THE DFIR REPORT

Real Intrusions by Real Attackers, The Truth Behind the Intrusion

adfind bazar cobaltstrike ransomware rdp ryuk yara

Ryuk in 5 Hours

October 18, 2020

Intro

The Ryuk threat actors went from a phishing email to domain wide ransomware in 5 hours. They escalated privileges using Zerologon (CVE-2020-1472), less than 2 hours after the initial phish. They used tools such as Cobalt Strike, AdFind, WMI, and PowerShell to accomplish their objective.

Ryuk has been one of the most proficient ransomware gangs in the past few years, with the FBI claiming $61 million USD having been paid to the group as of February 2020. Earlier in the year, the group grew a little quiet, but that seems to have changed in the past few weeks, with incidents like what occurred at UHS hospitals.

Case Summary

In our previous Ryuk case, we saw the threat actors leverage access to an environment via the Bazar Loader malware. This time around, we saw them accomplish their objective faster, but the general tactics and techniques stayed similar between incidents.

Bazar was introduced to the environment again with the delivery via phishing emails. For an in depth breakdown on this loader, see this analysis by Roman Marshanski & Vitali Kremez. Bazar, once running, was seen again injecting into explorer.exe, svchost.exe, and spawning command shell processes.

From this loader we saw initial mapping of the domain, using built-in windows utilities such as Nltest. However, unlike the last case, the threat actors started at a lower privileged user and rather than proceed slowly or cautiously, they exploited the recently disclosed Zerologon vulnerability (CVE-2020-1472) to reset the machine password of the primary domain controller.

Lateral movement was initiated via SMB file transfers and WMI executions of Cobalt Strike Beacons. The network indicators align similarly to the prior campaign and were noted by Kyle Ehmke in response to our last post pivoting off the prior report's intel. From memory analysis, we were also able to conclude the actors were using a trial version of Cobalt Strike with the EICAR string present in the network configuration for the beacon. Both portable executable and DLL beacons were used.

After moving laterally to the secondary domain controller, the threat actor started on more domain discovery via Net and the PowerShell Active Directory module. From there, the threat actors appeared to use the default named pipe privilege escalation module on the server. At this point, the threat actors used RDP to connect from the secondary domain controller, to the first domain controller, using the built in Administrator account.

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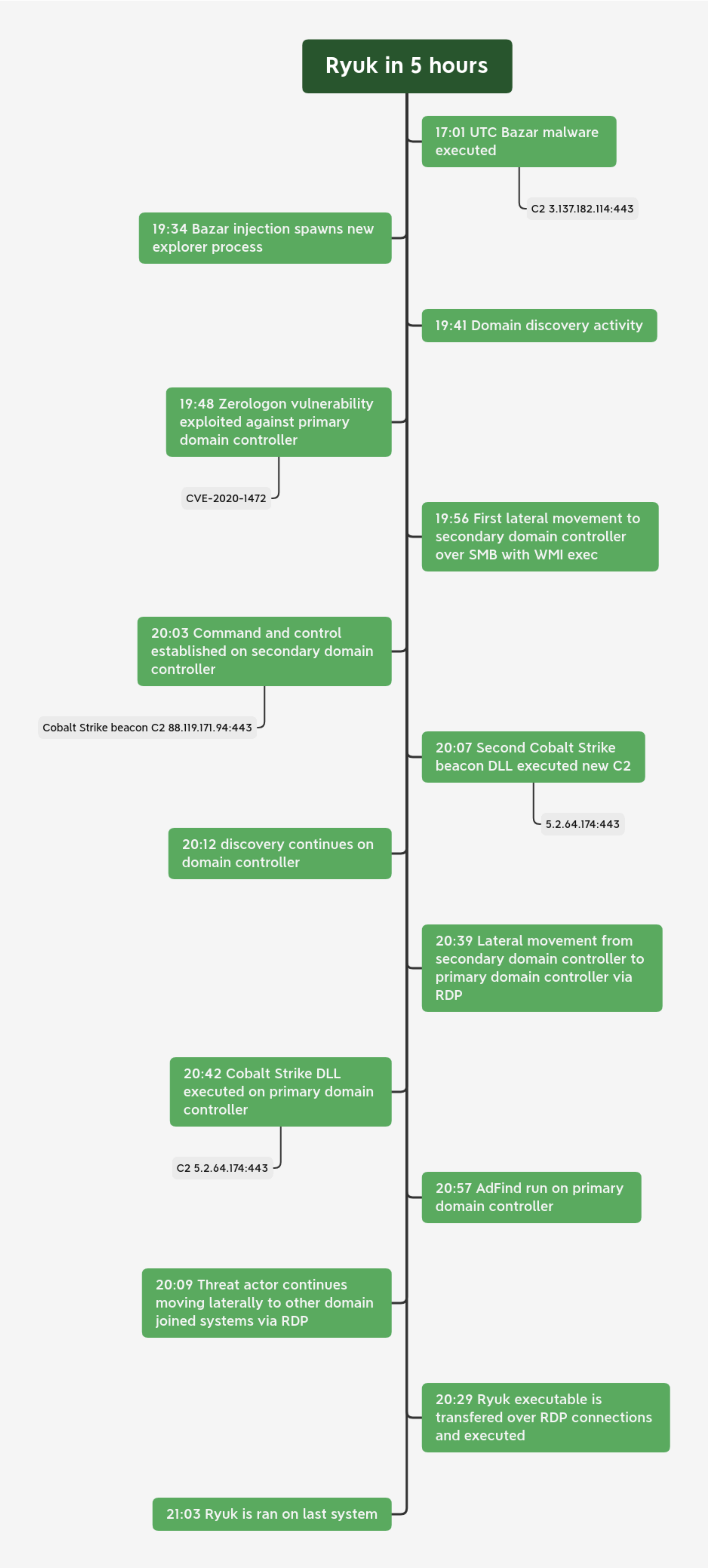
Detection Rules

