Defending Election Campaigns from Cyberspace

Joshua Franklin Kevin Franklin



OHN LEWIS FOR CONGRESS

John Lewis is tired of sitting on the sidelines watching his boss, longtime liberal crusader Max Baucus, get all the credit for advancing President Obama's out-of-touch agenda, including ObamaCare. But despite being ObamaCare's "chief architect," Baucus hasn't had any problem trying to distance himself from the law earlier this year, saying he sees "a huge train wreck coming." Will John Lewis put himself at odds with the President now that he'll be in the spotlight? Or will he stand by the disastrous bill his boss helped to craft?

John Lewis is bad for Montana:

- After more than a decade working under Baucus, John Lewis has pocketed over \$568,000 of taxpayers' money
- Lewis has been laying the groundwork for his campaign by visiting every county in Montana on the taxpayers' dime
- Lewis has spent nearly 12 years working under Baucus and was a top aide to the "chief architect" of Obamcare

Photo was taken by Eliza Wiley

Please come back and visit this site to learn more about why Lewis needs to retire from Washington.

DONATE

Had anough of John Lawish Cian up Today



architect" of Obamcare

Photo was taken by Eliza Wiley

Please come back and visit this site to learn more about why Lewis needs to retire from Washington.

DONATE

Had enough of John Lewis? Sign up Today

First Name*	Last Name
Email*	Zip Code*

SUBMIT

f Like < 81 Help Stop John Lewis in his tracks Tweet 3

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Paid for by the National Republican Congressional Committee and not authorized by any candidate or candidate's committee.

www.nrcc.org

Agenda

- Bonda fides
- Previous work
- Introducing Election Buster
 - How it works, issues, results
- WHOIS information
- Applications to other areas
- 2016 presidential hopefuls
- Recommendations and conclusions

Note on Politics & Cybersecurity

This work is party agnostic.

Where possible, we made every attempt to provide examples from both parties. When we did not, it was solely because we didn't have an example from the other party.

Bona Fides

- Joshua Franklin
 - 10+ years experience in election technology at state & federal levels
 - MS Information Security & Assurance
- Kevin Franklin
 - Big expertise in big data (15+ years)
 - MS Computer Science

