Machoke

CFG based fuzzy hash for malware classification

@Maxou56800, @rbnctl
CONIX CyberSecurity

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Maxou56800
Twitter: @Maxou56800
CERT-Conix

Robin Marsollier
Twitter: @rbnctl
robin.marsollier@conix.fr
CERT-Conix

1. Apparently used by AV
2. Used by academics
3. Used by other actors

Machoke
CFG-based classification

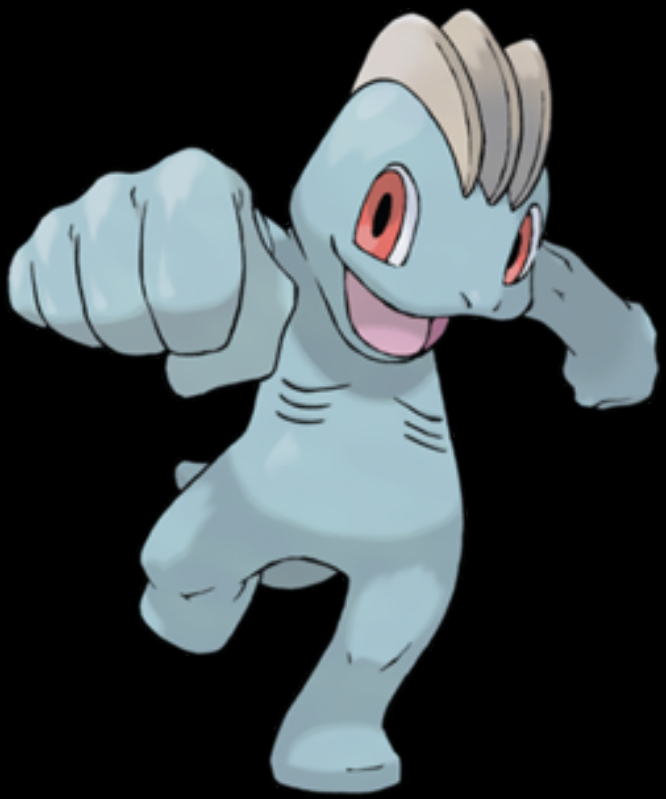
1. Apparently used by AV
2. Used by academics
3. Used by other actors
4. But yet no public implementation ...

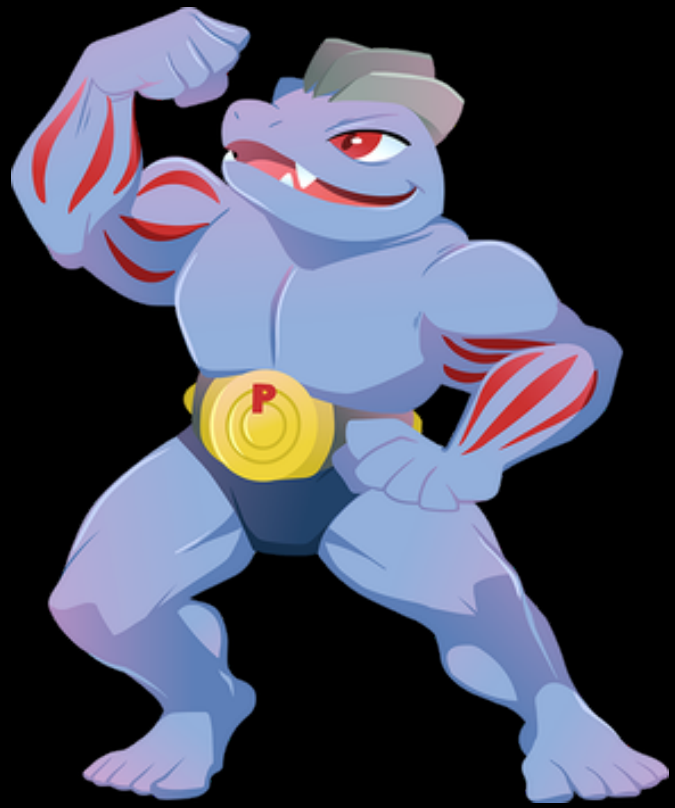
1. Get something better than md5/sha* (resistant to small changes inside samples notably, etc.)
2. A fuzzy hash better than good old ssdeep
3. Get a small and independent tool easy to use and deploy at large
4. Let other tools do the clustering

