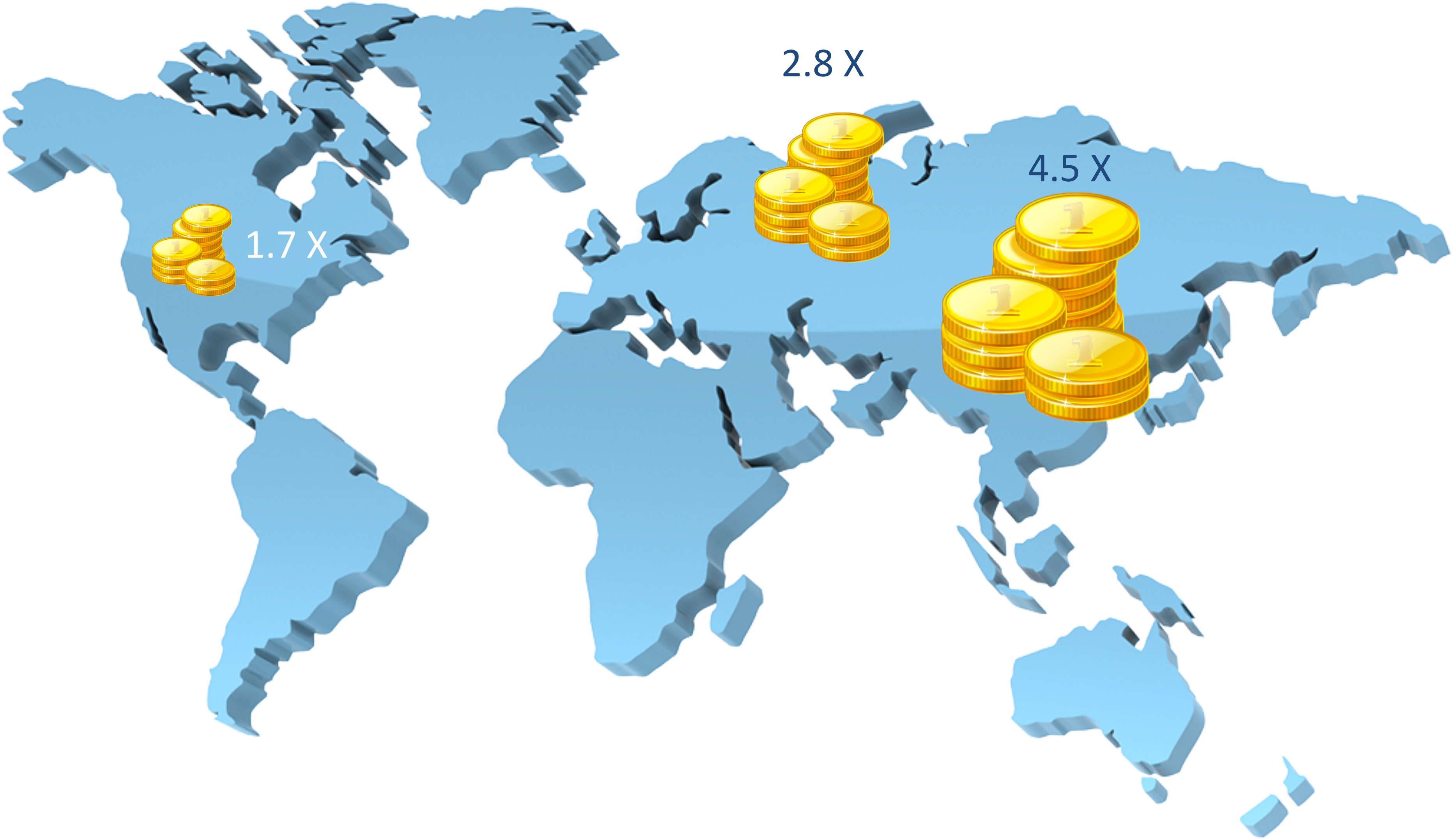
black hat USA 2013

Is that a government in your network or are you just happy to see me?