Previous Work – 2012 Election

- Presented at Shmoocon 2014
- Found many examples of internet chicanery





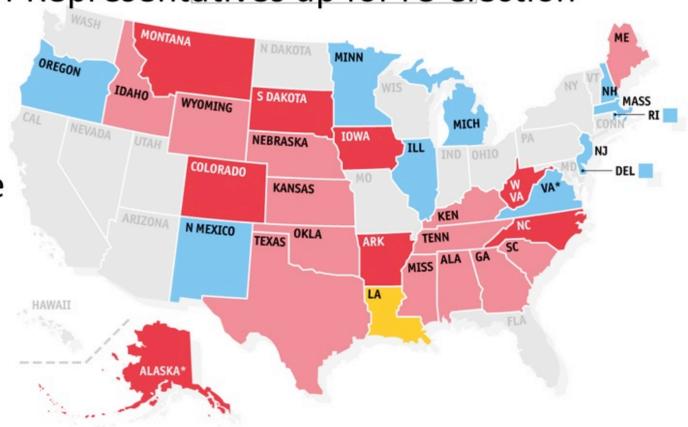


2014 General Election

- Not a presidential election year
- 1/3 the Senate up for re-election

Entire House of Representatives up for re-election

 Many, many, many, local and state elections nationwide

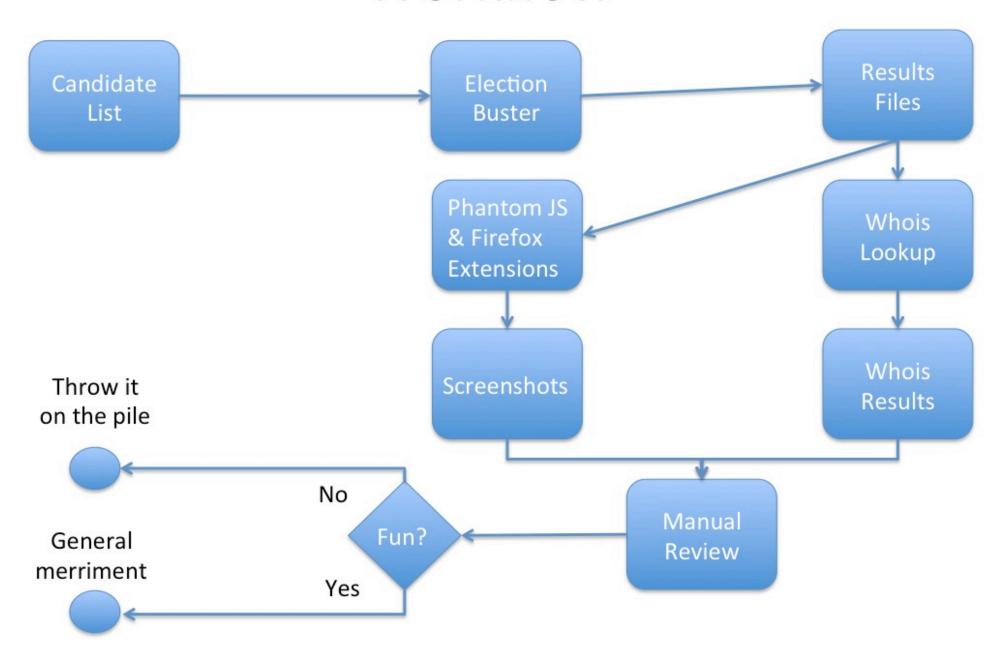


Methodology

- Looked for:
 - Fake campaign sites and other malfeasance
 - Candidates stealing traffic and money from another candidate
- Wrote tools to find suspect sites
 - Scanned every candidate for Senate and House in 2014 (1000+ candidates) + 2016 hopefuls
 - Wrote tools to take screenshots and collect WHOIS information
- Combed through data to identify malicious and questionable sites

Timeline of Scans: February 2014 – October 2015

Workflow



Introducing ElectionBuster.py

- Open source Python tool
- Requires 5 inputs for a candidate
 - first name, last name, state of the election, type of election (e.g., House, Senate), year of the election
- Requests <u>every</u> combination of characters for a domain
- Uses our templates to be a little smarter

./electionBuster.py –f Barack –l Obama –e president –s Hawaii –y 2008 ./electionBuster.py –f Mitt –l Romney –e president –s Massachusetts –y 2008

Uses of Election Buster

- Identify a candidate's domains
- Identify typosquatters
- Identify sites that should be defensively purchased or acquired
- Predict if someone is thinking about running for a particular office
 - Precognition!

Available at: https://github.com/thorshand/electionBuster

Issues

Speed

- It takes 8 12 hours to scan each candidate with my 2008 Macbook using WiFi
- It takes 5 15 minutes per scan with Amazon EC2
- Names with punctuation marks
 - O'Malley need to be input as OMalley
- Names and states with spaces
 - Remove spaces and concatenate words
 - West Virginia is concatenated = WestVirginia

Sample Scan

************** Page Exists: http://www.alfranken.com http://www.alfranken.com, 200 Date: Fri, 17 Oct 2014 22:17:14 GMT Server: Apache Last-Modified: Fri, 17 Oct 2014 00:03:50 GMT Content-Length: 31479 Cache-Control: max-age=3, must-revalidate Expires: Fri, 17 Oct 2014 22:17:17 GMT Content-Type: text/html; charset=UTF-8 ********** Page Exists: http://www.alfranken.net http://www.alfranken.net, 200 Date: Fri, 17 Oct 2014 22:17:14 GMT Server: Apache Set-Cookie: is mobile=0; path=/; domain=www.alfranken.net X-Host: app-64-13.intern.weebly.net X-UA-Compatible: IE=edge,chrome=1 Content-Type: text/html; charset=UTF-8 ***************** http://www.alfranken.me, URLError, [Errno -2] Name or service not known http://www.alfranken.org, HTTPError, 403 http://www.alfranken.biz, URLError, [Errno -2] Name or service not known http://www.alfranken.info, URLError, [Errno -2] Name or service not known

