

Analysis Report

FOR SAMPLE2.EXE

[Contains a brief malware analysis report for the file sample.exe which was provided as an assignment during the SecurityXploded Student Mentorship Programme]

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“A Trojan horse, or Trojan, is a non-self-replicating type of malware which appears to perform a desirable function but instead facilitates unauthorized access to the user’s computer system”

Introduction and Technical Analysis

General Information

- File Name : Sample2.exe
- MD5 : f0cf91991966cf57c207e24fa9ca8afd
- SHA-1 : 12e935c3add1f698098a2d625c98e6f7935b20cd
- Detected as : TROJ_GEN.R47CCIG
- Other know Aliases : Backdoor.Win32.IRCBot.faa, Backdoor.Win32.IRCBot.ai009, Win32:IRCBot-DIC [Trj]

Analysis Overview

Sample2.exe was identified as ‘TROJ_GEN.R47CCIG’ which is a trojan that connects to an Internet Relay Chat server (IRC server) and provides attacker with remote access to the infected system.

Technical Analysis

- The worm copies itself as ircaddon.exe in system32 directory.
- It modifies and Adds new registry keys to victim machine so that it runs every time Windows starts.
- Tries to spread via attachments sent via messenger services.
- Allows the attacker to gain access and take control of the computer via Internet Relay Chat
- Attacker can perform actions like create, delete or shell execute by sending keywords like “buzz”, “sun”, “open” etc.
- It tries to connect to the Internet Relay Chat server by making calls via system localhost (i.e. 127.0.0.1) using port no 7777.
- It randomly generates the nickname and user credentials to join the Internet Relay Chat.

```

.data:00449A01 a422 db '422',0 ; DATA XREF: sub_402303+EBTo
.data:00449A05 ; char a376[4]
.data:00449A05 a376 db '376',0 ; DATA XREF: sub_402303+07To
.data:00449A09 aPong$ db 'PONG %s',0Ah,0 ; DATA XREF: sub_402303+99To
.data:00449A12 ; char aPing[]
.data:00449A12 aPing db 'PING',0 ; DATA XREF: sub_402303+85Td
.data:00449A17 aNick$User$Nick db 'NICK %s',0Ah ; DATA XREF: sub_402036+82To
.data:00449A17 ; USER %s "nick" "%s" :%s',0Ah,0
.data:00449A38 aD_D_D_D db '%d.%d.%d.%d',0 ; DATA XREF: sub_402036+80To
.data:00449A44 db 69h ; i
.data:00449A45 byte_449A45 db 4Ch ; DATA XREF: sub_401FB9+4ATr
.data:00449A46 a4znann3udpen8w db '4zMaNn3uDpEn8wFk0v6PeQ1kFax9dB1tC7GHIJ2hKRbSg0TjUcoU5yWrXq2sY',0
.data:00449A84 db 66h ; F
.data:00449A85 byte_449A85 db 41h ; DATA XREF: sub_401F3C+4ATr
.data:00449A86 aX9db1tc3udpen8 db 'x9dB1tC3uDpEn8wFk7G-HIJ2hKiL4zMaNn0v6PeQ1kRbSg0TjUcoU5yWrXq2sY',0
.data:00449AC5 db 48h ; K
.data:00449AC6 byte_449AC6 db 69h ; DATA XREF: sub_401EBF+4ATr
.data:00449AC7 aL4zmannov6peql db 'L4zMaNn0v6PeQ1kFax9dB1tC3uDpEn8wFk7G-HIJ2hRbSg0TjUcoU5yWrXq2sY',0
.data:00449B06 aPrivmsg$S db 'PRIVMSG %s :%s',0 ; DATA XREF: sub_4014D8+7B6To
.data:00449B15 ; char Source[]
.data:00449B15 Source db 0Ah,0 ; DATA XREF: sub_4014D8:loc_401C40To
.data:00449B17 aRedirect$ISI db 'redirect %s:%i > %s:%i',0 ; DATA XREF: sub_4014D8+6BFTo
.data:00449B2E ; char aSend[]
.data:00449B2E aSend db 'SEND',0 ; DATA XREF: sub_4014D8+631To

