

Loading RevengeRAT

An initial glance may have overlooked the readable stage2, but the Base64 encoded portable executable (PE) file is still obfuscated. Scattered around the Base64 string are @ symbols, which need to be replaced with “0” in order for the PE to be decoded properly. However, it doesn’t do this immediately.

In order to maintain persistence, the script first copies Microsoft.vbs from AppData/Local/Temp to Appdata/Roaming, and then saves a run key called “microsoft” with the value set to “C:\User\%USER%\Appdata\Roaming\microsoft.vbs”

Path

HKEY_USERS:S-1-5-21-782015159-3888652635-181968987-1000\Software\Microsoft\Windows\CurrentVersion\Run

Data

C:\Users\James Quinn\AppData\Roaming\MICROSOFT.VBS

Name

microsoft

Screenshot from Binary Defense MDR after it detected the installation

This allows the vbs to run at startup. Next, the script saves the obfuscated PE file into HKCU:\Software\Microsoft\microsoft as a string. The script then reads the previously saved key into memory and de-obfuscates the PE file before finally executing the file. This allows RevengeRAT to run in memory and not drop any files onto the system—a technique known as “fileless.”

See bottom of analysis for IOCs:

Digging into the “Interesting” Base64 String

Circling back around to the other Base64 string contained in the stage2 reveals a few things. First, unlike all other Base64 encountered so far, this string is not obfuscated. Additionally, the stage2 decodes the Base64 before saving the now decoded Base64 string to a file in Appdata/Roaming called GXxdZDvzyH.vbs, which it then executes with wscript /b. The /b flag specifies batch mode, which does not result in errors or input prompts.

Decoding the Base64 string gives us a file that strongly resembles the original obfuscated stage2:

| | |
|--------------------------|--|
| install-sdk | Download the wshsdk.zip file from C2, consists of a standalone python installation |
| get-pass | Grab password from specified file |
| get-pass-offline | Grab passwords from browsers along with specified file |
| update | Update the malware |
| uninstall | Uninstall the malware |
| up-n-exec | Download and update the malware |
| bring-log | Send wshlogs\ to the C2 |
| down-n-exec | Download and execute new malware |
| filemanager | File manager plugin using "fm-plugin.exe" |
| rdp | RDP plugin using "rd-plugin.exe" |
| keylogger | Keylogger plugin using "kl-plugin.exe" |
| offline-keylogger | Keylogger plugin using "kl-plugin.exe" |
| browse-logs | Browse logs generated by the rat |
| cmd-shell | Open a CMD shell |
| get-processes | List all processes |
| disable-uac | Disable UAC checks |
| check-eligible | Check eligibility for supplied file |
| force-eligible | Force eligibility for supplied file |
| elevate | Elevate to admin |
| if-elevate | Check elevation status |
| kill-process | Kill specified process |
| sleep | Sleep for specified amount of time |

Remediation

Unfortunately, as this file is resident in the registry, full removal is a bit more challenging than just removing a file. The first thing that should be removed are the two files stored in %APPDATA%, which are microsoft.vbs and GXxdZDvzyH.vbs. This will stop the malware from

executing. If any errors are received during deletion, the computer will need to be restarted in safe mode to try to delete those files again—and stay in safe mode—so that the registry can be edited without worrying about the malware executing.

In the registry, locate the Run key (HKEY_LOCAL_MACHINE:Software\Microsoft\Windows\CurrentVersion\Run) and delete the value “microsoft” as well as the value “GXxdZDvzyH”. Additionally, navigate to HKCU:Software\Microsoft\, find the value “microsoft” (should consist of the Base64 encoded PE file), and delete that value.

After following these steps, the computer should be safe to reboot in normal mode.

IOCs

RevengeRAT IOCs

Hash: 9ada62e4b06f7e3a61d819b8a74f29f589b645a7a32fd6c4e3f4404672b20f24

Mutex: RV_Mutex-toqqNLCGRFbTXZ

ID: House

Registry Location: HKCU:Software\Microsoft\microsoft

C2(s): 193.56.28.134:5478, 185.84.181.102:5478

WSHRAT IOCs (pulled from config, mainly)

Hash: d86081a0795a893ef8dc251954ec88b10033166f09c1e65fc1f5368b2fd6f809

C2: britanica.uk[.]com:4132

Registry

Location: HKEY_LOCAL_MACHINE:Software\Microsoft\Windows\CurrentVersion\Run\GXxdZDvzyH

Loader IOCs

Hash

(microsoft.vbs): c229c614c9bd2b347fd24ad12e3c157c686eb86bc0a02df1c7080cf40b659e10

Hash

(GXxdZDvzyH.vbs): ced8be6a20b38f5f4d5af0f031bd69863a60be53b9d6434deea943bf668ac8d8

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