1. Designed by ANSSI, published with Polichombr (https://github.com/ANSSI-FR/polichombr)
2. CFG-based fuzzy hash
3. 2 implementations: Ruby/miasm || Python/IDAPython (Machoc lost in lots of ruby/python/whatever code)

Machoke

Naming

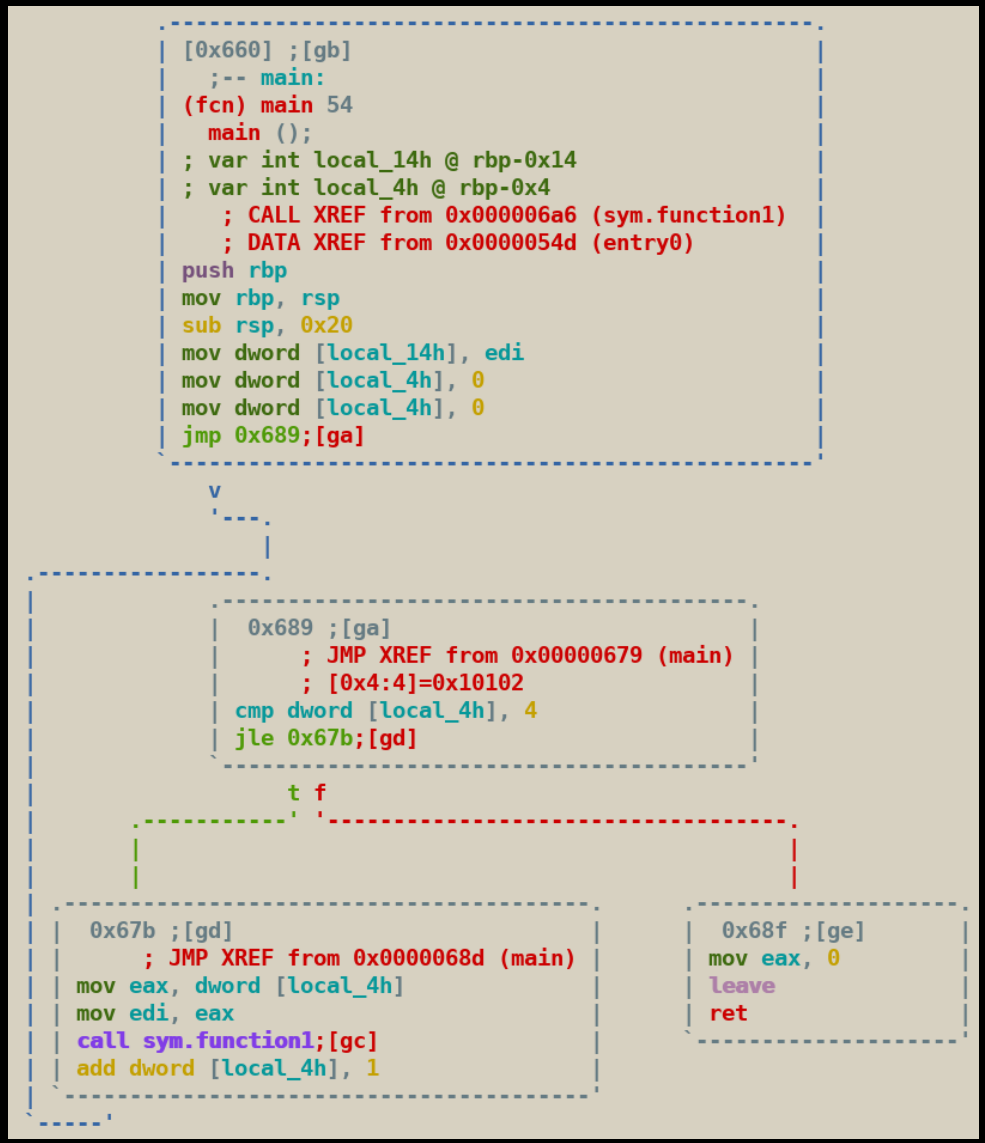


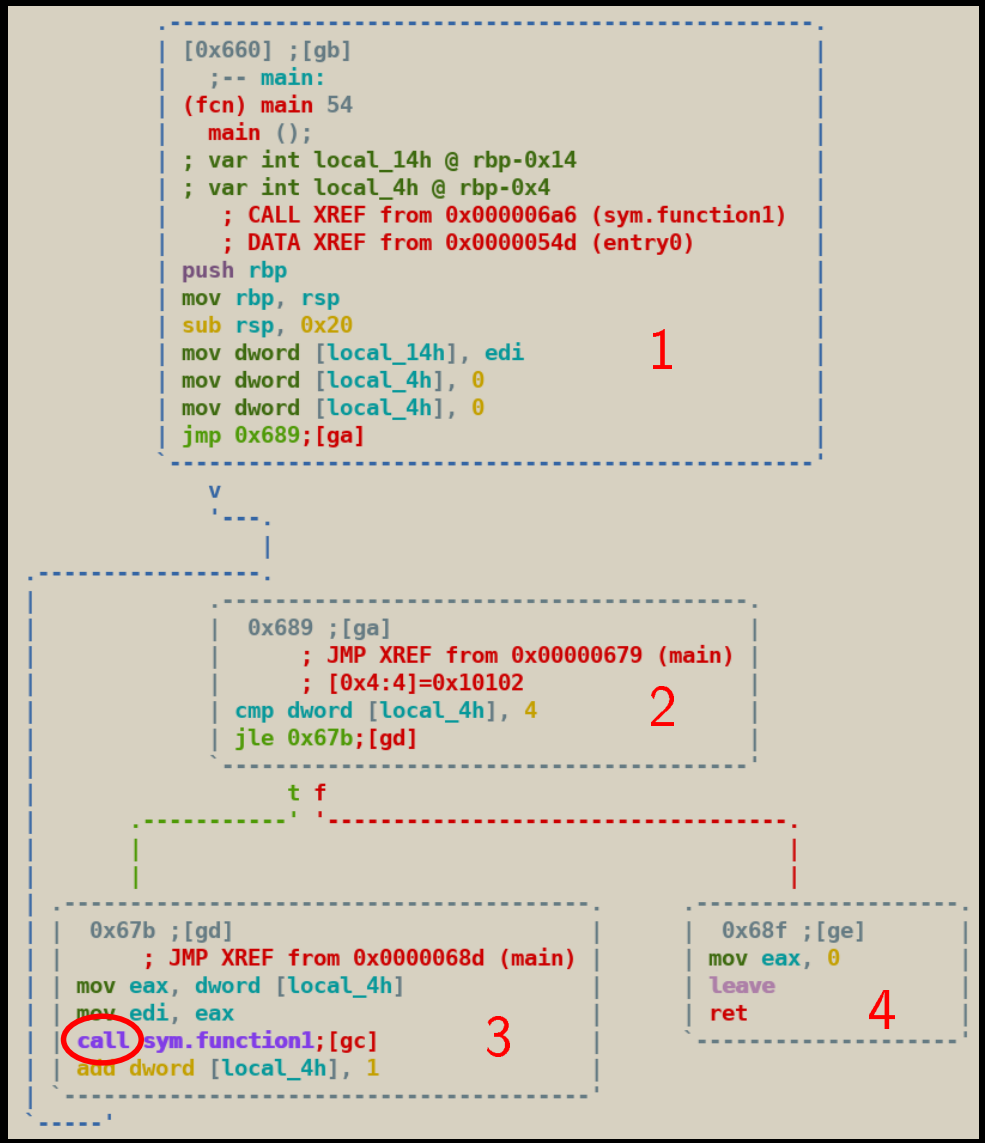


1. Radare2 + r2pipe
