ANALYSIS REPORT

10382580.r1.v1 NUMBER

Malware Analysis Report

2022-06-03 DATE

Notification

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Summary

Description

This report analyzes 8 unique files. 5 files are malicious loaders that contain an embedded executable. Two of the embedded executables are included in this report. The embedded executables are Remote Access Tool (RAT) that provides a vast array of Command and Control (C2) capabilities. These C2 capabilities include the ability to remotely monitor a system's desktop, gain reverse shell access, exfiltrate data, and upload and execute additional payloads. The malware can also function as a proxy, allowing a remote operator to pivot to other systems.

The remaining file is a heavily encoded Java Server Pages (JSP) application that functions as a malicious webshell. This Java application will allow an operator to upload and download files from a target system and control the system via a reverse shell.

Submitted Files (8)

28e4e7104cbffa97a0aa2f53b5ebcbcdba360ec416b34bb617e2f8891d204816 (error_401.jsp)

33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b (odbccads.exe)

3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0 (fontdrvhosts.exe)

66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16 (winds.exe)

7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751 (praiser.exe)

88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8 (f7_dump_64.exe)

d071c4959d00a1ef9cce535056c6b01574d8a8104a7c3b00a237031ef930b10f (d071c4959d00a1ef9cce535056c6b0...)

f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab (SvcEdge.exe)

IPs (4)

134.119.177.107

155.94.211.207

162.245.190.203

185.136.163.104

Findings

66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16

Tags

remote-access-trojan trojan

Details	
Name	winds.exe
Size	850432 bytes
Type	PE32+ executable (GUI) x86-64, for MS Windows
MD5	21fa1a043460c14709ef425ce24da4fd
SHA1	33638da3a83c2688e1d20862b1de0b242a22e87c
SHA256	66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16
SHA512	00afc06c46397d106489c63492437100ae8a872169918c1b2a0c7acfcbe8b6c7b77e587f50551d33603693755081bafbaddfe62bfccb9a3803e940a9b9a5a30e
ssdeep	12288:nHphzO/LbA9xVeAayauoGqKv4Kyxa30vKc6wVqSfpOH8KAGG6SfUTuy4aN+h:JqGxMUKGqKv4OEvBHVqSfMFyUSjs
Entropy	7.555857

Antivirus	
Adaware	Gen:Variant.Ulise.345018
AhnLab	Trojan/Win.Generic
Avira	TR/Injector.vkchy
Bitdefender	Gen:Variant.Ulise.345018
ESET	a variant of Win64/Injector.HA.gen trojan
Emsisoft	Gen:Variant.Ulise.345018 (B)
IKARUS	Trojan.Win64.Injector
K7	Trojan (0058e94e1)
McAfee	RDN/Generic.dx
Zillya!	Trojan.Chapak.Win32.92597

YARA Rules

```
rule CISA_10382580_03 : loader
{
  meta:
    Author = "CISA Code & Media Analysis"
    Incident = "10382580"
    Date = "2022-05-02"
    Last_Modified = "20220602_1200"
    Actor = "n/a"
    Category = "Loader"
    Family = "n/a"
    Description = "Detects loader samples"
    MD5_1 = "3764a0f1762a294f662f3bf86bac776f"
    SHA256_1 = "f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab"
    MD5_2 = "21fa1a043460c14709ef425ce24da4fd"
    SHA256_2 = "66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16"
    MD5_3 = "e9c2b8bd1583baf3493824bf7b3ec51e"
    SHA256_3 = "7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751"
    MD5_4 = "de0d57bdc10fee1e1e16e225788bb8de"
    SHA256_4 = "33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b"
    MD5_5 = "9b071311ecd1a72bfd715e34dbd1bd77"
    SHA256_5 = "3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0"
    MD5_6 = "05d38bc82d362dd57190e3cb397f807d"
    SHA256_6 = "4cd7efdb1a7ac8c4387c515a7b1925931beb212b95c4f9d8b716dbe18f54624f"
  strings:
    $s0 = { B8 01 00 00 00 48 6B C0 00 C6 44 04 20 A8 B8 01 }
    $s1 = { 00 00 48 6B C0 01 C6 44 04 20 9A B8 01 00 00 }
    $s2 = { 48 6B C0 02 C6 44 04 20 93 B8 01 00 00 00 48 }
    $s3 = { C0 03 C6 44 04 20 9B B8 01 00 00 00 48 6B C0 }
```

```
    condition:
        all of them
}
```

ssdeep Matches

No matches found.

PE Metadata

Compile Date	2016-06-28 14:54:12-04:00
Import Hash	8b276f4187d986d845fbeca4606978e5
Company Name	Sysinternals - www.sysinternals.com
File Description	PsPing - ping, latency, bandwidth measurement utility
Internal Name	PsPing
Legal Copyright	Copyright (C) 2012-2016 Mark Russinovich
Original Filename	psping.exe
Product Name	Sysinternals PsPing
Product Version	2.10

PE Sections

MD5	Name	Raw Size	Entropy
f7563c080ebc1ddfde8cd35a391c013b	header	1024	2.941811
dee2271d40bae0ee404bd93800669e7f	.text	148992	6.183880
f9ca0448650e2c20a1c84bdf4d21e1f5	.rdata	76800	3.959956
ef7c0cd1e8c1cb59d89b9bb7cb3e38b7	.data	37888	4.076162
a94f35a1d82b7ea31758e552c5c8dd4d	.pdata	7680	5.174204
0a5f1fe82123e133fb124fb65751dd19	.rsrc	574976	7.974682
b89ab7dbe7f05df8a1bebb81afcdbc9f	.reloc	3072	5.054629

Relationships

66966ceae7...	Connected_To	185.136.163.104
66966ceae7...	Contains	d071c4959d00a1ef9cce535056c6b01574d8a8104a7c3b00a237031ef930b10f

Description

This malware is a 64-bit Windows loader that contains an encrypted malicious executable. During runtime, this encrypted executable is decrypted and loaded into memory, never touching the system's hard disk. The encrypted executable is similar in functionality to the file "f7_dump_64.exe" (88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8), described below. The malware embedded within this loader attempts to communicate with the hard-coded C2 Internet Protocol (IP) address 185[.]136[.]163[.]104. This malware provides a vast array of C2 capabilities including the ability to log keystrokes, upload and execute additional payloads, function as a proxy, and have graphical user interface (GUI) access over a target Windows system's desktop. Many of the structures utilized to implement the C2 capabilities in this malware appear to be derived from the same source code as "f7_dump_64.exe", however this malware utilizes much more complex obfuscation to hinder the analysis of its code structures.

Screenshots

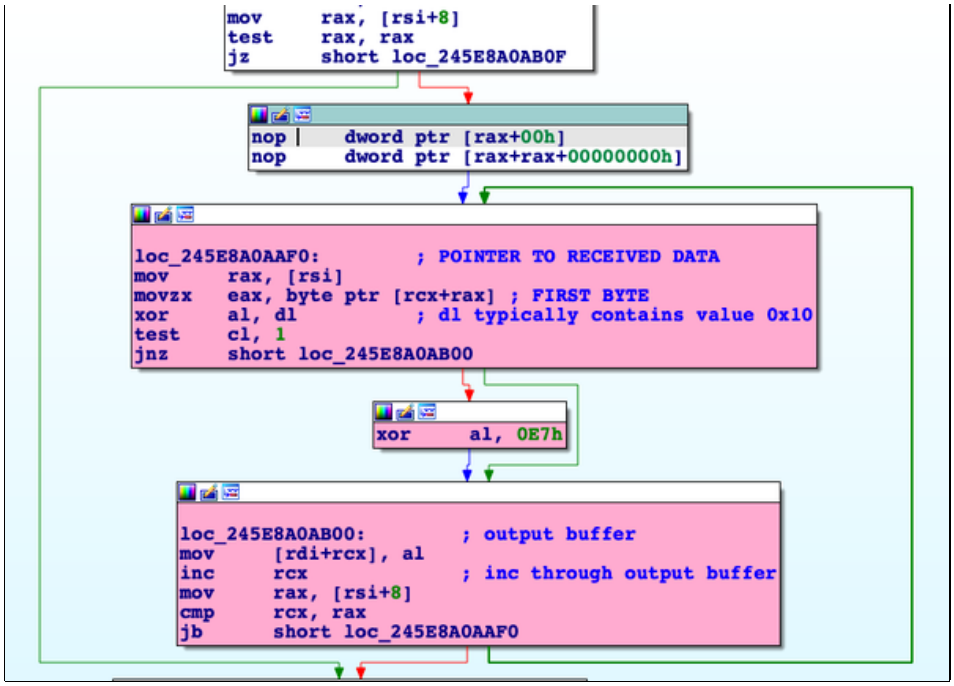


Figure 1 - This screenshot illustrates the algorithm the malware uses to encrypt its inbound and outbound communications from the remote C2. This is a simple algorithm that relies primarily on incrementing through the target data and modifying each byte by either XOR'ing it with 0x10 or 0xe7. The basic arithmetic of the algorithm is to XOR every byte of the target data by 0x10 and then every other byte by 0xe7. Notably, outbound data appears to be prepended with a block of data that contains random bytes and is a random length. Therefore, the result of the encryption, even of the exact same data, will vary as the length of the prepended block will cause the 0xe7 XOR operation to occur on different bytes in the target data. If PCAP is collected, all observed communications between this RAT and its remote C2 may be decrypted by following this simple algorithm.

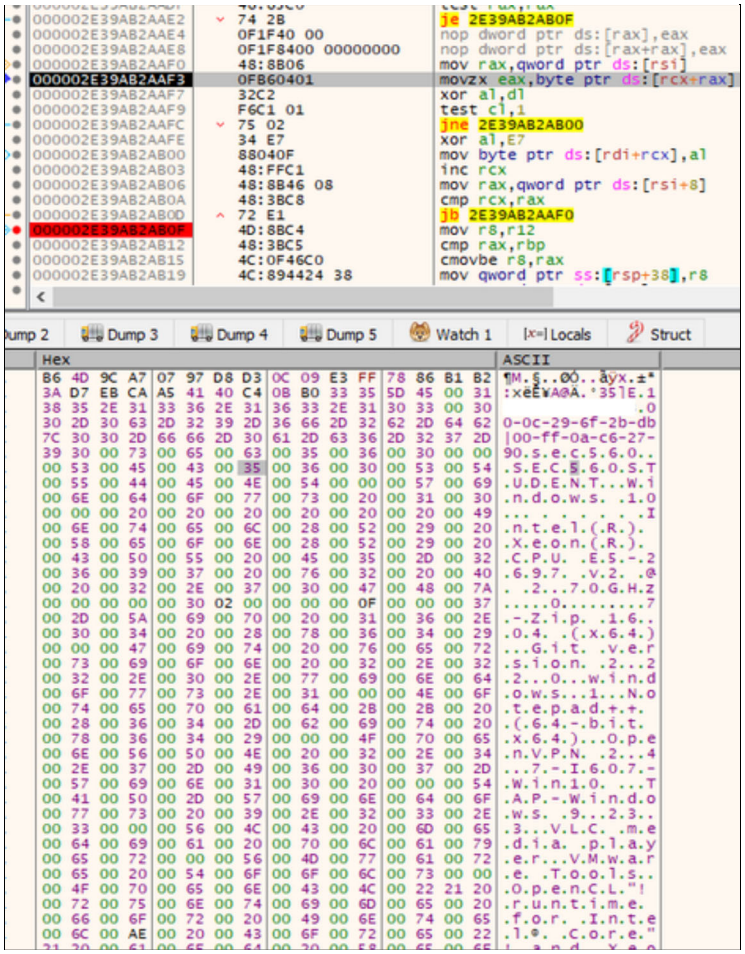


Figure 2 - This screenshot illustrates the malware sending a great deal of target system information outbound. As illustrated, this system information contains the computer name, user name, MAC address, IP address, operating system version, processor version, and all currently running processes. The malware responds with this data when simply echoing back the outbound (encrypted) data illustrated in Figure 3 and Figure 4. Effectively, the malware says hello and if the same hello response is provided it will provide a great deal of information about the compromised system. As further illustrated, the outbound data is encrypted with the algorithm displayed in Figure 1.