http://www.alfranken.us, URLError, [Errno -2] Name or service not known

************************************* ElectionBuster v12 Scan Results: INPUTS = al, franken, 2014, senateminnesota Total runtime was (1137.5537490844727, 'seconds') There were 20 positive results. There were 22677 unique URLs tested. Positive results: http://www.alfranken.com http://www.alfranken.net http://www.al2014.org http://www.franken2014.com http://www.alfranken2014.com http://www.senatoralfranken.org http://www.frankenforsenate.com http://www.frankenforsenate.net http://www.frankenforsenate.org http://www.afranken.com http://www.afranken.net http://www.alfranke.com http://www.altfranken.com http://www.altfranken.net http://www.altfranken.info http://www.rlfranken.com http://www.alfranzen.com http://www.teamfranken.com http://www.repal.com http://www.voteal.com

Sample Scan

http://www.corygardner.com, HTTPError, 403

http://www.corygardner.net, HTTPError, 403

http://www.corygardner.me, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.corygardner.org, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.corygardner.biz, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.corygardner.info, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.corygardner.us, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.c0rygardner.com, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.c0rygardner.net, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.c0rygardner.me, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.c0rygardner.org, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.c0rygardner.biz, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.c0rygardner.info, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.c0rygardner.us, URLError, [Errno 8] nodename nor servname provided, or not known

http://www.corygardmer.com, URLError, [Errno 8] nodename nor servname provided, or not known

ElectionBuster v5 Scan Results:
#######################################
INPUTS = cory, gardner, 2014, senate
Total runtime was (31729.032551050186, 'seconds')
There were 15 positive results.
There were 23544 unique URLs tested
Positive results:

http://www.corygardnerforsenate.net http://www.corygardnerforsenate.org http://www.corygardnerforsenate.info http://www.coryforsenate.com http://www.gardnerforsenate.com http://www.carygardner.com http://www.corigardner.com http://www.rorygardner.com http://www.rorygardner.com

http://www.rorygardner.net http://www.rorygardner.us http://www.cobygardner.com http://www.codygardner.net http://www.teamcory.com http://www.teamgardner.com

EOF

Results

- Scanning was a multi-year project
- Now have <u>lots</u> of log files and screenshots taking up Google's cloud storage
- Lots of results for non-election related pages
 - False positives everywhere
 - Lots of parked domains
- Didn't find a lot of malicious activity
 - Found mostly slanderous sites
- No statistical analysis

Slanderous Sites

- We call this mukraking
 - Someone purchases a domain that people are likely to visit
 - Places negative information
- These sites may be blogs from citizens, or sites set up by their opponent
- Probably legal (1st amendment)
- Mukraking sites are the most common "interesting thing" that we identified

Mark Udall – D – CO – Senate



Home 2008 ???

We're Back





Log In

Koch Addict

03/19/2014

0 Comments

N RSS Feed

Archives

November 2014 March 2014 anuary 2014

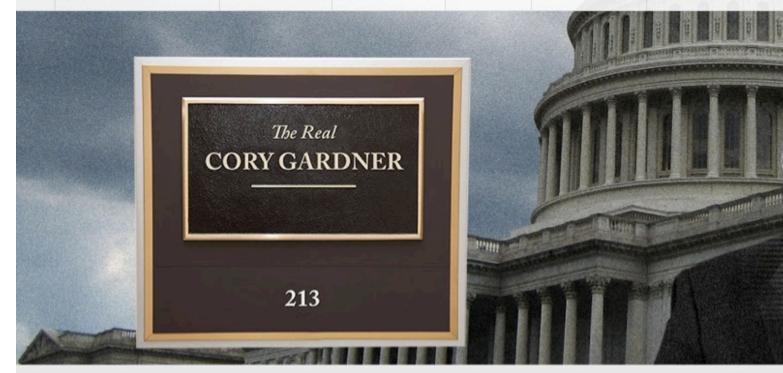
If the trend continues, the first email from the Udall campaign that only has the words "Koch" and "brothers" in it is imminent. And why not? Pavlov never used salad, worked out for him.