Once on the main domain controller, another Cobalt Strike beacon was dropped and executed. Then more domain reconnaissance was performed using AdFind. Once this completed, at the four hour mark, the threat actors were ready for their final objective.

Four hours and 10 minutes in, the threat actors used the pivot from the primary domain controller to RDP into the Backup server. Backup servers were again targeted first for deployment of the ransomware executable, followed by servers and then workstations.The threat actors finished their objective by executing the ransomware on the primary domain controller, and at the 5 hour mark, the attack completed.

While last time we commented on the lead time between the first and second day to aid detection and response activity, this case goes to show that you can’t count on that kind of timescale. You need to be ready to act in less than an hour, to make sure you can effectively disrupt the threat actor.

Timeline



Ryuk in 5 hours

17:01 UTC Bazar malware executed

C2 3.137.182.114:443

19:34 Bazar injection spawns new explorer process

19:41 Domain discovery activity

19:48 Zerologon vulnerability exploited against primary domain controller

CVE-2020-1472

19:56 First lateral movement to secondary domain controller over SMB with WMI exec

20:03 Command and control established on secondary domain controller

Cobalt Strike beacon C2 88.119.171.94:443

20:07 Second Cobalt Strike beacon DLL executed new C2

5.2.64.174:443

20:12 discovery continues on domain controller

20:39 Lateral movement from secondary domain controller to primary domain controller via RDP

20:42 Cobalt Strike DLL executed on primary domain controller

C2 5.2.64.174:443

20:57 AdFind run on primary domain controller

20:09 Threat actor continues moving laterally to other domain joined systems via RDP

20:29 Ryuk executable is transfered over RDP connections and executed

21:03 Ryuk is ran on last system

MITRE ATT&CK

Initial Access

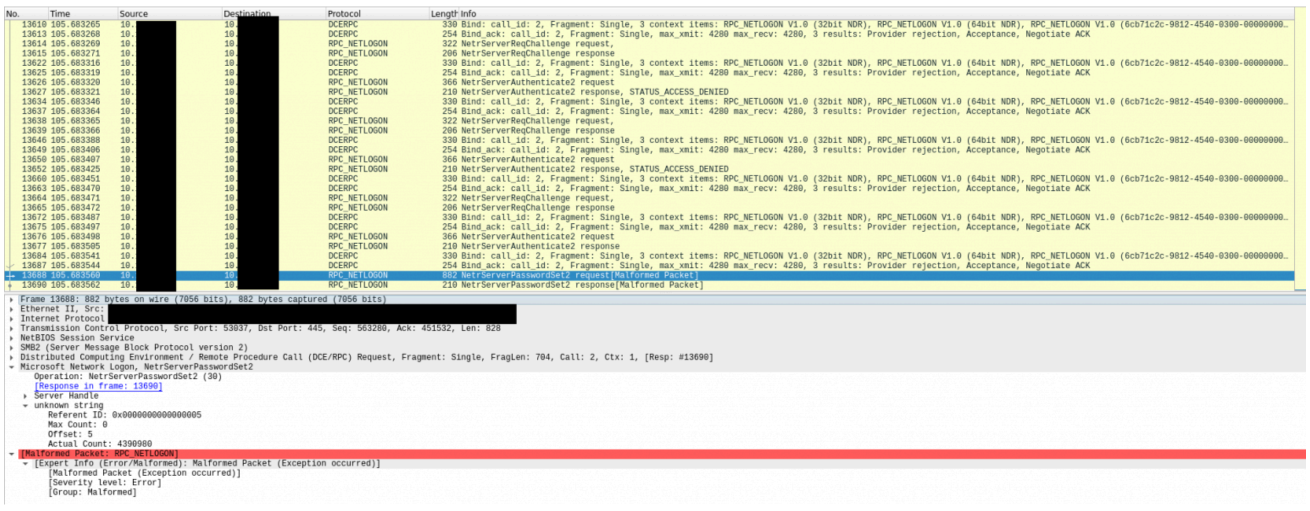
Access was initiated by a phishing email leading to the Bazar Loader malware executable.

Execution

Bazar relies on user execution of an executable to run. This user was a Domain User and did not have any other permissions.

