

DNS中的“奇葩数据”解析

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Netlab OpenData Project

By Network Security Research Lab at 360

Description

The Netlab OpenData project was presented to the public first at ISC' 2016 on August 16, 2016. We currently provide multiple data feeds, including DGA, EK, MalConn, Mirai-Scanner and Mirai C2, and DRDoS Reflector.

We share these data feeds to the security community, looking forward to improve the cyberspace security. And contributor are welcome to provide us more data to expand the diversity of current data feeds.



Outliner

- Domain
 - DGA
 - DNS suffix
 - 组合
 - IDN域名
- IP
 - Sinkhole
 - NXDOMAIN
 - 特殊用途IP
 - 开源情报 (OSINT)

“奇葩Domain”

- 先看几组域名

```
o594de30e878a211a56c90acab08de7adc.cc
hcf35c452fc744b36653774b05859d5502.cn
u6f28440b8649db41985e1bf036dd65226.cc
o52946f088a5dc2f51985f57b1cd70f2e0.cc
p78f75b5dbae6f80a67762f51e8c2be058.ws
he614eb55d093977f6aa9582671fdd64f6.cn
o6ffa5d75a147c189a80490bb96c335af0.to
e2790713da0820b43fb0a4c85a734a22fb.cc
d8654ecea0a8a5f22ef2732abedba902f6.ws
pccd4cabb8bd14546af2bf4c3aaca91093.ws
k1a9b8bbb1d6567d55c898f442c467805f.tk
ffd30a8f13e0b114f364bbd1ecf8c9f1cd.cn
h7372c048d9d661b1ca07514d6c0005967.in
e4e38df5e87a39c284d107b9317e3eff97.to
w06b9180d42309a5b0ae21956f8881d7d4.to
h05baeb41e72d3686ad9913d74c3f83635.cn
```

```
xmawhfglbcm.you
qpztqimfv.you
vofizwdpscvsunw.you
adixjvamwepsyrn.you
fikzjru.you
obwjfrcxebod.you
jvjygzxrundqk.you
afpcrzea.you
rwcytobkwgzwe.you
odukeitxzfq1.you
ekjzdnq.you
aioswetntayrd.you
cugmpln.you
life.china.com.cn.you
mmmzgbvovhirc.you
dwutyxsuziwwkk.you
```

```
vwhwijsuo5q1kv5wct0vc2tvd.cnn.com
qw4kootxrtchltjlatqv5umba.com
xblnrfzxsidruofhaksmcwktg.com
mmgatj1roq510kjshsqgffc3oh.com
ljfw0jdqj331tcnelpscsawc4a.com
iks4zlfrrannez31gzsc50zyea.com
mitnwtfxwtladeb21lqgacwqbc.com
gvrwn4huo4ih0jcwfltodfbame.com
l4dvr5fwpd2ajrphecq0gppvqwf.com
a2kji42ry3ueqittyrccfrcgpb.com
fsnfzcwv33d3nyu5xrgzytdld.com
0mzd2hiwrpggx1wgrsmv0il5a.ask.com
of3y4perrlv3kyqy24qeln2knd.com
fhrgodpsdticfdututsiirfhh.blogspot.com
4vd2lofvx34yw2zclbqg32zyuh.com
reudbnzvs25pk50lrryntuxde.go.com
```

“奇葩Domain”

- DGA
 - Malware
 - Example: [Dyre](#)
 - 垃圾站群
 - 批量购买二级域名
 - 前缀生成器生成子域

eslttkc.1xq3f.faith	41	1	1703181440	1703181440	23.89.10.147
xgmhkjxjg.1xq3f.faith	41	1	1703181040	1703181040	23.89.10.147
lhckjjglsjl.1xq3f.faith	41	1	1703180925	1703180925	23.89.10.147
nbgdsms.1xq3f.faith	41	1	1703180800	1703180800	23.89.10.147
cdrrsdj.1xq3f.faith	41	1	1703181425	1703181425	23.89.10.147
xgsszztwqr.1xq3f.faith	41	1	1703180840	1703180840	23.89.10.147
xgmhbjbctk.1xq3f.faith	41	1	1703181455	1703181455	23.89.10.147
hdxptyx.1xq3f.faith	41	1	1703181445	1703181445	23.89.10.147
ptyxgslt.1xq3f.faith	41	1	1703181205	1703181205	23.89.10.147
lhstdygs.1xq3f.faith	41	1	1703180855	1703180855	23.89.10.147
ssqxglhct.1xq3f.faith	41	1	1703180525	1703180525	23.89.10.147
xgsmhhdh.1xq3f.faith	41	1	1703180845	1703180845	23.89.10.147

“奇葩Domain”

- DGA
 - Chrome 探测
 - Pattern
 - 周期
 - DNS benchmark
 - [pattern](#)
 - others
 - Omnibox prefetching
 - 特定CNAME
 - ...