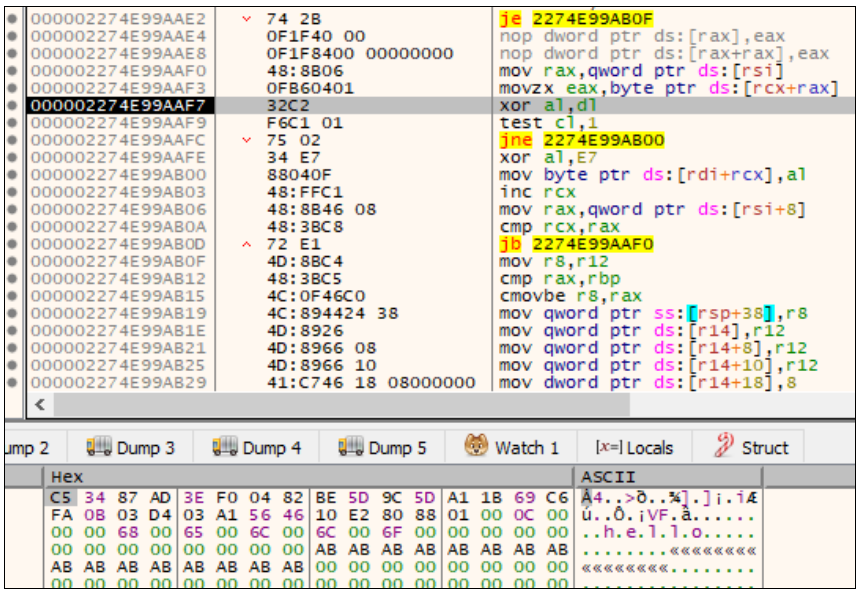


Figure 3 - This screenshot illustrates the malware forming a block of data the implant will send to its remote C2 during its initial connection attempts. Note the phrase "hello" inside this initial block of data. Also, note the apparent random data prepended to the outbound "hello".

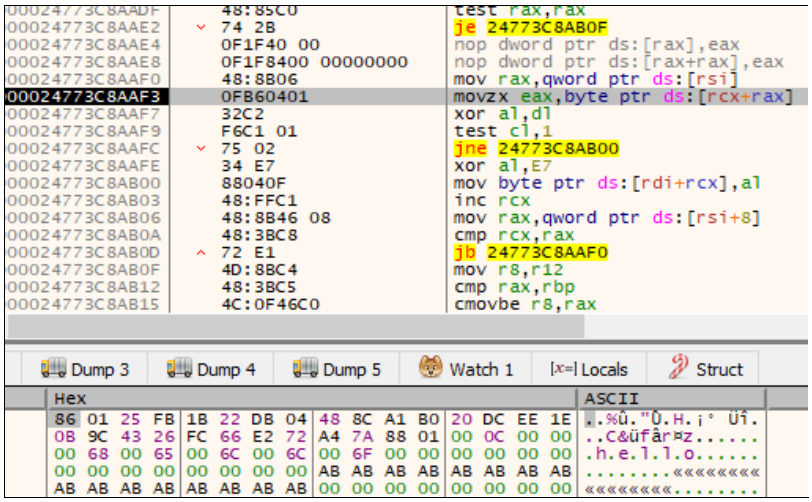


Figure 4 - This screenshot illustrates the malware forming a block of data the implant will send to its remote C2 during its initial connection attempts. Note the phrase "hello" inside this initial block of data. Also note the apparent random data prepended to the outbound "hello". The purpose of this screenshot is to illustrate how the malware prepends a random block of data of a random size to the outbound data in an effort to make the entire packet more difficult to signature.

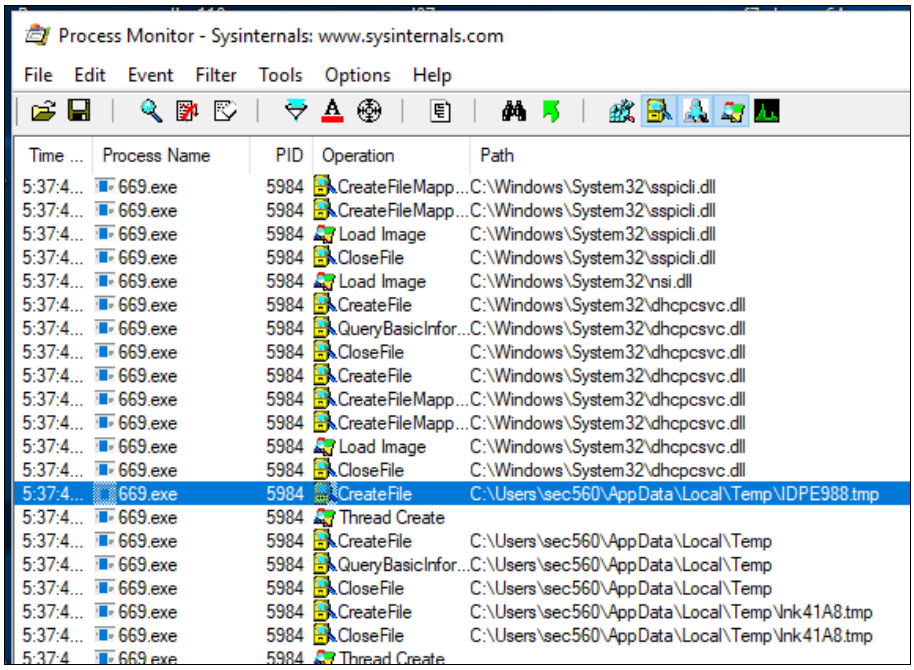


Figure 5 - This screenshot illustrates the malware attempting to read a file named %Temp%\IDPE988.tmp. This file was not available for analysis therefore the contents are unknown.

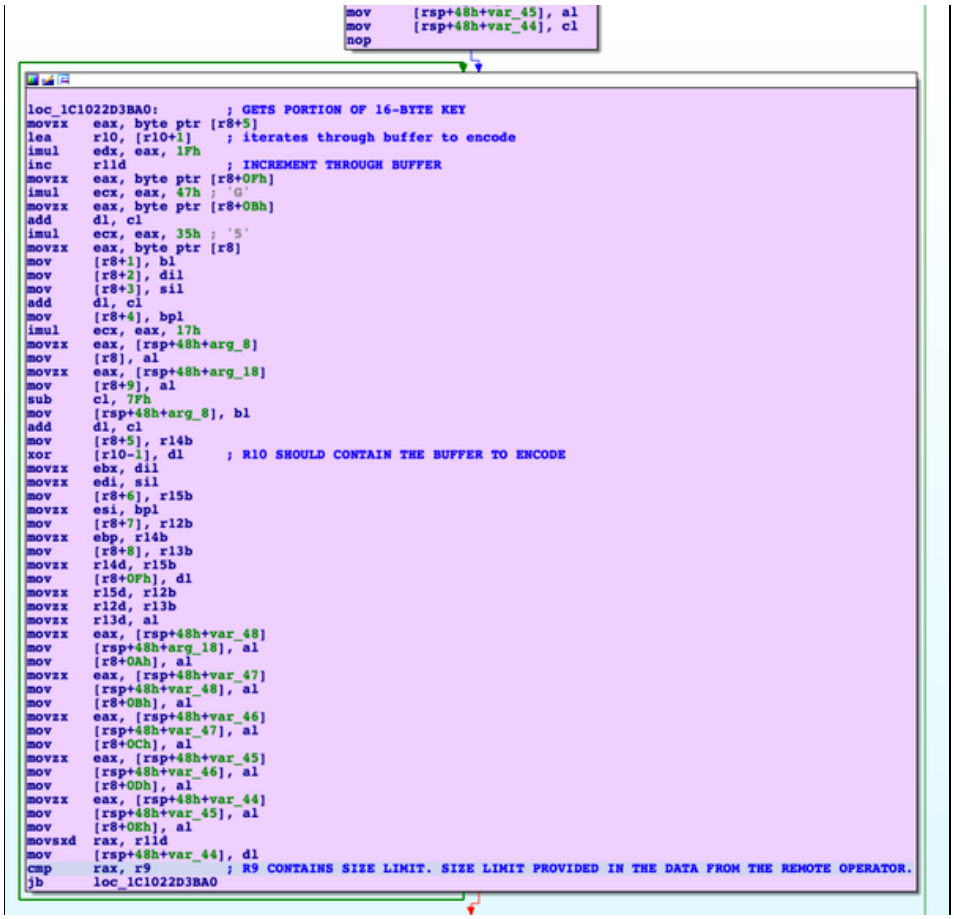


Figure 6 - This screenshot illustrates the algorithm utilized to encrypt communications between the file "f7_dump_64.exe" (88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8), described below. This malware and "f7_dump_64.exe" share many similarities, and large parts of their code structures appear to be derived from the same source code. However, their communication protocols differ and their methodology for encrypting their inbound and outbound communications differ. This screenshot is designed to highlight those communication protocol differences.