Privilege Escalation

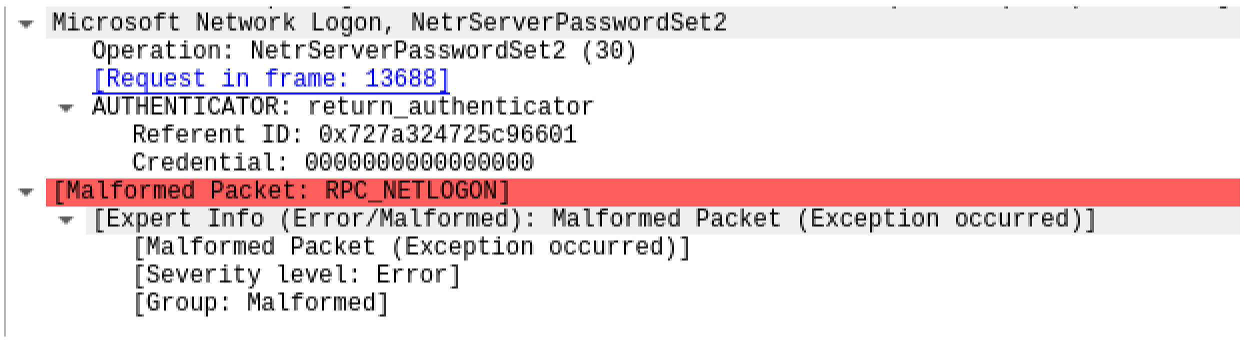
CVE-2020-1472 was used to reset the credentials on one of the domain controllers in the environment. After resetting the password, the threat actors then targeted a different domain controller, potentially due to breaking services by use of their exploit.



```
No.   Time       Source        Destination   Protocol     Length Info
13610 105.683265 10.[redacted] 10.[redacted] DCERPC       330 Bind: call_id: 2, Fragment: Single, 3 context items: RPC_NETLOGON V1.0 (32bit NDR), RPC_NETLOGON V1.0 (64bit NDR), RPC_NETLOGON V1.0 (6cb71c2c-9812-4540-0300-00000000…
13613 105.683268 10.[redacted] 10.[redacted] DCERPC       254 Bind_ack: call_id: 2, Fragment: Single, max_xmit: 4280 max_recv: 4280, 3 results: Provider rejection, Acceptance, Negotiate ACK
13614 105.683269 10.[redacted] 10.[redacted] RPC_NETLOGON 322 NetrServerReqChallenge request,
13615 105.683271 10.[redacted] 10.[redacted] RPC_NETLOGON 206 NetrServerReqChallenge response
13622 105.683316 10.[redacted] 10.[redacted] DCERPC       330 Bind: call_id: 2, Fragment: Single, 3 context items: RPC_NETLOGON V1.0 (32bit NDR), RPC_NETLOGON V1.0 (64bit NDR), RPC_NETLOGON V1.0 (6cb71c2c-9812-4540-0300-00000000…
13625 105.683319 10.[redacted] 10.[redacted] DCERPC       254 Bind_ack: call_id: 2, Fragment: Single, max_xmit: 4280 max_recv: 4280, 3 results: Provider rejection, Acceptance, Negotiate ACK
13626 105.683320 10.[redacted] 10.[redacted] RPC_NETLOGON 366 NetrServerAuthenticate2 request
13627 105.683321 10.[redacted] 10.[redacted] RPC_NETLOGON 210 NetrServerAuthenticate2 response, STATUS_ACCESS_DENIED
13634 105.683346 10.[redacted] 10.[redacted] DCERPC       330 Bind: call_id: 2, Fragment: Single, 3 context items: RPC_NETLOGON V1.0 (32bit NDR), RPC_NETLOGON V1.0 (64bit NDR), RPC_NETLOGON V1.0 (6cb71c2c-9812-4540-0300-00000000…
13637 105.683364 10.[redacted] 10.[redacted] DCERPC       254 Bind_ack: call_id: 2, Fragment: Single, max_xmit: 4280 max_recv: 4280, 3 results: Provider rejection, Acceptance, Negotiate ACK
13638 105.683365 10.[redacted] 10.[redacted] RPC_NETLOGON 322 NetrServerReqChallenge request,
13639 105.683366 10.[redacted] 10.[redacted] RPC_NETLOGON 206 NetrServerReqChallenge response
13646 105.683388 10.[redacted] 10.[redacted] DCERPC       330 Bind: call_id: 2, Fragment: Single, 3 context items: RPC_NETLOGON V1.0 (32bit NDR), RPC_NETLOGON V1.0 (64bit NDR), RPC_NETLOGON V1.0 (6cb71c2c-9812-4540-0300-00000000…
13649 105.683406 10.[redacted] 10.[redacted] DCERPC       254 Bind_ack: call_id: 2, Fragment: Single, max_xmit: 4280 max_recv: 4280, 3 results: Provider rejection, Acceptance, Negotiate ACK
13650 105.683407 10.[redacted] 10.[redacted] RPC_NETLOGON 366 NetrServerAuthenticate2 request
13652 105.683425 10.[redacted] 10.[redacted] RPC_NETLOGON 210 NetrServerAuthenticate2 response, STATUS_ACCESS_DENIED
13660 105.683451 10.[redacted] 10.[redacted] DCERPC       330 Bind: call_id: 2, Fragment: Single, 3 context items: RPC_NETLOGON V1.0 (32bit NDR), RPC_NETLOGON V1.0 (64bit NDR), RPC_NETLOGON V1.0 (6cb71c2c-9812-4540-0300-00000000…
13663 105.683470 10.[redacted] 10.[redacted] DCERPC       254 Bind_ack: call_id: 2, Fragment: Single, max_xmit: 4280 max_recv: 4280, 3 results: Provider rejection, Acceptance, Negotiate ACK
13664 105.683471 10.[redacted] 10.[redacted] RPC_NETLOGON 322 NetrServerReqChallenge request,
13665 105.683472 10.[redacted] 10.[redacted] RPC_NETLOGON 206 NetrServerReqChallenge response
13672 105.683487 10.[redacted] 10.[redacted] DCERPC       330 Bind: call_id: 2, Fragment: Single, 3 context items: RPC_NETLOGON V1.0 (32bit NDR), RPC_NETLOGON V1.0 (64bit NDR), RPC_NETLOGON V1.0 (6cb71c2c-9812-4540-0300-00000000…
13675 105.683497 10.[redacted] 10.[redacted] DCERPC       254 Bind_ack: call_id: 2, Fragment: Single, max_xmit: 4280 max_recv: 4280, 3 results: Provider rejection, Acceptance, Negotiate ACK
13676 105.683498 10.[redacted] 10.[redacted] RPC_NETLOGON 366 NetrServerAuthenticate2 request
13677 105.683505 10.[redacted] 10.[redacted] RPC_NETLOGON 210 NetrServerAuthenticate2 response
13684 105.683541 10.[redacted] 10.[redacted] DCERPC       330 Bind: call_id: 2, Fragment: Single, 3 context items: RPC_NETLOGON V1.0 (32bit NDR), RPC_NETLOGON V1.0 (64bit NDR), RPC_NETLOGON V1.0 (6cb71c2c-9812-4540-0300-00000000…
13687 105.683544 10.[redacted] 10.[redacted] DCERPC       254 Bind_ack: call_id: 2, Fragment: Single, max_xmit: 4280 max_recv: 4280, 3 results: Provider rejection, Acceptance, Negotiate ACK
13688 105.683560 10.[redacted] 10.[redacted] RPC_NETLOGON 882 NetrServerPasswordSet2 request[Malformed Packet]
13690 105.683562 10.[redacted] 10.[redacted] RPC_NETLOGON 210 NetrServerPasswordSet2 response[Malformed Packet]

▸ Frame 13688: 882 bytes on wire (7056 bits), 882 bytes captured (7056 bits)
▸ Ethernet II, Src: [redacted]
▸ Internet Protocol
▸ Transmission Control Protocol, Src Port: 53037, Dst Port: 445, Seq: 563280, Ack: 451532, Len: 828
▸ NetBIOS Session Service
▸ SMB2 (Server Message Block Protocol version 2)
▸ Distributed Computing Environment / Remote Procedure Call (DCE/RPC) Request, Fragment: Single, FragLen: 704, Call: 2, Ctx: 1, [Resp: #13690]
▾ Microsoft Network Logon, NetrServerPasswordSet2
    Operation: NetrServerPasswordSet2 (30)
    [Response in frame: 13690]
  ▸ Server Handle
  ▾ unknown string
      Referent ID: 0x0000000000000005
      Max Count: 0
      Offset: 5
      Actual Count: 4390980
▾ [Malformed Packet: RPC_NETLOGON]
  ▾ [Expert Info (Error/Malformed): Malformed Packet (Exception occurred)]
      [Malformed Packet (Exception occurred)]
      [Severity level: Error]
      [Group: Malformed]
```

