blind (ELT)'
23:45:02] [INFO] testing 'MySQL AND time-based blind (ELT - comment)'
23:45:06] [INFO] testing 'PostgreSQL > 8.1 AND time-based blind'
23:45:13] [INFO] testing 'PostgreSQL > 8.1 AND time-based blind (comment)'
                  testing 'PostgreSQL AND time-based blind (heavy query)
23:45:15]
          [INFO]
```

```
[23:00:56] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (SLEEP)'
[23:01:04] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (SLEEP - comment)'
[23:01:08] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (BENCHMARK)'
[23:44:36] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (BENCHMARK)'
[23:44:36] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (Benchmark)'
[23:44:38] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (BENCHMARK)'
[23:44:44] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (BENCHMARK)'
[23:44:44] [INFO] testing 'MySQL > 5.0.12 AND time-based blind (heavy query - comment)'
[23:44:44] [INFO] testing 'MySQL > 5.0.12 RLIKE time-based blind (query SLEEP)'
[23:44:49] [INFO] testing 'MySQL > 5.0.12 RLIKE time-based blind (query SLEEP)'
[23:44:49] [INFO] testing 'MySQL > 5.0.12 RLIKE time-based blind (query SLEEP)'
[23:44:53] [INFO] testing 'MySQL AND time-based blind (ELT)'
[23:44:53] [INFO] testing 'MySQL AND time-based blind (ELT)'
[23:45:02] [INFO] testing 'MySQL AND time-based blind (ELT)'
[23:45:13] [INFO] testing 'PostgreSQL > 8.1 AND time-based blind (comment)'
[23:45:13] [INFO] testing 'PostgreSQL > 8.1 AND time-based blind (comment)'
[23:45:13] [INFO] testing 'PostgreSQL > 8.1 AND time-based blind (comment)'
[23:45:13] [INFO] testing 'PostgreSQL > 8.1 AND time-based blind (comment)'
[23:45:23] [MARNING] user aborted during detection phase
how do you want to proceed? ((S)kip current test/(e)nd detection phase/(n)ext parameter/(c)hange verbosity/(q)uit] e
[23:45:23] [MARNING] parameter 'Referer' does not seem to be injectable.
[23:45:28] [MARNING] parameter 'Referer' does not seem to be injectable.
[23:45:28] [MARNING] parameter 'Referer' does not seem to be injectable.
[23:45:28] [MARNING] HTP error codes detected during run:

[*] ending @ 23:45:28 /2024-05-01/
```

There no any positive result on the vulnerability when scanned with sqlmap.



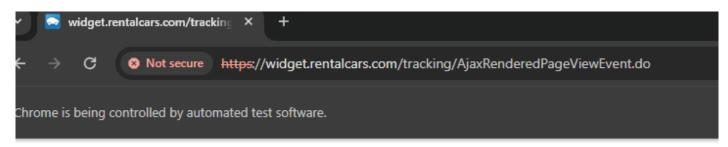
IE2062 - Web Security

Semester 2, 2024



The above page is in inaccessible the below screenshot gives appearance of the above site

https://widget.rentalcars.com/tracking/AjaxRenderedPageViewEvent.do

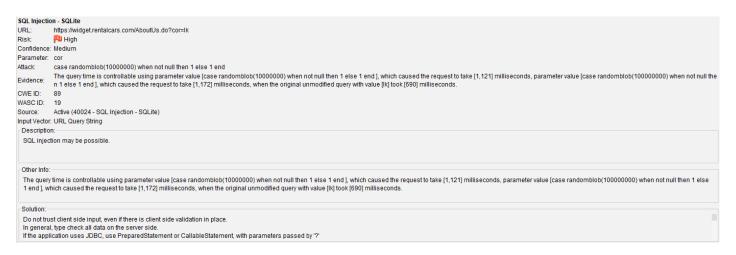


Above site was just a blank site.