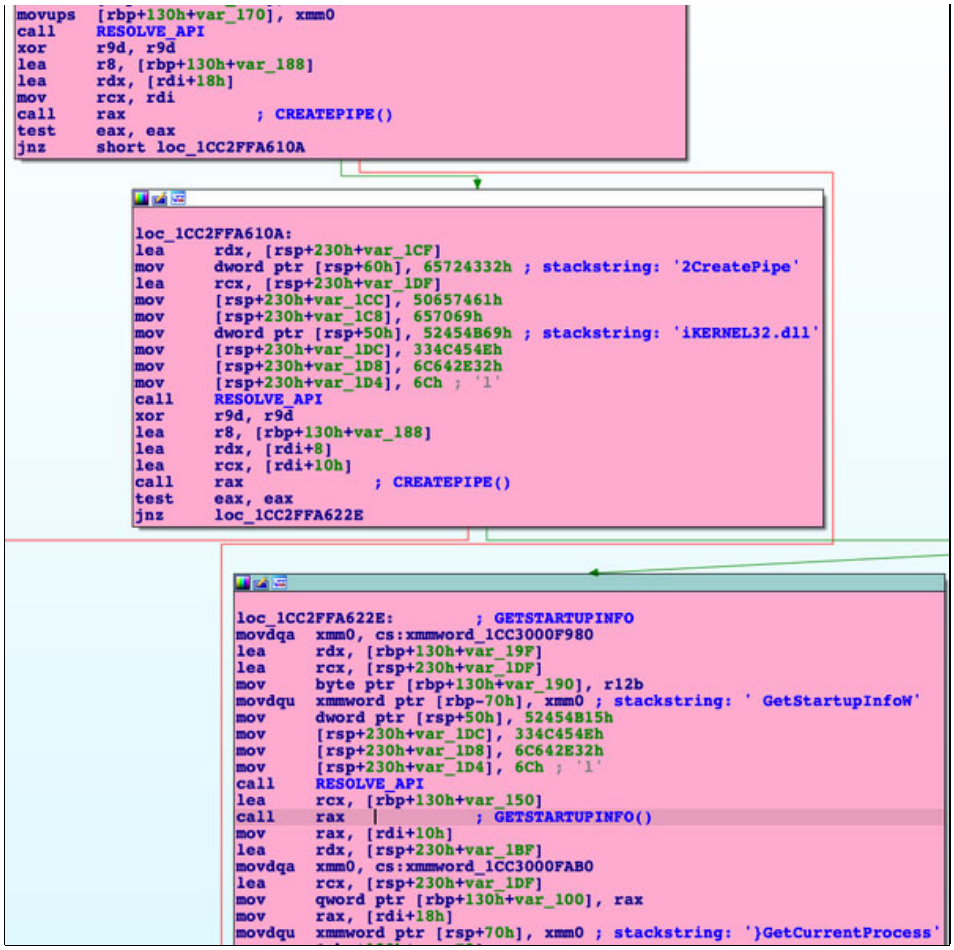


Figure 7 - This screenshot illustrates a section of code utilized by the malware to implement a "reverse shell" capability. Note the complex obfuscation utilized to obfuscate the various API calls.

185.136.163.104

Tags

command-and-control

Whois

Queried whois.ripe.net with "-B 185.136.163.104"...

% Information related to '185.136.163.0 - 185.136.163.255'

% Abuse contact for '185.136.163.0 - 185.136.163.255' is 'pivps.com@gmail.com'

inetnum: 185.136.163.0 - 185.136.163.255
netname: VELIANET-FR-PINETLLC
descr: Pi NET, LLC
country: FR
org: ORG-PNL20-RIPE
admin-c: PNL16-RIPE
tech-c: PNL16-RIPE
status: ASSIGNED PA
remarks: ticket.velia.net 122001
notify: vnid-hostmaster@godaddy.com
mnt-by: FGK-MNT
created: 2018-10-26T15:33:38Z

last-modified: 2018-10-26T15:33:38Z
source: RIPE

organisation: ORG-PNL20-RIPE
org-name: Pi NET, LLC
org-type: OTHER
address: No 74, Tang Thiet Giap, Co Nhue
address: Tu Liem
address: 100000 Hanoi
address: Viet Nam
phone: +84 977471775
e-mail: pivps.com@gmail.com
admin-c: PNL16-RIPE
tech-c: PNL16-RIPE
abuse-c: PNL16-RIPE
mnt-ref: FGK-MNT
mnt-by: FGK-MNT
created: 2017-09-07T11:08:29Z
last-modified: 2017-09-07T11:08:29Z
source: RIPE

role: Pi NET, LLC
address: No 74, Tang Thiet Giap, Co Nhue
address: Tu Liem
address: 100000 Hanoi
address: Viet Nam
phone: +84 977471775
e-mail: pivps.com@gmail.com
nic-hdl: PNL16-RIPE
mnt-by: FGK-MNT
created: 2017-09-07T11:08:29Z
last-modified: 2017-09-07T11:08:29Z
source: RIPE
abuse-mailbox: pivps.com@gmail.com

% Information related to '185.136.160.0/22AS29066'

route: 185.136.160.0/22
descr: velia.net Internetdienste GmbH
origin: AS29066
notify: vnid-hostmaster@godaddy.com
mnt-by: FGK-MNT
mnt-by: GODADDY-MNT
created: 2018-09-03T07:40:03Z
last-modified: 2019-06-04T09:16:09Z
source: RIPE

% This query was served by the RIPE Database Query Service version 1.103 (ANGUS)

Relationships

185.136.163.104	Connected_From	66966ceae7e3a8aace6c27183067d861f9d72 67aed30473a95168c3fe19f2c16

Description

winds.exe attempts to connect to this IP address.

---

d071c4959d00a1ef9cce535056c6b01574d8a8104a7c3b00a237031ef930b10f

Tags

backdoor

Details

Name	d071c4959d00a1ef9cce535056c6b01574d8a8104a7c3b00a237031ef930b10f
Size	581632 bytes
Type	PE32+ executable (console) x86-64, for MS Windows
MD5	7b1ce3fe542c6ae2919aa94e20dc860e
SHA1	49a5852783fcefd9513b02d27a0304ae171f4459
SHA256	d071c4959d00a1ef9cce535056c6b01574d8a8104a7c3b00a237031ef930b10f
SHA512	07ab85017714ded24ef9cf25310c76b5b05616398b09b85e0e7b177c7ab662b5c855e6814dc50c12f88a130921afb5f7f8134583cbbdc7c21917c2dfcad0f2d2
ssdeep	6144:r47ZkpeF7uuHVEokxXHxFCgPOcUx3X6wUNSz3m3+CRn7qGkFgIkwLB6iZf:r47/F7uuHDY1OPxhUuKeGw3Z
Entropy	6.181663

Antivirus

AhnLab	Backdoor/Win.NukeSped
Avira	HEUR/AGEN.1213015

YARA Rules

```
rule CISA_10382580_02 : rat
{
  meta:
    Author = "CISA Code & Media Analysis"
    Incident = "10382580"
    Date = "2022-06-02"
    Last_Modified = "20220602_1200"
    Actor = "n/a"
    Category = "RAT"
    Family = "n/a"
    Description = "Detects unidentified Remote Access Tool samples"
    MD5_1 = "7b1ce3fe542c6ae2919aa94e20dc860e"
    SHA256_1 = "d071c4959d00a1ef9cce535056c6b01574d8a8104a7c3b00a237031ef930b10f"
  strings:
    $s0 = { 48 8B 06 0F B6 04 01 32 C2 F6 C1 01 75 02 34 E7 }
    $s1 = { 88 04 0F 48 FF C1 48 8B 46 08 48 3B }
    $s2 = { 0F BE CA C1 CF 0D 8D 41 E0 80 FA 61 0F 4C C1 03 }
    $s3 = { F8 4D 8D 40 01 41 0F B6 10 84 D2 }
  condition:
    all of them
}
```

ssdeep Matches

No matches found.

PE Metadata

Compile Date	2022-03-03 01:35:56-05:00
Import Hash	78edf5fc05b665f28f902f99b039c408

PE Sections

MD5	Name	Raw Size	Entropy
0fd74e4e16029f0837428b76b1d62b68	header	4096	0.896086
bfdaba9ac4dadf31b2346cf1104ecc0d	.text	397312	6.440368
9c82a4527253007ab20b19fef102c551	.rdata	126976	4.853780
a7502cfe7c93b5a4882fb1e6078e6652	.data	20480	4.180216
9c3d8f5359ac9abd96529387b2acbdde	.pdata	24576	5.115554
791660e03dd58cccf36d40f4c9bb6d75	_RDATA	4096	0.259819
f3f7d9cb1331a4d1270bc0b08b2090bc	.reloc	4096	5.005726

Packers/Compilers/Cryptors

Microsoft Visual C++ 8.0 (DLL)

Relationships

d071c4959d...	Contained_Within	66966ceae7e3a8aace6c27183067d861f9d72 67aed30473a95168c3fe19f2c16

Description

Analysis of this file indicates it is a memory dump and is the embedded malicious executable contained within wind.exe.

33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b

Tags

trojan

Details

Name	odbccads.exe
Size	724992 bytes
Type	PE32+ executable (GUI) x86-64, for MS Windows
MD5	de0d57bdc10fee1e1e16e225788bb8de
SHA1	695d31cdac532be8e6d2a98220c0c55f3385aa0b
SHA256	33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b
SHA512	45bea34a3248e2d8ef1c1922f9b9bd89b80552bf9429e1e83595b5684c2067f6a1f04ef44f2d086cd9248a01022efe9ebf539c6a280f780aee9796225b960f0f
ssdeep	12288:q50ggg3QpKI+CjNu5s1luYiEoCvhHw3lZjUwJx8qpXeS/E9mHLO/dk:K0Hg3eK18g5s7ziSqVZj980P/E9ka/d
Entropy	7.624236

Antivirus

Adaware	Gen:Variant.Ulise.345018
AhnLab	Trojan/Win.Generic
Avira	HEUR/AGEN.1248665
Bitdefender	Gen:Variant.Ulise.345018
ESET	a variant of Win64/Injector.HA.gen trojan
Emsisoft	Gen:Variant.Ulise.345018 (B)
IKARUS	Trojan.Win64.Injector

YARA Rules

```
rule CISA_10382580_03 : loader
{
  meta:
    Author = "CISA Code & Media Analysis"
    Incident = "10382580"
    Date = "2022-05-02"
    Last_Modified = "20220602_1200"
    Actor = "n/a"
    Category = "Loader"
    Family = "n/a"
    Description = "Detects loader samples"
    MD5_1 = "3764a0f1762a294f662f3bf86bac776f"
    SHA256_1 = "f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab"
    MD5_2 = "21fa1a043460c14709ef425ce24da4fd"
    SHA256_2 = "66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16"
    MD5_3 = "e9c2b8bd1583baf3493824bf7b3ec51e"
```

```
    SHA256_3 = "7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751"
    MD5_4 = "de0d57bdc10fee1e1e16e225788bb8de"
    SHA256_4 = "33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b"
    MD5_5 = "9b071311ecd1a72bfd715e34dbd1bd77"
    SHA256_5 = "3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0"
    MD5_6 = "05d38bc82d362dd57190e3cb397f807d"
    SHA256_6 = "4cd7efdb1a7ac8c4387c515a7b1925931beb212b95c4f9d8b716dbe18f54624f"
  strings:
    $s0 = { B8 01 00 00 00 48 6B C0 00 C6 44 04 20 A8 B8 01 }
    $s1 = { 00 00 48 6B C0 01 C6 44 04 20 9A B8 01 00 00 }
    $s2 = { 48 6B C0 02 C6 44 04 20 93 B8 01 00 00 00 48 }
    $s3 = { C0 03 C6 44 04 20 9B B8 01 00 00 00 48 6B C0 }
  condition:
    all of them
}
```

ssdeep Matches

No matches found.