To be sure, we realize who and what campaign emails are for, but seriously? This is embarrassing.

www.marxudall.com

Cory Gardner – D – CO – House

nen Energy & Environment Immigration LGBT Rights Seniors Middle Class Press Releases









Middle Class



Seniors



Energy & Environment



Immigration



LGBT Rights

CONGRESSWOMAN SHELLEY CAPITO

IS CONGRESSWOMAN CAPITO USING HER OFFICE TO GET A PARDON FOR HER FATHER?

WEDNESDAY, FEBRUARY 21, 2007

Hypocrite and Coward

Shelley said that while she agrees with the content of the resolution against the escalation, she fears that the Democrats may see it as a first step towards taking away funding from existing troops in the field.

Why don't you just do the right thing, one way or another. The resolution said nothing about funding. Either yes or no. Your behavior leads us to believe that you are just like your Daddy: being whatever people want him to be for the right price.

Labels: war

POSTED BY WVAGAINSTCORRUPTION AT 1:39 PM 0 COMMENTS

THURSDAY, JANUARY 11, 2007

Shelley to run against Rockefeller?

POSTED BY WVAGAINSTCORRUPTION AT 11:02 AM 1 COMMENTS

WEDNESDAY, NOVEMBER 08, 2006

ABOUT ME

WVAGAINSTCORRUPTION WEST VIRGINIA, UNITED STATES

VIEW MY COMPLETE PROFILE

LINKS

modernamerica

backporch politics

PREVIOUS POSTS

Hypocrite and Coward

Shelley to run against Rockefeller?

I guess I shouldn't be surprised that the convicte...

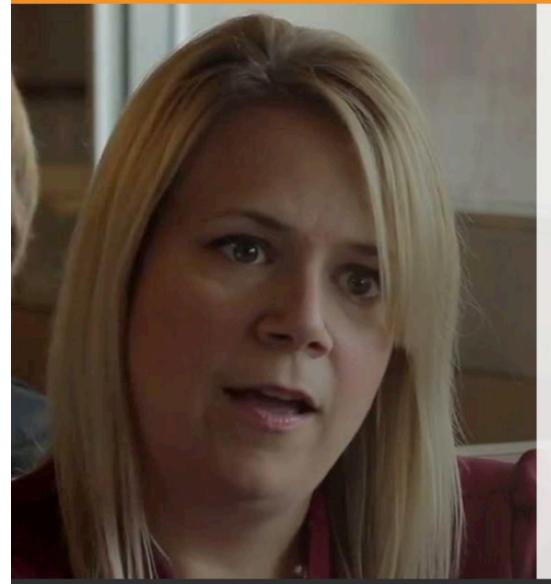
One Breath Shelley is one breath away from this en...

Capito attacking free speech

Scandal at the Gate: Capito contributors under in...

Flashback: Go back to the archive to find out She ...

TAXPAYER-FUNDED PERKS POLICE LAYOFFS TAX HIKES OBAMACARE PERENNIAL CANDIDATE BELGARD'S HYPOCRISY



BELGARD

Welcome to FreeholderBelgard.com!

The place to get the true story about say-one-thing, do another, perennial politician Aimee Belgard.

For instance

Belgard said that she wouldn't take a salary as Freeholder, then she did.

Belgard bragged about not raising taxes, then she did. Again and again and again.



www.aimmee4congress.com

Identifying Typosquatters

Mitch McConnell - R - KY - Senate

ElectionBuster Scan Results:

Total run time was (39887.82146000862, 'seconds')

Alison Grimes - D - KY - Senate

2014 KY Senate Race

Positive results:

http://www.mitchmcconnell.com

http://www.mitchmcconnell.us

http://www.mcconnell2014.com

http://www.senatormitchmcconnell.com

http://www.senatormitchmcconnell.org

http://www.mitchmcconnall.com

http://www.mitchmconnell.com

http://www.mitchmcconell.com

http://www.mitchmcconell.org

http://www.mitchmcconnel.com

http://www.mcconnell2016.com

Results:

http://www.mitchmcconell.org

HTTP/1.1 302 Moved Temporarily

Server: nginx

Date: Mon, 22 Sep 2014 12:43:20 GMT

Content-Type: text/html

Content-Length: 154

Connection: keep-alive

Location: http://www.alisonforky.com

Attribution is difficult. With WHOIS information redacted, we have no idea who registered the domain.

