Blind Elephant:

Web Application Fingerprinting & Vulnerability Inferencing

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QUALYS®

Outline

- Web Apps & Security
- Existing Fingerprinting Approaches
- Static File Approach
- Observations From A Net Survey

- Q & A

Well-Known Web Applications

- Every conceivable use…
  - Content Management/Blogging
  - Forums
  - Email
  - E-Commerce
  - DB Admin
  - Backup and File Storage Admin
  - Device/System/VM Admin
  - Version Control UI
  - Intranet/Collaboration

Well-Known Web Applications

LIFERAY
Enterprise. Open Source. For Life.

Microsoft® Office SharePoint®

Joomla!™

moodle

osCommerce
Open Source E-Commerce Solutions

MOVABLE TYPE™ 4
Publishing Platform

phpMyAdmin

Drupal

vmware®

Special Challenges Securing Web Apps

- Remotely accessible by nature
- Lots of attack surface exposed (direct and indirect)
- Easy to set up and admin → Fly under IT radar

Special Challenges Securing Web Apps

- Fast release cycle (often open-source)
- Exploits are (often) simpler to create & comprehend

  "wget http://example.com/wp-login.php?action=rp&key[]="

  "wget –header "Cookie: tinybrowser_lang=../../../../../../../ZOMGSECRETS\r\n" http://example.com/plugins/editors/tinymce/jscripts/tiny_mce/plugins/tinybrowser/folders.php

- (…and of course everything the WAF vendors are saying)

WAS Is Overkill For Well-Known Apps

- Known app + known-vulnerability list = traditional vulnerability management
- Knowing the version is good enough to infer vulnerabilities
  - It's not nearly as sexy, but it works
- Discovering the app and version → Fingerprinting

Existing Fingerprinting Approaches

- Labor intensive to add/update signatures
  - Manually locate version in files or build regexes for headers
  - If selected strings go away, human effort to notice and update
- Decent hardening pretty much nukes them
  - Built-in options to remove identifiers (eg, meta generator)
  - Remove standard files
- Easy to lie to

- Fingerprinters like this:
- Sedusa (in nmap), Wappalyzer, BackendInfo, Plecost, etc, etc…

More Advanced Tools

- Typically improve in one area
  - Resistant to hardening
  - Less labor intensive
- Have their own downsides
  - Less specific results
  - Some request massive amounts of data (> 20 megs!)
  - Some are less generic (Plecost = Wordpress Only)
- Fingerprinters like this:
- Sucuri, WAFP, WhatWeb, BackEndInfo (sortof),

Goals for a (WebApp) Fingerprinter

- Very Generic
- Fast
- Low resource usage
- Accurate (Low FP/FN)
- Resistant to hardening/banner removal
- Super easy to support new versions/apps

→ We'll come back to these later

The Blind Men and the Elephant

Collect and Eliminate Possibilities

Tree or Elephant

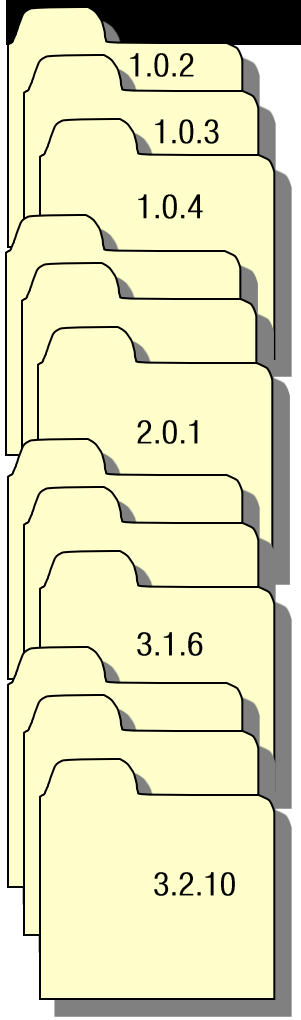
Spear or Elephant

Vine or Elephant

Fan or Elephant

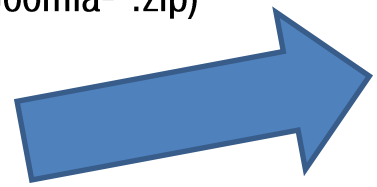
Intersect the Possibilities and…

Preparing the Data



Web App Versions

(eg, Joomla-*.zip)

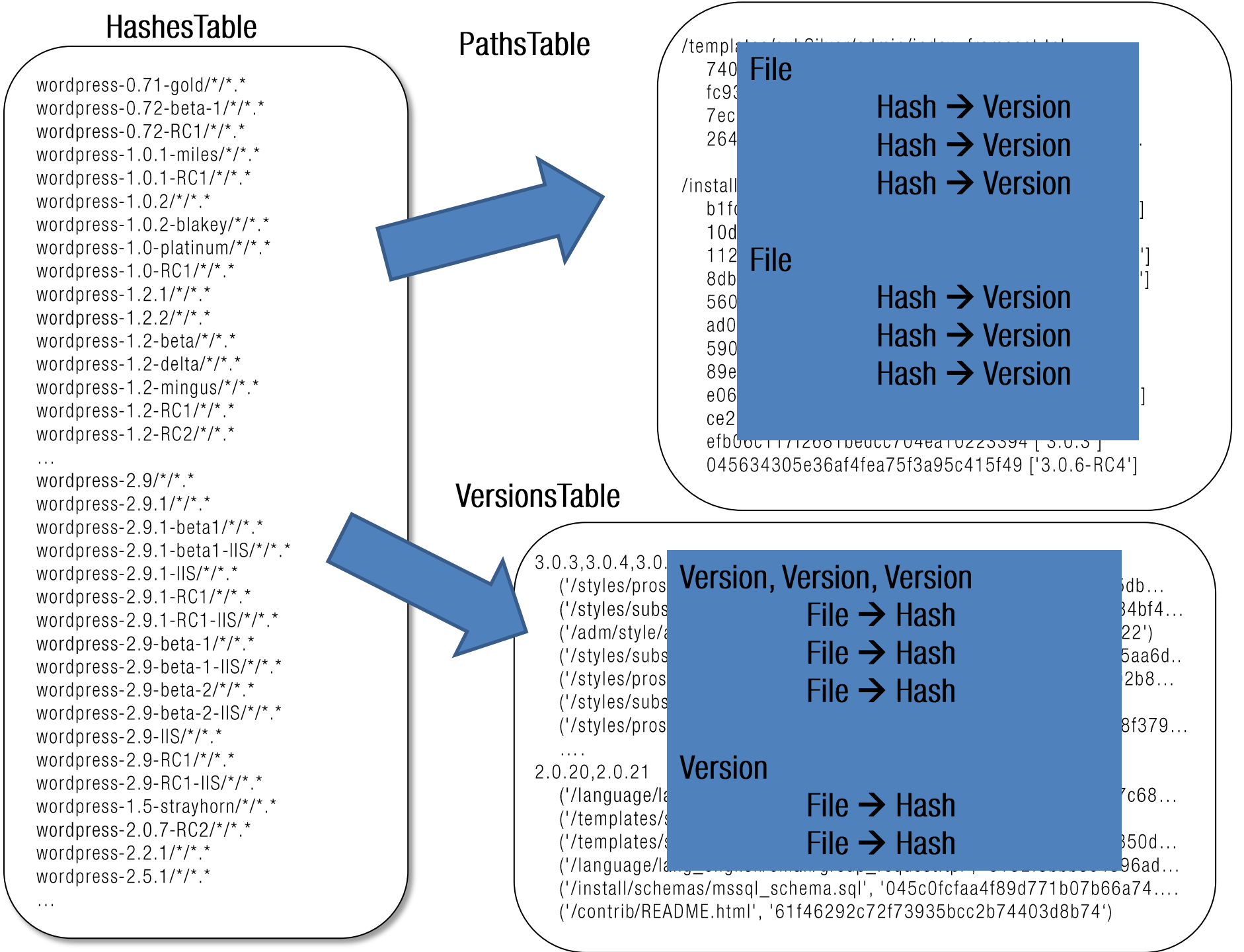


Paths Table

What versions will a path give me info on?

Versions Table

If I want to confirm or rule out a version/versions, what's a path that will do that?

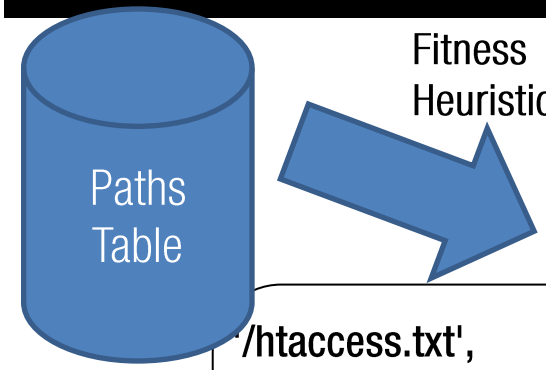

HashesTable
wordpress-0.71-gold/*/*.*
wordpress-0.72-beta-1/*/*.*
wordpress-0.72-RC1/*/*.*
wordpress-1.0.1-miles/*/*.*
wordpress-1.0.1-RC1/*/*.*
wordpress-1.0.2/*/*.*
wordpress-1.0.2-blakey/*/*.*
wordpress-1.0-platinum/*/*.*
wordpress-1.0-RC1/*/*.*
wordpress-1.2.1/*/*.*
wordpress-1.2.2/*/*.*
wordpress-1.2-beta/*/*.*
wordpress-1.2-delta/*/*.*
wordpress-1.2-mingus/*/*.*
wordpress-1.2-RC1/*/*.*
wordpress-1.2-RC2/*/*.*
...
wordpress-2.9/*/*.*
wordpress-2.9.1/*/*.*
wordpress-2.9.1-beta1/*/*.*
wordpress-2.9.1-beta1-IIS/*/*.*
wordpress-2.9.1-IIS/*/*.*
wordpress-2.9.1-RC1/*/*.*
wordpress-2.9.1-RC1-IIS/*/*.*
wordpress-2.9-beta-1/*/*.*
wordpress-2.9-beta-1-IIS/*/*.*
wordpress-2.9-beta-2/*/*.*
wordpress-2.9-beta-2-IIS/*/*.*
wordpress-2.9-IIS/*/*.*
wordpress-2.9-RC1/*/*.*
wordpress-2.9-RC1-IIS/*/*.*
wordpress-1.5-strayhorn/*/*.*
wordpress-2.0.7-RC2/*/*.*
wordpress-2.2.1/*/*.*
wordpress-2.5.1/*/*.*
...
PathsTable
File
Hash → Version
Hash → Version
Hash → Version
File
Hash → Version
Hash → Version
Hash → Version
045634305e36af4fea75f3a95c415f49 ['3.0.6-RC4']
VersionsTable
Version, Version, Version
File → Hash
File → Hash
File → Hash
Version
File → Hash
File → Hash
('/install/schemas/mssql_schema.sql', '045c0fcfaa4f89d771b07b66a74....
('/contrib/README.html', '61f46292c72f73935bcc2b74403d8b74')

How Many Files?

- Wordpress ~83k files in 166 versions
- phpBB ~17k files in 32 versions
- MediaWiki ~68k files in 68 versions
- Joomla ~109k files in 33 versions
- MovableType ~164k files in 95 versions
- Drupal ~33k files in 114 versions
- … and many more

- Wordpress Plugins ~103k files in 1200 versions
- Drupal Plugins ~76K files in 983 versions

Fingerprinting



Fitness
Heuristic

Best Candidates to Identify the Version

'/htaccess.txt',	**14 hashes/31 versions, fitness=15.0**
'/language/en-GB/en-GB.ini',	**14 hashes/20 versions, fitness=14.64**
'/language/en-GB/en-GB.com_content.ini',	**13 hashes/20 versions, fitness=13.64**
'/configuration.php-dist',	**10 hashes/28 versions, fitness=10.90**
'/includes/js/joomla.javascript.js',	**8 hashes/28 versions, fitness=8.90**
'/media/system/js/validate.js',	8 hashes/20 versions, fitness=8.64
'/media/system/js/caption.js',	8 hashes/20 versions, fitness=8.64
'/language/en-GB/en-GB.mod_feed.ini',	8 hashes/20 versions, fitness=8.64
'/media/system/js/openid.js',	8 hashes/20 versions, fitness=8.64
'/language/en-GB/en-GB.com_contact.ini',	8 hashes/20 versions, fitness=8.64
'/language/en-GB/en-GB.mod_breadcrumbs.ini',	7 hashes/20 versions, fitness=7.64
'/media/system/js/combobox.js',	7 hashes/20 versions, fitness=7.64
'/language/en-GB/en-GB.mod_search.ini',	7 hashes/20 versions, fitness=7.64
'/templates/rhuk_milkyway/css/template.css',	7 hashes/20 versions, fitness=7.64
'/media/system/js/switcher.js',	7 hashes/20 versions, fitness=7.64

Candidate Files: MovableType

- /mt-static/mt.js
- /mt-static/js/tc/client.js
- /mt-static/css/main.css
- /tools/run-periodic-tasks
- /mt-static/js/tc/tagcomplete.js
- /mt-static/js/edit.js
- /mt-static/js/tc/mixer/display.js
- /mt-static/js/archetype_editor.js
- /mt-static/js/tc/mixer.js
- /mt-static/js/tc/tableselect.js
- …

Candidate Files: Mediawiki

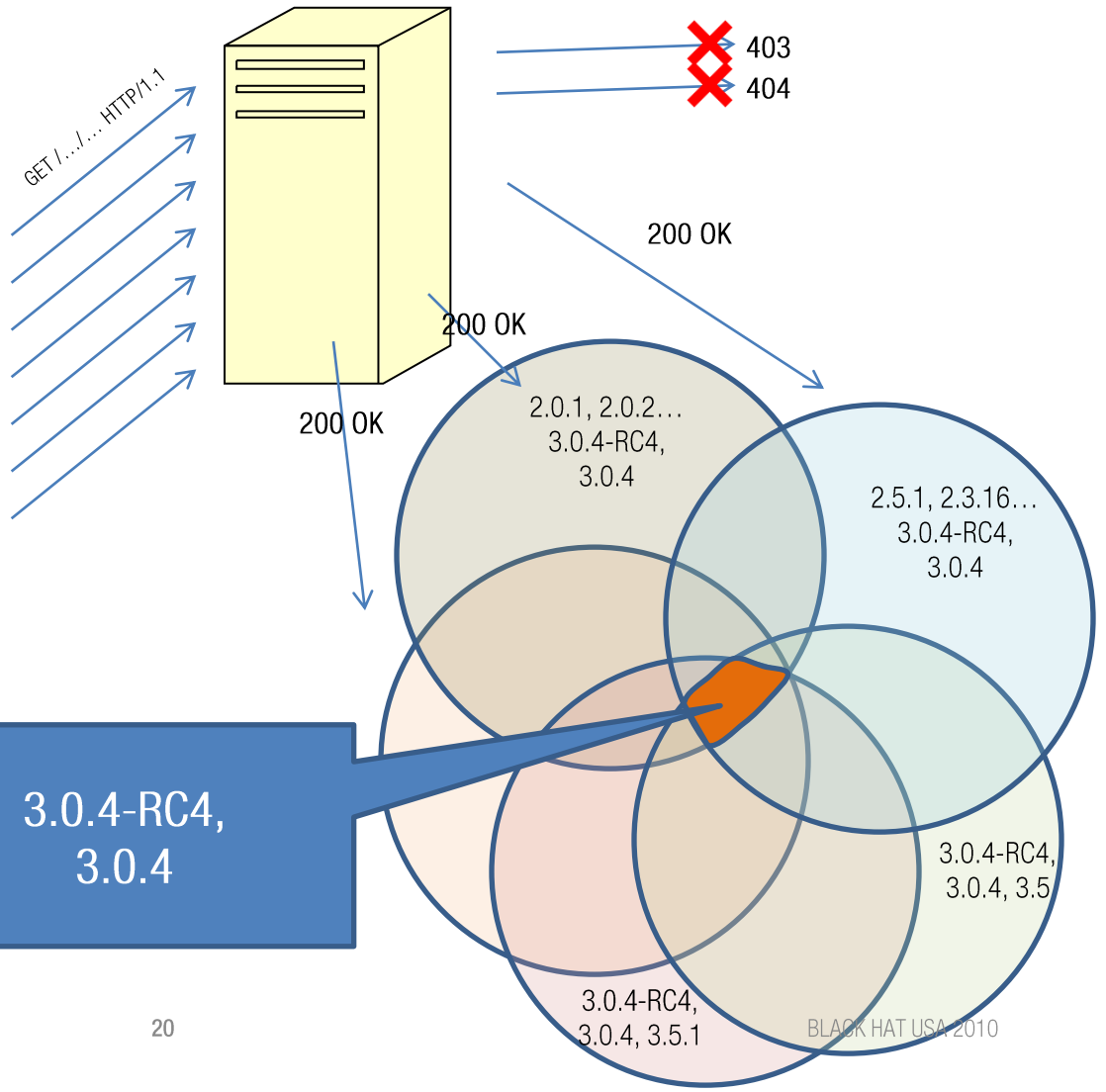
- /Documentation.html
- /ChangeLog
- /translators.html
- /README
- /scripts/create-release.sh
- /lang/sync_lang.sh
- /Documentation.txt
- /scripts/create_tables.sql
- /js/functions.js
- /lang/check_lang.sh
- …