2. Python

Machoke

Machoke algorithm

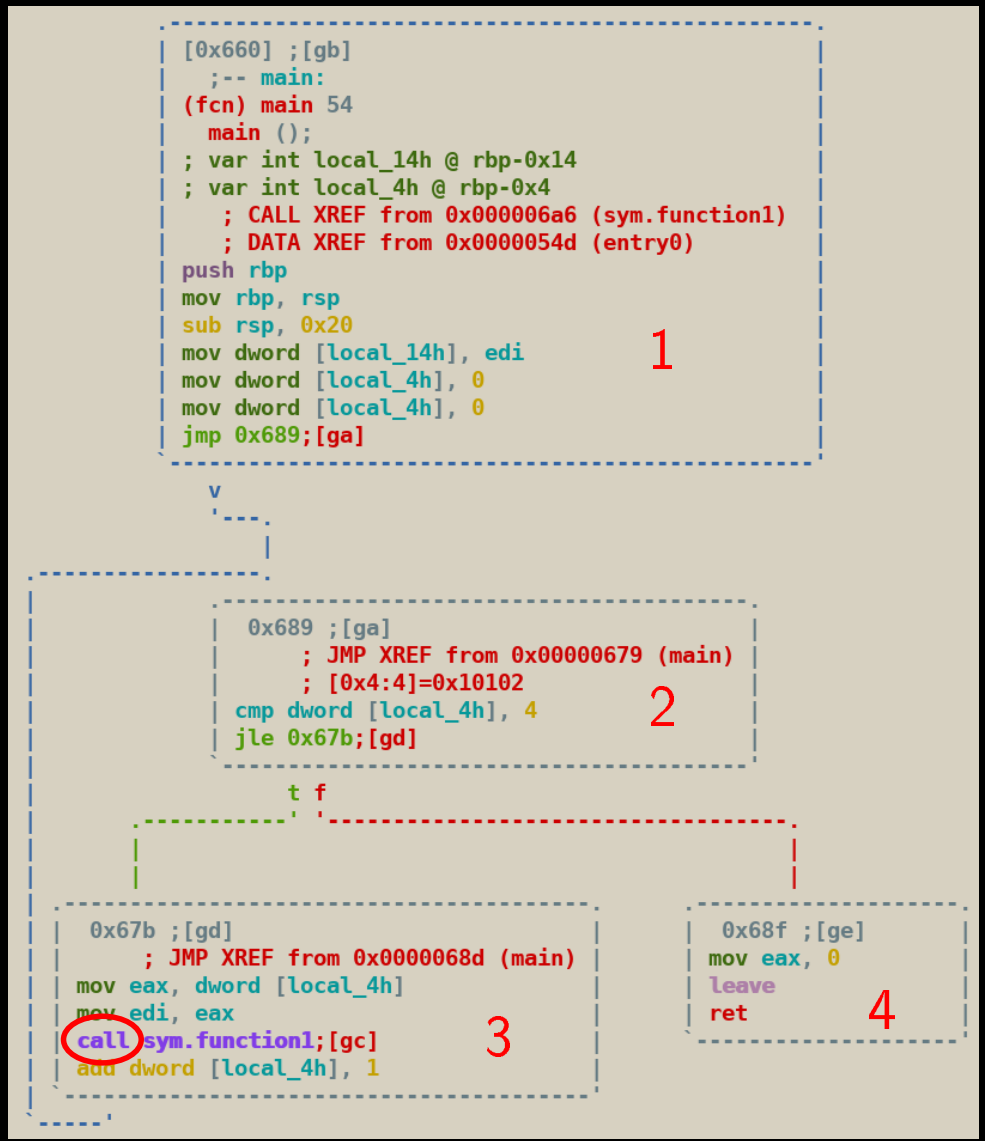




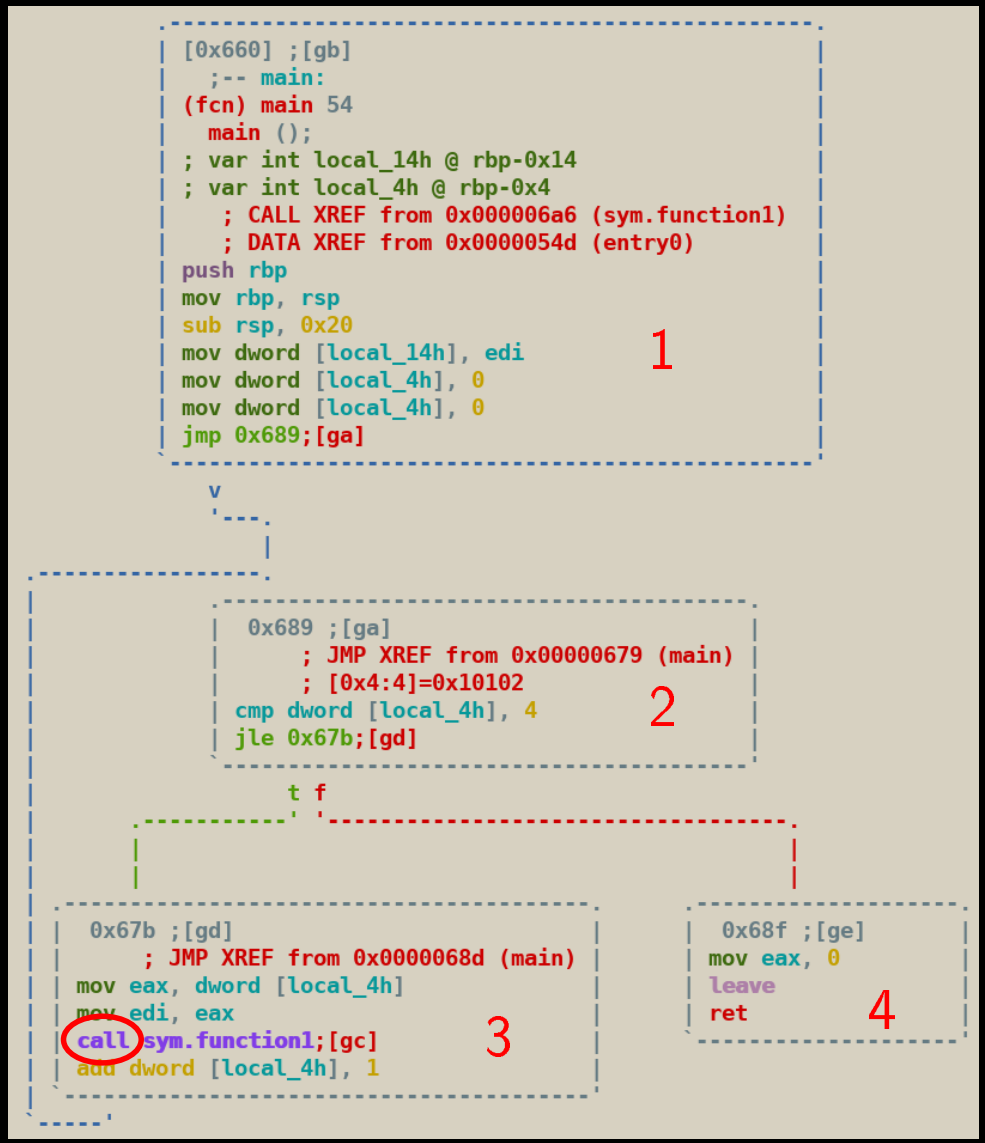