Predicting who will Run http://www.christie2016.us

http://www.chrischristie.com http://www.chrischristie.net http://www.chrischristie.me http://www.chrischristie.org http://www.chrischristie.biz http://www.chrischristie.us http://www.chris-christie.com http://www.chris-christie.net http://www.chris-christie.org http://www.chris-christie.info http://www.chris-christie.us http://www.chris2016.com http://www.christie2016.com http://www.christie2016.net http://www.christie2016.org

http://www.christie2016.biz

http://www.christie2016.info

http://www.chrischristie2016.com http://www.chrischristie2016.net http://www.chrischristie2016.me http://www.chrischristie2016.org http://www.chrischristie2016.biz http://www.chrischristie2016.info http://www.chrischristieforpresident.info http://www.chrischristie4president.com http://www.chrischristie4president.net http://www.chrischristie4president.info http://www.chrischristie4president.us http://www.chrisforpresident.com http://www.chrisforpresident.net http://www.presidentchrischristie.com http://www.presidentchrischristie.net http://www.presidentchrischristie.info http://www.presidentchrischristie.us http://www.chrischristieforNJ.com http://www.christieforNJ.com

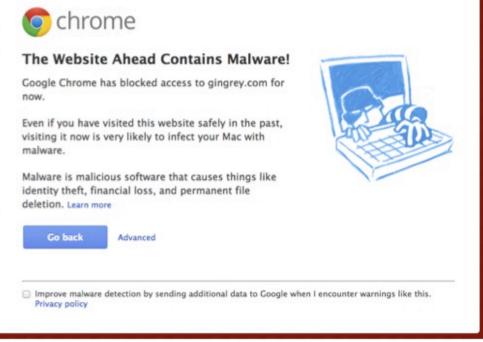
Predicting who will Run http://www.hillaryclintonforpresident.org

http://www.hillary2016.com http://www.hillary2016.net http://www.hillary2016.biz http://www.hillary2016.info http://www.hillary2016.us http://www.clinton2016.net http://www.clinton2016.me http://www.clinton2016.biz http://www.clinton2016.info http://www.clinton2016.us http://www.hillaryclinton2016.com http://www.hillaryclinton2016.net http://www.hillaryclinton2016.me http://www.hillaryclinton2016.org http://www.hillaryclinton2016.biz http://www.hillaryclinton2016.info http://www.hillaryclinton2016.us http://www.hillaryclintonforpresident.com http://www.hillaryclintonforpresident.info http://www.hillaryclinton4president.com http://www.hillaryclinton4president.org http://www.hillaryforpresident.com http://www.hillaryforpresident.net http://www.hillaryforpresident.org http://www.hillaryforpresident.biz http://www.hillaryforpresident.info http://www.hillaryforpresident.us http://www.hillary4president.com http://www.hillary4president.net http://www.hillary4president.me http://www.hillary4president.info http://www.hillary4president.us http://www.hillaryforpresident2016.com http://www.hillaryforpresident2016.net http://www.hillaryforpresident2016.org http://www.hillaryforpresident2016.biz http://www.hillaryforpresident2016.info

Malware

- Found real candidate's sites distributing malware
- We alerted candidate via Twitter





Future Updates

- Make Election Buster faster
- Statistical analysis

 Use computer vision to automatically remove parked domains from results to make manual

review easier

- GoDaddy
- Namecheap
- Bluehost
- Hover
- Huge Domains



Piping into WHOIS

- We have a giant list of domains what now?
 - Pull down the WHOIS information for each domain, of course!
- Wrote a tool to parse it Whoarethey.py
 - Relies on Google's (now deprecated) PYWhols library
- Found personal information from a variety of candidates