Fully data-driven approach finds useful info even in obscure and counterintuitive files

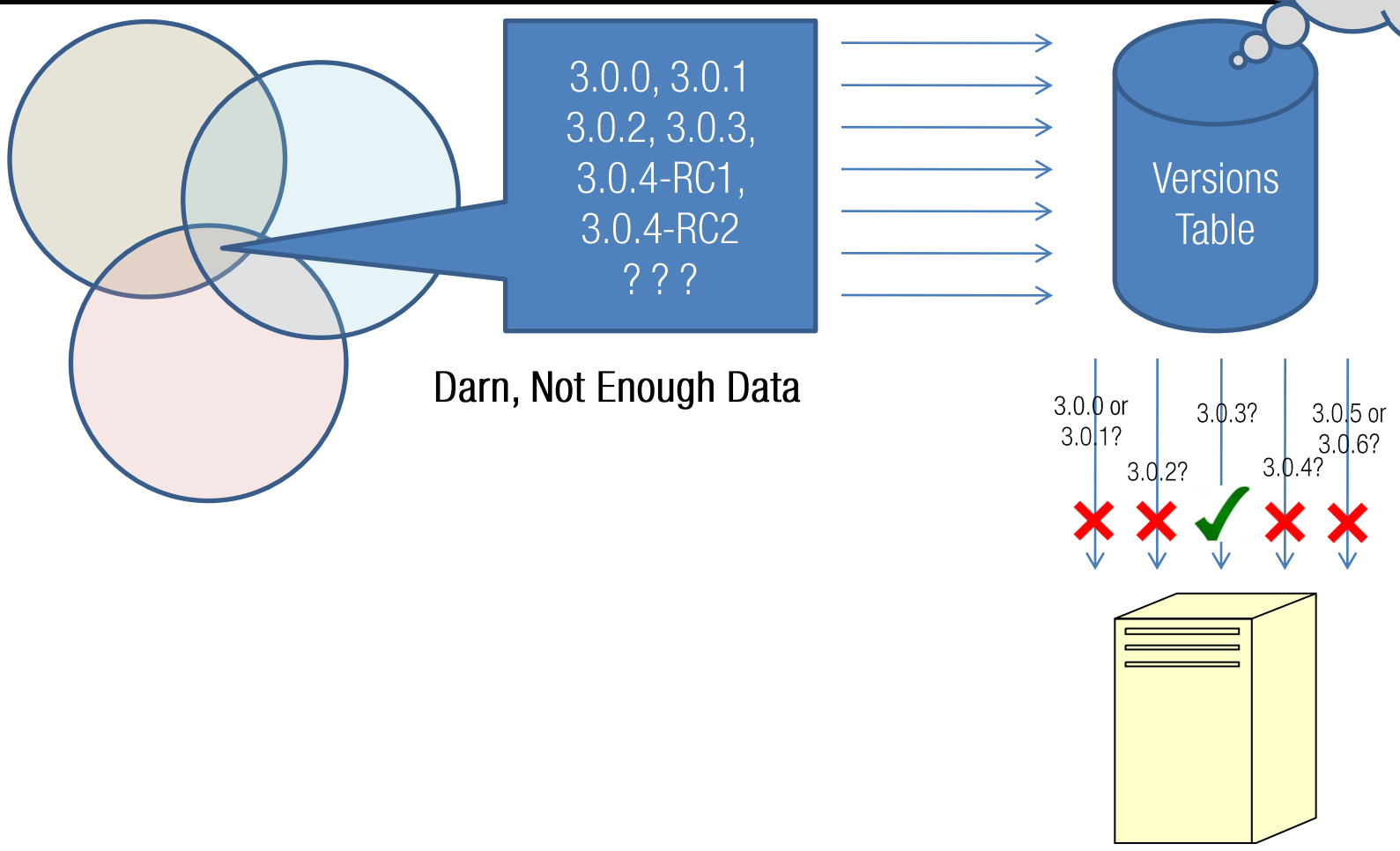
Fingerprinting

Best Candidates

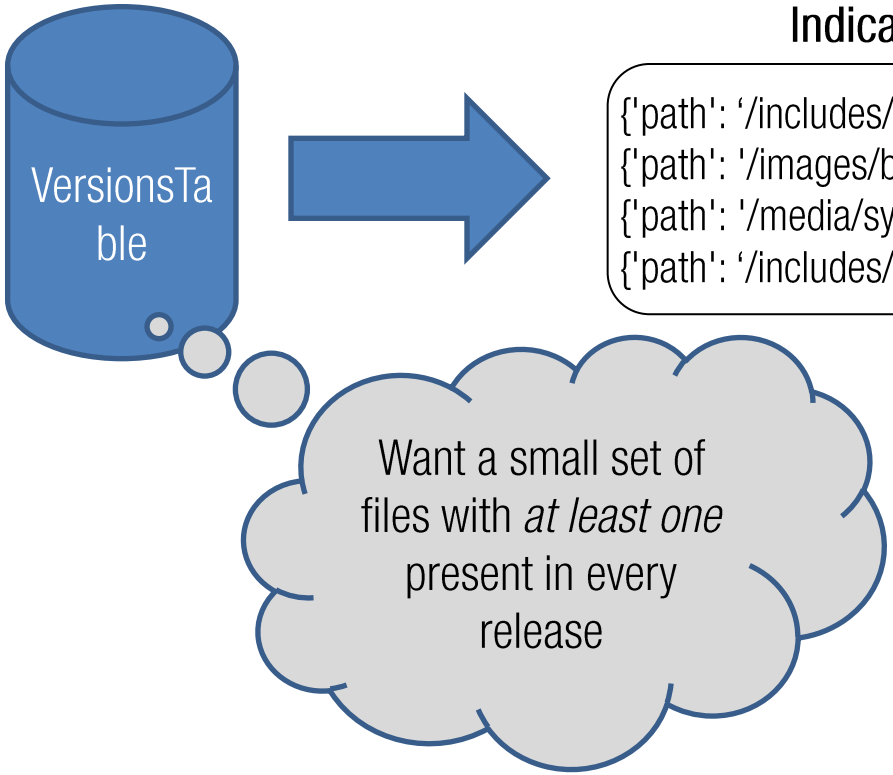
'/htaccess.txt'
'/language/en-GB/en-GB.ini'
'/language/en-GB/en-GB.com_content.ini'
'/configuration.php-dist',
'/includes/js/joomla.javascript.js'
'/media/system/js/validate.js'
'/media/system/js/caption.js'
'/language/en-GB/en-GB.mod_feed.ini'
'/media/system/js/openid.js'
'/language/en-GB/en-GB.com_contact.ini'
'/language/en-GB/en-GB.mod_breadcrumbs.ini'
'/media/system/js/combobox.js'
'/language/en-GB/en-GB.mod_search.ini'
'/templates/rhuk_milkyw/css/template.css'
'/media/system/js/switcher.js'



Winnowing


(confirm or rule out versions)
3.0.0, 3.0.1
3.0.2, 3.0.3,
3.0.4-RC1,
3.0.4-RC2
? ? ?
Versions Table
Darn, Not Enough Data
3.0.0 or 3.0.1?
3.0.2?
3.0.3?
3.0.4?
3.0.5 or 3.0.6?

App Discovery / App Guessing



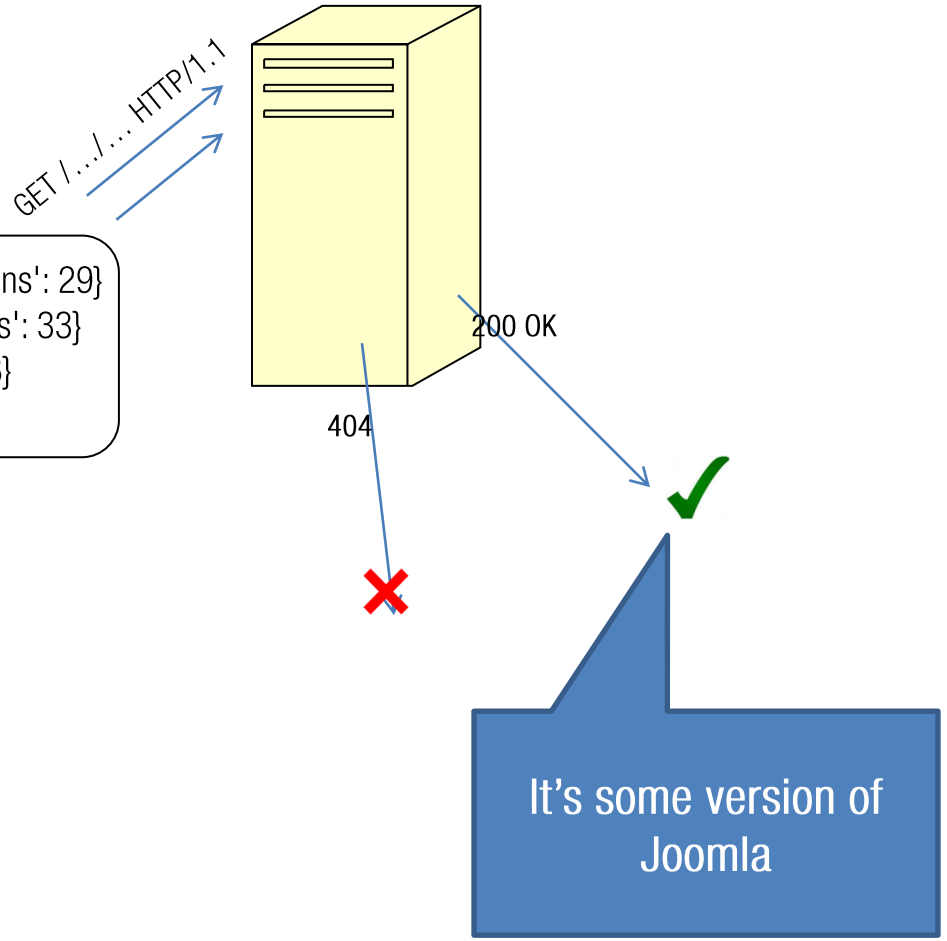
Indicator Files

```
{'path': '/includes/js/dtree/img/frontpage.gif"',  'versions': 29}
{'path': '/images/banners/osmbanner2.png',  'versions': 33}
{'path': '/media/system/js/mootools.js',  'versions': 18}
{'path': '/includes/js/wz_tooltip.js ',  'versions': 29}
```

App Discovery / App Guessing

Indicator Files

{'path': '/includes/js/dtree/img/frontpage.gif"', 'versions': 29}
{'path': '/images/banners/osmbanner2.png', 'versions': 33}
{'path': '/media/system/js/mootools.js', 'versions': 18}
{'path': '/includes/js/wz_tooltip.js ', 'versions': 29}



Supporting a New App

- Gather every version you can find, dump them in a directory
- [Optional] Supply a regex to exclude directories/files from fingerprinting
  - (eg .php files, protected admin directory, .htaccess, etc)
- Use BlindElephant to build the datafiles
- Fingerprint!
- …Profit?

Does it work?

- **$./BlindElephant.py http://laws.qualys.com movabletype**
- **Loaded movabletype with 96 versions, 2229 differentiating paths, and 209 version groups.**
- **Starting BlindElephant fingerprint for version of movabletype at http://laws.qualys.com**

- Hit http://laws.qualys.com/mt-static/mt.js
- Possible versions based on result: 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/tc/client.js
- Possible versions based on result: 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/css/main.css
- Possible versions based on result: 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM

- Hit http://laws.qualys.com/tools/run-periodic-tasks
- File produced no match. Error: Error code: 404 (Not Found)

Does it work?

- Hit http://laws.qualys.com/mt-static/js/tc/tagcomplete.js
- Possible versions based on result: 4.1-en, 4.1-en-CS, 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/edit.js
- Possible versions based on result: 4.1-en, 4.1-en-CS, 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/tc/mixer/display.js
- Possible versions based on result: 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/archetype_editor.js
- Possible versions based on result: 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

Does it work?

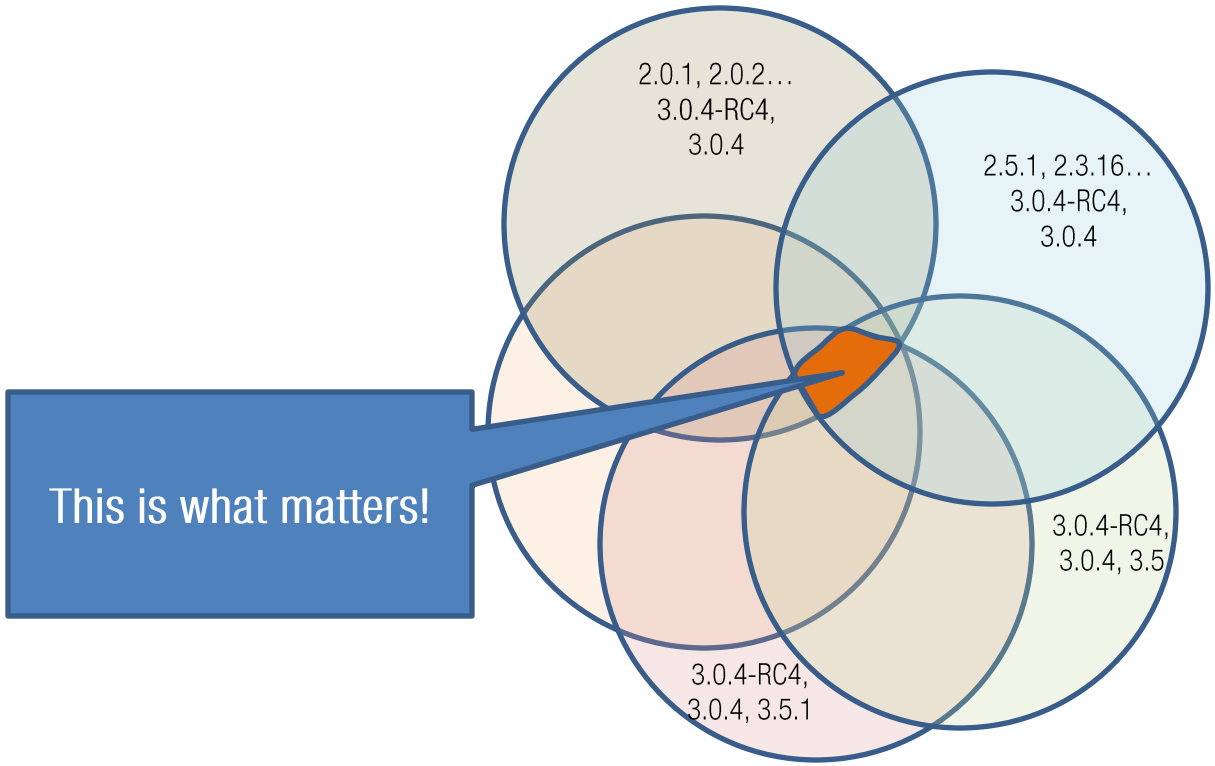
- Hit http://laws.qualys.com/mt-static/js/tc/mixer.js
- Possible versions based on result: 4.1-en, 4.1-en-CS, 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/tc/tableselect.js
- Possible versions based on result: 4.1-en, 4.1-en-CS, 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/tc/focus.js
- Possible versions based on result: 4.1-en, 4.1-en-CS, 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/tc.js
- Possible versions based on result: 4.1-en, 4.1-en-CS, 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

Interlude


2.0.1, 2.0.2…
3.0.4-RC4,
3.0.4
2.5.1, 2.3.16…
3.0.4-RC4,
3.0.4
3.0.4-RC4,
3.0.4, 3.5
3.0.4-RC4,
3.0.4, 3.5.1
This is what matters!

Does it work?