PE Metadata

Compile Date	2016-06-12 12:53:34-04:00
Import Hash	4f2b9ad89041fedc43298c09c8e7b948
Company Name	Sysinternals - www.sysinternals.com
File Description	Lists logon session information
Internal Name	LogonSessions
Legal Copyright	Copyright (C) 2004-2016 Mark Russinovich
Original Filename	logonsessions.exe
Product Name	Sysinternals LogonSessions
Product Version	1.4

PE Sections

MD5	Name	Raw Size	Entropy
061073798e31a66598c1b1a1089e1256	header	1024	2.887037
acb35e1a2a26fb3ddd19a088cecb3166	.text	89088	6.366966
4d9a0bcd9467b5aaee5d4d762219821b	.rdata	65536	4.425938
f80417eeab656641c6a5206454b398d3	.data	6656	3.054858
e0d2510e666231c532ff97edf51abd10	.pdata	5120	4.855993
28c72f93d407e70be44e0cacd3994710	.rsrc	555520	7.909148
bca539afcd691a4a238b78fc830dc55a	.reloc	2048	4.939573

Relationships

33b89b8915...	Connected_To	134.119.177.107

Description

This malware is a loader that contains an encrypted executable. During runtime, this encrypted executable is decrypted and loaded into memory, never touching the system hard disk. The encrypted executable is the same family of malware as "f7_dump_64.exe" (88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8). The malware embedded within this loader attempts to communicate with the remote C2 134[.]119[.]177[.]107.

Screenshots

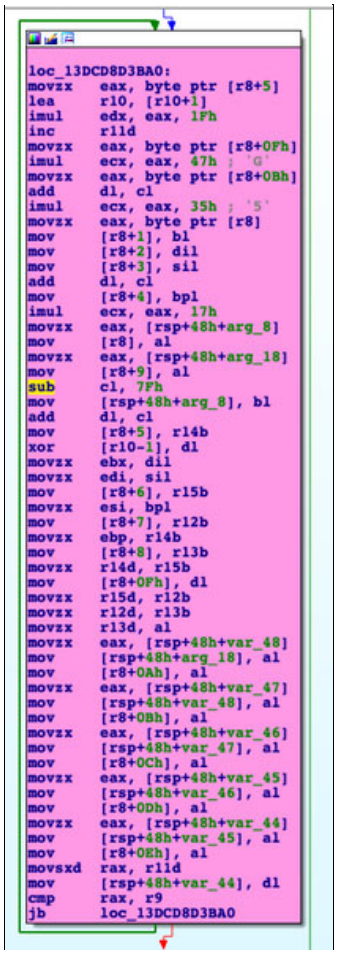


Figure 8 - This screenshot illustrates the encryption algorithm the malware uses to encrypt data sent to and received from the remote operator. Static analysis indicates a random 16-byte key is generated before each transmission of data, and this key is included in blocks of data sent and received. It may be possible to decrypt communications of this malware by extracting this cryptographic key from sent and received data.

134.119.177.107

Tags

command-and-control

Ports

- 443 TCP

Whois

Queried whois.ripe.net with "-B 134.119.177.107"...

% Information related to '134.119.177.0 - 134.119.177.255'

% Abuse contact for '134.119.177.0 - 134.119.177.255' is 'pivps.com@gmail.com'

inetnum: 134.119.177.0 - 134.119.177.255
netname: VELIANET-FR-PINETLLC
descr: Pi NET, LLC
country: FR
org: ORG-PNL18-RIPE
admin-c: PNL14-RIPE

tech-c: PNL14-RIPE
status: LEGACY
remarks: ticket.velia.net 87114
notify: hostmaster@velia.net
mnt-by: FGK-MNT
created: 2017-05-12T09:24:37Z
last-modified: 2017-05-12T09:24:37Z
source: RIPE

organisation: ORG-PNL18-RIPE
org-name: Pi NET, LLC
org-type: OTHER
address: No 74, Tang Thiet Giap, Co Nhue
address: Tu Liem
address: 100000 Hanoi
address: Viet Nam
phone: +84 977471775
e-mail: pivps.com@gmail.com
admin-c: PNL14-RIPE
tech-c: PNL14-RIPE
abuse-c: PNL14-RIPE
mnt-ref: FGK-MNT
mnt-by: FGK-MNT
created: 2017-05-09T08:44:12Z
last-modified: 2017-05-09T08:44:12Z
source: RIPE

role: Pi NET, LLC
address: No 74, Tang Thiet Giap, Co Nhue
address: Tu Liem
address: 100000 Hanoi
address: Viet Nam
phone: +84 977471775
e-mail: pivps.com@gmail.com
nic-hdl: PNL14-RIPE
mnt-by: FGK-MNT
created: 2017-05-09T08:44:12Z
last-modified: 2017-05-09T08:44:12Z
source: RIPE
abuse-mailbox: pivps.com@gmail.com

% Information related to '134.119.176.0/20AS29066'

route: 134.119.176.0/20
descr: velia.net
origin: AS29066
mnt-by: FGK-MNT
notify: hostmaster@velia.net
created: 2017-05-11T09:17:20Z
last-modified: 2017-05-11T09:17:20Z
source: RIPE

% This query was served by the RIPE Database Query Service version 1.103 (HEREFORD)

Relationships

134.119.177.107	Connected_From	33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b
134.119.177.107	Connected_From	88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8

Description

"odbccads.exe" and "f7_dump_64.exe" attempt to connect to this IP address.

7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751

Tags

trojan

Details

Name	praiser.exe
Size	727040 bytes
Type	PE32+ executable (GUI) x86-64, for MS Windows
MD5	e9c2b8bd1583baf3493824bf7b3ec51e
SHA1	76f2c5f0312346caf82ed42148e78329f8d7b35a
SHA256	7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751
SHA512	d3ee9a7ecbade56c72dbbdacf29cb122a6254dfc159427166829ca793d80ee21d3bf0229ebef46fdb9e326e49ad1cb84b49121417462b3a79d299708cf578acb
ssdeep	12288:e5jggl3QpKOnH0FxuvHNZXXbt8Qx1+d/Amk31:0jHl3eKOH06vHNZXbtVxS/Amo1
Entropy	7.622654

Antivirus

Adaware	Gen:Variant.Ulise.345018
AhnLab	Trojan/Win.Generic
Avira	TR/Injector.oqsge
Bitdefender	Gen:Variant.Ulise.345018
ESET	a variant of Win64/Injector.HA.gen trojan
Emsisoft	Gen:Variant.Ulise.345018 (B)
IKARUS	Trojan.Win64.Injector
K7	Trojan (0058e94e1)
McAfee	RDN/Generic.dx
Zillya!	Trojan.Injector.Win64.1263

YARA Rules

```
rule CISA_10382580_03 : loader
{
  meta:
    Author = "CISA Code & Media Analysis"
    Incident = "10382580"
    Date = "2022-05-02"
    Last_Modified = "20220602_1200"
    Actor = "n/a"
    Category = "Loader"
    Family = "n/a"
    Description = "Detects loader samples"
    MD5_1 = "3764a0f1762a294f662f3bf86bac776f"
    SHA256_1 = "f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab"
    MD5_2 = "21fa1a043460c14709ef425ce24da4fd"
    SHA256_2 = "66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16"
    MD5_3 = "e9c2b8bd1583baf3493824bf7b3ec51e"
    SHA256_3 = "7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751"
    MD5_4 = "de0d57bdc10fee1e1e16e225788bb8de"
    SHA256_4 = "33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b"
    MD5_5 = "9b071311ecd1a72bfd715e34dbd1bd77"
    SHA256_5 = "3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0"
    MD5_6 = "05d38bc82d362dd57190e3cb397f807d"
```

```
    SHA256_6 = "4cd7efdb1a7ac8c4387c515a7b1925931beb212b95c4f9d8b716dbe18f54624f"
  strings:
    $s0 = { B8 01 00 00 00 48 6B C0 00 C6 44 04 20 A8 B8 01 }
    $s1 = { 00 00 48 6B C0 01 C6 44 04 20 9A B8 01 00 00 }
    $s2 = { 48 6B C0 02 C6 44 04 20 93 B8 01 00 00 00 48 }
    $s3 = { C0 03 C6 44 04 20 9B B8 01 00 00 00 48 6B C0 }
  condition:
    all of them
}
```

ssdeep Matches

No matches found.

PE Metadata

Compile Date	2016-06-12 12:53:34-04:00
Import Hash	4f2b9ad89041fedc43298c09c8e7b948
Company Name	Sysinternals - www.sysinternals.com
File Description	Lists logon session information
Internal Name	LogonSessions
Legal Copyright	Copyright (C) 2004-2016 Mark Russinovich
Original Filename	logonsessions.exe
Product Name	Sysinternals LogonSessions
Product Version	1.4

PE Sections

MD5	Name	Raw Size	Entropy
0c44f8237fa873b9bd4efaa9489ad650	header	1024	2.879905
1a1bf58f62faa7d93ce17441b9bf738d	.text	89088	6.367004
4d9a0bcd9467b5aaee5d4d762219821b	.rdata	65536	4.425938
f80417eeab656641c6a5206454b398d3	.data	6656	3.054858
e0d2510e666231c532ff97edf51abd10	.pdata	5120	4.855993
8c14221bada15cef72ccc7f336dbe5f5	.rsrc	557568	7.903129
bca539afcd691a4a238b78fc830dc55a	.reloc	2048	4.939573

Relationships

7ea294d309...	Connected_To	162.245.190.203

Description

This malware is a 64-bit Intel Windows loader that contains an encrypted malicious executable. During runtime, this encrypted executable is decrypted and loaded into memory, never touching the system hard disk. The encrypted executable is the same family of malware as "f7_dump_64.exe" (88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8). The malware embedded within this loader attempts to communicate with the hard-coded C2 162[.]245[.]190[.]203.

Screenshots

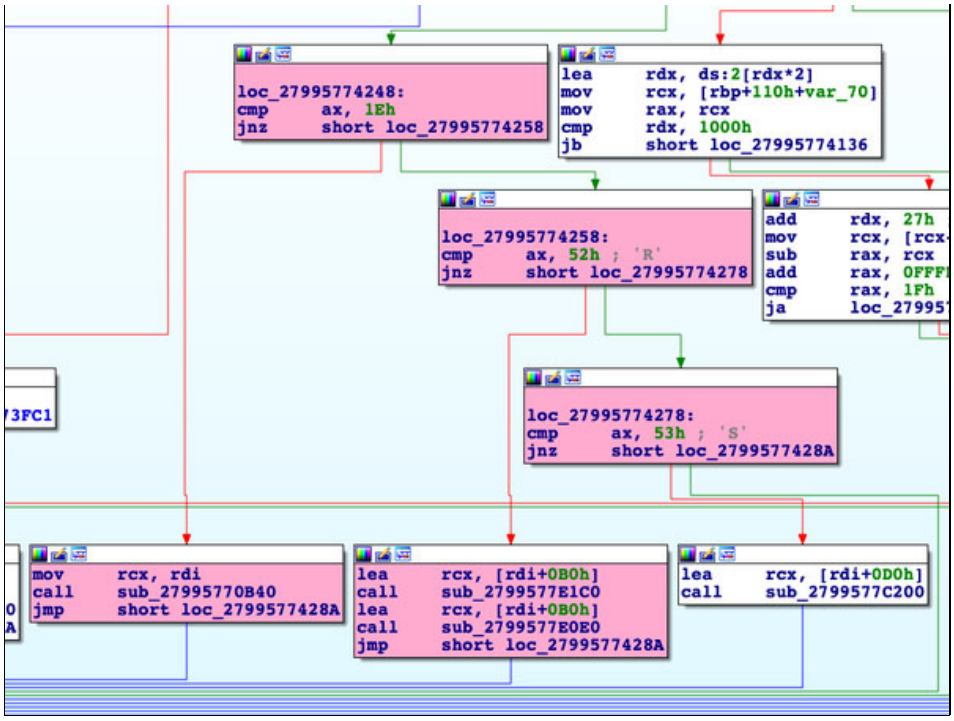


Figure 9 - This screenshot illustrates a portion of the C2 structure extracted from this loader's embedded executable. This code illustrates this malware is the same family of malware as the malware f7_dump_64.exe, also detailed within this report.