Eric M. Fiterman
www.spotkick.com

black hat USA 2013

2000-2012 military spending increases



Data courtesy of SIPRI: http://www.sipri.org/

Which of the following is a more cost-effective intelligence collection platform?

ATLAS
ATLAS
USAF
ULA
ATLAS
ULA
AV-016

OR

Photo courtesy of mac_ivan under CC license

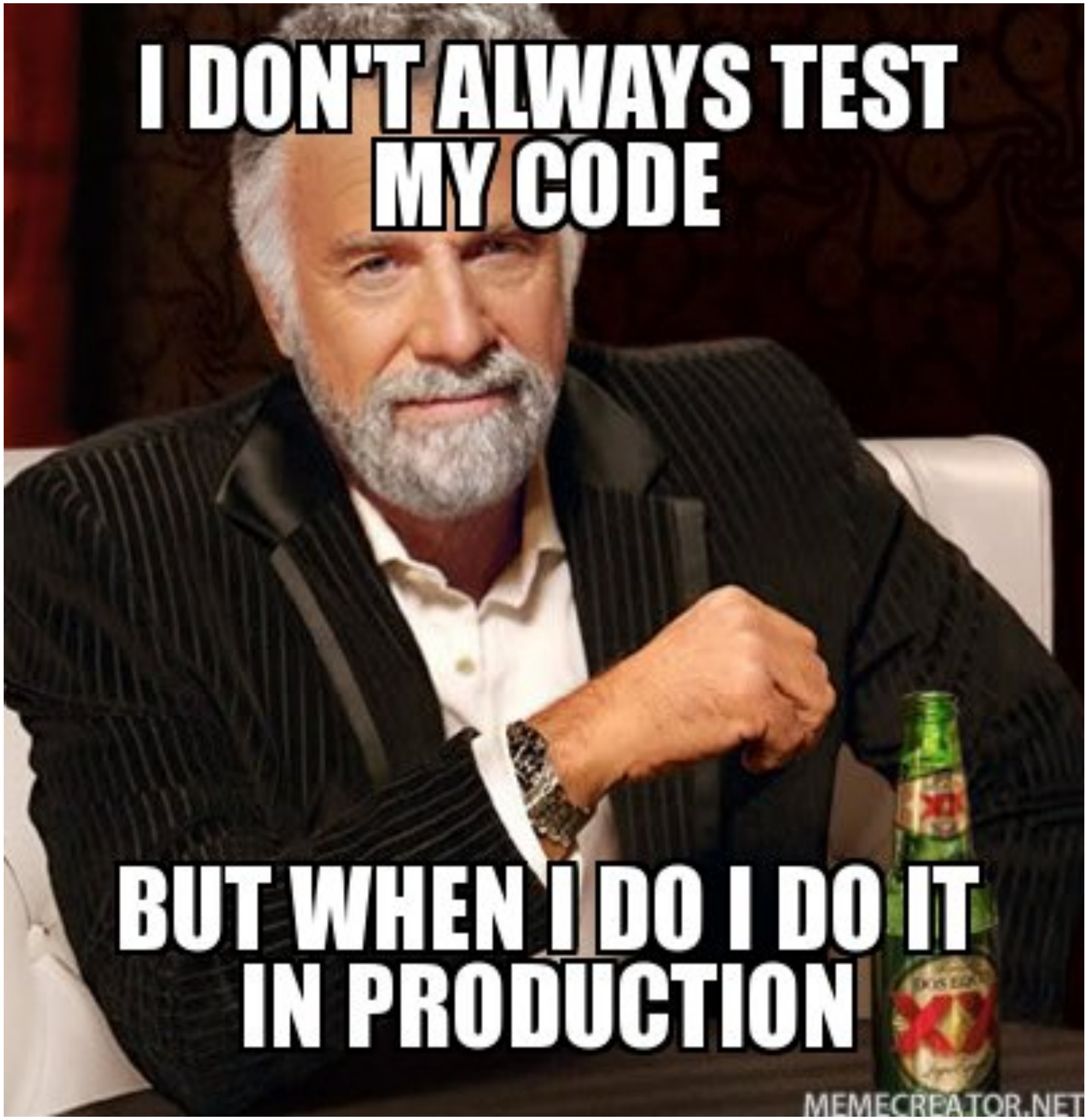
Superpower status
is not a prerequisite to {collect/disseminate}
intelligence anymore

Wikileaks is rollin’ on 20s

This means you probably have someone in your network that can maneuver around as well as you can.