- Hit http://laws.qualys.com/mt-static/css/simple.css
- Possible versions based on result: 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM

- Hit http://laws.qualys.com/mt-static/mt_ja.js
- Possible versions based on result: 4.2-en, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.23-en-OS, 4.24-en, 4.24-en, 4.24-en-COM

- Hit http://laws.qualys.com/mt-static/js/tc/gestalt.js
- Possible versions based on result: 4.1-en, 4.1-en-CS, 4.2-en, 4.21-en, 4.21-en, 4.21-en-COM, 4.22-en, 4.22-en, 4.22-en-COM, 4.23-en, 4.23-en, 4.23-en-COM, 4.24-en, 4.24-en, 4.24-en-COM

- Fingerprinting resulted in:
- 4.22-en,
- 4.22-en-COM,
- 4.23-en,
- 4.23-en-COM

Best Guess: **4.23-en-COM**

BTW: It Does Plugins Too

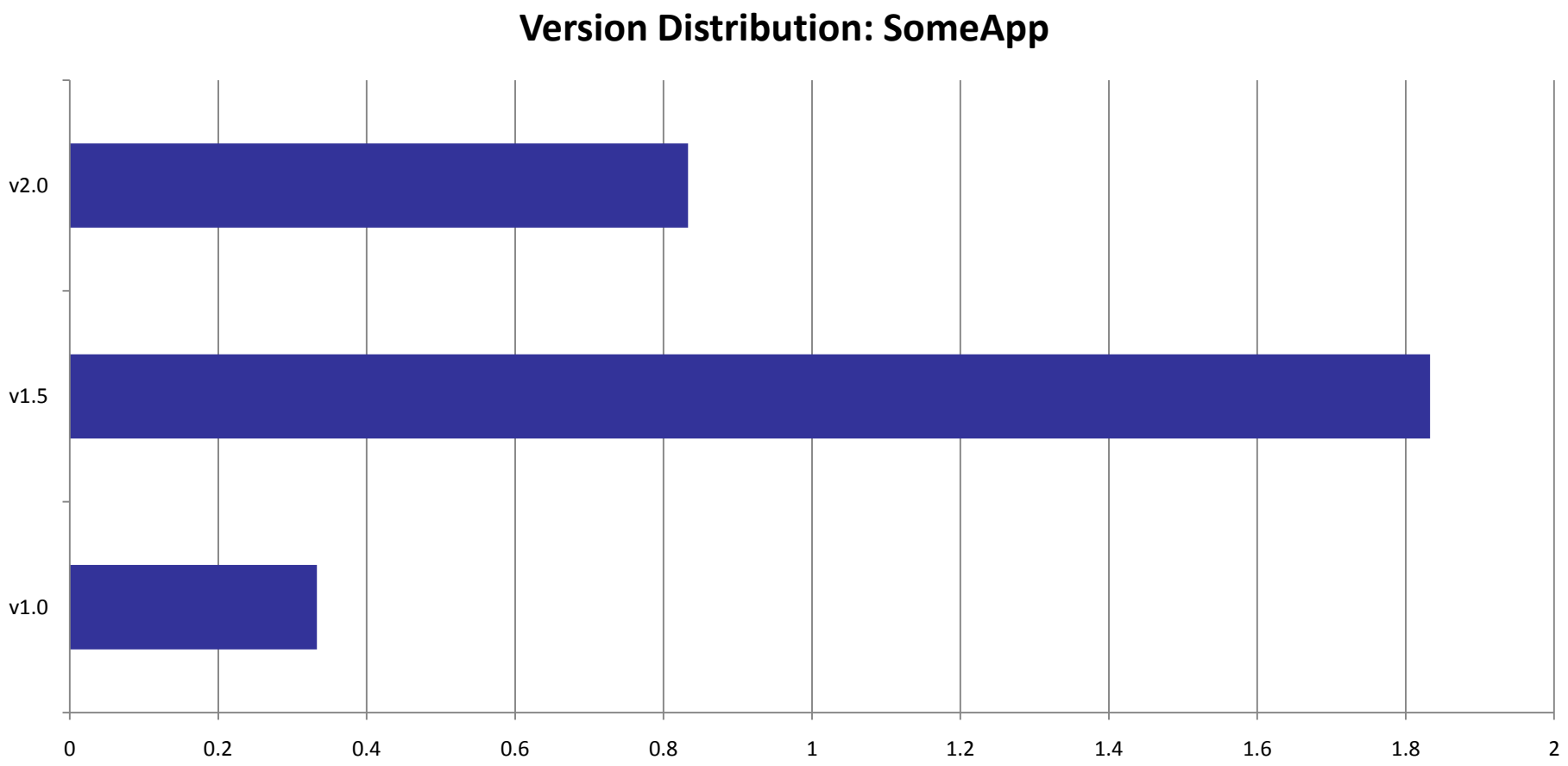
- $ ./BlindElephant.py -s **-p guess** http://example.com drupal
- Possible plugins:
- ['admin_menu', 'cck', 'date', 'google_analytics', 'imce', 'imce_swfupload', 'pathauto', 'print', 'spamicide', 'tagadelic', 'token', 'views‘]

- $./BlindElephant.py -s **-p imce** http://example.com drupal
- <snip>
- Fingerprinting resulted in:
- 6.x-1.3

New Toy! Lets Play

- App ID & Fingerprinting on **1,084,152** hosts
- **~34k** targeted scans for bug shakeout and calibration
  - Shodan = Really, really useful (kinda expensive though)
    - Is John here? I owe him a beer.
  - Slightly biased sample (skews to default installs, s'okay though)
- **~50k** and **~1M** host random sample of 87M .com domains
  - Stats on accuracy and net-wide webapp population are from these

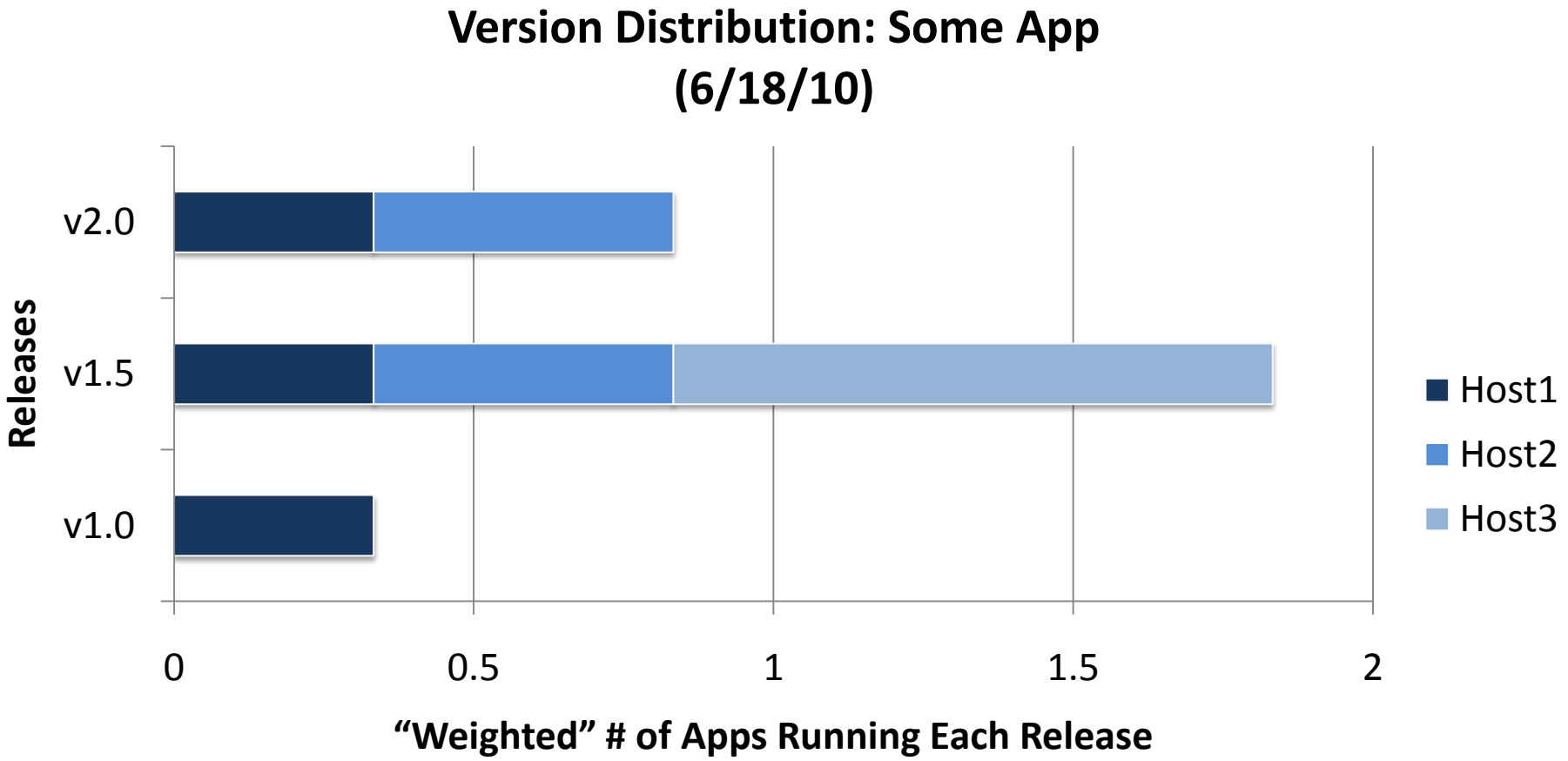
On To the Results…



Graphing Sets of Possibilities

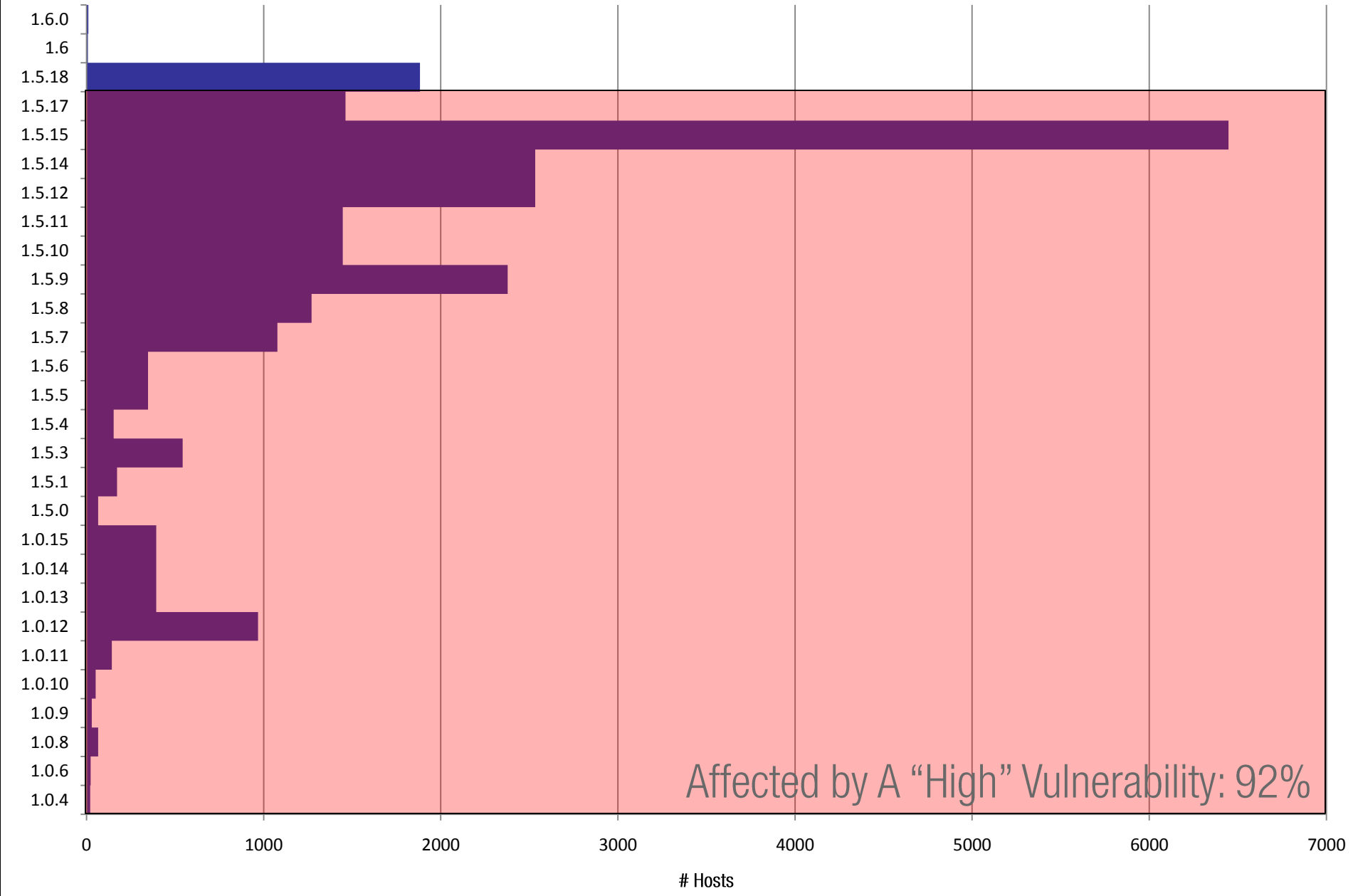
- Host1 Possible Versions: v1.0, v1.5, v2.0
  - .33 to three version columns
- Host2 Possible Versions: v1.5, v2.0
  - .5 to two version columns
- Host3 Possible Versions: v1.5
  - 1.0 to v1.5

Graphing Sets of Possibilities

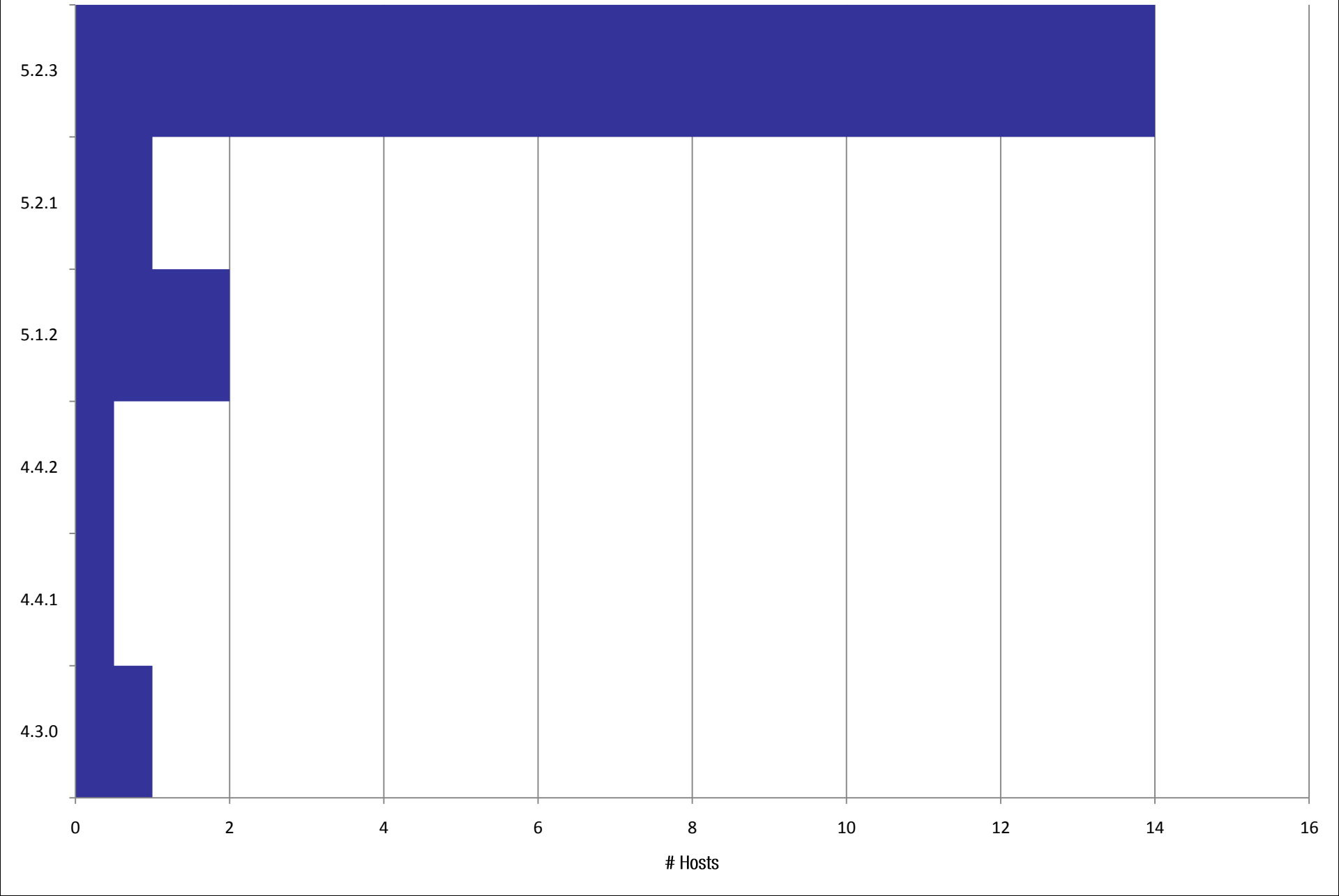


Version Distribution: Drupal
(June 18, 2010)

Version Distribution: Joomla
(June 18 2010)