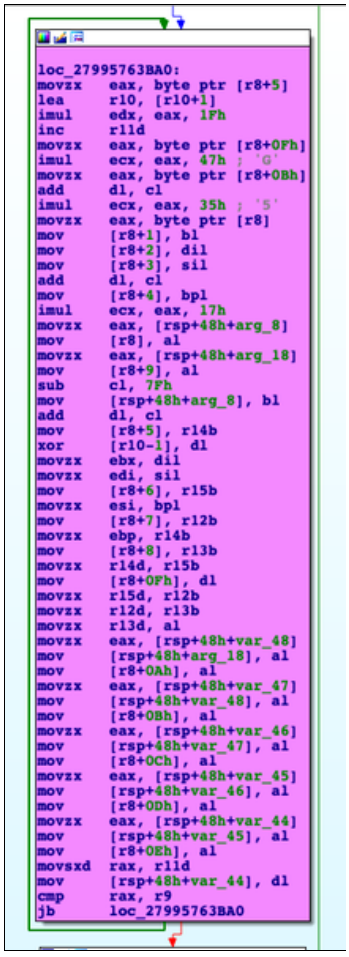


Figure 10 - This screenshot illustrates a portion of the communication cryptographic function extracted from this loaders embedded executable. This code illustrates this malware is the same family of malware as the malware f7_dump_64.exe, also detailed within this report.

162.245.190.203

Tags

command-and-control

Whois

NetRange: 162.245.184.0 - 162.245.191.255
CIDR: 162.245.184.0/21
NetName: QUADRANET-DOWNSTREAM
NetHandle: NET-162-245-184-0-1
Parent: NET162 (NET-162-0-0-0-0)
NetType: Direct Allocation
OriginAS: AS8100
Organization: QuadraNet Enterprises LLC (QEL-5)
RegDate: 2014-03-28
Updated: 2018-08-30
Ref: https://rdap.arin.net/registry/ip/162.245.184.0

OrgName: QuadraNet Enterprises LLC
OrgId: QEL-5
Address: 19528 Ventura Blvd #433
City: Tarzana
StateProv: CA
PostalCode: 91356
Country: US
RegDate: 2018-06-07
Updated: 2018-10-11
Ref: https://rdap.arin.net/registry/entity/QEL-5

ReferralServer: rwhois://rwhois.quadranet.com:4321

Relationships

162.245.190.203	Connected_From	7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751

Description

"praiser.exe" attempts to connect to this IP address.

3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0

Tags

trojan

Details

Name	fontdrvhosts.exe
Size	950272 bytes
Type	PE32+ executable (GUI) x86-64, for MS Windows
MD5	9b071311ecd1a72bfd715e34dbd1bd77
SHA1	4a3f79d6821139bc1c3f44fb32e8450ee9705237
SHA256	3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0
SHA512	73444e81e02ac8649fa99aa6d98c3818589a627da687f7813a27b83e70e04b4eb4b38f69e7a103398440f9e03b47c6dcfc9b7a42ef5bae71c9e527ed52789efc
ssdeep	24576:VUQ+clWhn/PvswcxMnTndLF2nepjcrDXrVXK5ODcD:VUCqTnKbK5

Entropy	7.475351

Antivirus

ESET	a variant of Win64/Injector.HA.gen trojan
IKARUS	Trojan.Win64.Injector

YARA Rules

```
rule CISA_10382580_03 : loader
{
  meta:
    Author = "CISA Code & Media Analysis"
    Incident = "10382580"
    Date = "2022-05-02"
    Last_Modified = "20220602_1200"
    Actor = "n/a"
    Category = "Loader"
    Family = "n/a"
    Description = "Detects loader samples"
    MD5_1 = "3764a0f1762a294f662f3bf86bac776f"
    SHA256_1 = "f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab"
    MD5_2 = "21fa1a043460c14709ef425ce24da4fd"
    SHA256_2 = "66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16"
    MD5_3 = "e9c2b8bd1583baf3493824bf7b3ec51e"
    SHA256_3 = "7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751"
    MD5_4 = "de0d57bdc10fee1e1e16e225788bb8de"
    SHA256_4 = "33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b"
    MD5_5 = "9b071311ecd1a72bfd715e34dbd1bd77"
    SHA256_5 = "3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0"
    MD5_6 = "05d38bc82d362dd57190e3cb397f807d"
    SHA256_6 = "4cd7efdb1a7ac8c4387c515a7b1925931beb212b95c4f9d8b716dbe18f54624f"
  strings:
    $s0 = { B8 01 00 00 00 48 6B C0 00 C6 44 04 20 A8 B8 01 }
    $s1 = { 00 00 48 6B C0 01 C6 44 04 20 9A B8 01 00 00 }
    $s2 = { 48 6B C0 02 C6 44 04 20 93 B8 01 00 00 00 48 }
    $s3 = { C0 03 C6 44 04 20 9B B8 01 00 00 00 48 6B C0 }
  condition:
    all of them
}
```

ssdeep Matches

No matches found.

PE Metadata

Compile Date	2020-11-04 13:24:40-05:00
Import Hash	c85981382fb4eb606f6d91ad6bdc7112
Company Name	Sysinternals - www.sysinternals.com
File Description	Directory disk usage reporter
Internal Name	DU
Legal Copyright	Copyright (C) 2005-2018 Mark Russinovich
Original Filename	du.exe
Product Name	Sysinternals Du
Product Version	1.62

PE Sections

MD5	Name	Raw Size	Entropy

78d132074de70aeea7869dd58a1c9f94	header	1024	3.116777
440d1de1ebc4370b4c5b9484f4d6bceb	.text	322048	6.447230
2e1630eccc28f57d2eb5e243b81b472b	.rdata	105984	5.104773
de30a21bcd286f9ecbbe9b5430d748fd	.data	4096	2.850634
85d64a30df840f5f518c92faefdbf3a3	.pdata	19456	5.731131
753a82453395193c63bfea56bfcf1ef2	.rsrc	495104	7.970015
a9c4c9e1bc46b5a68f1853eabc7543bb	.reloc	2560	5.037904

Relationships

3c2c835042...	Connected_To	155.94.211.207

Description

This malware is a malicious 64-bit Intel Windows loader that contains an encrypted executable. During runtime, this encrypted executable is decrypted and loaded into memory, never touching the system's hard disk. The encrypted executable is the same family of malware as "f7_dump_64.exe" (88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8). This malware attempts to communicate with the hard-coded C2 location 155[.]94[.]211[.]207.

155.94.211.207

Tags

command-and-control

Whois

NetRange: 155.94.128.0 - 155.94.255.255
CIDR: 155.94.128.0/17
NetName: QUADRANET
NetHandle: NET-155-94-128-0-1
Parent: NET155 (NET-155-0-0-0-0)
NetType: Direct Allocation
OriginAS: AS8100
Organization: QuadraNet Enterprises LLC (QEL-5)
RegDate: 2014-06-11
Updated: 2018-08-30
Ref: https://rdap.arin.net/registry/ip/155.94.128.0

OrgName: QuadraNet Enterprises LLC
OrgId: QEL-5
Address: 19528 Ventura Blvd #433
City: Tarzana
StateProv: CA
PostalCode: 91356
Country: US
RegDate: 2018-06-07
Updated: 2018-10-11
Ref: https://rdap.arin.net/registry/entity/QEL-5

Relationships

155.94.211.207	Connected_From	3c2c835042a05f8d974d9b35b994bcf8d5a0c e19128ebb362804c2d0f3eb42c0

Description

"fontdrvhosts.exe" attempts to connect to the IP address.

28e4e7104cbffa97a0aa2f53b5ebcbcdba360ec416b34bb617e2f8891d204816

Tags

trojan

Details	
Name	error_401.jsp
Size	23171 bytes
Type	ASCII text, with very long lines, with no line terminators
MD5	3e200093f737fcd1e4bd350f6ffb7d56
SHA1	0e9e98d93463798645cc0a972a4ff6f99977318a
SHA256	28e4e7104cbffa97a0aa2f53b5ebcbcdba360ec416b34bb617e2f8891d204816
SHA512	9269ad158e16df39acf56a209b9afd91713282d8a9a7f5a51efefa8ef1de0c8093495e2994e11ef464753171bdf1d762d4def0d0191b111403250ae47d63cf8e
ssdeep	192:/2OkbSJWwmduoToGPJswyEnczKvN4/kV+8YBRKY9O/9:ESJeUgybee5o9
Entropy	5.172150

Antivirus

No matches found.

YARA Rules

No matches found.

ssdeep Matches

No matches found.

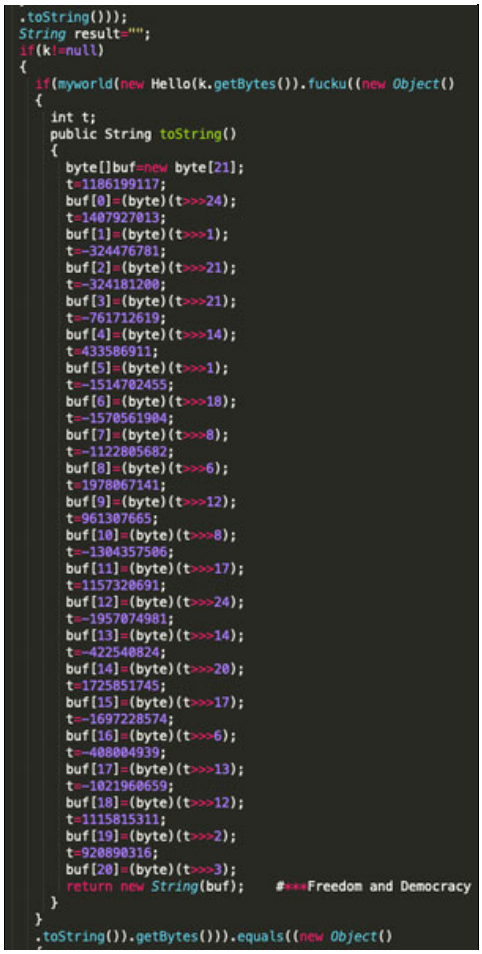
Description

This file contains heavily encrypted Java code. Analysis of this application reveals it is a malicious JSP application. It is designed to parse data and commands from incoming Hypertext Transfer Protocol (HTTP) requests, providing a remote operator C2 capabilities over a compromised system. This malicious webshell will allow a hacker to retrieve files from the target system, upload files to the target system, and execute commands on the target system. The webshell is portable and can be used to remotely control both Linux and Windows servers.