My background in incident response gave me visibility into tactics and techniques used by sophisticated adversaries.

I also write a lot of code.


I DON'T ALWAYS TEST MY CODE
BUT WHEN I DO I DO IT IN PRODUCTION
MEMECREATOR.NET

So here I’m going to present you with…

3 ROGUE TECHNIQUES TO SNIFF OUT THE NASTIES IN YOUR NETWORK

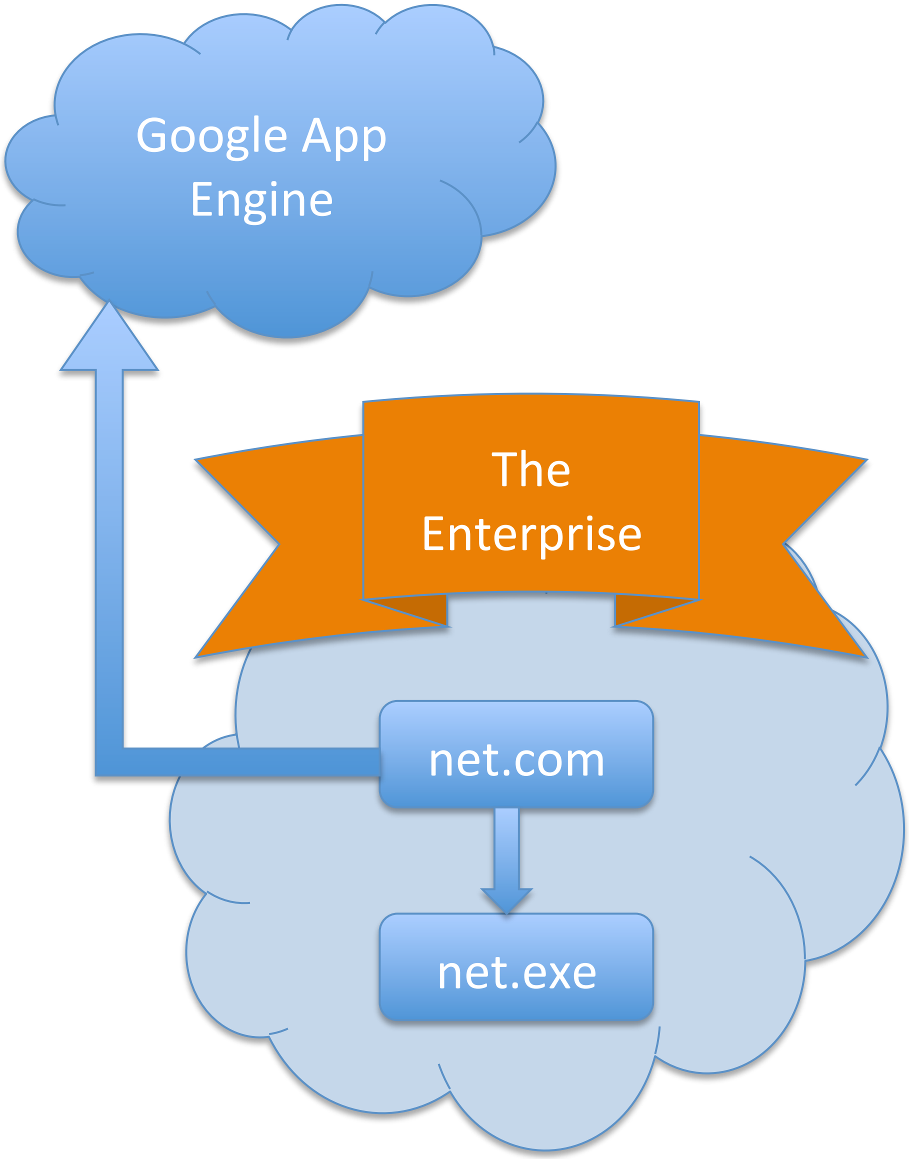
ROGUE TECHNIQUE #1

- TROJANIZE YOUR DOS/WIN32 SHELL

In our case, threat actors were heavy command-line users – using the *net* executable to mount shares and propagate malicious payloads

We trojanized the shell

- Placed a net.com binary in the system32 folder (runs 1st)
- Our version beaconed out to a Google App Engine service that logged the activity and ran the original utility as intended
- Transparent to the attackers



- This gave us a subtle, **last-ditch warning** if a compromise was not caught by our other sensors

- Very simple wrapper makes outbound HTTP calls (interestingly, not flagged by enterprise A/V either)

Code available at:

https://github.com/RogueNetworks

How can we extend this concept?

Where do we go from here?

** Any similarity between this Socrates clip-art and Jesus is purely coincidental*

Let’s build **sandboxed** versions of the COMMAND.COM shell that can present actors with the illusion of access to real system resources!