Packet showing the zeroed out password.



```
▾ Microsoft Network Logon, NetrServerPasswordSet2
    Operation: NetrServerPasswordSet2 (30)
    [Request in frame: 13688]
  ▾ AUTHENTICATOR: return_authenticator
      Referent ID: 0x727a324725c96601
      Credential: 0000000000000000
▾ [Malformed Packet: RPC_NETLOGON]
  ▾ [Expert Info (Error/Malformed): Malformed Packet (Exception occurred)]
      [Malformed Packet (Exception occurred)]
      [Severity level: Error]
      [Group: Malformed]
```

On one of the domain controllers we saw use of the Cobalt Strike named pipe escalation.

```
C:\Windows\system32\cmd.exe /c echo 92d8cc45954 >; \\.\pipe\446b3c
```

Defense Evasion

On the first domain controller that the treat actors connected to after their initial connection, they dropped a DLL and executed it via rundll32.

```
C:\Windows\system32\cmd.exe /C rundll32 C:\Windows\system32\SQL.dll, S
```

Dropped via RDP and executed via rundll32 on the second domain controller.

```
rundll32 C:\PerfLogs\arti64.dll, rundll
```

Shortly after, the DLL was called again via regsrv32.

```
regsvr32 C:\PerfLogs\arti64.dll
```

Then a 2nd DLL was dropped and executed in a similar manner on the 2nd DC.

```
rundll32 C:\\PerfLogs\\socks64.dll, rundll
```

Discovery

Ran on the beachhead.

```
nltest /domain_trusts /all_trusts
nltest /dclist:DOMAIN
net group "Domain admins" /DOMAIN
```

Ran on a domain controller.

```
net group "enterprise admins" /domain
nltest /domain_trusts /all_trusts
nltest /dclist:"DOMAIN"
ping DOMAINCONTROLLER
cmd.exe /C time
net user administrator /domain
```

Then they imported the PowerShell Active Directory module.