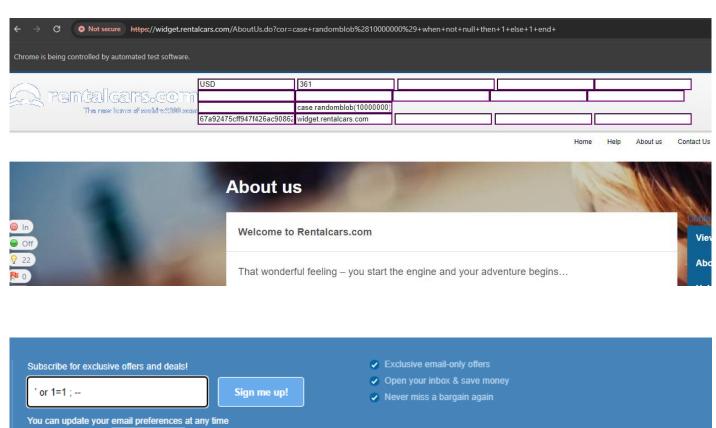
IE2062 - Web Security

Semester 2, 2024



https://widget.rentalcars.com/AboutUs.do?cor=lk

The above site contain 22 hidden fields is shown in the below screenshot

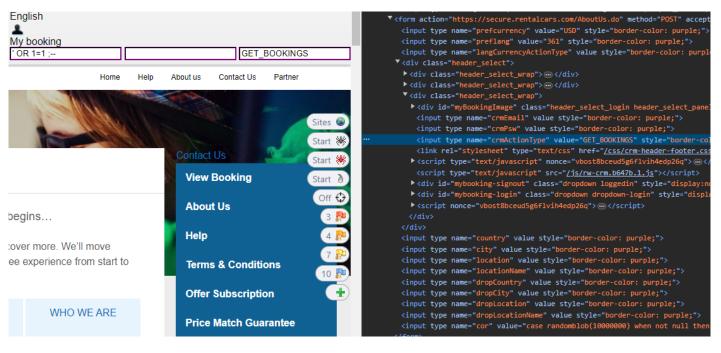


We can't inject here, there the data is properly sanitized.



IE2062 - Web Security

Semester 2, 2024



Following inject also didn't work and I tried to change GET_BOOKINGS in the hidden field to the payload but we can't change it once the enter button is pressed it automatically changes.





IE2062 – Web Security

Semester 2, 2024

Checking with sqlmap for this particular site

https://widget.rentalcars.com/AboutUs.do?cor=case+randomblob%281000 0000%29+when+not+null+then+1+else+1+end+

results are as follows.

```
[23:55:56] [INFO] testing 'Boolean-based blind - Parameter replace (CASE)'
[23:55:58] [INFO] testing 'Boolean-based blind - Parameter replace (CASE - original value)'
[23:55:08] [INFO] testing 'MySQL ≥ 5.0 boolean-based blind - ORDER BY, GROUP BY clause'
[23:56:08] [INFO] testing 'MySQL ≥ 5.0 boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:08] [INFO] testing 'MySQL < 5.0 boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:08] [INFO] testing 'MySQL < 5.0 boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:08] [INFO] testing 'PostgreSQL boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:12] [INFO] testing 'PostgreSQL boolean-based blind - ORDER BY clause (original value)'
[23:56:12] [INFO] testing 'PostgreSQL boolean-based blind - ORDER BY clause (GENERATE_SERIES)'
[23:56:12] [INFO] testing 'Microsoft SQL Server/Sybase boolean-based blind - ORDER BY clause (original value)'
[23:56:13] [INFO] testing 'Microsoft SQL Server/Sybase boolean-based blind - ORDER BY clause (original value)'
[23:56:13] [INFO] testing 'Oracle boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:13] [INFO] testing 'Microsoft Access boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:13] [INFO] testing 'Microsoft Access boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:23] [INFO] testing 'SAP MaxDB boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:26] [INFO] testing 'SAP MaxDB boolean-based blind - ORDER BY, GROUP BY clause (original value)'
[23:56:26] [INFO] testing 'IBM DB2 boolean-based blind - ORDER BY (GROUP BY clause (original value)'
[23:56:26] [INFO] testing 'IBM DB2 boolean-based blind - ORDER BY (CAUSE (ORIGINAL VALUE))'
[23:56:26] [INFO] testing 'MySQL ≥ 5.0 boolean-based blind - Stacked queries'
[23:59:10] [INFO] testing 'PostgreSQL boolean-based blind - Stacked queries'
[23:59:13] [INFO] testing 'PostgreSQL boolean-based blind - Stacked queries (GENERATE_
```



IE2062 - Web Security

Semester 2, 2024

Results given by SQLmap for https://widget.rentalcars.com/

```
sqlmap -u https://widget.rentalcars.com/ -a -f -level 5 -risk 2
                                     {1.8.3#stable}
                                     https://sqlmap.org
  legal disclaimer: Usage of sqlmap for attacking targets without prior mutual consent is illegal. It is the end user's responsib
 ity to obey all applicable local, state and federal laws. Developers assume no liability and are not responsible for any misuse o
damage caused by this program