```

Above is the code excerpt from the Trojan showing auto generation of nick and user credentials to join the Internet Relay Chat

```

00411571 60 32 PUSH ECX
00411573 6A 00 PUSH 0
00411575 68 F04000 PUSH sample2.004000FC
00411577 68 952000 CALL (.JMP-ECRDL,reverse)
00411579 55 571400 MOV DWORD PTR DS:[449124],0
0041157B 68 114200 PUSH DWORD PTR DS:[EBP+10]
0041157D 68 084000 PUSH sample2.00404008
0041157F 50 MOV EAX,14
00411581 50 MOV EAX,14
00411583 75 00 JNC SHORT sample2.00401587
00411585 50 MOV EAX,1
00411587 50 MOV EAX,1
00411589 50 MOV EAX,1
0041158B 50 MOV EAX,1
0041158D 50 MOV EAX,1
0041158F 50 MOV EAX,1
00411591 50 MOV EAX,1
00411593 50 MOV EAX,1
00411595 50 MOV EAX,1
00411597 50 MOV EAX,1
00411599 50 MOV EAX,1
0041159B 50 MOV EAX,1
0041159D 50 MOV EAX,1
0041159F 50 MOV EAX,1
004115A1 50 MOV EAX,1
004115A3 50 MOV EAX,1
004115A5 50 MOV EAX,1
004115A7 50 MOV EAX,1
004115A9 50 MOV EAX,1
004115AB 50 MOV EAX,1
004115AD 50 MOV EAX,1
004115AF 50 MOV EAX,1
004115B1 50 MOV EAX,1
004115B3 50 MOV EAX,1
004115B5 50 MOV EAX,1
004115B7 50 MOV EAX,1
004115B9 50 MOV EAX,1
004115BB 50 MOV EAX,1
004115BD 50 MOV EAX,1
004115BF 50 MOV EAX,1
004115C1 50 MOV EAX,1
004115C3 50 MOV EAX,1
004115C5 50 MOV EAX,1
004115C7 50 MOV EAX,1
004115C9 50 MOV EAX,1
004115CB 50 MOV EAX,1
004115CD 50 MOV EAX,1
004115CF 50 MOV EAX,1
004115D1 50 MOV EAX,1
004115D3 50 MOV EAX,1
004115D5 50 MOV EAX,1
004115D7 50 MOV EAX,1
004115D9 50 MOV EAX,1
004115DB 50 MOV EAX,1
004115DD 50 MOV EAX,1
004115DF 50 MOV EAX,1
004115E1 50 MOV EAX,1
004115E3 50 MOV EAX,1
004115E5 50 MOV EAX,1
004115E7 50 MOV EAX,1
004115E9 50 MOV EAX,1
004115EB 50 MOV EAX,1
004115ED 50 MOV EAX,1
004115EF 50 MOV EAX,1
004115F1 50 MOV EAX,1
004115F3 50 MOV EAX,1
004115F5 50 MOV EAX,1
004115F7 50 MOV EAX,1
004115F9 50 MOV EAX,1
004115FB 50 MOV EAX,1
004115FD 50 MOV EAX,1
004115FF 50 MOV EAX,1
0042104c sample2.0042104c (ASCII "esp")

```

Above is the code excerpt showing the use of keywords to perform certain operations.

System Activity

Registry changes

This worm creates the following registry entries to enable its automatic execution at every system startup under the name *'Internet Messaging File System'*

HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Run

The following registry entries are Read

HKLM\SYSTEM\CurrentControlSet\Services\Winsock\Parameters

HKLM\System\CurrentControlSet\Services\Tcpip\Parameters\Winsock

HKLM\System\CurrentControlSet\Services\WinSock2\Parameters\NameSpace_Catalog5\Catalog_Entries\000000000001

File Changes

It creates a replica of itself at the system folder (system32) with a name ircaddon.exe.