Available on Github <u>here</u>

Personal Information

```
http://www.alisongrimes4kentucky.us
                                                             registrant address2: []
                                                             registrant application purpose: P2
admin address1:
                                                             registrant_city:
admin address2: []
                                                             registrant country: United States
admin application purpose: P2
                                                             registrant country code: US
admin city: Lexington
                                                             registrant email:
admin country: United States
                                                             registrant id: CR146666826
                                                             registrant name: Andrew Grimes
admin country code: US
                                                             registrant nexus category: C11
admin email:
                                                             registrant phone number:
admin_id: CR146666828
                                                             registrant postal code:
admin name: Andrew Grimes
                                                             registrant_state_province:
admin nexus category: C11
                                                             registrar: GODADDY.COM, INC.
                                                             registrar id: 146
admin phone number:
                                                             registrar url: whois.godaddy.com
admin_postal_code:
                                                             status: ok
admin state province:
                                                             tech address1:
billing address1:
                                                             tech address2: []
billing address2: []
                                                             tech application purpose: P2
                                                             tech city: Lexington
billing application purpose: P2
                                                             tech country: United States
billing city:
                                                             tech country code: US
billing country: United States
                                                             tech email:
billing country code: US
                                                             tech id: CR146666827
                                                             tech name: Andrew Grimes
billing email:
                                                             tech nexus category: C11
billing_id: CR146666829
                                                             tech phone number:
billing name:
                                                             tech postal code:
billing nexus category: C11
                                                             tech state province: Kentucky
```

PA House Republicans

- Most of the PA
 House Republicans
 use the same
 email to register
 domains
- Seems like a good idea
- Here's an example

```
http://www.repjames.com
creation date: 2012-11-15 00:00:00
domain_name: ['REPJAMES.COM', 'REPJAMES.COM']
emails: ['pahouserepublicans@gmail.com',
'pahouserepublicans@gmail.com', 'support@dyn.com']
expiration date: 2015-11-15 00:00:00
name servers: ['NS1.P10.DYNECT.NET',
'MS2.P10.DYNECT.NET', 'NS3.P10.DYNECT.NET',
NS4.P10.DYNECT.NET'
referral url: http://www.dyn.com
registrar: DYNAMIC NETWORK SERVICES, INC
status: ['clientDeleteProhibited',
'clientTransferProhibited', 'clientUpdateProhibited',
'clientDeleteProhibited']
updated date: 2014-03-04 00:00:00
whois server: whois.dyndns.com
```

R. Lee James – R – PA – State House

Rosemary Brown – R – PA – State House

Sheryl Delozier – R – PA – State House

And many more...

Applying to Other Areas

- State, county, local government election sites
- Super PACs
 - Act Blue
 - Our Country Deserves Better
 - American Crossroads
 - House Majority
- Other interest groups

Act Blue – D – SuperPAC

Act Blue PAC

- Fundraising platform for Democrats
- When you push "donate" on a Democrat's site, you're probably using Act Blue's tech
- Kept showing up in scans
- No positive results

http://www.actblue.com Real sites http://www.actblue.net http://www.actblue.org http://www.atblue.com http://www.acblue.com http://www.act4blue.com http://www.act4blue.net http://www.act4blue.org http://www.altblue.com http://www.altblue.net http://www.antblue.com http://www.artblue.net http://www.artblue.me http://www.artblue.us

Our Country Deserves Better PAC

- Large Republican
 SuperPAC
- Not as active in 2014
- No positive results

+++++++++++++++++++++++++++++++++++++++
PACscan v1 Scan Results:
+++++++++++++++++++++++++++++++++++++++
NPUTS = ourcountrydeservesbetter, 2014
Total runtime was (54481.58076405525, 'second
There were 1 positive results.
There were 40754 unique URLs tested.
Positive results:
http://www.ourcountrydeservesbetter.com
Pool site
Real site

MD State Board of Elections

- Saw message below, so let's scan it
- Never reviewed the results for this until Oct 2015
- Still analyzing

Potential phishing alert! Legitimate emails from the State Board of Elections end with maryland.gov. If you receive an email stating that it is from "The State Board of Elections" from an email address that does not end with maryland.gov, do not open the email and delete it immediately.