 ] starting @ 19:44:20 /2024-05-01/
9:44:20] [INFO] testing connection to the target URL
u have not declared cookie(s), while server wants to set its own ('JSESSIONID=25DF4D42561...0.node516a;_cflb=02DiuG4uJ5X...cqCA1
PASE;tj_seed=006559246a0 ...3073000000;CONNECTIONID=17144685974 ...-516|36758;JSESSIONID=25DF4D42561 ...0.node516a;tj_conf="tj_pref_c
 ..tjcor:lk|";tjex=eJwrsTU0NzQ...AK4BCGQ%3D;tjex_infra=""'). Do you want to use those [Y/n] Y
9:44:27] [INFO] checking if the target is protected by some kind of WAF/IPS
9:44:27] [CRITICAL] WAF/IPS identified as 'CloudFlare'
e you sure that you want to continue with further target testing? [Y/n] Y
9:44:32] [WARNING] please consider usage of tamper scripts (option
9:44:32] [INFO] testing if the target URL content is stable
9:44:32] [INFO] testing if the target URL content is stable
9:44:33] [WARNING] target URL content is not stable (i.e. content differs). sqlmap will base the page comparison on a sequence ma
 her. If no dynamic nor injectable parameters are detected, or in case of junk results, refer to user's manual paragraph 'Page com
                                      'MySQL boolean-based blind - Parameter replace (bool*int - original value)'
                                     Mysel Doutean-Dased blind - Parameter replace (book*int - original value)'

'PostgreSQL boolean-based blind - Parameter replace'
'PostgreSQL boolean-based blind - Parameter replace (original value)'
'PostgreSQL boolean-based blind - Parameter replace (GENERATE_SERIES)'
'PostgreSQL boolean-based blind - Parameter replace (GENERATE_SERIES - original value)'
'Microsoft SQL Server/Sybase boolean-based blind - Parameter replace'
'Microsoft SQL Server/Sybase boolean-based blind - Parameter replace'
                                      'Microsoft SQL Server/Sybase boolean-based blind - Parameter replace (original value)'
'Oracle boolean-based blind - Parameter replace'
'Oracle boolean-based blind - Parameter replace (original value)'
               [INFO] testing
 20:47:40]
                [INFO] testing
                                      'Informix boolean-based blind - Parameter replace'
'Informix boolean-based blind - Parameter replace (original value)'
               [INFO] testing 'Microsoft Access boolean-based blind - Parameter replace'
[INFO] testing 'Microsoft Access boolean-based blind - Parameter replace (original value)'
               [INFO] testing 'Boolean-based blind - Parameter replace (DUAL)
              [WARNING] user aborted during detection phase
 ow do you want to proceed? [(S)kip current test/(e)nd detection phase/(n)ext parameter/(c)hange verbosity/(q)uit] e
20:47:53] [WARNING] parameter 'Host' does not seem to be injectable
20:47:53] [RITTCAL] all tested parameters do not appear to be injectable. Try to increase values for '--level'/'--risk' options i you wish to perform more tests. If you suspect that there is some kind of protection mechanism involved (e.g. WAF) maybe you coul try to use option '--tamper' (e.g. '--tamper=space2comment') and/or switch '--random-agent'
20:47:53] [WARNING] HTTP error codes detected during run:
 *] ending @ 20:47:53 /2024-05-01/
```

This domain is invulnerable to SQL injection. I tested this manually also here are the results.