It also modifies \Device\Ndf\Endpoint

An Image excerpt from CaptureBat showing registry entries

Name	File Time	Total Events	Opens	Closes	Reads	Writes	Read...	Write...	Get ACL	Set ACL	Other
C:	0.0189840	154	31	23	0	4	0	197,152	0	0	96
Documents and Settings	0.0030848	24	2	1	0	0	0	0	0	0	21
Administrator	0.0030848	24	2	1	0	0	0	0	0	0	21
Desktop	0.0030848	24	2	1	0	0	0	0	0	0	21
SK_nerontship_samples	0.0030848	24	2	1	0	0	0	0	0	0	21
sample2	0.0030848	24	2	1	0	0	0	0	0	0	21
CRTDLL.DLL	0.0000779	1	0	0	0	0	0	0	0	0	1
LPK.DLL	0.0000207	1	0	0	0	0	0	0	0	0	1
USP10.dll	0.0000511	1	0	0	0	0	0	0	0	0	1
W52HELP.dll	0.0000234	1	0	0	0	0	0	0	0	0	1
W52_32.DLL	0.0000196	1	0	0	0	0	0	0	0	0	1
hnetcfg.dll	0.0000196	1	0	0	0	0	0	0	0	0	1
sample2.exe	0.0001283	14	1	1	0	0	0	0	0	0	12
sample2.exe.Local	0.0000378	2	0	0	0	0	0	0	0	0	2
WINDOVS	0.0158952	130	29	22	0	4	0	197,152	0	0	75
Prefetch	0.0000522	1	1	0	0	0	0	0	0	0	0
SAMPLE2.EXE-1CB68413.pl	0.0000522	1	1	0	0	0	0	0	0	0	0
WINS45	0.00011363	11	3	2	0	0	0	0	0	0	6
x86_Microsoft.Windows.Common-Controls_6595	0.00011363	11	3	2	0	0	0	0	0	0	6
comctl32.dll	0.00011077	9	2	2	0	0	0	0	0	0	5
WindowsShell.Config	0.0000336	1	1	0	0	0	0	0	0	0	0
WindowsShell.Manifest	0.0013098	18	3	3	0	0	0	0	0	0	12
system32	0.0123573	99	21	17	0	4	0	197,152	0	0	57
SHELL32.DLL.124.Config	0.0000375	1	1	0	0	0	0	0	0	0	0
SHELL32.DLL.124.Manifest	0.0000411	1	1	0	0	0	0	0	0	0	0
comctl32.dll	0.0004236	5	1	1	0	0	0	0	0	0	3
comctl32.dll.124.Config	0.0000013	1	1	0	0	0	0	0	0	0	0
comctl32.dll.124.Manifest	0.0000052	1	1	0	0	0	0	0	0	0	0
cmd.dll	0.0001259	6	1	1	0	0	0	0	0	0	4
hnetcfg.dll	0.0015037	5	1	1	0	0	0	0	0	0	3
imm32.dll	0.0002190	19	3	3	0	0	0	0	0	0	13
ircaddon.exe	0.0008026	10	1	1	0	4	0	197,152	0	0	4
ipk.dll	0.0000872	5	1	1	0	0	0	0	0	0	3
netsocket.dll	0.0016190	12	2	2	0	0	0	0	0	0	8
shell32.dll	0.0005474	5	1	1	0	0	0	0	0	0	3
usp10.dll	0.0002940	5	1	1	0	0	0	0	0	0	3
wic_32.dll	0.0000437	5	1	1	0	0	0	0	0	0	3
wic2help.dll	0.0000453	5	1	1	0	0	0	0	0	0	3
wihtcpip.dll	0.0002053	11	2	2	0	0	0	0	0	0	7

Network Activity

The Trojan tries to connect to the Internet Relay Chat server by making calls via system localhost (i.e. 127.0.0.1) using port no 7777

An image showing the Trojan trying to establish the connection via local host using port no 7777

12:26:...	sample2.exe	252	TCP Reconnect	localhost:1644 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1644 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Disconnect	localhost:1644 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1645 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1645 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Disconnect	localhost:1645 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1646 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1646 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Disconnect	localhost:1646 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1647 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1647 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Disconnect	localhost:1647 -> localhost:7777	SUCCESS	Length: 0
12:26:...	sample2.exe	252	TCP Reconnect	localhost:1648 -> localhost:7777	SUCCESS	Length: 0

An image showing IRC credentials being sent over by the Trojan via port 7777.

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Administrator>cd C:\Documents and Settings\Administrat
or\My Documents\Downloads\nc111nt

C:\Documents and Settings\Administrator\My Documents\Downloads\nc111nt>nc -l -p
7777
NICK vNanvaaaaNu
USER xA1diddxBx9 "nick" "vNanvaaaaNu" :a4LzaLLLL4aaL
```