** Any similarity between this Socrates clip-art and Jesus is purely coincidental*

The propagation of malicious payloads also depends on weaknesses in Active Directory authentication

The use of NTLM hash-injection tools allow seamless + native file/share access as any domain (or local) user

What is PTH?

Chef Monte's World-Famous Recipe for Pass-the-Hash

Ingredients

- ✓ 1 Microsoft Active Directory Network
- ✓ 1-3 servings of domain admin hashes, *unsalted*
- ✓ 1 teaspoon of lemon zest
- ✓ 1 hash-injection tool

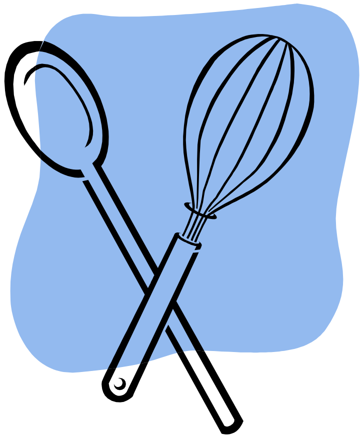
Step 1: Remove the hash

✓ First, ensure the local host is ripe enough and has the residue necessary to extract NTLM hashes

✓ Using the edge of a bowl, crack open the LSASS process to extract cached or in-memory hashes to produce your hashes

Step 2: Inject the hash

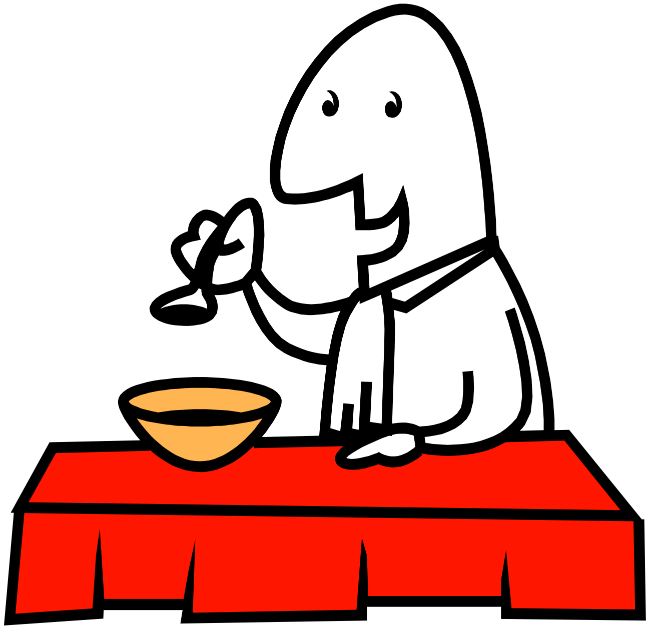
- ✓ After allowing the hashes to rest, prepare the NTLM hash using your injection tool of choice (console recommended)



- ✓ Then, *carefully* whisk the extracted hash into memory to replace the in-memory NTLM hash with the desired hash of your choice

Step 3: Enjoy!