They then ran the following looking for host names, operating systems and last logon dates of all AD systems.

```
C:\Windows\system32\cmd.exe /C Get-ADComputer -Filter {enabled -eq $tr
```

After already completing the above discovery work and having already pivoted to their 2nd domain controller, the threat actors moved on to AdFind for further domain reconnaissance.

```
C:\Windows\Temp\adf\AdFind.exe
C:\Windows\Temp\adf\adf.bat
```

Contents of the script ran the following with AdFind.

```
adfind.exe -f "(objectcategory=person)"
adfind.exe -f "objectcategory=computer"
adfind.exe -f "(objectcategory=organizationalUnit)"
adfind.exe -sc trustdmp
adfind.exe -subnets -f (objectCategory=subnet)
adfind.exe -f "(objectcategory=group)"
adfind.exe -gcb -sc trustdmp
```

The threat actor then ran this command a few times.

```
nltest /domain_trusts /all_trusts
```

Lateral Movement

The first lateral movement occurred to the domain controller not affected by the use of CVE-2020-1472. An executable was transferred to it via SMB using a domain administrator account.

After transferring the exe, the threat actors utilized WMI from the beachhead host to execute the file.

```
C:\Windows\system32\cmd.exe /C WMIC/node:"DC.DOMAIN.local" process cal
```

The presence of the EICAR strings point to the Cobalt Strike software being used as a trial version.

They accessed the GPO's for the domain but none were modified or added.

```
mmc.exe" "C:\Windows\System32\gpedit.msc"
```

Shortly there after we saw a Cobalt Strike DLL transferred via the RDP connection.

RDP was used to pivot from the main domain controller and distribute the final ransomware payload enterprise wide.

Command and Control

After our previous report, @kyleehmke pivoted off of our prior Ryuk report and used the network data to link several of these domains which we saw in this case.

Bazar:

Report_Print.exe

3.137.182.114:443

cstr3.com

Cobalt Strike:

servisses.exe

88.119.171.94:443
Certificate [86:77:d8:5e:51:69:ac:e2:08:07:2e:b0:dc:6c:10:9e:25:80:70:a6]
Not Before 2020/10/06 13:33:55 UTC
Not After 2021/10/06 13:33:55 UTC
Issuer Org lol
Subject Common havemosts.com
Subject Org lol
Public Algorithm rsaEncryption
JA3: 57f3642b4e37e28f5cbe3020c9331b4c
JA3s: e35df3e00ca4ef31d42b34bebaa2f86e
SQL.dll
5.2.64.174:443
Certificate [36:d5:68:f9:be:2a:34:e1:76:3d:89:78:e5:62:4d:fc:ae:02:97:ad]
Not Before 2020/10/02 16:45:57 UTC
Not After 2021/10/02 16:45:57 UTC
Issuer Org lol
Subject Common quwasd.com
Subject Org lol
Public Algorithm rsaEncryption
JA3: a0e9f5d64349fb13191bc781f81f42e1
JA3s: ae4edc6faf64d08308082ad26be60767

Impact

Starting around 4.5 hours after the initial Bazar malware was executed, the Ryuk threat actors acted on their final objectives and initiated RDP connections from the domain controller previously exploited, to the rest of the environment. This time they initiated the ransomware first on the secondary domain controller (their 1st pivot) and transferred the Ryuk executable over the RDP connection.

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We also have pcaps, files, memory images, Kape and Redline packages available here.

IOCs

https://misppriv.circl.lu/events/view/80223 &
https://otx.alienvault.com/pulse/5f8cce76f5614d9b220181b6

Network

```
3.137.182.114:443
cstr3.com
88.119.171.94:443
havemosts.com
5.2.64.174:443
quwasd.com
```

File

```
servisses.exe
d971827d974effedaeaf7d62b619b1dd
c3a846eb04e2fe765e56fa15a0d5c1eb650ccba3
1d8b7faf5f290465cc742e07abca78fac419135b191071cc77912263cd1dde1d
socks64.dll
890206f0c506366d480e02fc9fed988a
ba1542d9b55fff21bda9495ed884404b0436cff2
feb8c2bcb71da02dbbeecb999869e053cf96af8cce6f9705cadca4338133d3b5
SQL.dll
3785d87f6995b4b95d9b55f8d2556237
```

```
9b44a8f0bb2d65fb19e7ca7bbd85b36c176f3d60
d67461ba45a4edf3b2a69b3e64303fda8130bd1fc7a1173f35c1fe67b40c9639
arti64.dll
3785d87f6995b4b95d9b55f8d2556237
9b44a8f0bb2d65fb19e7ca7bbd85b36c176f3d60
d67461ba45a4edf3b2a69b3e64303fda8130bd1fc7a1173f35c1fe67b40c9639
xxx.exe
5b8b66ddbbf1fd67211e9a4bf78c1700
cdb042dd8e9dc17f677c991b386f4cd242f2628d
ccde47a0d315dcd4740fccfe8e8110fbb1fd85bb305734fec409f52051790c98
```

