Curious Korlia

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Introduction

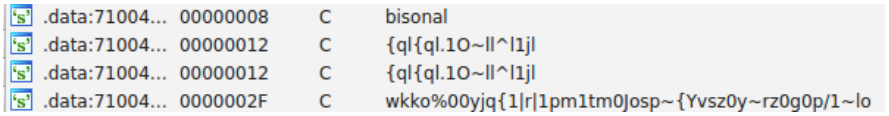
Reverse engineers organize discrete of pieces of malware into families. While digging through my malware collection I stumbled across this hash (B8FDFEE08DEEE5CCC1794BAF9ED553CE).

It turns out that this is a sample of the backdoor family known as Korlia. After doing some more digging, it turns out that Korlia doesn't seem to be that well documented or widely known. There is a little bit more written about it here.

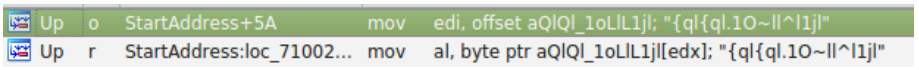
Korlia shares a lot of features with common remote access tools. Such as:

- Downloading and executing files
- Listing and controlling processes
- Creating and deleting files
- Creating a remote shell

Given the little amount of public information on Korlia, this made it a good candidate for further research. There isn't an obvious C2 address called out in strings, although there are some bizarre strings. Depending on luck, those might be actual strings, or code that is being misinterpreted as a string.

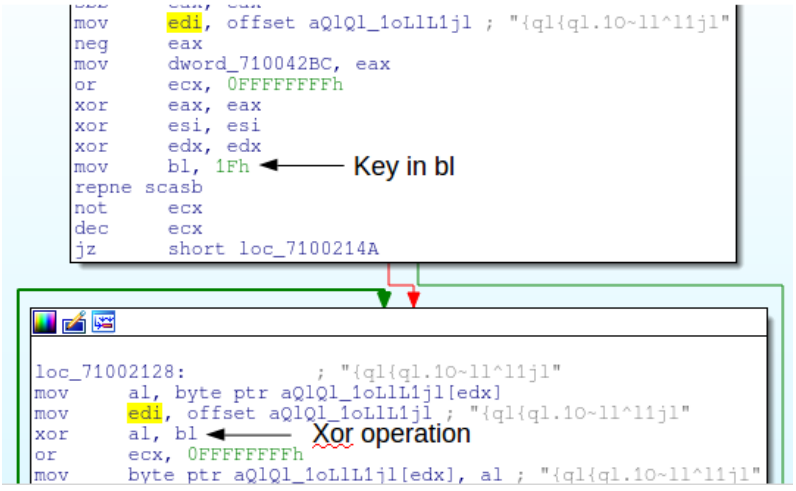


Diving in deeper on our first string:



There exists a cross reference to an address. For this case, that is a great sign! This particular piece of data is being referenced somewhere in the code. Let's follow.

In this case we can see that the data is being referenced as global data, and it's mov'd into an EDI. Shortly after, the value 0x1f is loaded into BL. As a general side note, when you see static values being pushed into the lower bytes of a general purpose register this usually means that some loop is going to follow and byte by byte modify a string or array.



This can be roughly written in Ruby with the following code.

```
"{ql{ql.1O~ll^l1jl".each_byte {|x| print "#{(x^0x1f).chr}"}
```

This will return the following information:

After a little bit of hunting on VirusTotal, I was able to find the following samples. Which also have the following configurations.