Static analysis indicates the malware parses data from the parameters named "X-Client-Data1" and "X-Client-Data2" from incoming web requests. This data is expected to be command and control data provided from a remote operator. Static analysis indicates the malware parses the data from the parameter "X-Client-Data1" and uses it as an Rivest Cipher 4 (RC4) key to encrypt the phrase "Freedom and Democracy". If the result of encrypting this phrase with the provided RC4 key equals "5lbknpgSPJSs5hQjT5mJAzn4Nqvo", the malware knows the hacker has the right key and will allow them to input commands to control the hacked server.

The command data will be provided in the parameter "X-Client-Data2". This data is decrypted using the previously mentioned RC4 key provided in parameter "X-Client-Data1". Refer to screenshots 11-14 for additional context of the functionality and purpose of this malicious webshell.

Screenshots



```
.toString()));
String result="";
if(k!=null)
{
  if(myworld(new Hello(k.getBytes()).fucku((new Object()
  {
    int t;
    public String toString()
    {
      byte[]buf=new byte[21];
      t=1186199117;
      buf[0]=(byte)(t>>>24);
      t=1407927013;
      buf[1]=(byte)(t>>>1);
      t=-324476781;
      buf[2]=(byte)(t>>>21);
      t=-324181200;
      buf[3]=(byte)(t>>>21);
      t=-761712619;
      buf[4]=(byte)(t>>>14);
      t=433586911;
      buf[5]=(byte)(t>>>1);
      t=-1514702455;
      buf[6]=(byte)(t>>>18);
      t=-1570561904;
      buf[7]=(byte)(t>>>8);
      t=-1122805682;
      buf[8]=(byte)(t>>>6);
      t=1978067141;
      buf[9]=(byte)(t>>>12);
      t=961307665;
      buf[10]=(byte)(t>>>8);
      t=-1304357506;
      buf[11]=(byte)(t>>>17);
      t=1157320691;
      buf[12]=(byte)(t>>>24);
      t=-1957074981;
      buf[13]=(byte)(t>>>14);
      t=-422540824;
      buf[14]=(byte)(t>>>20);
      t=1725851745;
      buf[15]=(byte)(t>>>17);
      t=-1697228574;
      buf[16]=(byte)(t>>>6);
      t=-408004939;
      buf[17]=(byte)(t>>>13);
      t=-1021960659;
      buf[18]=(byte)(t>>>12);
      t=1115815311;
      buf[19]=(byte)(t>>>2);
      t=920890316;
      buf[20]=(byte)(t>>>3);
      return new String(buf);    #***Freedom and Democracy
    }
  }
  .toString()).getBytes())).equals((new Object()
```

Figure 11 - This screenshot illustrates code utilized to encrypt the string "Freedom and Democracy" with the hacker provided RC4 key. If the result of this encryption is equal to "5lbknpgSPJSs5hQjT5mJAzn4Nqvo" the hacker is authenticated and able to submit commands to the malicious webshell.

```
            buf[34]=(byte)(t>>>24);
            return new String(buf);    #***key must be between 1 and 256 bytes
          }
        }
        .toString()));
      }
      else
      {
        keylen=k.length;
        for(int i=0;i<256;i++)
        {
          S[i]=(byte)i;
          T[i]=k[i%keylen];
        }
        int j=0;
        for(int i=0;i<256;i++)
        {
          j=(j+S[i]+T[i])&0xFF;
          byte temp=S[i];
          S[i]=S[j];
          S[j]=temp;
        }
      }
    }
    public byte[]fucku(final byte[]ptext)    //**RC4 ENCRYPTION
    {
      final byte[]ctext=new byte[ptext.length];
      int i=0,j=0,k,t;
      for(int counter=0;counter<ptext.length;counter++)
      {
        i=(i+1)&0xFF;
        j=(j+S[i])&0xFF;
        byte temp=S[i];
        S[i]=S[j];
        S[j]=temp;
        t=(S[i]+S[j])&0xFF;
        k=S[t];
        ctext[counter]=(byte)(ptext[counter]^k);
      }
      return ctext;
    }
  }
```

Figure 12 - This screenshot illustrates the code the malware utilizes to implement the RC4 encryption algorithm. The two sections of code illustrate the key initialization code as well as the actual stream cipher function.

```
else if(data.startsWith((new Object()
{
  int t;
  public String toString()
  {
    byte[]buf=new byte[4];
    t=1803775071;
    buf[0]=(byte)(t>>>19);
    t=2006479786;
    buf[1]=(byte)(t>>>3);
    t=430762186;
    buf[2]=(byte)(t>>>9);
    t=349283328;
    buf[3]=(byte)(t>>>5);
    return new String(buf);    #***put
  }
}
.toString()))
{
  String p=data.substring(4).split((new Object()
  {
    int t;
    public String toString()
    {
      byte[]buf=new byte[11];
      t=1332967169;
      buf[0]=(byte)(t>>>22);
      t=-1450764638;
      buf[1]=(byte)(t>>>23);
      t=-734695263;
      buf[2]=(byte)(t>>>1);
      t=1422557446;
```

Figure 13 - This screenshot illustrates the malware checking incoming data for the "put" command. The put command is used by the hacker to upload files to the target system. The "get" command is used to download files from the target system. The "rtelnet" command is used to actually execute commands on the target system. They could use these commands in conjunction to upload and execute payloads on the target system. Notably, the commands and data sent to and from this malware will be encrypted via RC4.

Figure 14 - This screenshot illustrates the capability the malware provides to execute commands on a target Linux system. This capability could be utilized to execute payloads previously uploaded to the system via the "put" command.

f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab

Tags

trojan

Details

Name	SvcEdge.exe
Size	716800 bytes
Type	PE32+ executable (GUI) x86-64, for MS Windows
MD5	3764a0f1762a294f662f3bf86bac776f
SHA1	6a87d8df99ea58d8612fa58a58b1a3a9512f160e
SHA256	f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab
SHA512	cb4ebb81c46246b92ae427f8cb0962af7420632e1806bd41e6169f5a98229f967d42bc843925679bee09b847462eb828adcdabe85e32b04f4cf859b0ed2d1725
ssdeep	12288:35OggY3QpK0ASd9ShPcr6rppUsCCkbiPppbvBPYLbYQPmfX:pOHY3eKGSar6pK2RlB2l
Entropy	7.625956

Antivirus

Adaware	Gen:Variant.Ulise.345018
AhnLab	Trojan/Win.Generic

Avira	TR/Injector.mhzsy
Bitdefender	Gen:Variant.Ulise.345018
ESET	a variant of Win64/Injector.HA.gen trojan
Emsisoft	Gen:Variant.Ulise.345018 (B)
IKARUS	Trojan.Win64.Injector

YARA Rules

```
rule CISA_10382580_03 : loader
{
  meta:
    Author = "CISA Code & Media Analysis"
    Incident = "10382580"
    Date = "2022-05-02"
    Last_Modified = "20220602_1200"
    Actor = "n/a"
    Category = "Loader"
    Family = "n/a"
    Description = "Detects loader samples"
    MD5_1 = "3764a0f1762a294f662f3bf86bac776f"
    SHA256_1 = "f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab"
    MD5_2 = "21fa1a043460c14709ef425ce24da4fd"
    SHA256_2 = "66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16"
    MD5_3 = "e9c2b8bd1583baf3493824bf7b3ec51e"
    SHA256_3 = "7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751"
    MD5_4 = "de0d57bdc10fee1e1e16e225788bb8de"
    SHA256_4 = "33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b"
    MD5_5 = "9b071311ecd1a72bfd715e34dbd1bd77"
    SHA256_5 = "3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0"
    MD5_6 = "05d38bc82d362dd57190e3cb397f807d"
    SHA256_6 = "4cd7efdb1a7ac8c4387c515a7b1925931beb212b95c4f9d8b716dbe18f54624f"
  strings:
    $s0 = { B8 01 00 00 00 48 6B C0 00 C6 44 04 20 A8 B8 01 }
    $s1 = { 00 00 48 6B C0 01 C6 44 04 20 9A B8 01 00 00 }
    $s2 = { 48 6B C0 02 C6 44 04 20 93 B8 01 00 00 00 48 }
    $s3 = { C0 03 C6 44 04 20 9B B8 01 00 00 00 48 6B C0 }
  condition:
    all of them
}
```

ssdeep Matches

No matches found.

PE Metadata

Compile Date	2016-06-12 12:53:34-04:00
Import Hash	4f2b9ad89041fedc43298c09c8e7b948
Company Name	Sysinternals - www.sysinternals.com
File Description	Lists logon session information
Internal Name	LogonSessions
Legal Copyright	Copyright (C) 2004-2016 Mark Russinovich
Original Filename	logonsessions.exe
Product Name	Sysinternals LogonSessions
Product Version	1.4

PE Sections

MD5	Name	Raw Size	Entropy
f11e7a01c20bdb65f339a2e16ff2ab71	header	1024	2.889552
e3e795ae8373330927da9e37b54a58b4	.text	89088	6.366985
4d9a0bcd9467b5aaee5d4d762219821b	.rdata	65536	4.425938
f80417eeab656641c6a5206454b398d3	.data	6656	3.054858
e0d2510e666231c532ff97edf51abd10	.pdata	5120	4.855993
807875fc3b991f68fdcc9dd7536ecf58	.rsrc	547328	7.907534
bca539afcd691a4a238b78fc830dc55a	.reloc	2048	4.939573

Relationships

f7f7b059b6...	Contains	88a5e4b24747648a4e3f0a2d5282b5168326 0f9208b06788fc858c44559da1e8

Description

This file is a 64-bit Intel binary which has been identified as a malicious Windows loader. Upon execution, it decrypts and loads the malware "f7_dump_64.exe" (88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8) in memory.

88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8

Tags

trojan

Details

Name	f7_dump_64.exe
Size	491520 bytes
Type	PE32+ executable (console) x86-64, for MS Windows
MD5	199a32712998c6d736a05b2dbd24a761
SHA1	45e0d90bd0283a1262d5afff46232e0ad4227d3b
SHA256	88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8
SHA512	b7a5c05135450fa6ea2a65dc227446ea52f9233a716f0fab78964d47898b53830441ecac54616d036b22d8241c2643f1c405b956037df63149fe8029f97b5899
ssdeep	6144:X0jj3qx0aEOjBiBQABYnBxxxa+Af2/hWPsWubPzpkVb4lOf9Dg4l/AxYL+p3Z/l:X0n3qaaEOjUBQXLA+/S89tgs4xY43Z
Entropy	6.114557

Antivirus

AhnLab	Trojan/Win.PWS
ESET	a variant of Win64/Spy.Agent.EA trojan

YARA Rules

```
rule CISA_10382580_01 : rat
{
  meta:
    Author = "CISA Code & Media Analysis"
    Incident = "10382580"
    Date = "2022-05-25"
    Last_Modified = "20220602_1200"
    Actor = "n/a"
    Category = "Remote Access Tool"
    Family = "n/a"
    Description = "Detects Remote Access Tool samples"
    MD5_1 = "199a32712998c6d736a05b2dbd24a761"
    SHA256_1 = "88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8"
  strings:
```

```
        $s0 = { 0F B6 40 0F 6B C8 47 41 0F B6 40 0B 02 D1 6B C8 }
        $s1 = { 35 41 0F B6 00 41 88 58 01 41 88 78 02 41 88 70 }
        $s2 = { 66 83 F8 1E }
        $s3 = { 66 83 F8 52 }
    condition:
        all of them
}
```

ssdeep Matches

No matches found.