5251	bav/pwbsvq	chrome:48208
5252	kapdkslpkzb	chrome:48208
5253	viiwdhrny	chrome:48208
5324	twluercuey	360chrome:40948
5325	yqnjiqok	360chrome:40948
5326	tdbqoizocdywqwz	360chrome:40948
3545	wdchromium.org /favicon.ico	360chrome:2260
3546	wwchromium.org /favicon.ico	360chrome:2260
3547	wwwchromium.org /favicon.ico	360chrome:2260
3548	www.wchromium.org /favicon.ico	360chrome:2260
3549	www.chromium.org /favicon.ico	360chrome:2260
3550	www.wchromium.org /favicon.ico	360chrome:2260
3551	www.wwwchromium.org /favicon.ico	360chrome:2260
3552	www.chromium.org /	360chrome:2260

“奇葩Domain”

- DNS suffix
 - PC
 - 个人
 - 公司/组织
 - 路由器
 - 用于区分内外网

```
C:\Documents and Settings\zzf>ipconfig /all

Windows IP Configuration

Host Name . . . . . : zzf-f037f78939b
Primary Dns Suffix . . . . . : forttest.com
Node Type . . . . . : Unknown
```

```
C:\Documents and Settings\zzf>nslookup www.360.cn
Server: [REDACTED]
Address: 192.168.0.222

Non-authoritative answer:
Name:    www.360.cn
Address: 106.120.167.67
```

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	10.0.2.15	192.168.0.222	DNS	82	Standard query A www.360.cn.forttest.com
2	0.000649	192.168.0.222	10.0.2.15	DNS	144	Standard query response, No such name
3	0.001003	10.0.2.15	192.168.0.222	DNS	70	Standard query A www.360.cn
4	0.001543	192.168.0.222	10.0.2.15	DNS	86	Standard query response A 106.120.167.67

“奇葩Domain”

- 组合
 - DGA + DNS suffix
 - Host + DNS suffix



source: <http://img2.iautos.cn/upload/2014/11/3/289080141103115106.jpg>

“奇葩Domain”

- DGA + DNS suffix
 - Chrome + DNS suffix
 - DNS suffix == [TLD](#)
 - DNS suffix == router AP
 - DNS suffix == 公司域名

```
jonsmfhzivmg.tendaap  
fnqrctlzbrbrglu.tendaap  
lmtqsvhrntdefzn.tendaap  
adtgkyt.tendaap  
wlgqsujhei.tendaap  
whavgvplwluanqf.tendaap  
sssetbeuq.tendaap  
wvffrhagix.tendaap  
ofnmlvuslg.tendaap  
gzpyyztwti.tendaap
```

```
wfkvfjyi.cn.juniper.net  
cawjhwonaton.cn.juniper.net  
lbzfrntkdveq.cn.juniper.net  
rvuswdjz.cn.juniper.net  
qdfnzqzafnaqo.cn.juniper.net  
gcuoulns.cn.juniper.net  
zqggsgdnac.cn.juniper.net  
kvmsaqegsbpyod.cn.juniper.net  
xnafjknptw.cn.juniper.net  
awjzjvczw.cn.juniper.net  
wkczlcrjgx.cn.juniper.net
```

“奇葩Domain”

- DGA + DNS suffix
 - Malware + DNS suffix
 - 泛解析

```
zokskmhs.org.yadon.com  
nvvaemrbwr.biz.yadon.com  
yovcgrv.org.yadon.com  
ppmyevvfydj.net.yadon.com  
xyamjrygba.biz.yadon.com  
tipdgbk.info.yadon.com  
ivxlxtsc.info.yadon.com  
ztkfd.cc.yadon.com  
xnyxss.org.yadon.com  
vnuvrsl.net.yadon.com  
xakemgpi.net.yadon.com  
zkjij.cc.yadon.com  
tmmgjzak.biz.yadon.com  
ibuayj.net.yadon.com  
psebnaw.net.yadon.com  
ntvnasy.cc.yadon.com
```