Detections

Network

```
GPL NETBIOS SMB-DS IPC$ share access
ET POLICY SMB2 NT Create AndX Request For a DLL File - Possible Latera
ET POLICY SMB2 NT Create AndX Request For an Executable File
```

Sigma

https://github.com/Neo23x0/sigma/blob/master/rules/windows/malware/win_mal_ryuk.yml

https://github.com/Neo23x0/sigma/blob/master/rules/windows/process_creation/win_powershell_suspicious_parameter_variation.yml

https://github.com/Neo23x0/sigma/blob/master/rules/windows/process_creation/win_susp_wmi_execution.yml

https://github.com/Neo23x0/sigma/blob/master/rules/windows/process_creation/win_trust_discovery.yml

https://github.com/Neo23x0/sigma/blob/master/rules/windows/process_creation/win_susp_net_execution.yml

Detects AdFind usage from a past case:

```
title: AdFind Recon
description: Threat Actor using AdFind for reconnaissance.
author: The DFIR Report
date: 2019/8/2
references:
    - https://thedfirreport.com/2020/08/03/dridex-from-word-to-domain-
tags:
    - attack.remote_system_discovery
    - attack.T1018
logsource:
    category: process_creation
    product: windows
detection:
    selection_1:
        CommandLine|contains:
            - adfind -f objectcategory=computer
    selection_2:
        CommandLine|contains:
            - adfind -gcb -sc trustdmp
    condition: selection_1 or selection_2
falsepositives:
    - Legitimate Administrator using tool for Active Directory queryir
level: medium
status: experimental
```