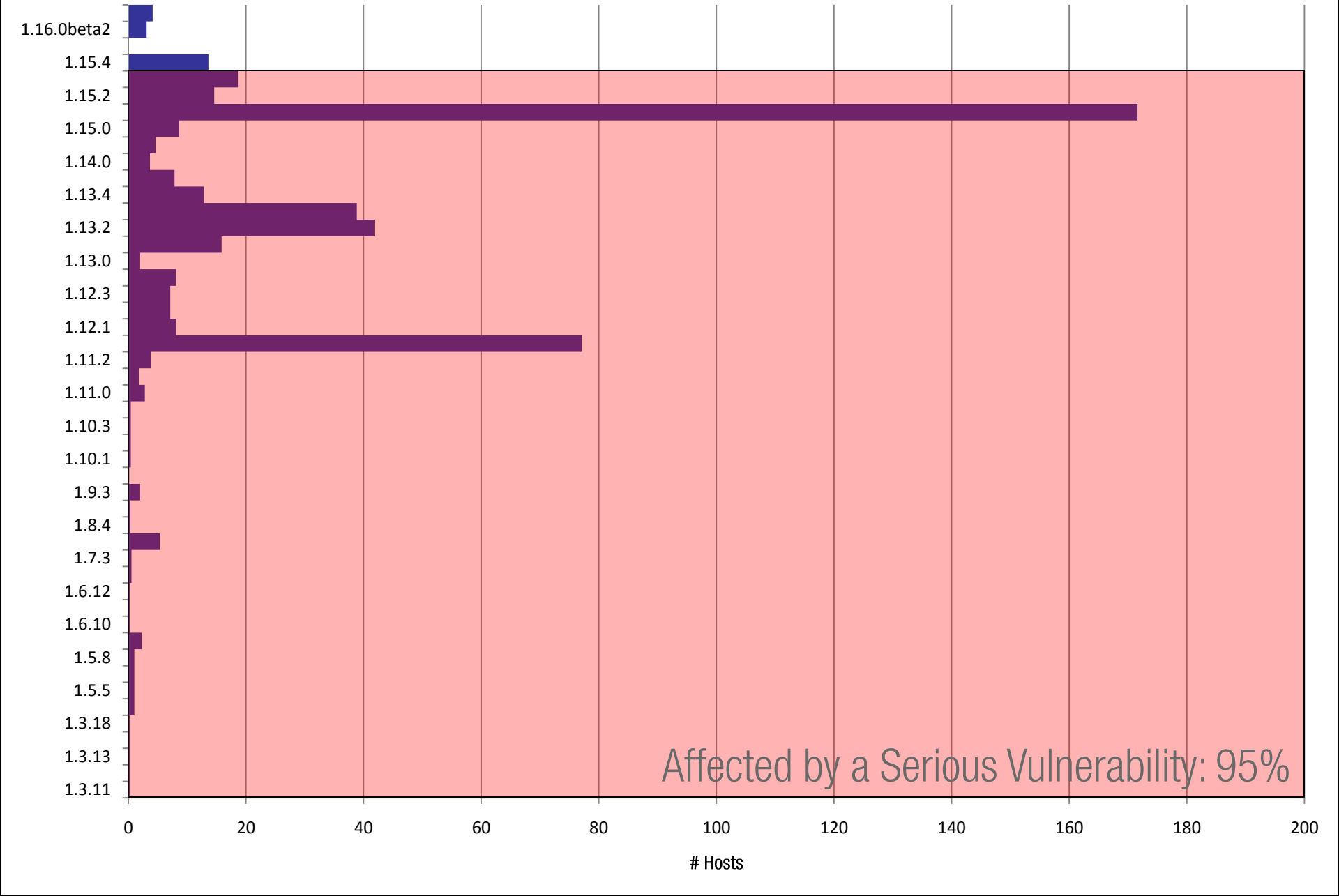


Version Distribution: Liferay
(June 18, 2010)



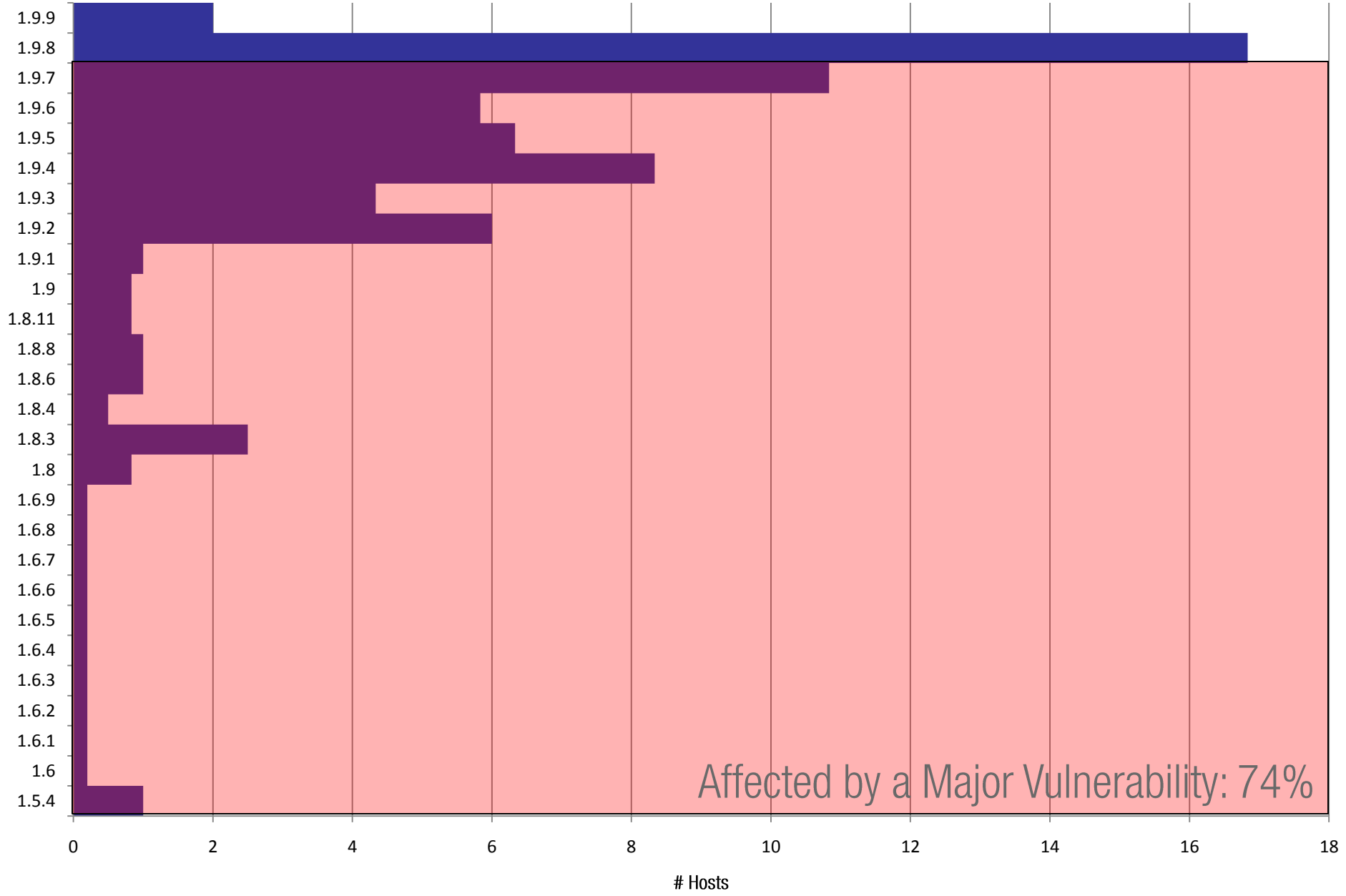
Version Distribution: Mediawiki

(June 18, 2010)



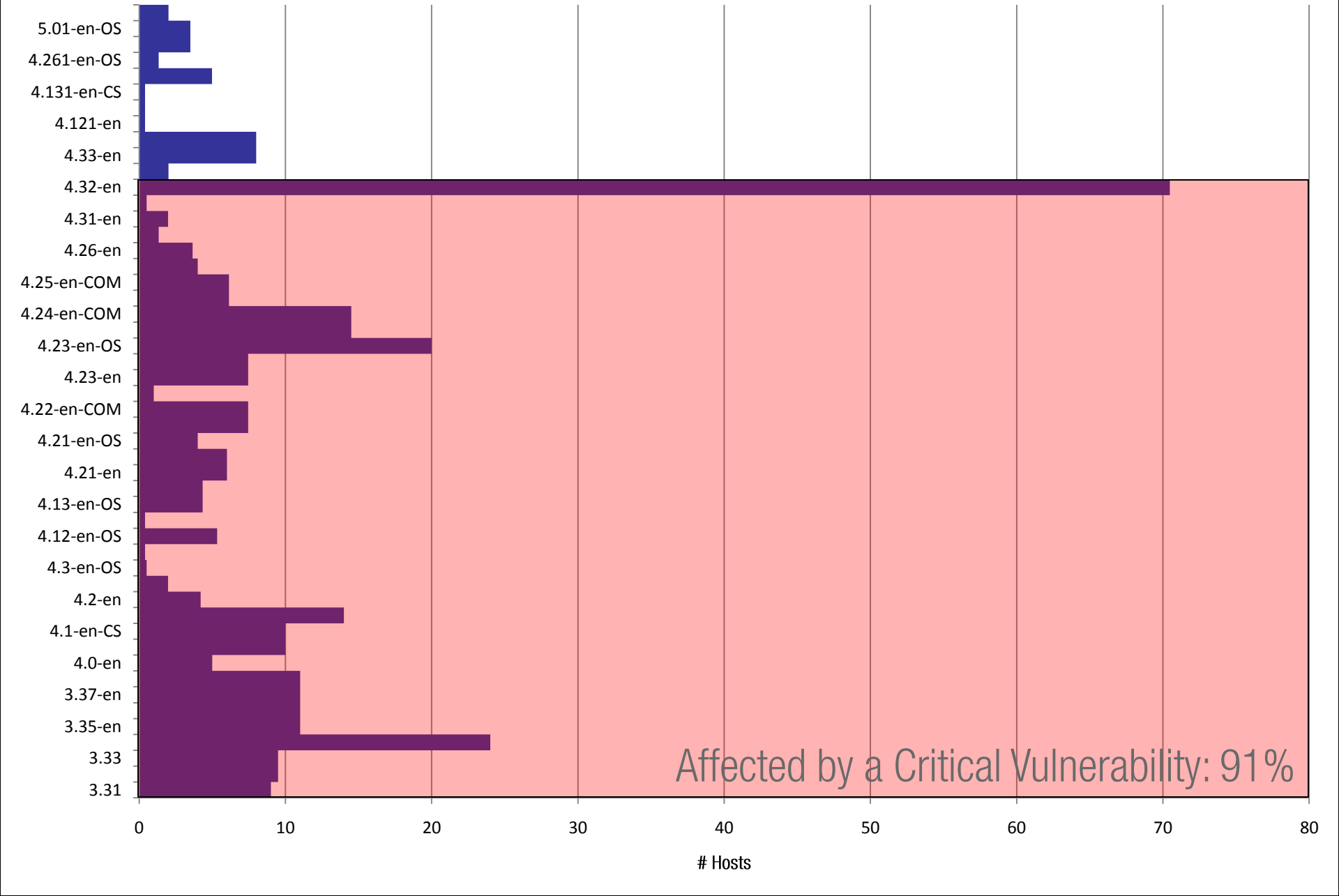
Version Distribution: Moodle

(June 18, 2010)



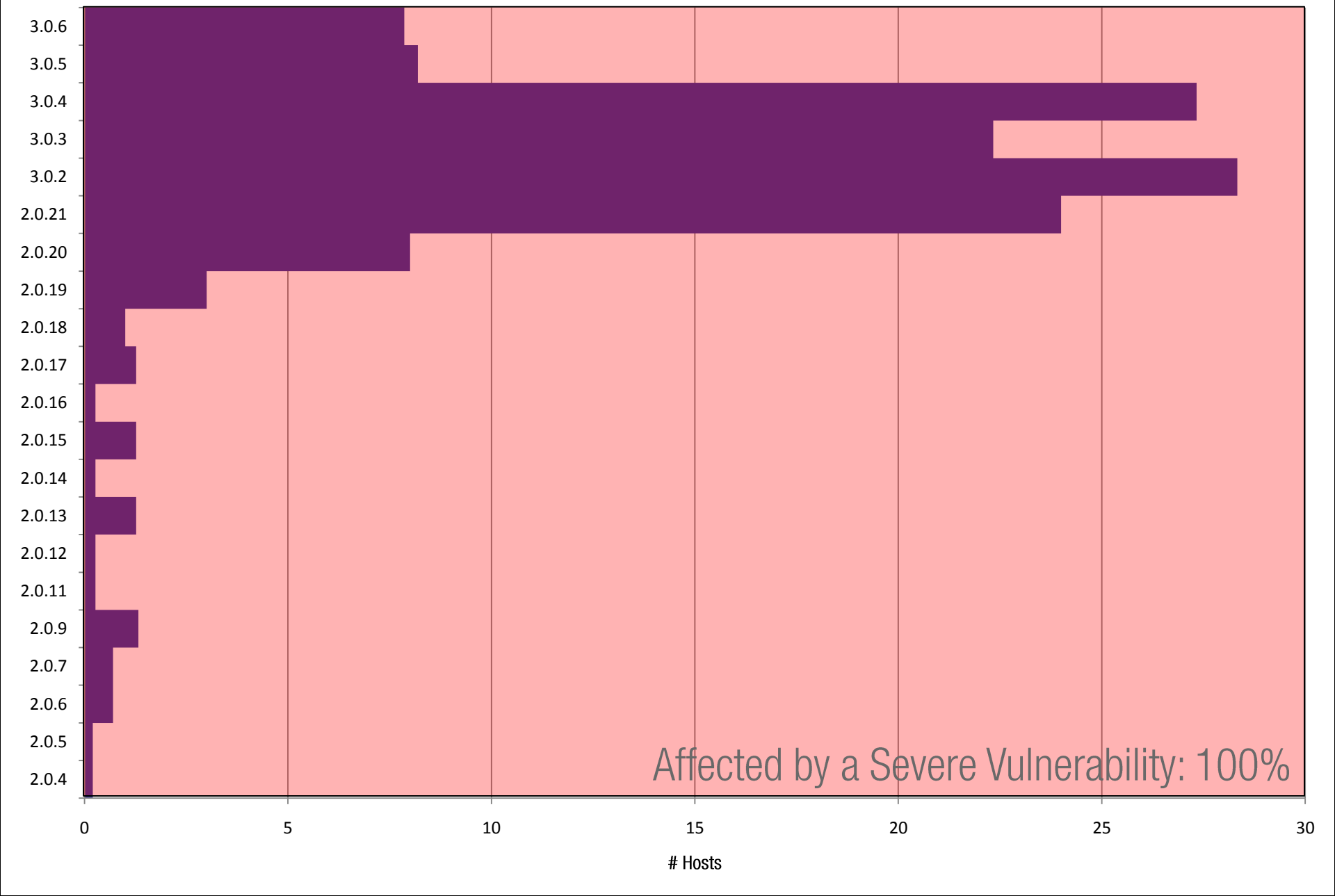
Version Distribution: MovableType

(June 18, 2010)