“奇葩Domain”

- Host + DNS suffix
 - Nested domain
 - VS Phishing domain

正常域名

```
img.wsd1.vivo.com.cn.jsahvc.edu.cn  
ynuf.alipay.com.jsahvc.edu.cn  
h5.m.taobao.com.jsahvc.edu.cn  
ifs.tanx.com.jsahvc.edu.cn  
dorangesource.alicdn.com.jsahvc.edu.cn  
ww1.sinaimg.cn.jsahvc.edu.cn  
s1.ananas.chaoxing.com.jsahvc.edu.cn  
log.voicecloud.cn.jsahvc.edu.cn  
i9.pdim.gs.jsahvc.edu.cn
```

钓鱼域名

```
touzi.sina.com.cn.444nnn444nnn.top  
licaishi.sina.com.cn.rgtzp.loan  
licaishi.sina.com.cn.wcyyk.loan  
apple.com.inacr.cn  
licaishi.sina.com.cn.99ua.top  
licaishi.sina.com.cn.qhstm.trade  
licaishi.sina.com.cn.nhckf.loan  
licaishi.sina.com.cn.hptkt.loan  
licaishi.sina.com.cn.wxkch.trade
```

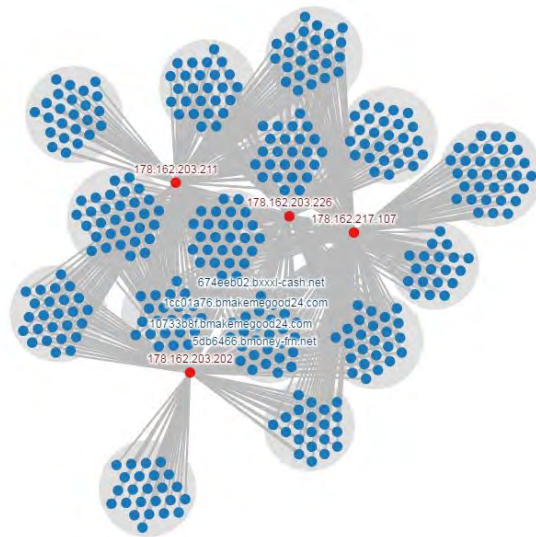
“奇葩Domain”

- IDN域名
 - 初衷
 - 方便非英语国家上网
 - 问题
 - 隐私泄漏 (IM)



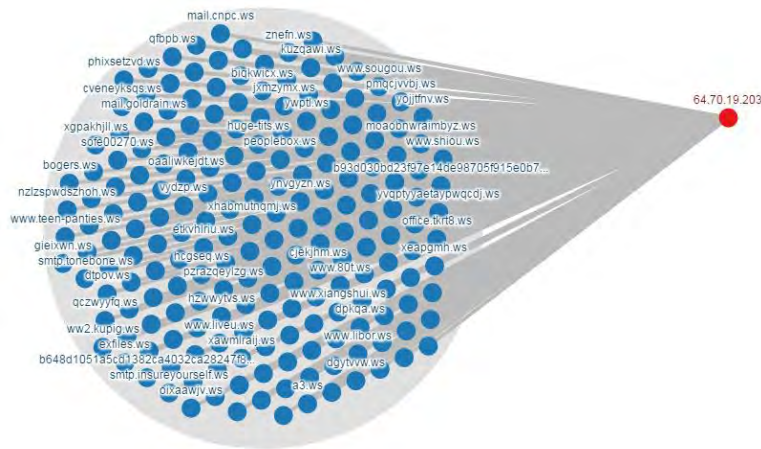
“奇葩IP”

- Sinkhole
 - 对恶意软件的C2域名进行接管的IP地址
 - 遇到sinkhole IP 说明什么
 - 分析落后于人
 - 可能被分析
 - Sinkhole的列表
 - abuse.ch
 - 360netlab