		1	My booking 🗸
aeb2a939b63047ee25216d2	widget.rentalcars.com	' or 1=1 ;	' or 1=1 ;
aeb2a939b63047ee25216d2	GET_BOOKINGS		widget.rentalcars.com



IE2062 – Web Security

or 1=1 ;				
Search for Car Hire				
Country	Andorra			
City	Andorra La Vella (All areas)			
Location	Andorra La Vella (All areas)			
Return car to the	same location			
Pick UpDate:				
(Married Married Marri	August '25 🔻			
Time:				
10 🗸 00 🗸	10 🗸 00 🗸			
Drop OffDate:	Drop OffDate:			
Wed 15 ✔ A	August '25			
Time:				
10 🗸 00 🗸	•			
3	5			
2024	6			
5 2024				
Driver aged 30 − 65? ✓ i				
0 20				
	Search			
' or 1=1 ;	true			

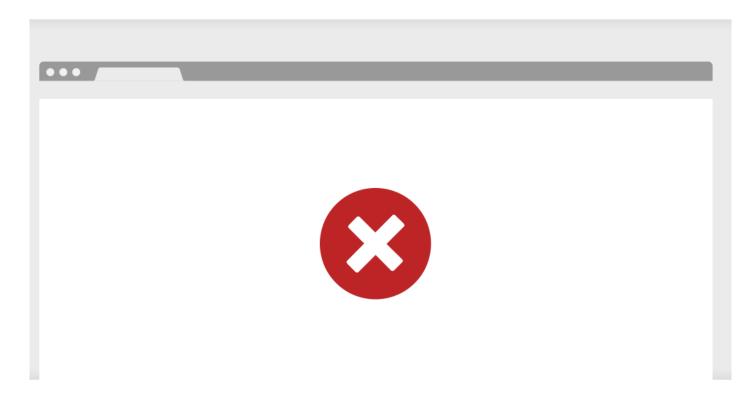


IE2062 - Web Security

Semester 2, 2024

Sorry, you have been blocked

You are unable to access rentalcars.com



Why have I been blocked?

This website is using a security service to protect itself from online attacks. The action you just performed triggered the security solution. There are several actions that could trigger this block including submitting a certain word or phrase, a SQL command or malformed data.

What can I do to resolve this?

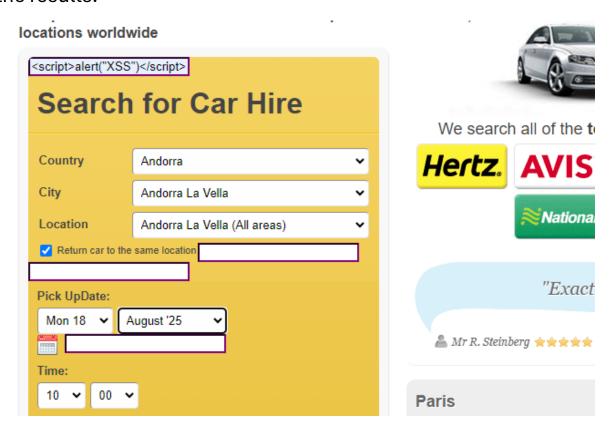
You can email the site owner to let them know you were blocked. Please include what you were doing when this page came up and the Cloudflare Ray ID found at the bottom of this page.



IE2062 - Web Security

Semester 2, 2024

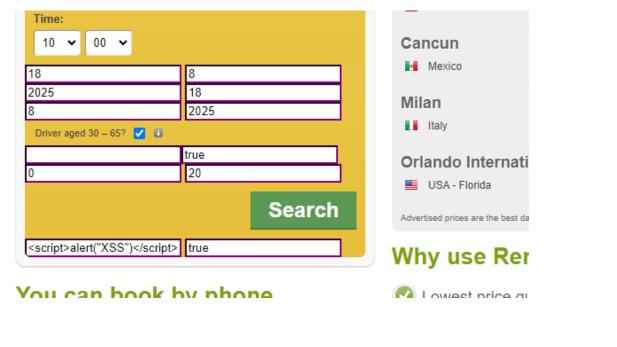
This domain is invulnerable to XSS injection. I test this manually also here are the results.

