

Objective--Stop the Malware (Part 1)

What you can learn from this

The WannaCookie malware in this year's challenge is patterned after the famous WannaCry ransomware. A young security person stumbled into a DNS domain name that was a kill switch for WannaCry and stopped the malware in its tracks. [This article](#) talks about the young man and his fate since then. Young hackers need to be careful.

If you want more than history, you can learn that in this challenge as well. This one is all about reverse-engineering malware written in PowerShell.

Malware functions list

The list we generated as homework will help us begin to understand this malware.

<u>Function</u>	<u>Purpose</u>	<u>Notes</u>
Enc_Dec-File	encrypts or decrypts files	uses AES 256
H2B	converts hex string to byte array	"-split '(.)' is regex for any two characters
A2H	converts ascii string to hex	"{0:X}" is a format operator, converts to hex
H2A	converts hex string to ascii	?"{\$_}" seems to strip extra lines
B2H	converts byte array to hex	
ti_rox	bitwise XOR	
B2G	compresses byte array with gzip	
G2B	uncompresses byte array	
sha1	computes SHA-1 hash	
Pub_Key_Enc	encrypts a byte array with pub key	\$key_bytes to be encrypted, byte array \$pub_bytes is public key, byte array output is hex of encrypted key
enc_dec	calls Enc_Dec-File to encrypt/decrypt	runs 12 jobs at a time
get_over_dns	receives files from DNS server	\$f.erohetfanu.com returns # of blocks \$i.\$f.ero.... Is an individual block
split_into_chunks	breaks string into 32 byte chunks	used by send_key
send_key	sends encrypted key to server	first time, gets botid after, prepends botid to chunk

Many of the functions are simple conversion routines. The evil deed in encrypting the file is done by Enc_Dec-File, using a key and AES. The actual control happens in the function wannacookie (or wanc in the minimized version of the script).

Caution

Remember to work on malware in a protected VM. Also, the end of the wannacookie function has code that downloads a large file via the DNS mechanism. That is really slow, so if it runs it will appear that your ISE has hung, and the malware DNS server has stopped. If you open Wireshark and see loads of DNS traffic to your machine, that is what happened.

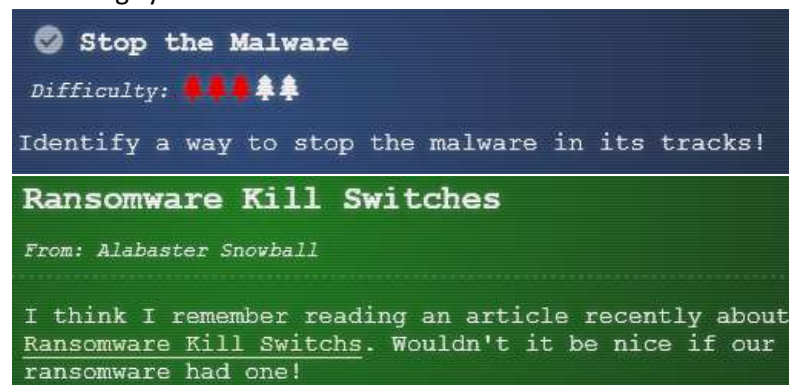
Dot sourcing

In his talk, Chris showed how to set a breakpoint in ISE and then step through the code. While the script is running in Debug mode, all its functions are available for your use on the command line. I found I wanted to use the functions even when the script was not running, so I resorted to dot sourcing. That just loads the functions into memory. The steps are simple:

- 1) Copy the functions you want into a separate file, let's say malware-functions.ps1. I left the main wannacookie function out of my file, as well as enc_dec and Enc_Dec-File since I didn't expect to need them.
- 2) From your ISE command prompt, enter `. path/to/malware-functions.ps1`
- 3) There is a period (dot) followed by a space at the beginning of the command, the reason it is called dot sourcing. Once it runs the functions will be loaded into memory
- 4) Now, you don't have to be in Debug mode to use the script's functions. You can type something like `H2A "77616E6E61636F6F6B69652E6D696E2E707331"` and it will run.

Get to work

Like WannaCry, WannaCookie also has a kill switch. Our job is to find it. Since wannacookie is the primary function, look for things that end it prematurely. It would also be a good idea to translate any hex strings you find into ASCII. Alabaster's hint about the kill switch [points here](#).



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Alabaster Snowball 1:50PM

Erohetfanu.com, I wonder what that means? Unfortunately, Snort alerts show multiple domains, so blocking that one won't be effective.

I remember another ransomware in recent history had a killswitch domain that, when registered, would prevent any further infections.

Perhaps there is a mechanism like that in this ransomware? Do some more analysis and see if you can find a fatal flaw and activate it!

Hand in

- 1) What is the domain that kills WannaCookie?