PE Metadata

Compile Date	2022-02-22 23:18:47-05:00
Import Hash	cc2269b4f6a11e02b40a384e27ad5e8c

PE Sections

MD5	Name	Raw Size	Entropy
053c02fb38d86cde0b2f936311eff105	header	4096	0.901639
3f71f9227c631d0a9e5fe0d336705ebf	.text	327680	6.393162
61a37d0b6fceed27908f87fe41ab1965	.rdata	110592	4.796744
c8b9c69d2f0ea35735ae2205a7762bcd	.data	20480	4.040144
38355455e83691feae2b4e6bc396081c	.pdata	20480	5.287506
11abdcdaaf0271c411451a3ae533aba4	_RDATA	4096	0.259819
023183b361ae5de3c7493f32da9ab756	.reloc	4096	4.895506

Packers/Compilers/Cryptors

Microsoft Visual C++ 8.0 (DLL)

Relationships

88a5e4b247...	Connected_To	134.119.177.107
88a5e4b247...	Contained_Within	f7f7b059b6a7dbd75b30b685b148025a0d4ce ceab405e553ca28cacdeae43fab

Description

This file is a 64-bit Windows executable that was extracted from the malware named SvcEdge.exe, also included within this submission. Static analysis of this application reveals it is a RAT that provides a vast array of C2 capabilities to a remote operator. During runtime, the malware connects out to its hard coded C2 server 134[.]119[.]177[.]107 on port 443. After establishing this connection, the malware sits and waits for data to be sent back to it from the remote C2 server. Static analysis indicates the malware will receive a block of data that contains command data, and a 16-byte key. The 16-byte key will be extracted from this received data, and utilized to decrypt the command portion. The decrypted command portion of the C2 data will be checked to ensure that its first four bytes are equal to the value 0x0E03882Ah. If the values match, the malware will attempt to process the received decrypted data as a command. If the values do not match, the C2 session will be terminated and the malware will attempt to reinitiate a connection to the C2 server.

Screenshots

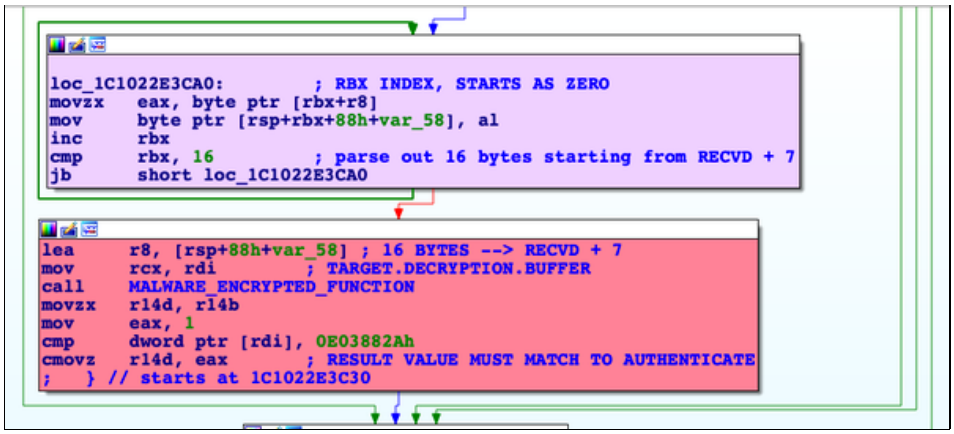


Figure 15 - This screenshot illustrates 16-bytes being parsed out from a block of data sent to this malware from its remote C2 server. Additionally, the screenshot illustrates this 16-bytes being utilized to decrypt another block of data retrieved from the C2 server and ensuring the first four bytes of the newly decrypted block match the value 0E03882Ah. If these bytes match the C2 session will continue. If not, the C2 session will be terminated.

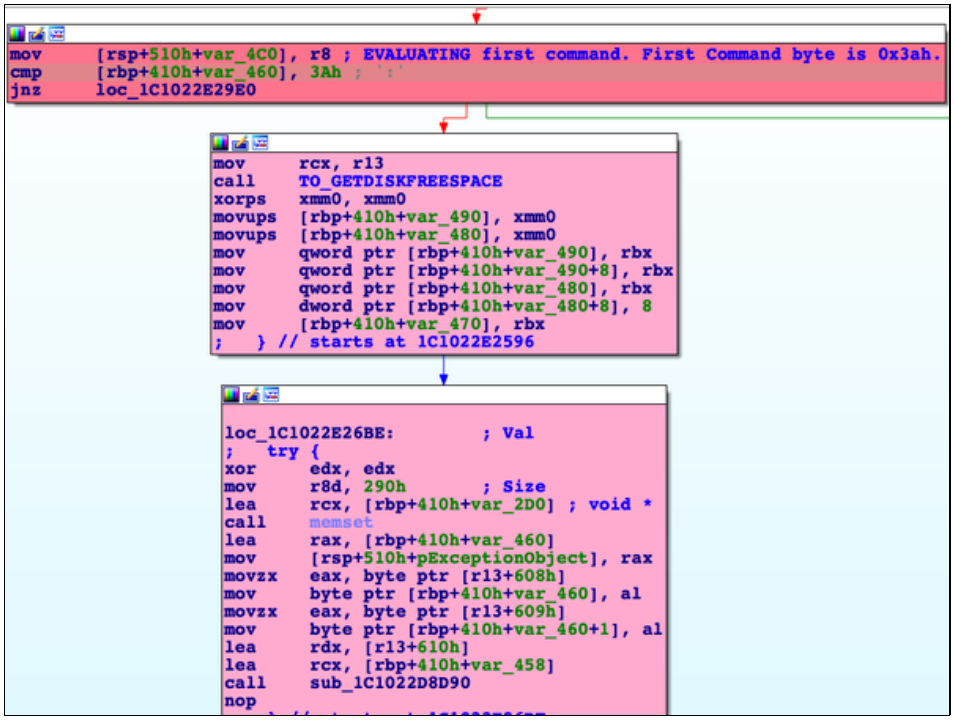


Figure 16 - This screenshot illustrates the malware evaluating a command byte against data retrieved from the remote operator. This is the "first command" checked for. If this command is issued, the malware will collect the target system information illustrated in Figure 17, encrypt it, and send it back to the remote operator.

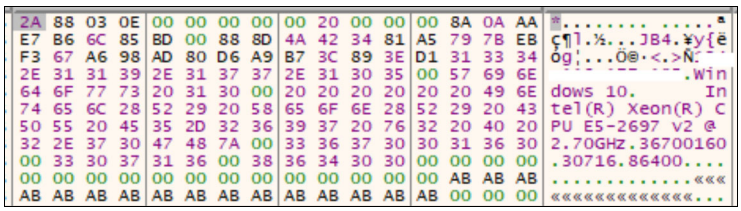


Figure 17 - This screenshot illustrates the malware sending a block of data to the remote C2 if the command byte 0x3a is provided. Note: This block of data contains the computer IP address, operating system type, processor type and other system information. The first four bytes of the block match the value 0x0E03882Ah indicating the remote operator does the same authentication check for this value on incoming data from this malware. This data was collected by the malware as a result of the command issued in Figure 16.

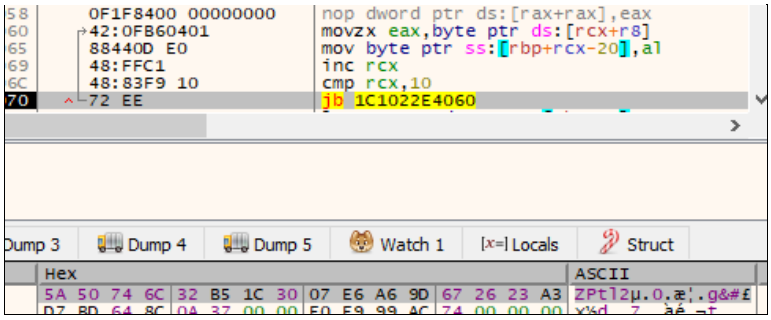


Figure 18 - This screenshot illustrates the malware generating the random 16-byte key. The key is used to encrypt the outbound data, which was collected as a result of the command illustrated in Figure 16.

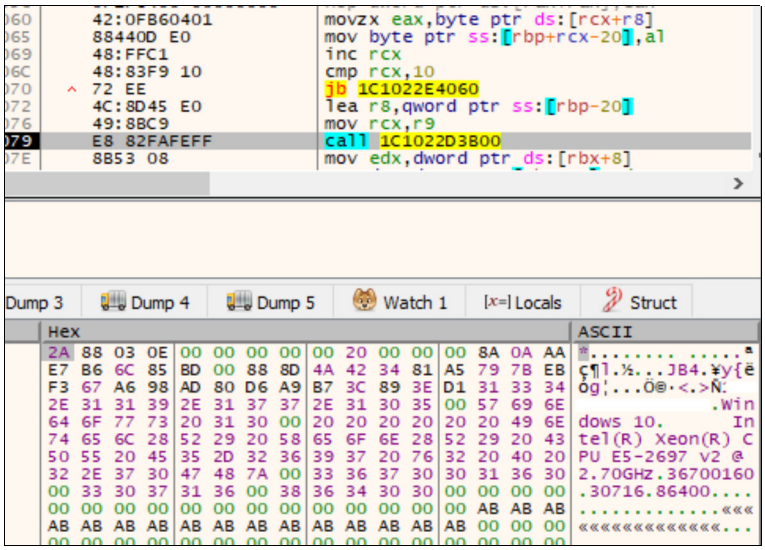


Figure 19 - This screenshot illustrates the malware about to encrypt an outbound block of data using the key generated by the code in Figure 18. This data was collected as a result of the command issued in Figure 16.

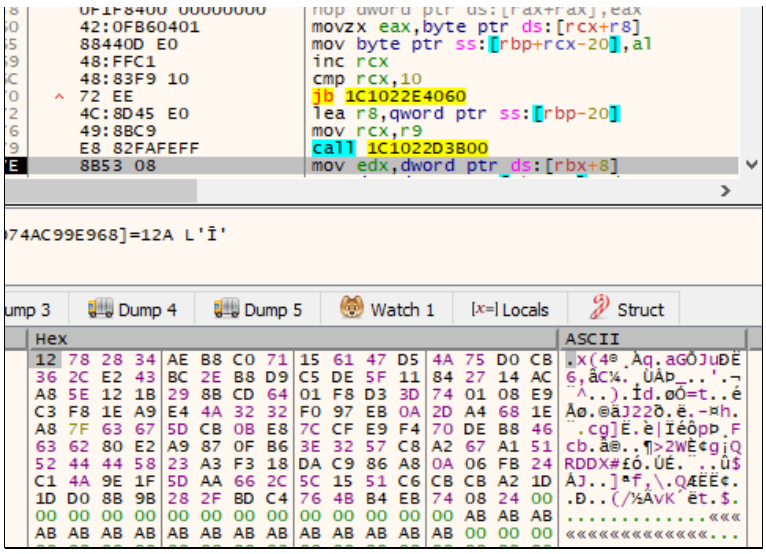


Figure 20 - This screenshot illustrates the appearance of an outbound block of data right after it is encrypted by this malware. Static analysis indicates this block is directly sent to the remote C2 using the Send() API. There is no further encryption performed on the data before it is sent outbound.