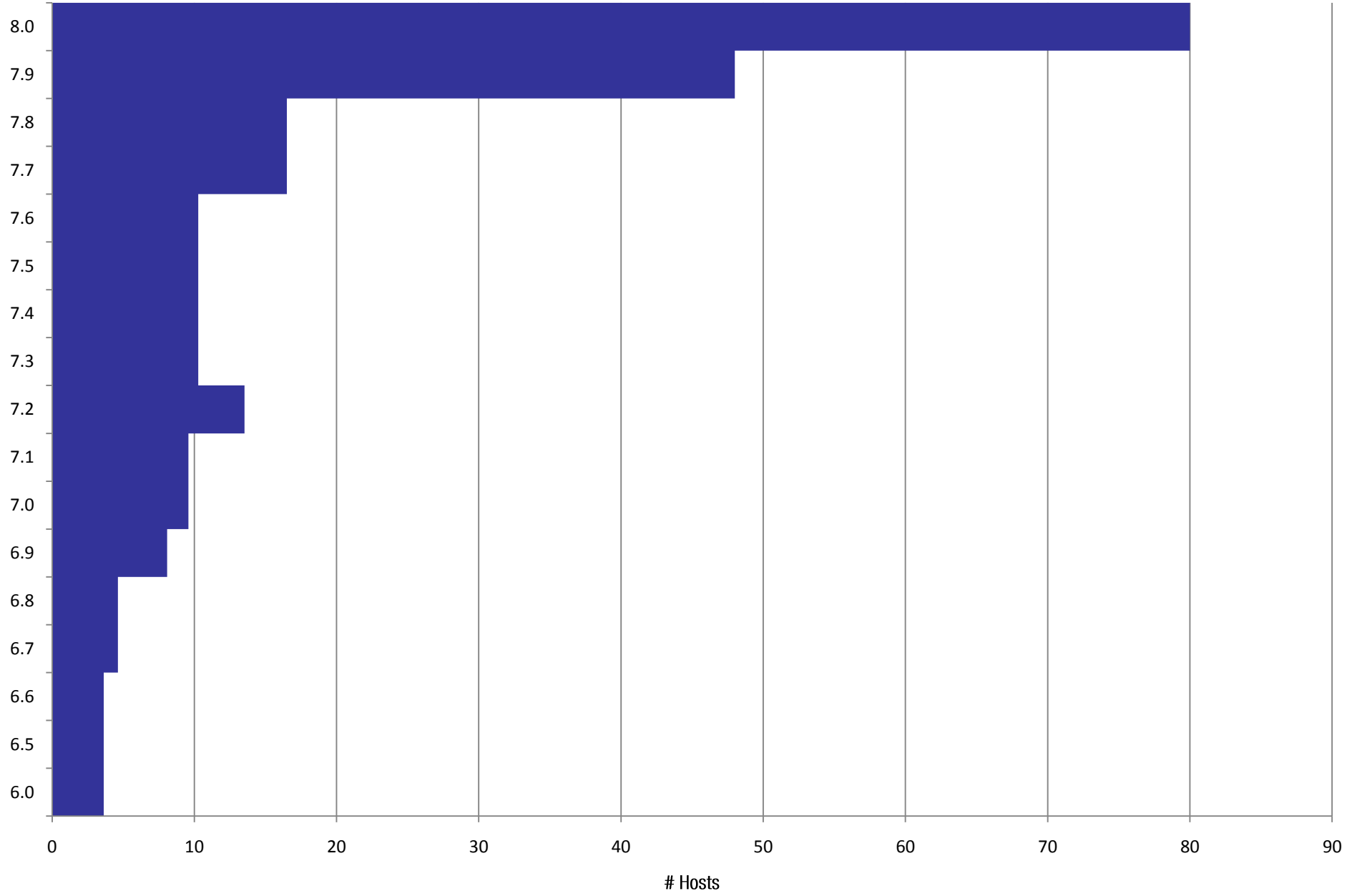


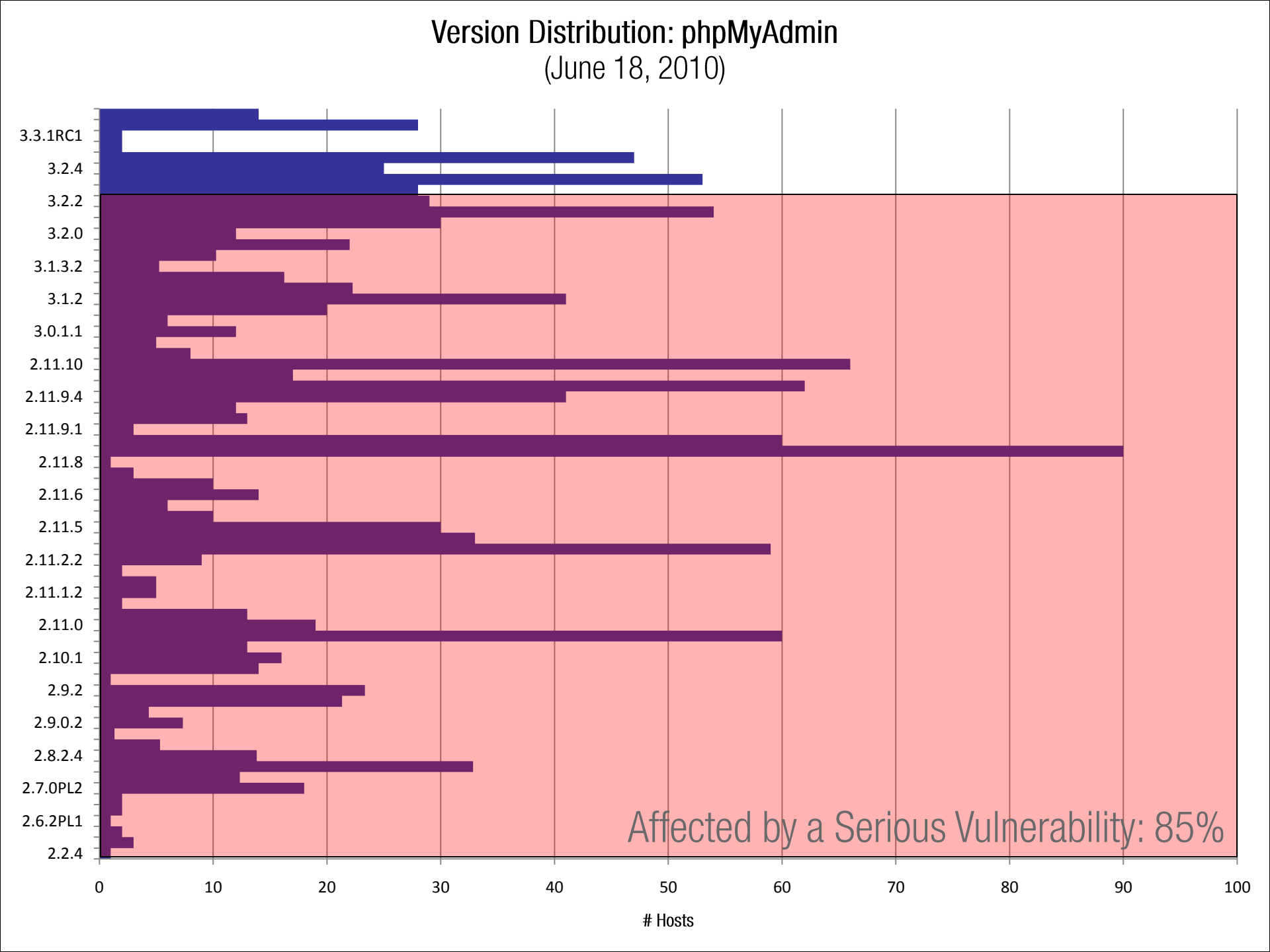
Version Distribution: phpBB

(June 18, 2010)

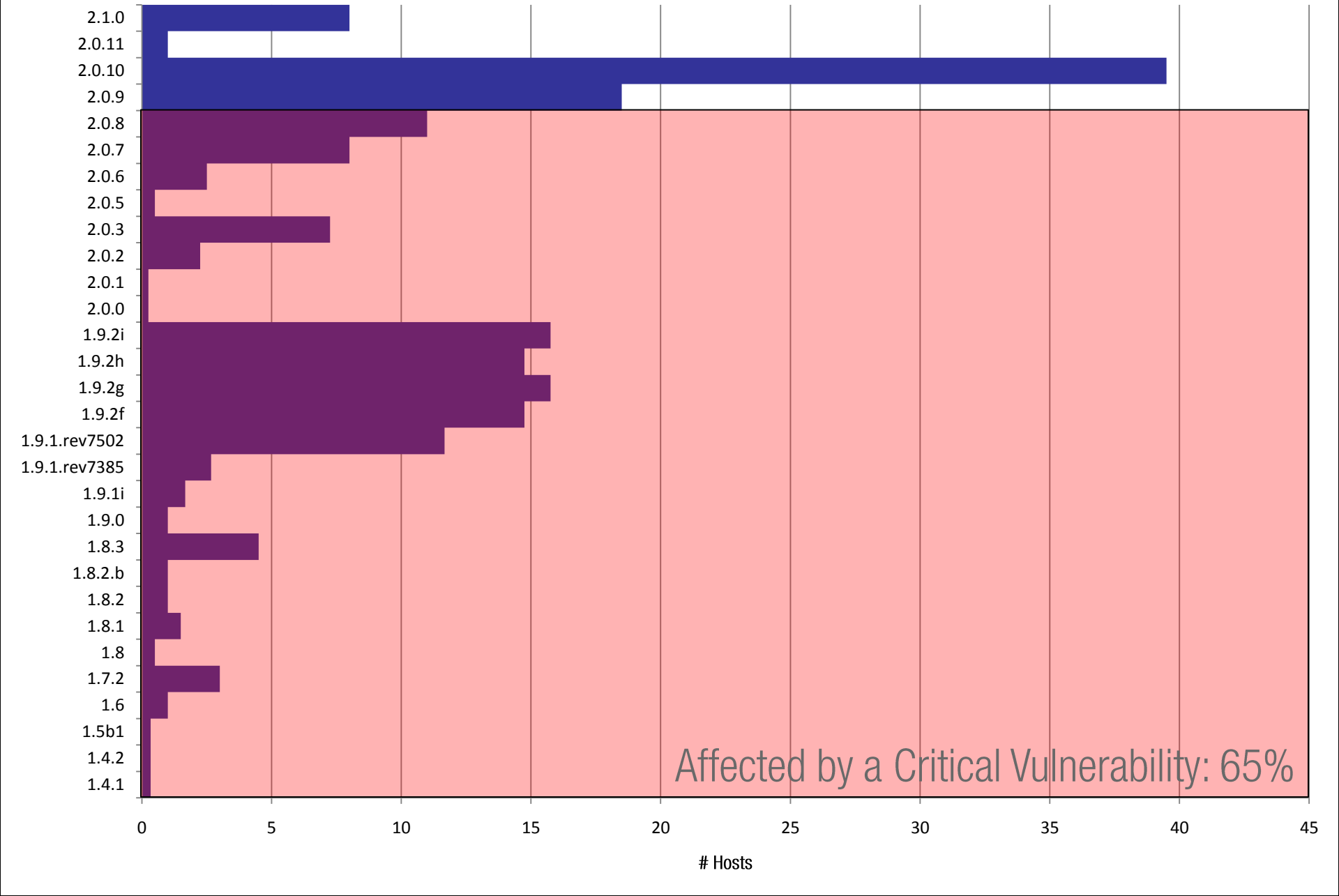


Version Distribution: PHPNuke
(June 18, 2010)



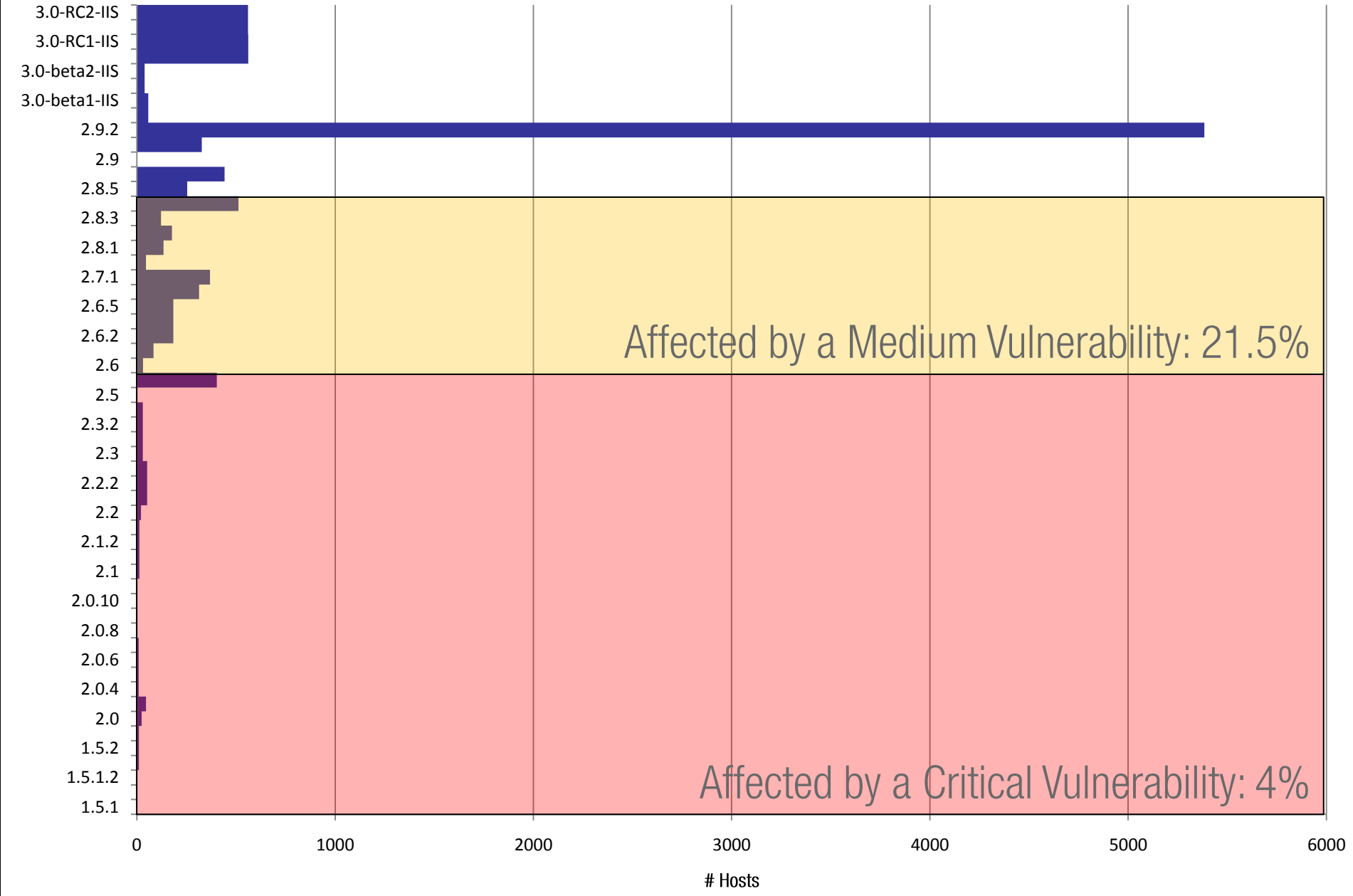

Version Distribution: phpMyAdmin
(June 18, 2010)
3.3.1RC1
3.2.4
3.2.2
3.2.0
3.1.3.2
3.1.2
3.0.1.1
2.11.10
2.11.9.4
2.11.9.1
2.11.8
2.11.6
2.11.5
2.11.2.2
2.11.1.2
2.11.0
2.10.1
2.9.2
2.9.0.2
2.8.2.4
2.7.0PL2
2.6.2PL1
2.2.4
0
10
20
30
40
50
60
70
80
90
100
Hosts
Affected by a Serious Vulnerability: 85%

Version Distribution: SPIP
(June 18, 2010)

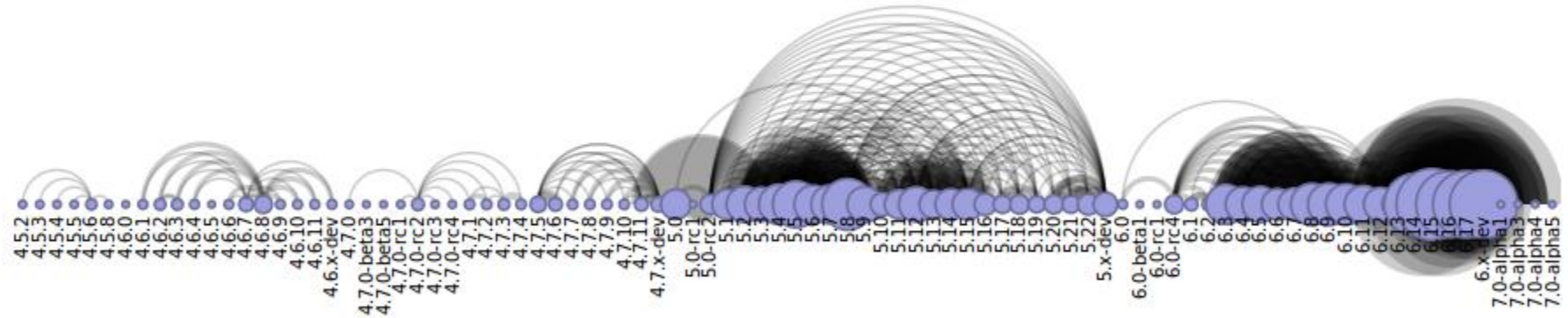


Version Distribution: Wordpress

(June 18, 2010)

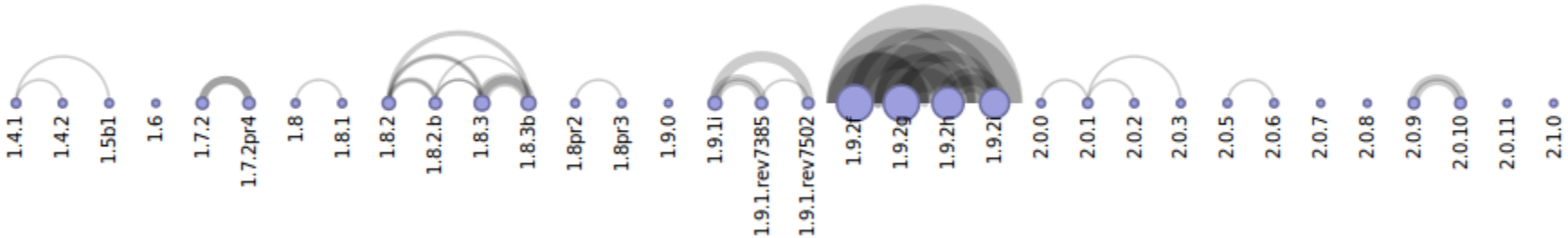


Version Clusters: Drupal



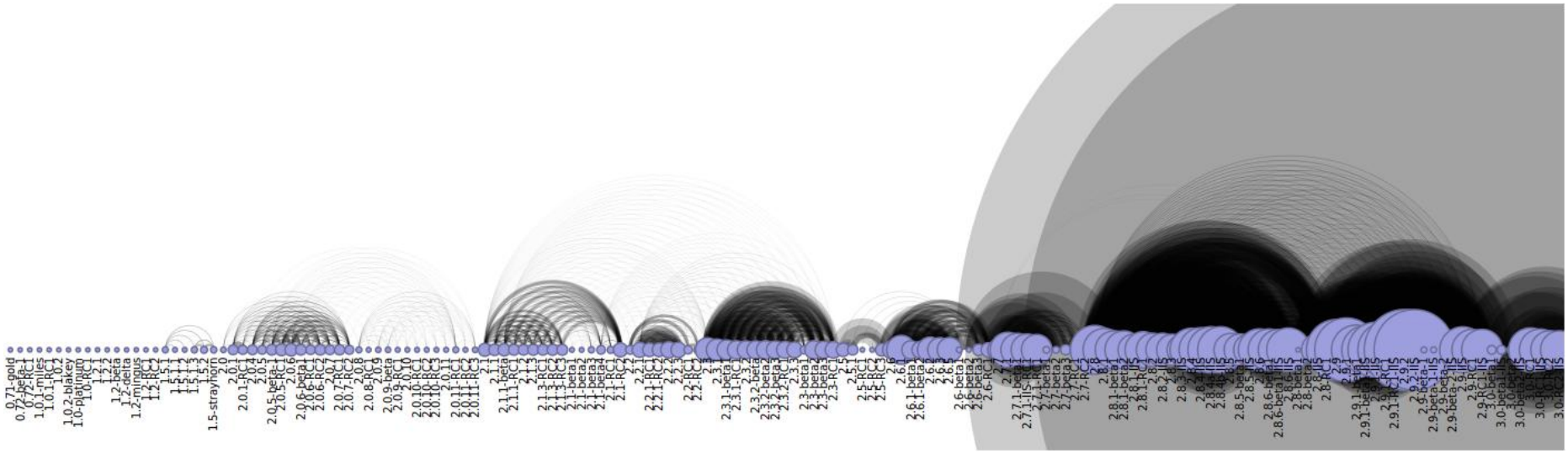
Connections between nodes (versions) indicate that a fingerprint job produced those versions and was unable to differentiate. Thicker connections indicate the number of times this confusion occurred (two particularly difficult to distinguish versions), while many connections among adjacent nodes indicates a family of difficult to distinguish versions.