✓ Congratulations, you are now able to access resources and generate Kerberos tickets as any domain user!



✓ Remember to wash your hands when done!

Chef Monte Says:

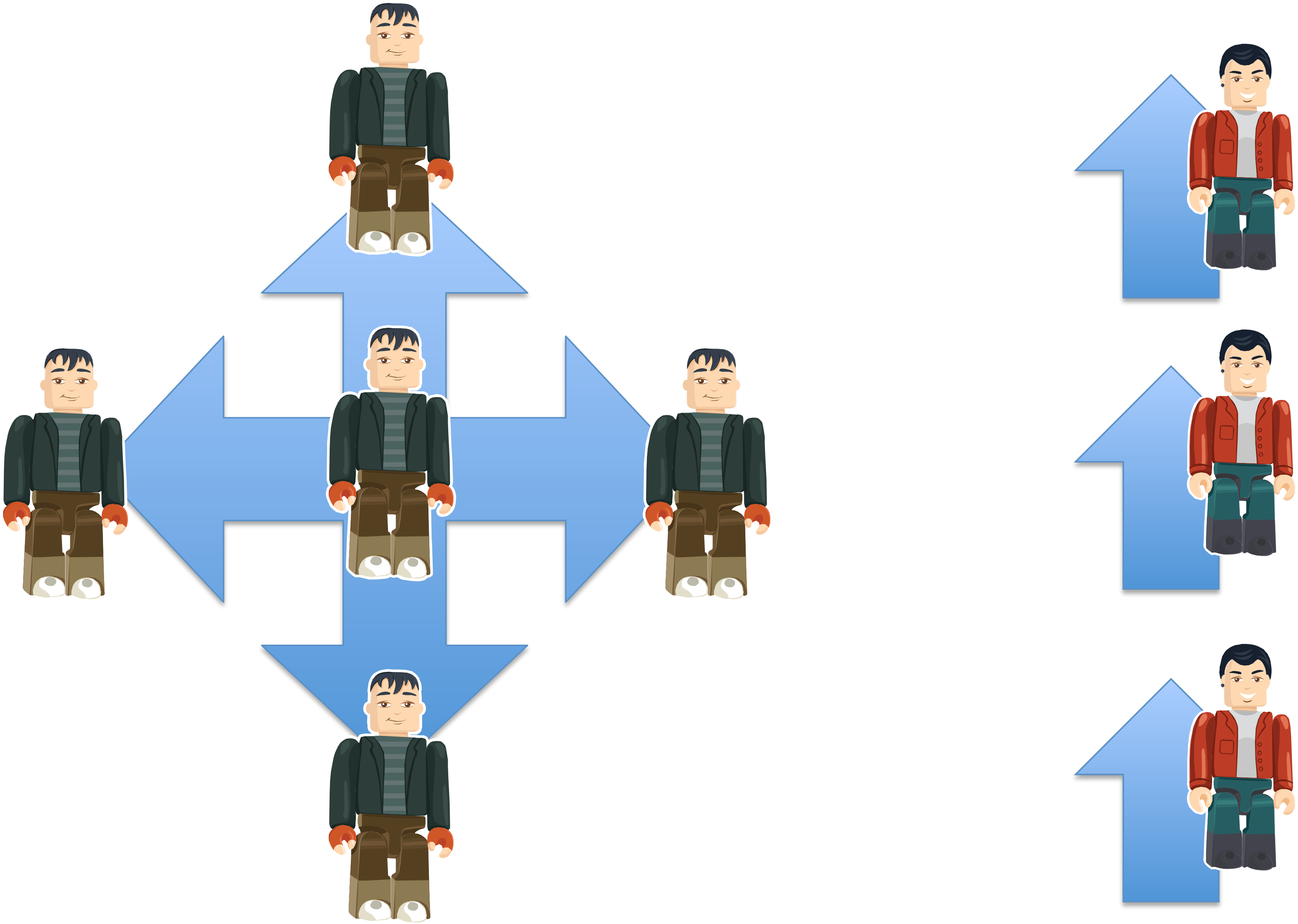
Remember to try my spam loaf recipe!!