Yara

```
/*
YARA Rule Set
Author: The DFIR Report
Date: 2020-10-13
Identifier: Case 1006 Ryuk
Reference: https://thedfirreport.com
*/

/* Rule Set ----------------------------------------------------------

import "pe"

rule ryuk_1006_servisses_procdump {
meta:
description = "files - file servisses-procdump.exe"
author = "The DFIR Report"
reference = "https://thedfirreport.com"
date = "2020-10-13"
hash1 = "387894a0b404c67e722799308b12ff2be31d2e8ce798aa53d971f0c13805c
strings:
$s1 = "c:/crossdev/src/winpthreads-svn6233/src/mutex.c" fullword ascii
$s2 = "mutex_global_shmem" fullword ascii
$s3 = "mutex_global_static_shmem" fullword ascii
$s4 = "_pthread_key_dest_shmem" fullword ascii
$s5 = "_pthread_key_sch_shmem" fullword ascii
$s6 = "_pthread_key_max_shmem" fullword ascii
$s7 = "_pthread_key_lock_shmem" fullword ascii
$s8 = "cannot find name of executable" fullword ascii
$s9 = "tiles32.png" fullword ascii
$s10 = "GetModuleFileName: %s" fullword ascii
$s11 = "IP_DEST_HOST_UNREACHABLE (11003)" fullword ascii
$s12 = "This program requires Windows NT!" fullword ascii
$s13 = "SNMP INVALID_SESSION" fullword ascii
$s14 = "SNMP TRAP_ERRORS" fullword ascii
$s15 = "SNMP SELECT_FDERRORS" fullword ascii
$s16 = "Some different radices: %d %x %o %#x %#o " fullword ascii
$s17 = "c:/crossdev/src/winpthreads-svn6233/src/rwlock.c" fullword asc
$s18 = "_pthread_tls_shmem" fullword ascii
$s19 = "IP_DEST_PORT_UNREACHABLE (11005)" fullword ascii
$s20 = "pthr_root_shmem" fullword ascii
condition:
uint16(0) == 0x5a4d and filesize < 2000KB and
( pe.imphash() == "a90d500745a1ce2417c01fecefbc2851" or 8 of them )
}

rule ryuk_1006_files_socks64 {
meta:
description = "files - file socks64.dll"
author = "The DFIR Report"
reference = "https://thedfirreport.com"
date = "2020-10-13"
hash1 = "feb8c2bcb71da02dbbeecb999869e053cf96af8cce6f9705cadca4338133c
strings:
$x1 = "C:\\Users\\Izidu\\Desktop\\2019\\WindowsSDK7-Samples-master\\Wi
```

```
$s2 = "C:\\Users\\Izidu\\Desktop\\2019\\WindowsSDK7-Samples-master\\Wi
$s3 = "PluginSample.dll" fullword ascii
$s4 = "AppPolicyGetProcessTerminationMethod" fullword ascii
$s5 = "luginSample.pdb" fullword ascii
$s6 = "rundll" fullword ascii
$s7 = "AcquireSamplePlugin::DisplayConfigureDialog" fullword wide
$s8 = "AppPolicyGetThreadInitializationType" fullword ascii
$s9 = "`template-parameter-" fullword ascii
$s10 = "operator<=>" fullword ascii
$s11 = "operator co_await" fullword ascii
$s12 = "AppPolicyGetWindowingModel" fullword ascii
$s13 = "Transfer Completed Successfully!" fullword wide
$s14 = "AppPolicyGetShowDeveloperDiagnostic" fullword ascii
$s15 = "noexcept" fullword ascii
$s16 = "Read-Only Photo Acquire Plugin" fullword wide
$s17 = "api-ms-win-appmodel-runtime-l1-1-2" fullword wide
$s18 = "Software\\Microsoft\\Windows\\CurrentVersion\\Photo Acquisitio
$s19 = ".?AUIUserInputString@@" fullword ascii
$s20 = "g0DVNrB\"Rtf#" fullword ascii
condition:
uint16(0) == 0x5a4d and filesize < 2000KB and
( pe.imphash() == "0fd22f187f22ab4ec2eb55f91ccefa7a" and ( pe.exports(
}

rule ryuk_1006_Report_Print {
meta:
description = "files - file Report_Print.exe"
author = "The DFIR Report"
reference = "https://thedfirreport.com"
date = "2020-10-13"
hash1 = "23ac461f9b5128841cafabb4282432252ea7b57874595cf6fe8457fc1ac65
strings:
$s1 = "kErNel32.Dll" fullword wide
$s2 = "DOOKOL.exe" fullword ascii
$s3 = "c:/crossdev/src/winpthreads-svn6233/src/mutex.c" fullword ascii
$s4 = "hmutex" fullword ascii
$s5 = "._FindPESectionExec" fullword ascii
$s6 = "mutex_global_shmem" fullword ascii
$s7 = "processthreadsapi.h" fullword ascii
$s8 = "mutex_global_static_shmem" fullword ascii
$s9 = "TargetIp" fullword ascii
$s10 = "c:\\crossdev\\gccmaster\\build-tdm64\\gcc\\x86_64-w64-mingw32\
$s11 = "h:\\crossdev\\gccmaster\\build-tdm64\\runtime\\mingw-w64-crt"
$s12 = "J__mingw_winmain_lpCmdLine" fullword ascii
$s13 = "GNU C 4.8.1 -mtune=generic -march=x86-64 -g -O2 -O2 -O2 -fbuil
$s14 = "GNU C 4.8.1 -mtune=generic -march=x86-64 -g -O2 -O2 -O2 -fbuil
$s15 = "GNU C 4.8.1 -m64 -mtune=generic -march=x86-64 -g -O2 -std=gnu9
$s16 = "GNU C 4.8.1 -mtune=generic -march=x86-64 -g -O2 -O2 -O2 -fbuil
$s17 = "9lpszCommandLine" fullword ascii
$s18 = "=__mingw_GetSectionForAddress" fullword ascii
$s19 = "__mingw_winmain_lpCmdLine" fullword ascii
$s20 = "%Target" fullword ascii
condition:
uint16(0) == 0x5a4d and filesize < 3000KB and
( pe.imphash() == "8f0088451a1156246379abc67514cacf" and pe.exports("C
}

rule ryuk_1006_files_xxx {
meta:
description = "files - file xxx.exe"
author = "The DFIR Report"
reference = "https://thedfirreport.com"
```

```
date = "2020-10-13"
hash1 = "ccde47a0d315dcd4740fccfe8e8110fbb1fd85bb305734fec409f52051790
strings:
$s1 = "DOOKOL.exe" fullword ascii
$s2 = "c:/crossdev/src/winpthreads-svn6233/src/mutex.c" fullword ascii