Shady?

PACscan v1 Scan Results: INPUTS = elections.state.md, 2014 Total runtime was (78352.55301308632, 'seconds') There were 2753 positive results. There were 31696 unique URLs tested. Positive results: http://www.elections.state.md.com http://www.elections.state.md.org http://www.elections.state.md.us http://www.elect1ons.state.md.com http://www.elect1ons.state.md.org Real site http://www.eiections.state.md.com http://www.eiections.state.md.org http://www.electlons.state.md.com http://www.electlons.state.md.org http://www.electi0ns.state.md.com http://www.electi0ns.state.md.org http://www.electioms.state.md.com http://www.electioms.state.md.org http://www.elections.state.nd.net http://www.elections.state.nd.org http://www.elections.state.nd.biz http://www.3l3ctions.stat3.md.com http://www.3l3ctions.stat3.md.org

2016 Presidential Hopefuls





Introducing a new American political party platform that offers a viable strategic alternative to the American governing system.

The Humanity Party™ calls for a civil uprising demanding real change of the political status quo, held peacefully and according to law at voting booths throughout the United States and its Districts during the 2016 Presidential election.

Americans can declare that they refuse to continue toleration of a flawed system, and demand that the United States institute a more humane government. To rise for change, simply register to vote and at the polling booth on the day of elections, write in the word ANONYMOUS.



THumP™ BLOG

The Worldwide Humanity Party™—Creating a New World O... (NOTE: The following are excerpts from the rough draft of the Humanity Party's ™ political platform that will be released as an option to the world

D'BRICKSHAW'S 15 REASONS NOT TO VOTE FOR DONALD TRUMP IN 2016





You aren't seriously considering voting for Donald Trump, are you?

#trumpyourcat

Home



Don't be an idiot.

Donald Trump is not a viable candidate.

STOP. JUST STOP.

You have a job, right? You have healthcare, right?

Then, don't vote for Donald Trump because all of this will change.

TRUMP

MAKE AMERICA GREAT AGAIN!



Ronald Trump 2016

Would you like to see Don

RONALD TRUMP 2016

Donald J. Trump 🕖



Carly Fiorina failed to register this domain.

So I'm using it to tell you how many people she laid off at Hewlett-Packard.

It was this many:

That's 30,000 people she laid off. People with families.

www.carlyfiorina.org - we removed a few thousand sad faces

Hillary Clinton – D – NY – President



www.hillaryclinton.net

Presidential Campaign of Donald Eugene Lowe









WORKING HARD FOR YOU

I am Presidential Candidate Donald Eugene Lowe running for President of United States and I'm committed to making *your voice* heard on Capitol Hill. Like you, I want to play an active role in making my community, state and country a safer, better place to raise my children, run my business, and forge a future filled with unlimited promise.

If you share my vision, I urge you to connect with me and help make it happen! Together, we can make a meaningful difference—for our families, our communities, and our country.

BERNIE SANDERS, THE INDEPENDENT UNITED STATES SENATOR FROM VERMO IS ASKING US IF WE THE PEOPLE WILL STAND UP FOR DEMOCRACY IN 20



www.bernie4prez.org





Elect Bernie Sanders

Bernie Sanders for President

Who is Bernie

Bernie Sanders for Presiden

Welcome!

In a large field of presidential contenders, unqualified for the office they seek, Sen. 5 most competent of the bunch. Sen. Sand with a firm understanding of the problems He offers sound proposals to tackle those

Some have mocked Sen. Sanders as an i pragmatic idealist - a realist with high idea American people - who is willing to respon concerns faced by ordinary Americans.



Bernie The Real Peoples candifate For President 2016

Sen. Bernie Sanders (I) Vermont is a tireless advocate for working families, the elderly and the underprivileged. He supports ending tax cuts for the rich and corporate tax loopholes which cost our country Billions of Dollars in lost revenue each year. Bernie has not been bought by Big Business and the Very Rich, he would focus on creating jobs, the environment and rebuilding America. Bernie is Of the People, By The People and For the People of the USA. Bernie Sanders for President 2016.