While this problem has persisted for years, it is possible to detect and identify the characteristics associated with this technique

ROGUE TECHNIQUE #2

- TURN PASS-THE-HASH INTO TRASH-THE-HASH

Lateral authentication looks odd:



The {code}

- **Breachbox core:** a suite of Linux daemons for monitoring Kerberos authentication traffic in the core

Features

- **Flexible deployment**: can be deployed via span port or in-line layer-2 for extra stealth

- **Zero-trust certified***: Rebuilds authentication transactions from the wire, *not from log data*

- **Plays well with log management**: Send alerts to enterprise log platforms via Syslog interface

Caveats

- **Doesn't completely support newest SMB protocols**

- **Protocol analyzer code is scary**

The {code}

Code available at:

https://github.com/RogueNetworks

ROGUE TECHNIQUE #3

- PROFILE YOUR APPLICATIONS

Good

Blacklist malicious activity

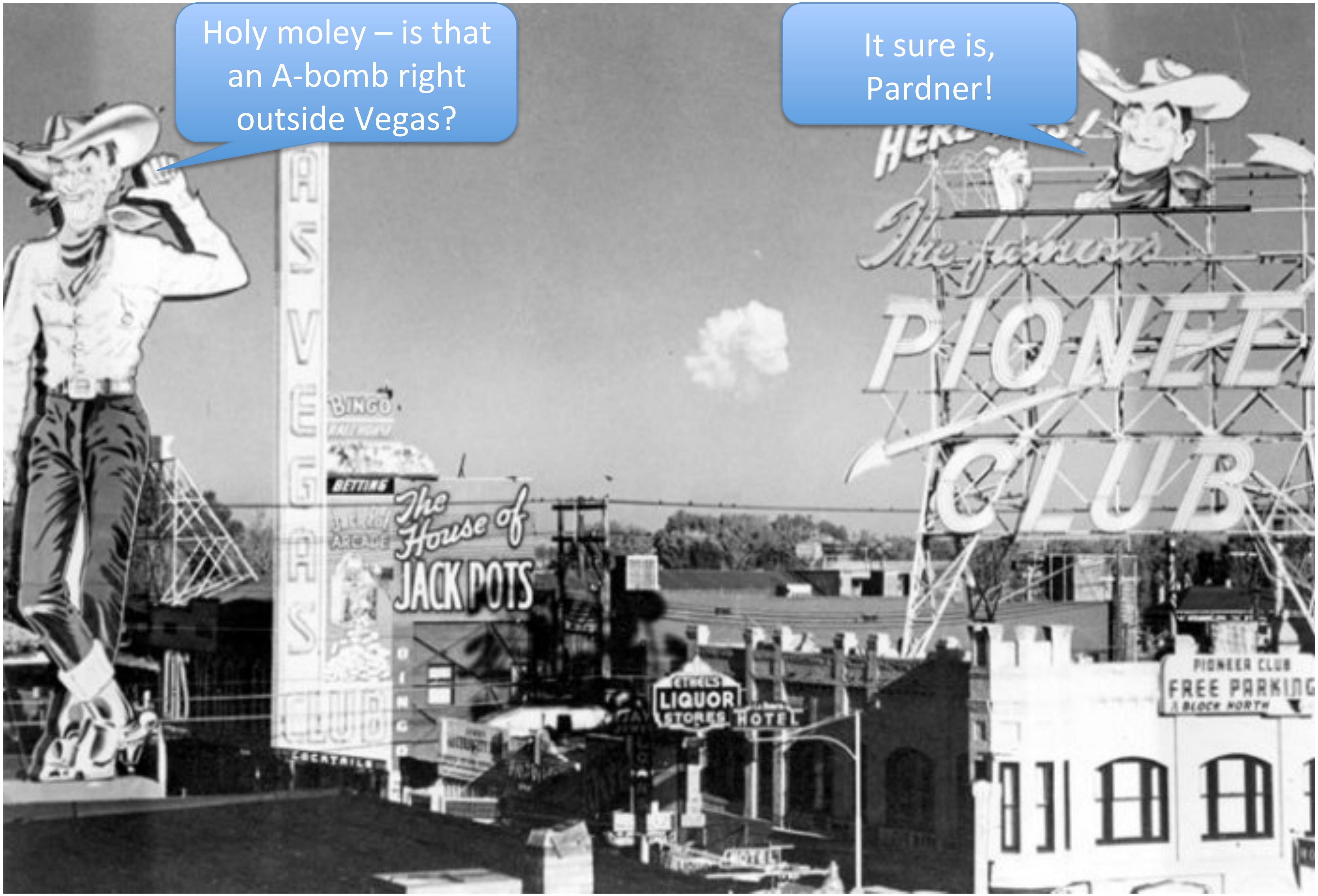
Better

Whitelist acceptable activity

Best

Use math + lists!

Math is powerful



Math lets you soar to new heights

Many spam-detection systems work this way. They use Bayesian statistics to flag anomalies.