$s3 = "hmutex" fullword ascii
$s4 = "mutex_global_shmem" fullword ascii
$s5 = "processthreadsapi.h" fullword ascii
$s6 = "mutex_global_static_shmem" fullword ascii
$s7 = "fake_get_output_format" fullword ascii
$s8 = "&rvaTarget" fullword ascii
$s9 = "h:\\crossdev\\gccmaster\\build-tdm64\\runtime\\mingw-w64-crt" f
$s10 = "c:\\crossdev\\gccmaster\\build-tdm64\\gcc\\x86_64-w64-mingw32\
$s11 = "E__mingw_winmain_lpCmdLine" fullword ascii
$s12 = "GNU C 4.8.1 -m32 -mtune=generic -march=x86-64 -g -O2 -O2 -O2 -
$s13 = "GNU C 4.8.1 -m32 -mtune=generic -march=x86-64 -g -O2 -O2 -O2 -
$s14 = "GNU C 4.8.1 -m32 -mtune=generic -march=x86-64 -g -O2 -O2 -O2 -
$s15 = "GNU C 4.8.1 -m32 -mtune=generic -march=x86-64 -g -O2 -std=gnu9
$s16 = "__mingw_winmain_lpCmdLine" fullword ascii
$s17 = "Npthread_getspecific" fullword ascii
$s18 = "__gthread_getspecific" fullword ascii
$s19 = "=__mingw_GetSectionForAddress" fullword ascii
$s20 = "4lpszCommandLine" fullword ascii
condition:
uint16(0) == 0x5a4d and filesize < 2000KB and
( pe.imphash() == "00f3261b5b33a9b1e8b6003f4056a885" and pe.exports("C
}

rule ryuk_1006_servisses {
meta:
description = "files - file servisses.exe"
author = "The DFIR Report"
reference = "https://thedfirreport.com"
date = "2020-10-13"
hash1 = "1d8b7faf5f290465cc742e07abca78fac419135b191071cc77912263cd1dd
strings:
$s1 = "DOOKOL.exe" fullword ascii
$s2 = "c:/crossdev/src/winpthreads-svn6233/src/mutex.c" fullword ascii
$s3 = "mutex_global_shmem" fullword ascii
$s4 = "mutex_global_static_shmem" fullword ascii
$s5 = "_pthread_key_dest_shmem" fullword ascii
$s6 = "_pthread_key_max_shmem" fullword ascii
$s7 = "_pthread_key_sch_shmem" fullword ascii
$s8 = "_pthread_key_lock_shmem" fullword ascii
$s9 = "cannot find name of executable" fullword ascii
$s10 = "tiles32.png" fullword ascii
$s11 = "GetModuleFileName: %s" fullword ascii
$s12 = "IP_DEST_HOST_UNREACHABLE (11003)" fullword ascii
$s13 = "This program requires Windows NT!" fullword ascii
$s14 = "SNMP INVALID_SESSION" fullword ascii
$s15 = "SNMP TRAP_ERRORS" fullword ascii
$s16 = "SNMP SELECT_FDERRORS" fullword ascii
$s17 = "Some different radices: %d %x %o %#x %#o " fullword ascii
$s18 = "c:/crossdev/src/winpthreads-svn6233/src/rwlock.c" fullword asc
$s19 = "_pthread_tls_shmem" fullword ascii
$s20 = "IP_DEST_PORT_UNREACHABLE (11005)" fullword ascii
condition:
uint16(0) == 0x5a4d and filesize < 2000KB and
( pe.imphash() == "a90d500745a1ce2417c01fecefbc2851" and pe.exports("K
}

rule ryuk_1006_files_SQL {
```

```
meta:
description = "files - file SQL.dll"
author = "The DFIR Report"
reference = "https://thedfirreport.com"
date = "2020-10-13"
hash1 = "d67461ba45a4edf3b2a69b3e64303fda8130bd1fc7a1173f35c1fe67b40c9
strings:
$s1 = ".data$_ZN12_GLOBAL__N_110fake_mutexE" fullword ascii
$s2 = ".data$_ZZN12_GLOBAL__N_116get_static_mutexEvE4once" fullword as
$s3 = "DOOKOL.dll" fullword ascii
$s4 = "_ZN12_GLOBAL__N_110fake_mutexE" fullword ascii
$s5 = "_ZZN12_GLOBAL__N_116get_static_mutexEvE4once" fullword ascii
$s6 = ".data$_ZN12_GLOBAL__N_115emergency_mutexE" fullword ascii
$s7 = ".data$_ZN12_GLOBAL__N_1L12static_mutexE" fullword ascii
$s8 = "__shmem_winpthreads_grabber_mutex_global_shmem" fullword ascii
$s9 = "__shmem_winpthreads_init_mutex_global_shmem" fullword ascii
$s10 = "__shmem_winpthreads_ptr_mutex_global_shmem" fullword ascii
$s11 = "c:/crossdev/src/winpthreads-svn6233/src/mutex.c" fullword asci
$s12 = "pthread_mutex_lock_intern" fullword ascii
$s13 = "__shmem_winpthreads_init_mutex_global_static_shmem" fullword a
$s14 = "__shmem_winpthreads_grabber_mutex_global_static_shmem" fullwor
$s15 = "__shmem_winpthreads_ptr_mutex_global_static_shmem" fullword as
$s16 = "_Z7ExecutePv" fullword ascii
$s17 = "hmutex" fullword ascii
$s18 = "._FindPESectionExec" fullword ascii
$s19 = "_ZN9__gnu_cxx17__recursive_mutex6unlockEv" fullword ascii
$s20 = ".text$_ZN9__gnu_cxx17__recursive_mutex6unlockEv" fullword asci
condition:
uint16(0) == 0x5a4d and filesize < 2000KB and
( pe.imphash() == "d16819dafefb97404d0d0e42adb82e5c" and ( pe.exports(
}
```

If you have detections you would like to add to this section, please contact us and we will credit you.

MITRE

Spearphishing Link – T1192

Remote Desktop Protocol – T1076

Remote File Copy – T1105

Windows Management Instrumentation – T1047

Command-Line Interface – T1059

Domain Trust Discovery – T1482

Remote System Discovery – T1018

System Time Discovery – T1124

Data Encrypted for Impact – T1486

Commonly Used Port – T1043

Standard Application Layer Protocol – T1071

Standard Cryptographic Protocol – T1032

User Execution – T1204

- Valid Accounts – T1078
- Exploitation for Privilege Escalation – T1068
- Signed Binary Proxy Execution – T1218
- Rundll32 – T1085
- Regsvr32 – T1117

(internal case 1006)

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