MD5	Config Offset	C2	C2	URL
172d68e10715b915ab3268db2174192b	11280	kfsinfo.ByInter.net	61.90.202.197	http://fund.cmc.or.kr/UploadFile/fa
211c25cdf120f5da8a2258b5d65cc263	14364	0906.toh.info	wew.myMom.info	http://fund.cmc.or.kr/UploadFile/fa
37513c17acfb0b122ffdc3e51501ecc3	11792	since.qpoe.com	69.197.149.98	http://fund.cmc.or.kr/UploadFile/fa
3f7b8f90acc4a01b3377942c409031dc	11808	mycount.MrsLove.com	mycount.MrsLove.com	http://fund.cmc.or.kr/UploadFile/fa
5217a2fc910479d36947d8fe6791d734	12816	mycount.MrsLove.com	mycount.MrsLove.com	http://fund.cmc.or.kr/UploadFile/fa
7807036a74b811c28f1fbb167ef545e3	15900	kazama.myfw.us		http://fund.cmc.or.kr/UploadFile/fa
7865b3c7e7f40ead123e97aae5dc0a57	17948	shinkhek.myfw.us		http://61.90.202.198/jp/log2.asp
932875565fc6a1356800aa9d3af01670	11792	usababa.myfw.us	indbaba.myfw.us	http://indbabababa.dns94.com/o.as
b57a30d94872e47186c7ef2e08e6e905	17440	mycount.MrsLove.com	mycount.MrsLove.com	http://fund.cmc.or.kr/UploadFile/fa
b7981c7d028cbfd2f0fe2089de02b391	11792	jennifer998.lookin.at	196.44.49.154	http://fund.cmc.or.kr/UploadFile/fa
b8fdfee08deee5ccc1794baf9ed553ce	11280	dnsdns1.PassAs.us	dnsdns1.PassAs.us	http://fund.cmc.or.kr/UploadFile/fa
c96a92565553c7dc67267c78bc2809bb	14352	since.qpoe.com	applejp.myfw.us	http://fund.cmc.or.kr/UploadFile/fa
cb0e358b534bdce8e2587ef3745b1723	11808	v3net.rr.nu	faceto.UglyAs.com	http://fund.cmc.or.kr/UploadFile/fa
e47f4ca37db57a9f22d85e021dc891a6	12816	mycount.MrsLove.com	mycount.MrsLove.com	http://fund.cmc.or.kr/UploadFile/fa
efe7598c675c1c71f0ad44cc686de587	17948	61.90.202.198	10.0.0.102	http://61.90.202.198/jp/log.asp

The next step in this process is to write a Yara rule looking for this sort of behavior. Writing Yara rules based on strings alone is often problematic as strings are very easy to change and modify. In this case, since we understand how the decoder works, writing a Yara rule for the loop is probably a better bet. While hunting I did find slight variations of the loop (highlighted in the Yara rule below). Those are accounted for in the final rule. The following rules will catch several variants of Korlia.

```
 rule korlia
{
meta:
author = "Nick Hoffman "
company = "CBTS - ACS"
information = "korlia malware found in apt dump"

//case a
//b2 1f mov dl, 0x1f ; mov key (wildcard)
// -----------------
//8A 86 98 40 00 71 mov al, byte ptr url[esi]
//BF 98 40 00 71 mov edi, offset url
//32 C2 xor al, dl
//83 C9 FF or ecx, 0FFFFFFFFh
//88 86 98 40 00 71 mov byte ptr url[esi], al
//33 C0 xor eax, eax
//46 inc esi
//F2 AE repne scasb
//F7 D1 not ecx
//49 dec ecx
//3B F1 cmp esi, ecx
//72 DE jb short loc_71001DE0

//case b (variant of loop a)
//8A 8A 28 50 40 00 mov cl, byte_405028[edx]
```

```
//BF 28 50 40 00 mov edi, offset byte_405028
//32 CB xor cl, bl
//33 C0 xor eax, eax
//88 8A 28 50 40 00 mov byte_405028[edx], cl
//83 C9 FF or ecx, 0FFFFFFFFh
//42 inc edx
//F2 AE repne scasb
//F7 D1 not ecx
//49 dec ecx
//3B D1 cmp edx, ecx
//72 DE jb short loc_4047F2

//case c (not a variant of the above loop)
//8A 0C 28 mov cl, [eax+ebp]
//80 F1 28 xor cl, 28h
//88 0C 28 mov [eax+ebp], cl
//8B 4C 24 14 mov ecx, [esp+0D78h+var_D64]
//40 inc eax
//3B C1 cmp eax, ecx
//7C EE jl short loc_404F1C

strings:
$a = {b2 ?? 8A 86 98 40 00 71 BF 98 40 00 71 32 c2 83 C9 FF 88 86 98 40 00 71 33 C0 46 F2 AE F7 D1 49 3B F1}
$b = {B3 ?? ?? ?? 8A 8A 28 50 40 00 BF 28 50 40 00 32 CB 33 C0 88 8A 28 50 40 00 83 C9 FF 42 F2 AE F7 D1 49 3B D1}
$c = {8A 0C 28 80 F1 ?? 88 0C 28 8B 4C 24 14 40 3B C1}
$d = {00 62 69 73 6F 6E 61 6C 00} //config marker "\x00bisonal\x00"
condition:
any of them
}
```

Source: https://securitykitten.github.io/2014/11/25/curious-korlia.html