Odds and Ends

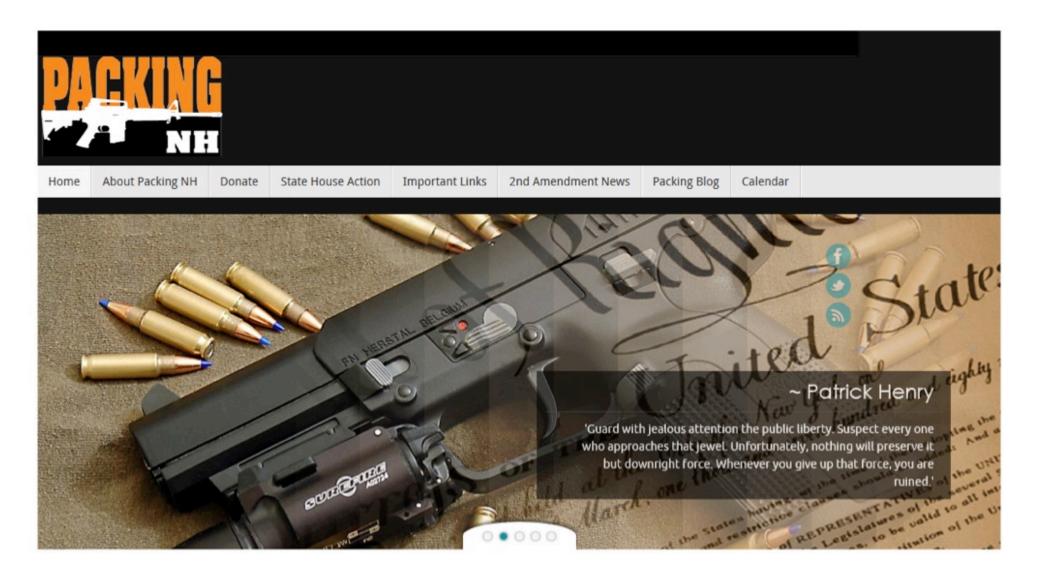
Political Domain Registrars

- Registars squat on popular names
- PoliticalWebNames.com is popular





Most American Domain



Recommendations & Conclusions

Common Templates

```
Lname + Fname :: http://www.barackobama.com
Lname + '-' + Fname :: http://www.chris-christie.com
Fname + year :: http://lepage2014.com
Fname + Lname + year :: http://johnwalsh2014.com
Fname + 'for' + state :: http://alisonforkentucky.com
Fname + Lname + 'for' + state :: http://www.edfitzgeraldforohio.com
Lname + '4' + state :: http://www.heck4nevada.com
Fname + 'for' + position :: http://bryansmithforcongress.com
Position + Fname + Lname :: http://www.congressmanbillyoung.com
'team' + Fname :: http://www.teammitch.com
'vote' + fName :: http://www.voteal.com
```

- Candidates need to decide which domains to purchase (e.g., .com, .net, .org, .me, .us)
- Our tool suggests domains you should purchase and it is being updated with new templates

Note: Many of these links are now broken.

Conclusions

- Much less malicious traffic in 2014 General vs. 2012 Presidential
- Our tools and templates can be used by any candidate to protect their brand from typosquatting
- Candidates may want to defensively purchase many of the templates we list for their own brands
- Candidates should not put personal info into the WHOIS database
- Look twice before you donate!
- If you want a copy of our data just ask

Questions?

- @thejoshpit www.jfranklin.me/ElectionCybercrime

Acknowledgements

- Thanks to all our friends and family who supported us in this work
 - Our wives for putting up with us
 - Ben, Kenny, Jayson, Phil, etc.
 - Everyone who I've bugged about this
- Big thanks to Amazon for the promotion we used to get 700 free hours of time on EC2!

CC License Attribution

 Obama vs Romney: http://www.flickr.com/photos/ donkeyhotey/7189682629/