Version Clusters: SPIP



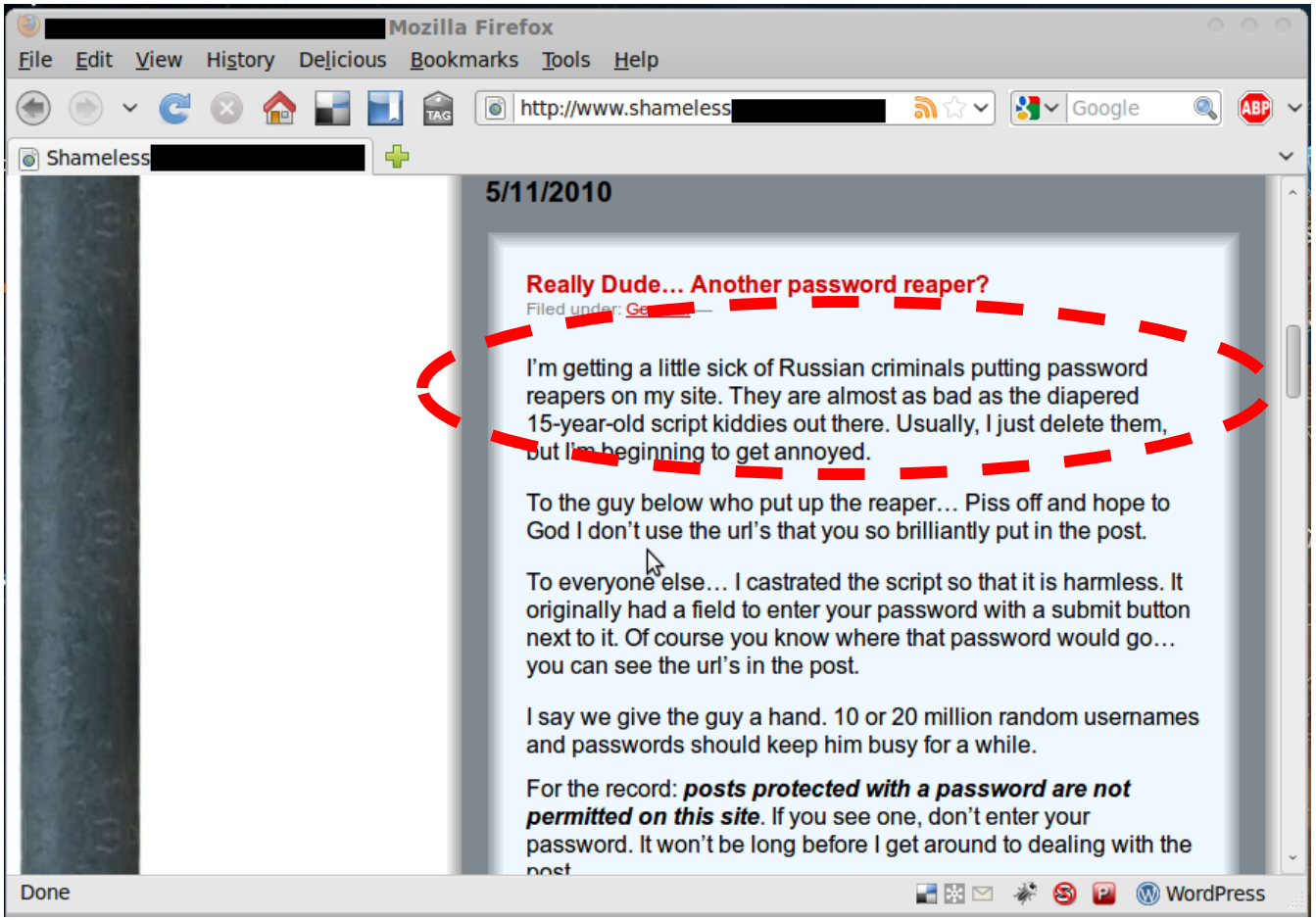
Connections between nodes (versions) indicate that a fingerprint job produced those versions and was unable to differentiate. Thicker connections indicate the number of times this confusion occurred (two particularly difficult to distinguish versions), while many connections among adjacent nodes indicates a family of difficult to distinguish versions.

Version Clusters: Wordpress

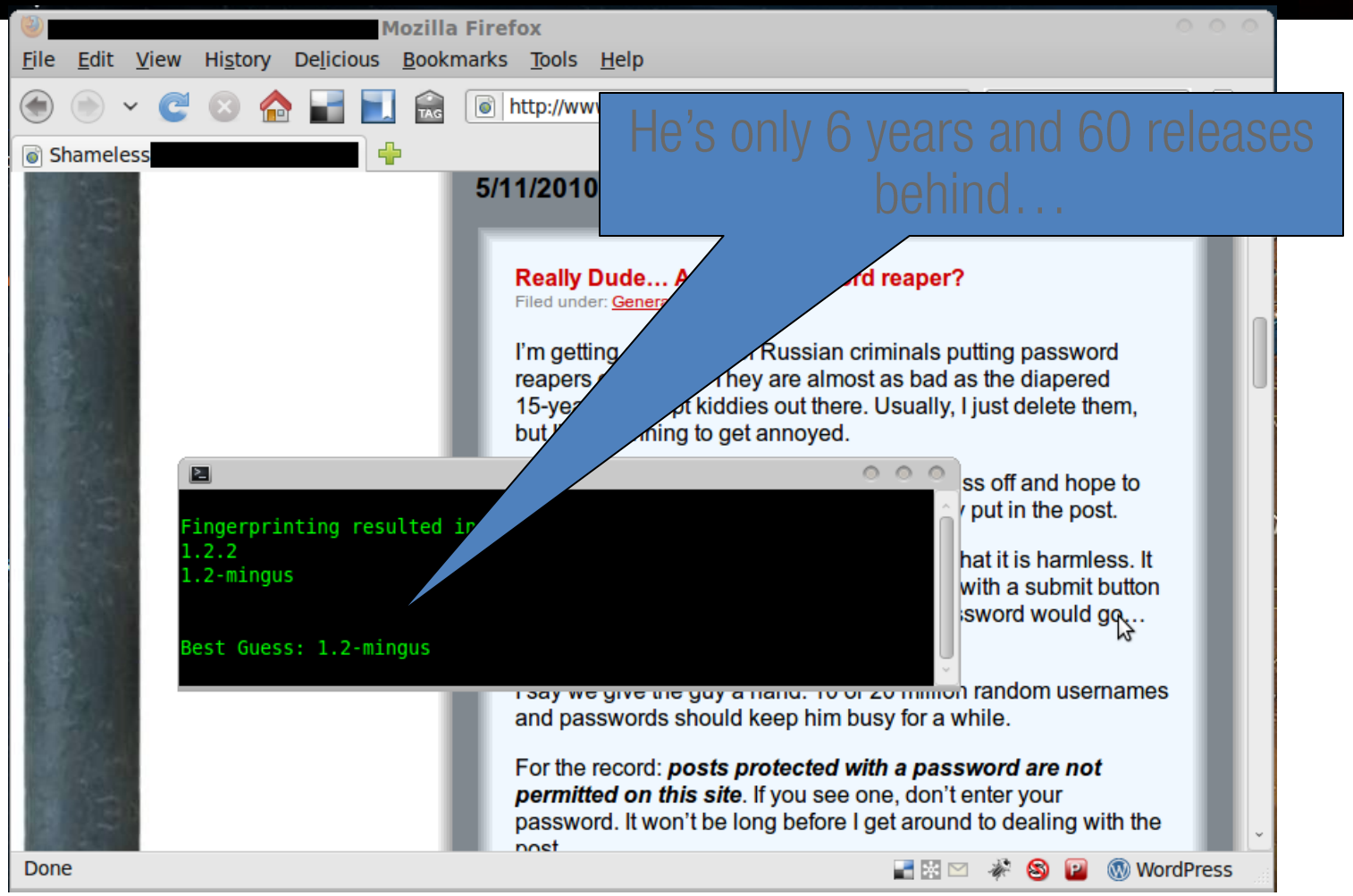


Connections between nodes (versions) indicate that a fingerprint job produced those versions and was unable to differentiate. Thicker connections indicate the number of times this confusion occurred (two particularly difficult to distinguish versions), while many connections among adjacent nodes indicates a family of difficult to distinguish versions.

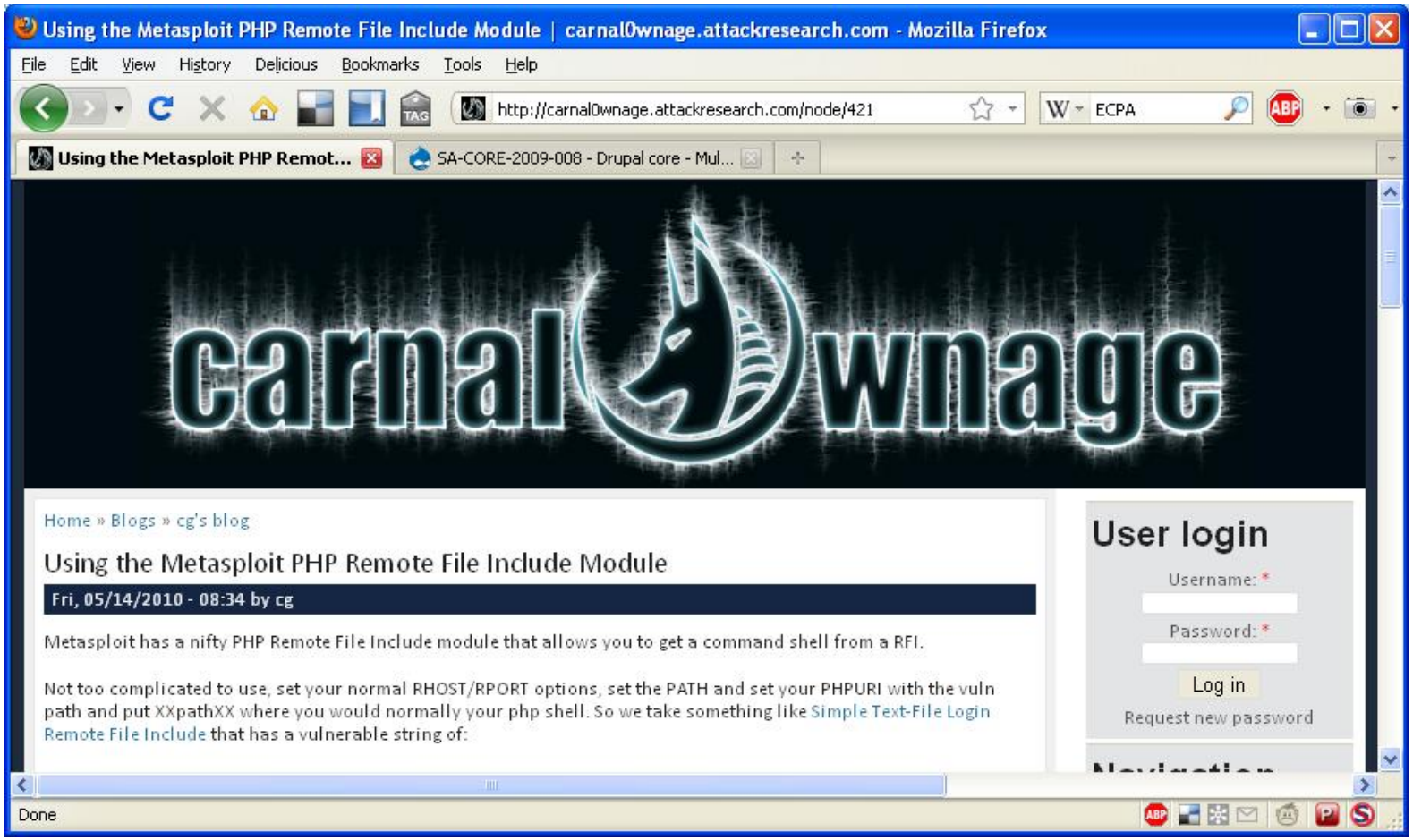
Lost: a Clue


Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help
http://www.shameless
Google
Shameless
5/11/2010
Really Dude... Another password reaper?
Filed under:
I'm getting a little sick of Russian criminals putting password reapers on my site. They are almost as bad as the diapered 15-year-old script kiddies out there. Usually, I just delete them, but I'm beginning to get annoyed.
To the guy below who put up the reaper… Piss off and hope to God I don't use the url's that you so brilliantly put in the post.
To everyone else… I castrated the script so that it is harmless. It originally had a field to enter your password with a submit button next to it. Of course you know where that password would go… you can see the url's in the post.
I say we give the guy a hand. 10 or 20 million random usernames and passwords should keep him busy for a while.
For the record: posts protected with a password are not permitted on this site. If you see one, don't enter your password. It won't be long before I get around to dealing with the
Done
WordPress

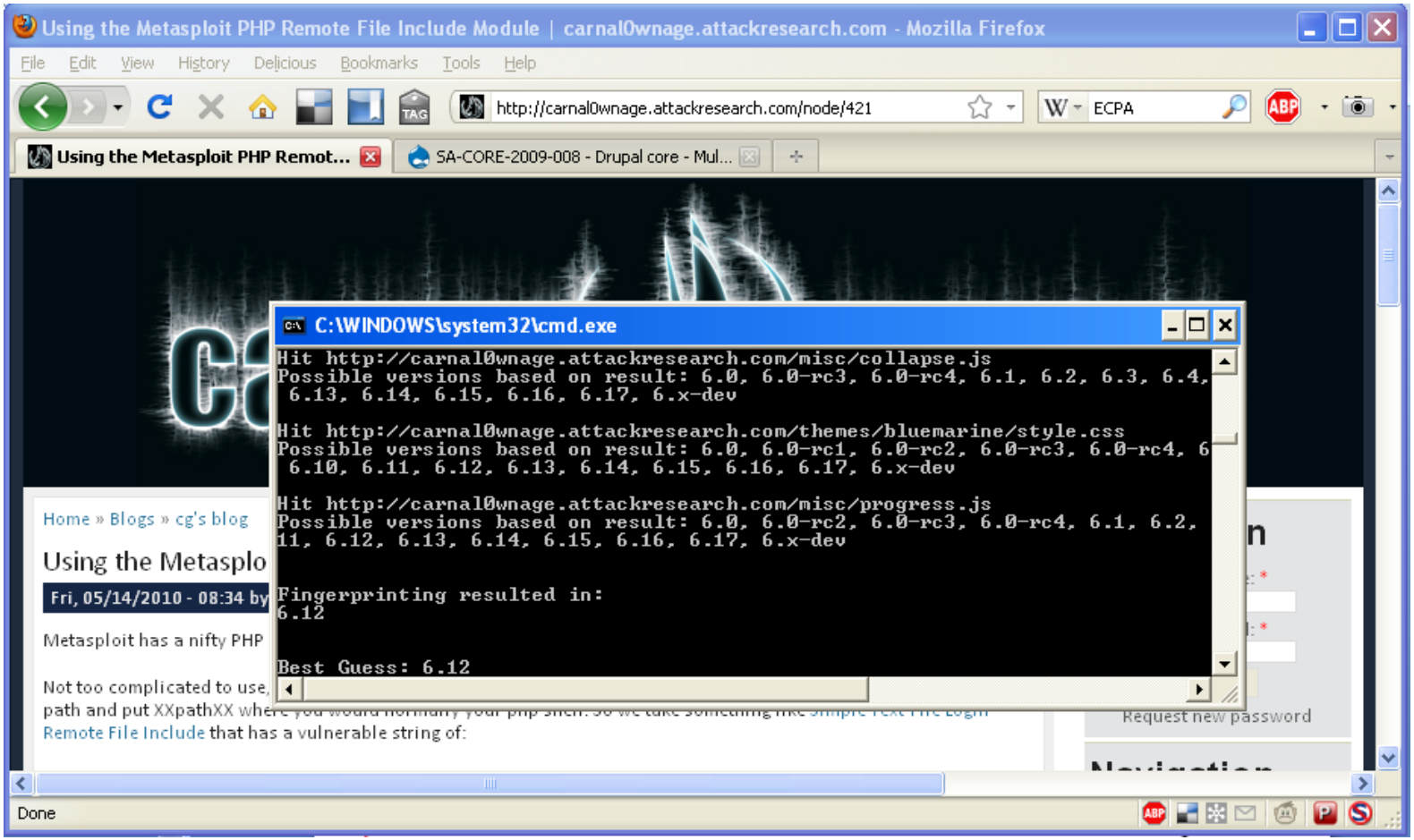
Lost: A Clue


Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help
Shameless
5/11/2010
Really Dude... A
rd reaper?
Filed under: Gener
I'm getting
Russian criminals putting password
reapers
They are almost as bad as the diapered
15-ye
pt kiddies out there. Usually, I just delete them,
but
ning to get annoyed.
ss off and hope to
put in the post.
hat it is harmless. It
with a submit button
sword would go...
Fingerprinting resulted in
1.2.2
1.2-mingus
Best Guess: 1.2-mingus
random usernames
and passwords should keep him busy for a while.
For the record: posts protected with a password are not permitted on this site. If you see one, don't enter your password. It won't be long before I get around to dealing with the
Done
WordPress
He's only 6 years and 60 releases behind…