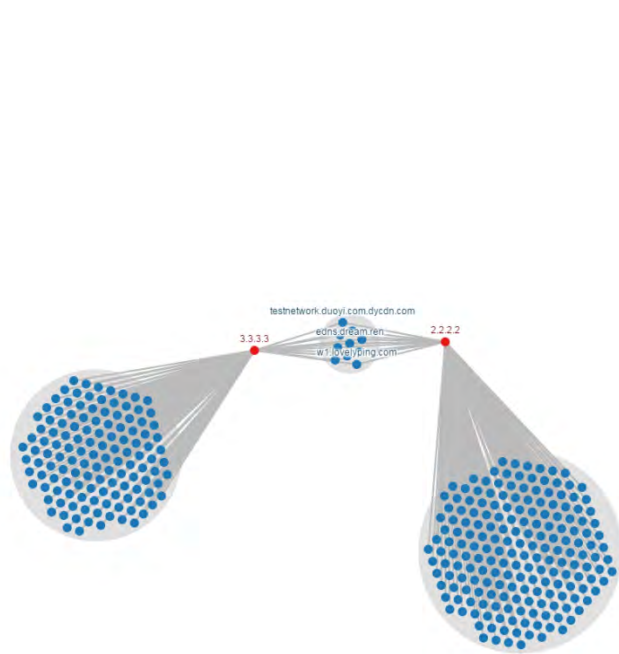
“奇葩IP”

- NXDomain → fake IP
 - ISP的问题
 - chrome 随机串
 - 安全厂商/安全DNS提供商
 - OpenDNS, OneDNS
 - 官方泛解析
 - ccTLD
 - WS/SY/PH
 - Dyre中的*.ws
 - 动态域名
 - *.cba.pl , *.3322.net



“奇葩IP”

- 特定用途的IPs
 - 1.1.1.1/2.2.2.2/8.8.8.8/114.114.114.114...
 - 原因及危害
 - 建议设置
 - 保留地址
 - 10.0.0.0/8, 172.16.0.0/12, 192.168.0.0/16
 - **192.0.2.0/24, 198.51.100.0/24 ...**
 - ICANN
 - 127.0.53.53
 - URS



“奇葩IP” In OSINT

- “奇葩IP” 在OSINT中的命中情况
 - Sinkhole : 48%
 - NXDOMAIN: **93.3%**
 - Reserved : 3.2%
 - Root server : **100% [shock]**

“奇葩IP” In OSINT

- 来源分布

	Team-cymru	bambenekconsulting	emergingthreats	alienvault	abuse.ch	talosintel	autoshun	dshield	spamhaus	malwaregroup	surriel
sinkhole	20	69	16	23	25	12	3	6	6	2	3
NXDOMAIN	18	7	2	7	4	3	2	11	27	0	0
Reserved	2	3	1	0	0	0	0	29	28	0	2
Root server	0	0	0	0	0	0	0	13	0	0	0

“奇葩IP” In OSINT

- 时间分布

	2014	2015	2016	2017
sinkhole	32	99	96	19
NXDOMAIN	20	65	79	22
Reserved	4	42	65	26
Root server	0	0	13	13

Reference

- https://en.wikipedia.org/wiki/Domain_generation_algorithm
- https://en.wikipedia.org/wiki/Reserved_IP_addresses
- https://en.wikipedia.org/wiki/DNS_sinkhole
- <https://sinkdb.abuse.ch/>
- http://www.symantec.com/content/en/us/enterprise/media/security_response/whitepapers/dyre-emerging-threat.pdf
- <https://www.icann.org/news/announcement-2-2014-08-04-zh>
- <https://mikewest.org/2012/02/chrome-connects-to-three-random-domains-at-startup>
- <https://www.icann.org/en/system/files/files/name-collision-mitigation-final-28oct15-en.pdf>
- <https://www.grc.com/dns/benchmark.htm>

构建安全大厦，从造砖，搬砖开始

微博：zhangzaifeng1，招砖家：<http://netlab.360.com/careers>

从DNS看apple设备...

```
minglude-iphone  
ozhangdeipadhua  
unde-iphone  
xiaoshande-iphone  
yapingde-ipad  
yangde-ipad  
ribindeiphone6s  
congyede-ipad  
dedeiphone2  
peipeide-iphone  
inide-iphone  
nhuide-ipad  
gzhicongde-ipadoj  
anjuande-ipad  
ngjiandeiphone8  
sende-ipad  
oxiade-iphone  
ongzhaode-iphone  
chengbode-iphone  
anfengde-iphone  
ngde-iphone  
nde-iphone  
ianhuade-iphone  
chaodeiphone  
ifade-ipad  
ongniude-ipad  
wilaoyunde-iphone
```



THANKS!