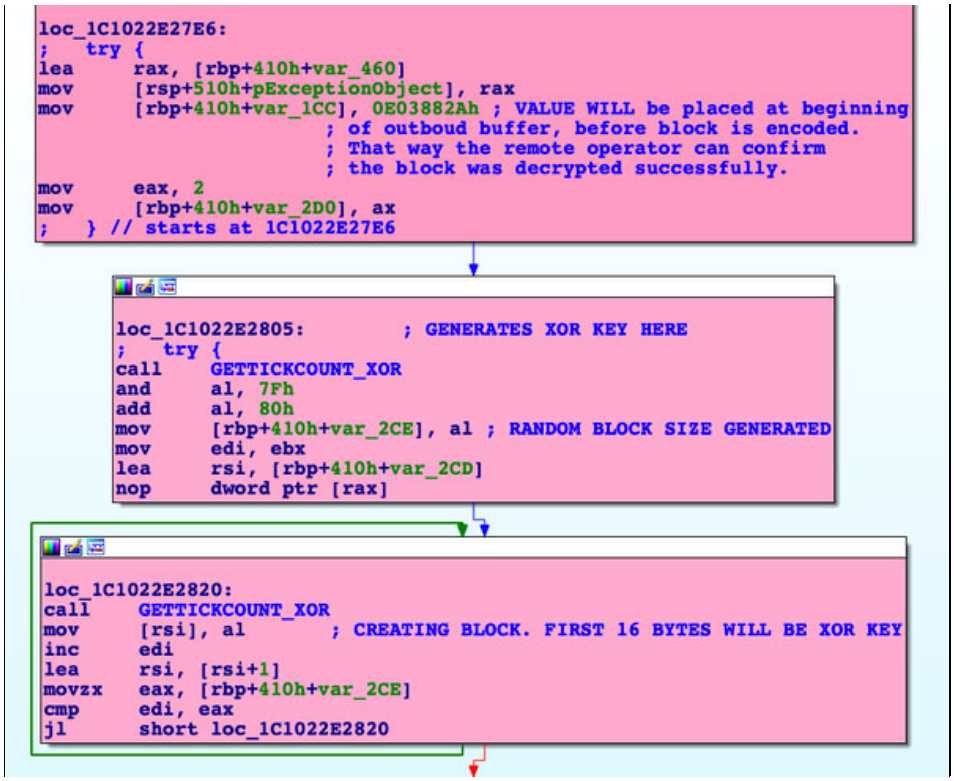


Figure 21 - This screenshot illustrates the malware building the first parts of an outbound data block. The static value 0E03882Ah is placed at the beginning of the buffer. This is so when the remote operator decrypts this block, it can ensure the first four bytes match 0E03882Ah, meaning the data was decrypted successfully.

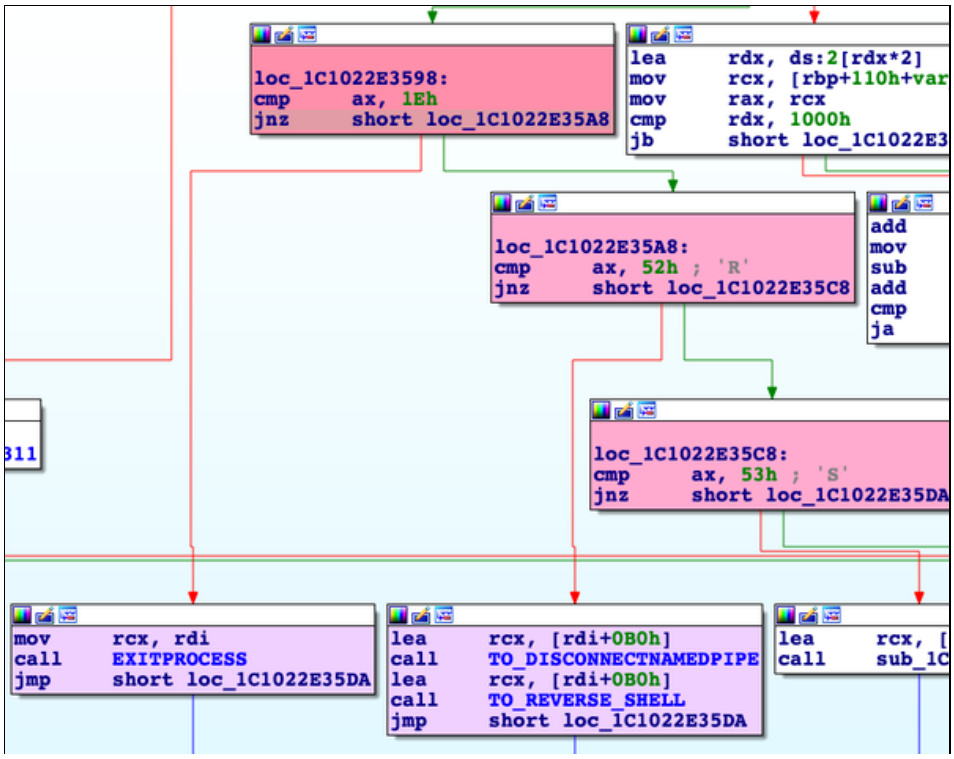


Figure 22 - This screenshot illustrates the malware comparing a "command byte" to a hard-coded value that represents a command. In this specific screenshot, the malware compares a hacker provided byte to see if the malware should initiate a reverse shell or terminate itself from running.

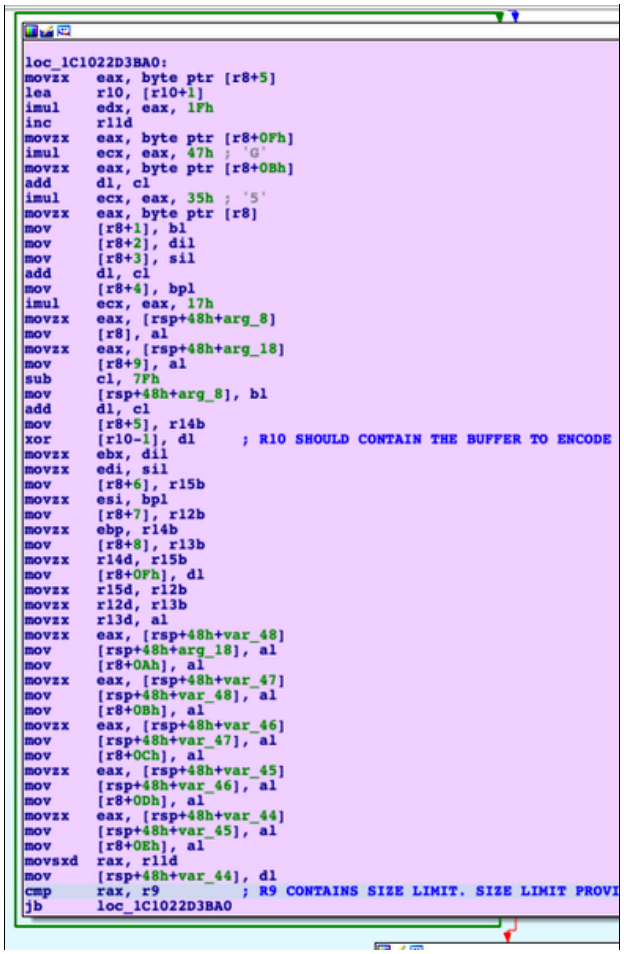


Figure 23 - This screenshot illustrates the cryptographic algorithm utilized to secure communications between this malware and its remote C2 server. Because the 16-byte key used to secure communications is included in the data sent and received from the remote hacker, it may be possible to decrypt the network communications of this malware. Notably, each time the malware sends data outbound to its new C2 server it will generate a new random 16-byte key which will be utilized to encrypt this outbound data. The 16-byte key will be included in the data sent to the remote C2.

Relationship Summary

66966ceae7...	Connected_To	185.136.163.104
66966ceae7...	Contains	d071c4959d00a1ef9cce535056c6b01574d8a8104a7c3b00a237031ef930b10f
185.136.163.104	Connected_From	66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16
d071c4959d...	Contained_Within	66966ceae7e3a8aace6c27183067d861f9d7267aed30473a95168c3fe19f2c16
33b89b8915...	Connected_To	134.119.177.107
134.119.177.107	Connected_From	33b89b8915aaa59a3c9db23343e8c249b2db260b9b10e88593b6ff2fb5f71d2b
134.119.177.107	Connected_From	88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8
7ea294d309...	Connected_To	162.245.190.203
162.245.190.203	Connected_From	7ea294d30903c0ab690bc02b64b20af0cfe66a168d4622e55dee4d6233783751
3c2c835042...	Connected_To	155.94.211.207

155.94.211.207	Connected_From	3c2c835042a05f8d974d9b35b994bcf8d5a0ce19128ebb362804c2d0f3eb42c0
f7f7b059b6...	Contains	88a5e4b24747648a4e3f0a2d5282b51683260f9208b06788fc858c44559da1e8
88a5e4b247...	Connected_To	134.119.177.107
88a5e4b247...	Contained_Within	f7f7b059b6a7dbd75b30b685b148025a0d4ceceab405e553ca28cacdeae43fab

Recommendations

CISA recommends that users and administrators consider using the following best practices to strengthen the security posture of their organization's systems. Any configuration changes should be reviewed by system owners and administrators prior to implementation to avoid unwanted impacts.

- Maintain up-to-date antivirus signatures and engines.
- Keep operating system patches up-to-date.
- Disable File and Printer sharing services. If these services are required, use strong passwords or Active Directory authentication.
- Restrict users' ability (permissions) to install and run unwanted software applications. Do not add users to the local administrators group unless required.
- Enforce a strong password policy and implement regular password changes.
- Exercise caution when opening e-mail attachments even if the attachment is expected and the sender appears to be known.
- Enable a personal firewall on agency workstations, configured to deny unsolicited connection requests.
- Disable unnecessary services on agency workstations and servers.
- Scan for and remove suspicious e-mail attachments; ensure the scanned attachment is its "true file type" (i.e., the extension matches the file header).
- Monitor users' web browsing habits; restrict access to sites with unfavorable content.
- Exercise caution when using removable media (e.g., USB thumb drives, external drives, CDs, etc.).
- Scan all software downloaded from the Internet prior to executing.
- Maintain situational awareness of the latest threats and implement appropriate Access Control Lists (ACLs).

Additional information on malware incident prevention and handling can be found in National Institute of Standards and Technology (NIST) Special Publication 800-83, **"Guide to Malware Incident Prevention & Handling for Desktops and Laptops".**

Contact Information

- 1-888-282-0870
- CISA Service Desk (UNCLASS)
- CISA SIPR (SIPRNET)
- CISA IC (JWICS)

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What is a MAR? A Malware Analysis Report (MAR) is intended to provide organizations with more detailed malware analysis acquired via manual reverse engineering. To request additional analysis, please contact CISA and provide information regarding the level of desired analysis.

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- E-Mail: submit@malware.us-cert.gov
- FTP: ftp.malware.us-cert.gov (anonymous)

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