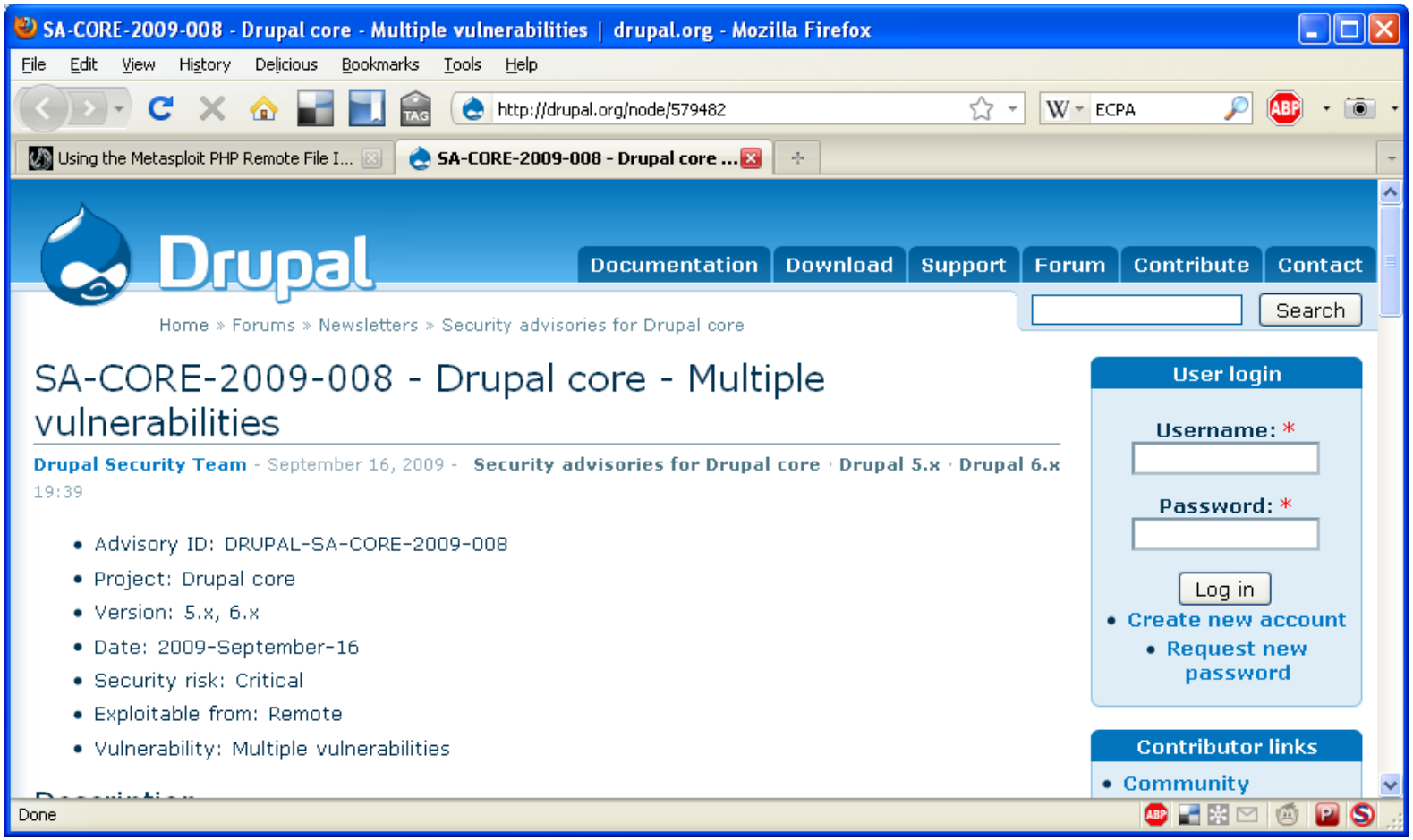
Sorry Guys…


Using the Metasploit PHP Remote File Include Module | carnal0wnage.attackresearch.com - Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help
http://carnal0wnage.attackresearch.com/node/421
ECPA
Using the Metasploit PHP Remot...
SA-CORE-2009-008 - Drupal core - Mul...
carnal0wnage
Home » Blogs » cg's blog
Using the Metasploit PHP Remote File Include Module
Fri, 05/14/2010 - 08:34 by cg
Metasploit has a nifty PHP Remote File Include module that allows you to get a command shell from a RFI.
Not too complicated to use, set your normal RHOST/RPORT options, set the PATH and set your PHPURI with the vuln path and put XXpathXX where you would normally your php shell. So we take something like Simple Text-File Login Remote File Include that has a vulnerable string of:
User login
Username: *
Password: *
Log in
Request new password
Done

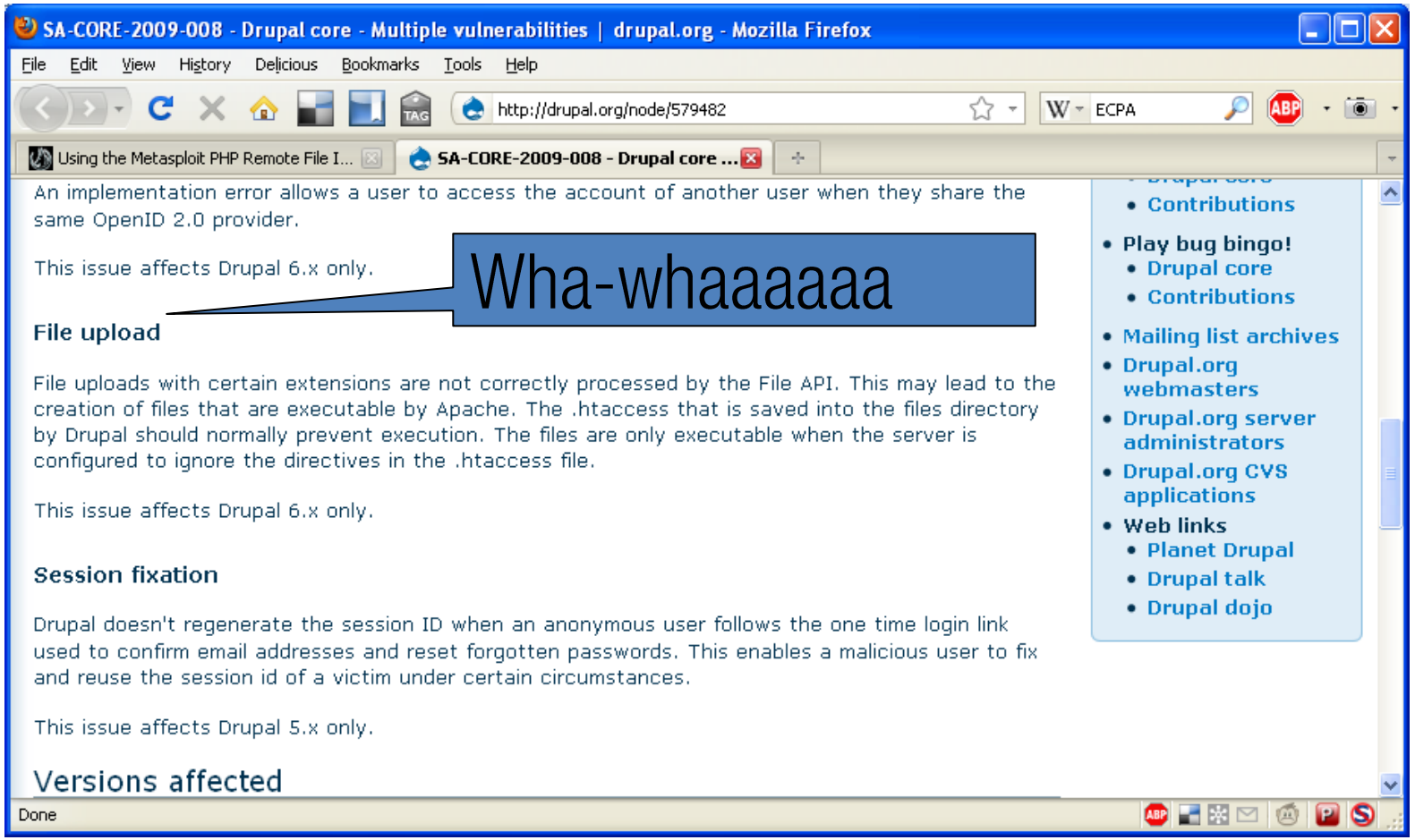
Sorry Guys…


Using the Metasploit PHP Remote File Include Module | carnal0wnage.attackresearch.com - Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help
http://carnal0wnage.attackresearch.com/node/421
ECPA
Using the Metasploit PHP Remot...
SA-CORE-2009-008 - Drupal core - Mul...
C:\WINDOWS\system32\cmd.exe
Hit http://carnal0wnage.attackresearch.com/misc/collapse.js
Possible versions based on result: 6.0, 6.0-rc3, 6.0-rc4, 6.1, 6.2, 6.3, 6.4, 6.13, 6.14, 6.15, 6.16, 6.17, 6.x-dev
Hit http://carnal0wnage.attackresearch.com/themes/bluemarine/style.css
Possible versions based on result: 6.0, 6.0-rc1, 6.0-rc2, 6.0-rc3, 6.0-rc4, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.x-dev
Hit http://carnal0wnage.attackresearch.com/misc/progress.js
Possible versions based on result: 6.0, 6.0-rc2, 6.0-rc3, 6.0-rc4, 6.1, 6.2, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.x-dev
Fingerprinting resulted in:
6.12
Best Guess: 6.12
Home » Blogs » cg's blog
Using the Metasplo
Fri, 05/14/2010 - 08:34 by
Metasploit has a nifty PHP
Not too complicated to use,
path and put XXpathXX
Remote File Include that has a vulnerable string of:
Request new password
Done

Sorry Guys…


SA-CORE-2009-008 - Drupal core - Multiple vulnerabilities | drupal.org - Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help
http://drupal.org/node/579482
Using the Metasploit PHP Remote File I...
SA-CORE-2009-008 - Drupal core ...
Drupal
Documentation Download Support Forum Contribute Contact
Search
Home » Forums » Newsletters » Security advisories for Drupal core
SA-CORE-2009-008 - Drupal core - Multiple vulnerabilities
Drupal Security Team - September 16, 2009 - Security advisories for Drupal core · Drupal 5.x · Drupal 6.x
19:39
Advisory ID: DRUPAL-SA-CORE-2009-008
Project: Drupal core
Version: 5.x, 6.x
Date: 2009-September-16
Security risk: Critical
Exploitable from: Remote
Vulnerability: Multiple vulnerabilities
User login
Username: *
Password: *
Log in
Create new account
Request new password
Contributor links
Community
Done

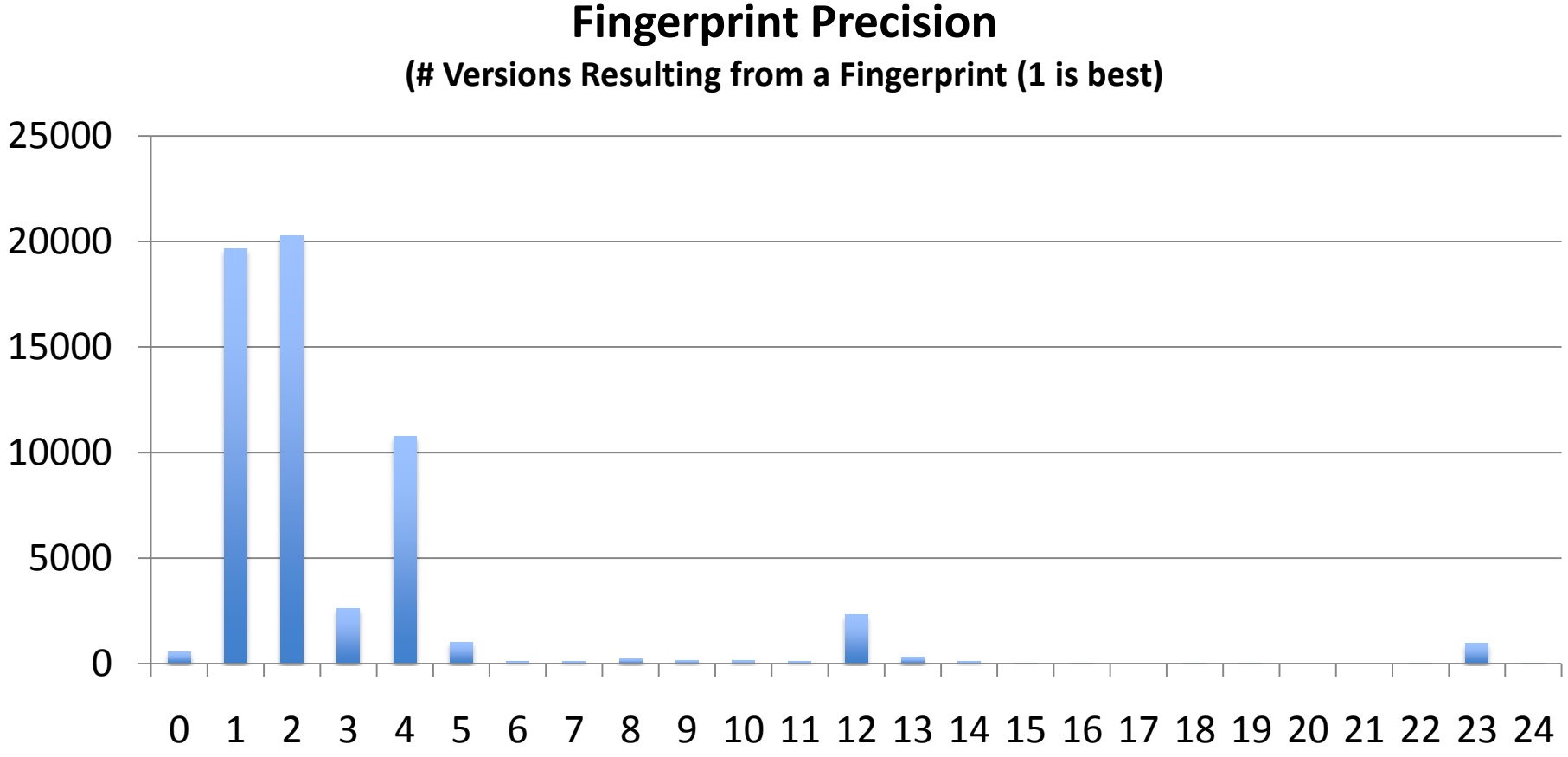
Sorry Guys…


SA-CORE-2009-008 - Drupal core - Multiple vulnerabilities | drupal.org - Mozilla Firefox
File Edit View History Delicious Bookmarks Tools Help
http://drupal.org/node/579482
Using the Metasploit PHP Remote File I...
SA-CORE-2009-008 - Drupal core ...
An implementation error allows a user to access the account of another user when they share the same OpenID 2.0 provider.
This issue affects Drupal 6.x only.
Wha-whaaaaaa
File upload
File uploads with certain extensions are not correctly processed by the File API. This may lead to the creation of files that are executable by Apache. The .htaccess that is saved into the files directory by Drupal should normally prevent execution. The files are only executable when the server is configured to ignore the directives in the .htaccess file.
This issue affects Drupal 6.x only.
Session fixation
Drupal doesn't regenerate the session ID when an anonymous user follows the one time login link used to confirm email addresses and reset forgotten passwords. This enables a malicious user to fix and reuse the session id of a victim under certain circumstances.
This issue affects Drupal 5.x only.
Versions affected
Contributions
Play bug bingo!
Drupal core
Contributions
Mailing list archives
Drupal.org webmasters
Drupal.org server administrators
Drupal.org CVS applications
Web links
Planet Drupal
Drupal talk
Drupal dojo
Done