How email looks in a Bayesian world

Eric:

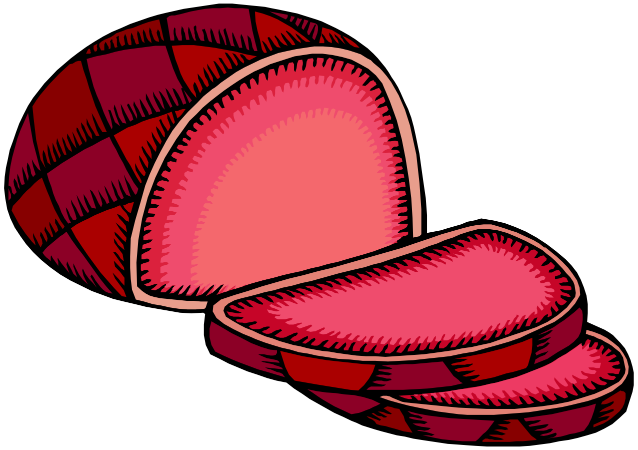
Thanks for the note. Did you see the article about how Walmart’s employees slammed the company on its own website?

Later,

-Skinner

Whatever your illness or disorder is it’s better to be sure of the medications you take!

Cialis, Viagra, Prozac…



We can apply the same approach to **web traffic**.

http://www.spotkick.com/api/push?
c=**breachbox**&tid=**1234567**&ctype=**3**

http://www.spotkick.com/api/push?
c=**spotkick**&tid=**7654321**&ctype=**2**

Profile for *push* api service call:

- **c: alphanumeric, 9+-2 characters**
- **tid: numeric, 7+-1 characters**
- **ctype: numeric, 1+-1 characters**

http://www.spotkick.com/api/push?c=**breachbox**&tid=**1234567’%20or %201=1**&ctype=**3**

Profile for *push* api service call:

- c expects: alphanumeric, 9+-2 character
  - received: alphanumeric, 9 characters (PASS)
- Ctype expects: numeric, 1+-1 characters
  - received: numeric, 1 character (PASS)
- tid: numeric, 7+-1 characters
  - received: alphanumeric + control characters, 14 characters (FAIL)