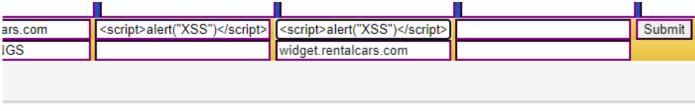




IE2062 - Web Security

Semester 2, 2024





Home

Best car rental prices - Guaranteed

Complete the search form below to find cheap car hire at over 60,0 locations worldwide



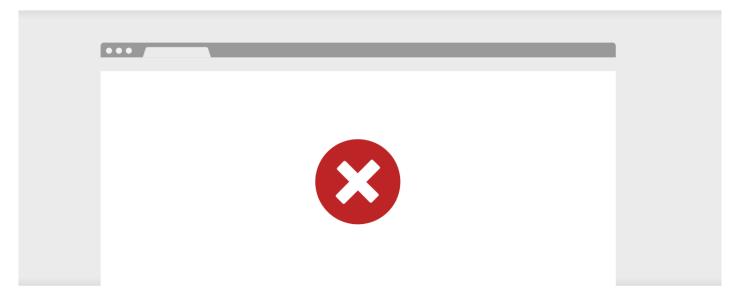
I enter basic XSS attack to almost all the hidden fields they are also properly sanitized

IE2062 - Web Security

Semester 2, 2024

Sorry, you have been blocked

You are unable to access rentalcars.com



Why have I been blocked?

This website is using a security service to protect itself from online attacks. The action you just performed triggered the security solution. There are several actions that could trigger this block

What can I do to resolve this?

You can email the site owner to let them know you were blocked. Please include what you were doing when this page came up and the Cloudflare Ray ID found at the bottom of this page.

Why have I been blocked?

This website is using a security service to protect itself from online attacks. The action you just performed triggered the security solution. There are several actions that could trigger this block including submitting a certain word or phrase, a SQL command or malformed data.

What can I do to resolve this?

You can email the site owner to let them know you were blocked. Please include what you were doing when this page came up and the Cloudflare Ray ID found at the bottom of this page.



IE2062 - Web Security

Semester 2, 2024

The site is invulnerable to directory traversal.

```
TESTING RESULTS =
 +] Ready to launch 3.33 traversals per second
+] Press Enter to start the testing (You can stop it pressing Ctrl + C)
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/../etc/passwd
*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/../../etc/passwd
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/../../../etc/passw
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/../../../etc/pa
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/../../../../etc
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/../../../../../
etc/passwd
[*] HTTP Status: 404 | Testing Path: http://widget.rentalcars.com:80/..%5Cetc%5Cpasswd
[*] HTTP Status: 404 | Testing Path: http://widget.rentalcars.com:80/..%5C..%5Cetc%5Cpa
sswd
[*] HTTP Status: 404 | Testing Path: http://widget.rentalcars.com:80/..%5C..%5C..%5Cetc
%5Cpasswd
[*] HTTP Status: 404 | Testing Path: http://widget.rentalcars.com:80/..%5C..%5C..%5C..%
5Cetc%5Cpasswd
[*] HTTP Status: 404 | Testing Path: http://widget.rentalcars.com:80/..%5C..%5C..%5C..%
5C..%5Cetc%5Cpasswd
[*] HTTP Status: 404 | Testing Path: http://widget.rentalcars.com:80/..%5C..%5C..%5C..%
5C.. %5C.. %5Cetc%5Cpasswd
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/..%2fetc%2fpasswd
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/..%2f..%2fetc%2fpa
[*] HTTP Status: 400 | Testing Path: http://widget.rentalcars.com:80/..%2f..%2f..%2fetc
2fpasswd
```



IE2062 - Web Security

```
| HTTP | Status | 404 | Testing | Path: http://widget.rentalcars.com:80/..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c0%25af..%01%25c
```