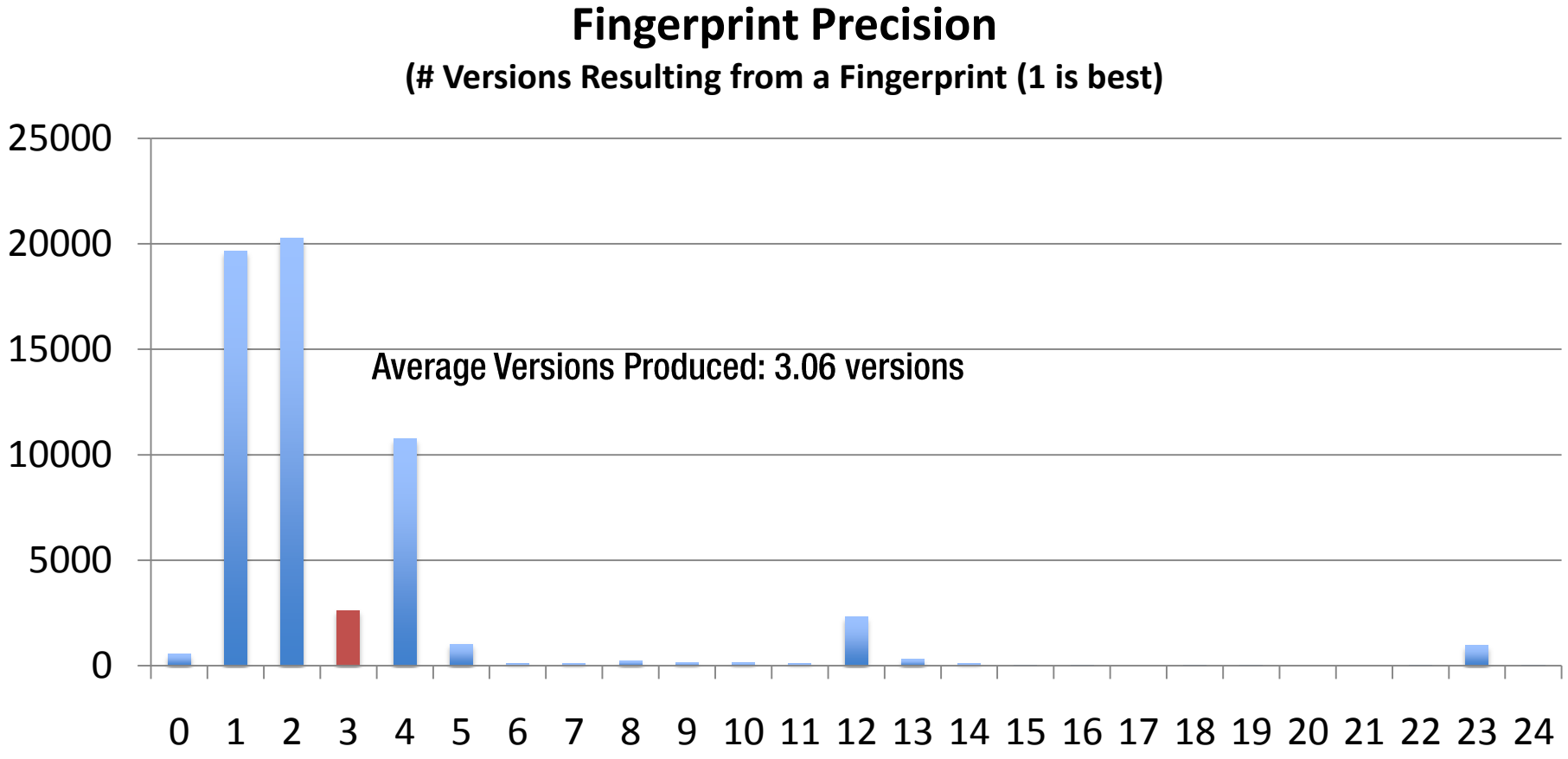
Observations

- Webapps actually doing pretty well update-wise
  - …but not quite good enough
- Huge spike at version provided by package managers and hosting services
  - If you're trusting either to keep you up to date, you're probably behind
- Improperly removed webapps abound
  - Switch from CMS A to CMS B, but leave A lying around
  - Net-visible test/QA sites

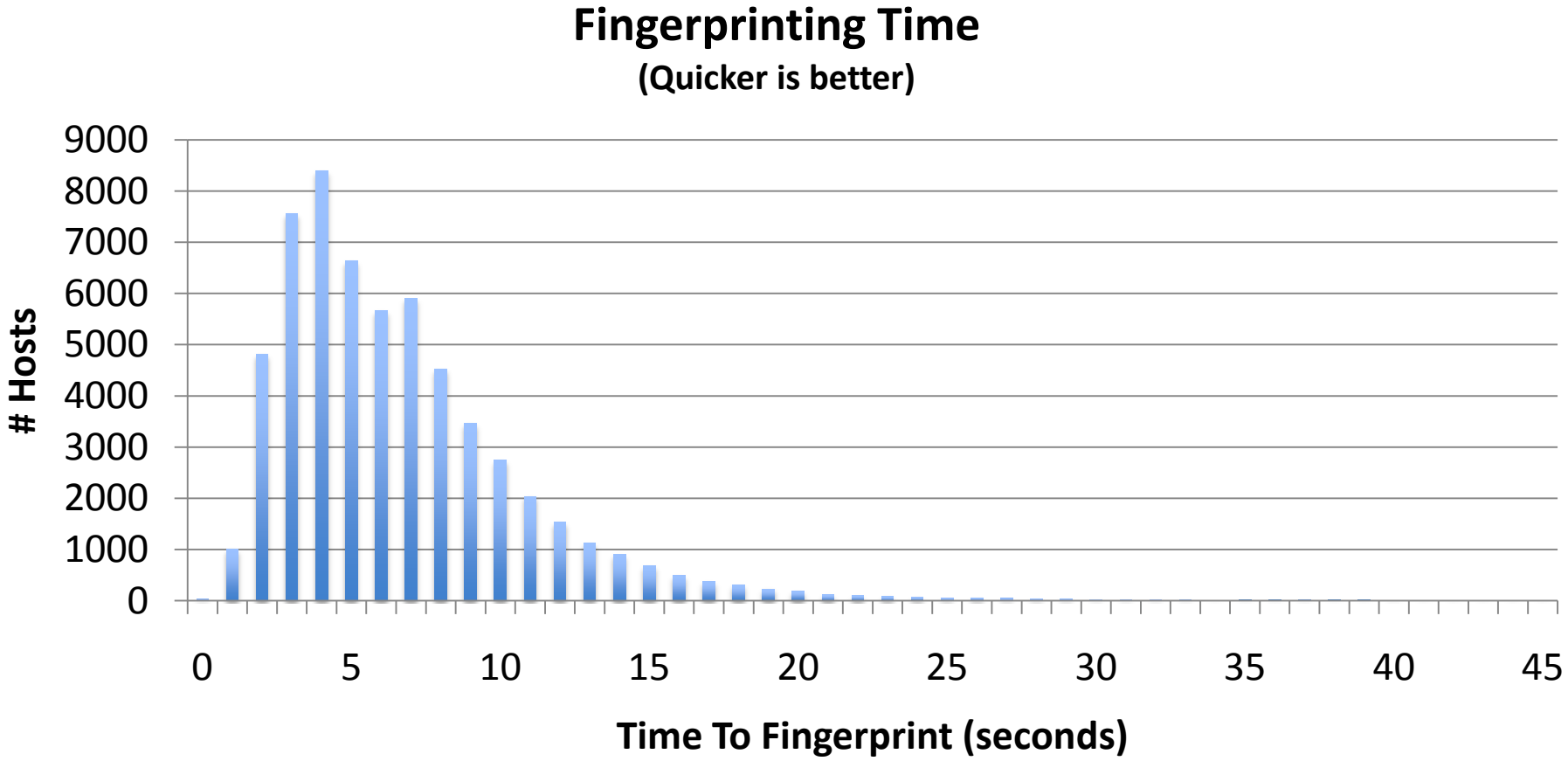
Precision


Fingerprint Precision
(# Versions Resulting from a Fingerprint (1 is best)
25000
20000
15000
10000
5000
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

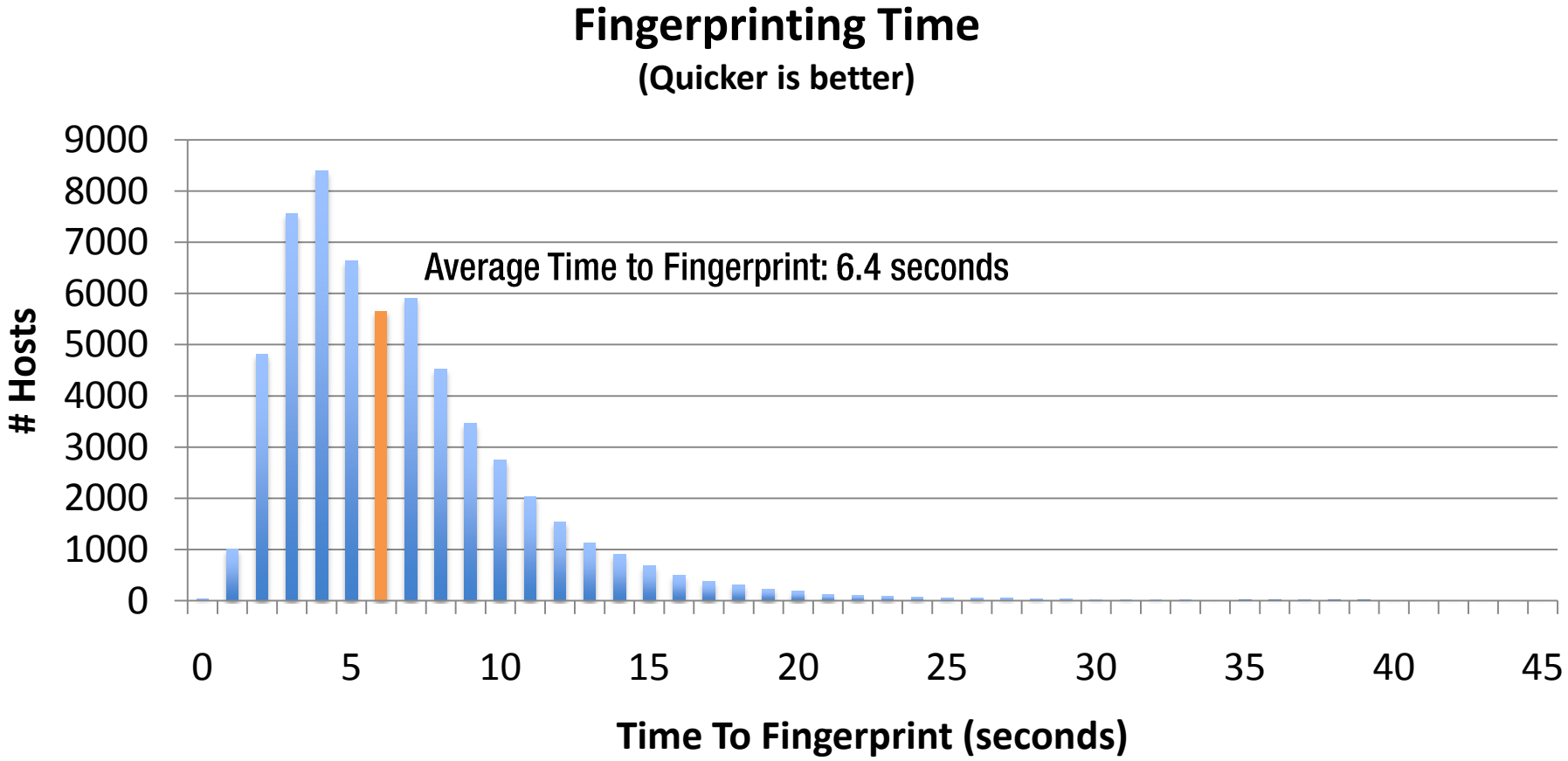
Precision


Fingerprint Precision
(# Versions Resulting from a Fingerprint (1 is best)
25000
20000
15000
10000
5000
0
Average Versions Produced: 3.06 versions
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Speed


Fingerprinting Time
(Quicker is better)
Hosts
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
5
10
15
20
25
30
35
40
45
Time To Fingerprint (seconds)

Speed


Fingerprinting Time
(Quicker is better)
Hosts
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Average Time to Fingerprint: 6.4 seconds
0
5
10
15
20
25
30
35
40
45
Time To Fingerprint (seconds)

BlindElephant Scorecard

- Very Generic → Same code for all apps & plugins
- Fast → 1-10 sec, based on host (Avg 6.4)
- Low resources → Avg 354.2 Kb to fingerprint
- Accurate →Avg 3.06 versions & ID 98.0% of sites
- Resistant to hardening/banner removal
  → Yes
- Easy to support new versions/apps
  → ~2 hours to support all available versions of a new app (1 if they're packed nicely)

Sources Of Error

- WebApp Incompletely Removed
- Partial/Manual Upgrades
  - We tend to catch these though
- Changed App Root
- Static hosting on alternate domain (eg, Wikipedia)
- Forked Project (osCommerce, phpNuke)

- Fails completely if static files are trivially modified
  - But guess what? People don't do it (yet)

Release the Kra… Elephant

http://blindelephant.sourceforge.net/

To Do

- Web App Developers
  - Help us create fingerprint files to recognize your app!
  - But also think about default deployments that resist fingerprinting
- Site Administrators
  - Fingerprint yourself – know what the attackers know
  - Harden to resist fingerprinting
  - Just… stay up to date
- Everyone Else
  - Try it out
  - Report bugs, contribute signatures, implement a pet feature…

Questions?

pthomas@qualys.com

@coffeetocode

Extras

Theory of Fingerprinting

- Find some characteristic(s) that is…
  - …always the same for a particular individual (implementation/version/person)
  - …always different from other members of the population
- If there's one piece of info that fulfills both, great
  - If not, take several that pin it down
  - Tons of interesting reading in information theory and entropy
- OS & HTTP Server Fingerprinting: Lots of protocol-aware checks that rely on subtle differences in implementation

The Question That Started This All

- **What % of (active) sites on the net are running a well-known webapp?**

- Not counting Parked/ad-only, down, or blank/40x
- Only examined the root of the domain
- Sample set is from a list of 87M .coms

The Question That Started This All

- What % of active sites on the net are running a well-known webapp?

- 23% Parked
- + 5.8% Ads only
- + 7.9% No Content/40x
- + 13.1% Down
- ~49.7% of the web is ***junk****

- **That's all? Hush you.*

The Question That Started This All

- What % of active sites on the net are running a well-known webapp?

- 4.4% of domains had a supported app
- ÷ 503 percent of domains are “active”
- ~8.8%

It Only Goes Up

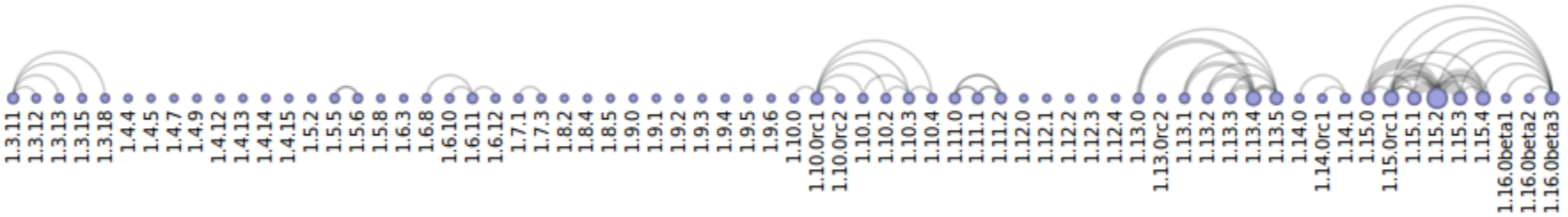
- 8.8% is *definitely* a lower bound
  - Support for more apps
  - Could test /blog, /wiki, /forum and subdomains
  - Improvements in app guessing (was tuned for false negatives)

- What % of web applications are a “well-known” webapp?
  - I don’t know… I’d like to find out though

Beyond Hashing

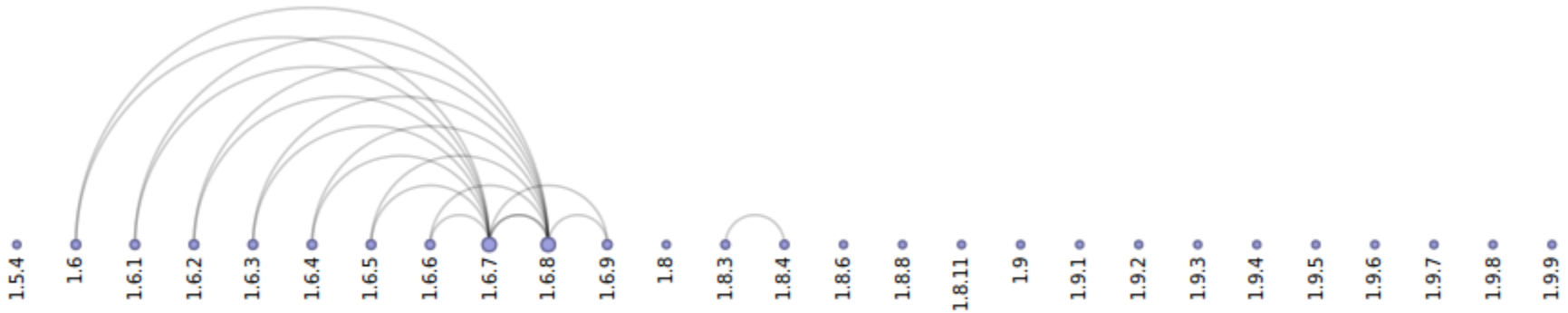
- Nearest neighbor search
- Rolling hashes
- Version trajectory
- Error tolerant hashing?

Version Clusters: Mediawiki



Connections between nodes (versions) indicate that a fingerprint job produced those versions and was unable to differentiate. Thicker connections indicate the number of times this confusion occurred (two particularly difficult to distinguish versions), while many connections among adjacent nodes indicates a family of difficult to distinguish versions.

Version Clusters: Moodle



Connections between nodes (versions) indicate that a fingerprint job produced those versions and was unable to differentiate. Thicker connections indicate the number of times this confusion occurred (two particularly difficult to distinguish versions), while many connections among adjacent nodes indicates a family of difficult to distinguish versions.