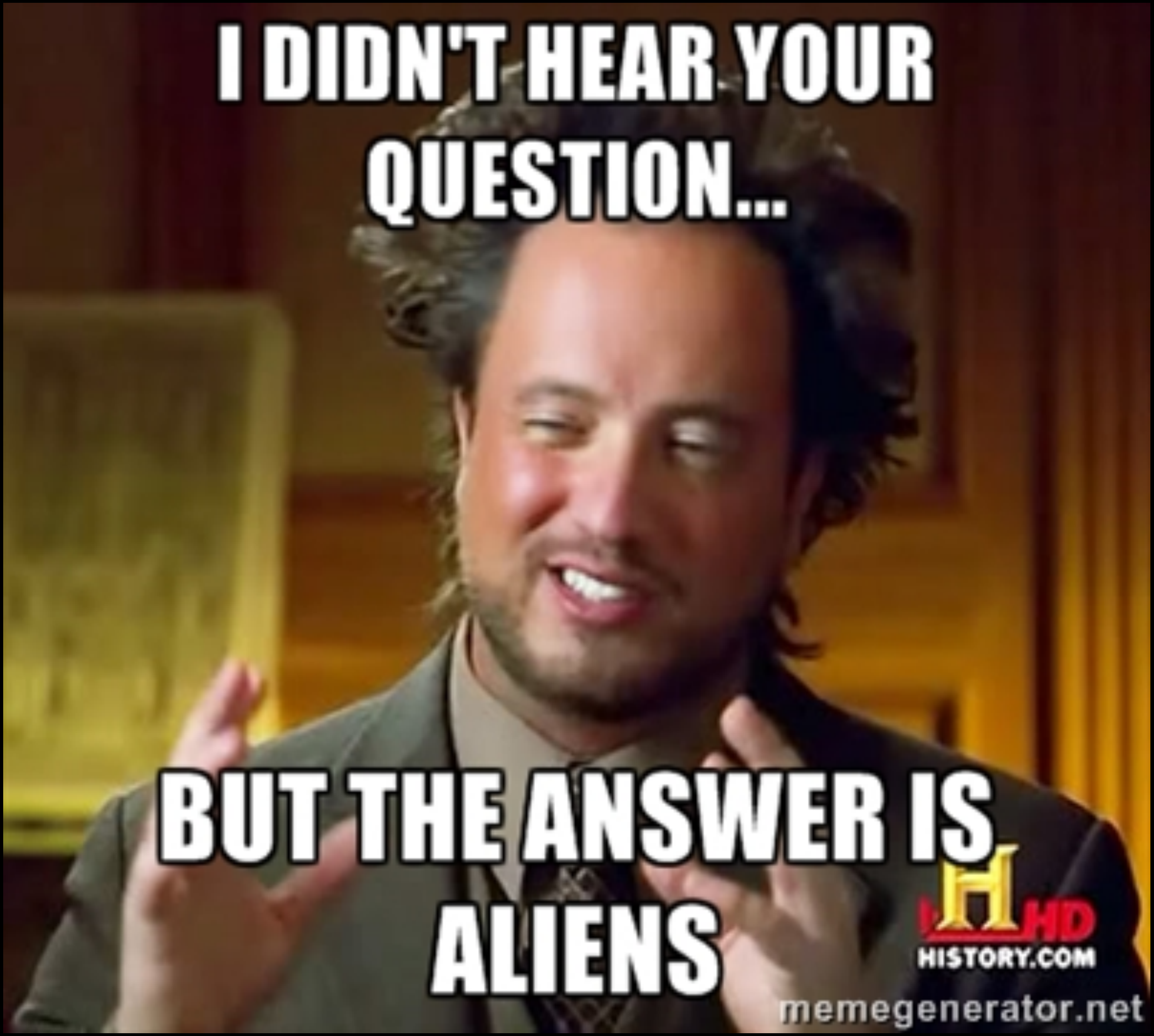
The {code}

- **Breachbox web:** a suite of Linux daemons for monitoring HTTP traffic

Features

- **Flexible deployment:** can be deployed via span port or in-line layer-2 for extra stealth

- **Hybrid scheme reduces false positives:** Statistical can be combined with list-based approaches



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