1. Blocks and call labelling

Machoke

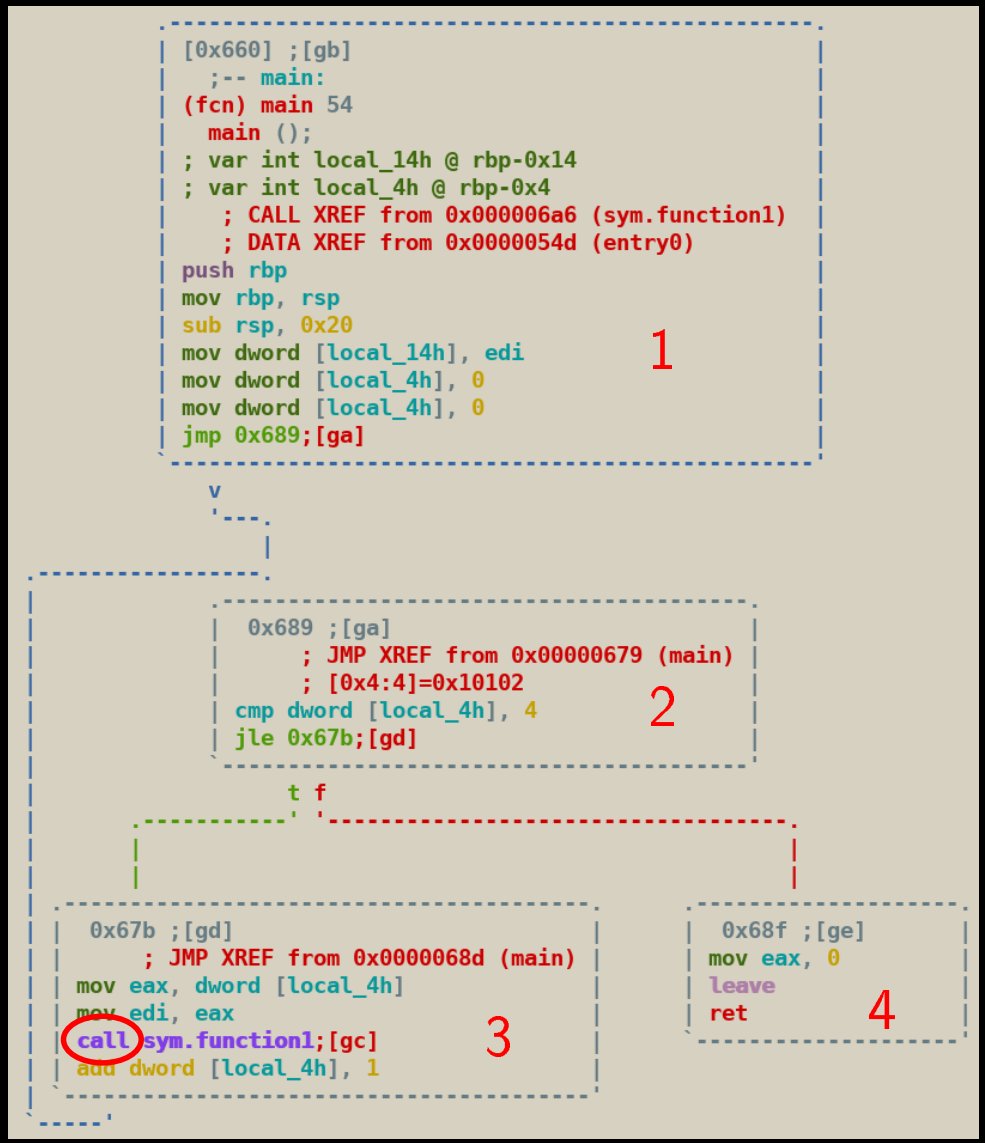
Machoke algorithm



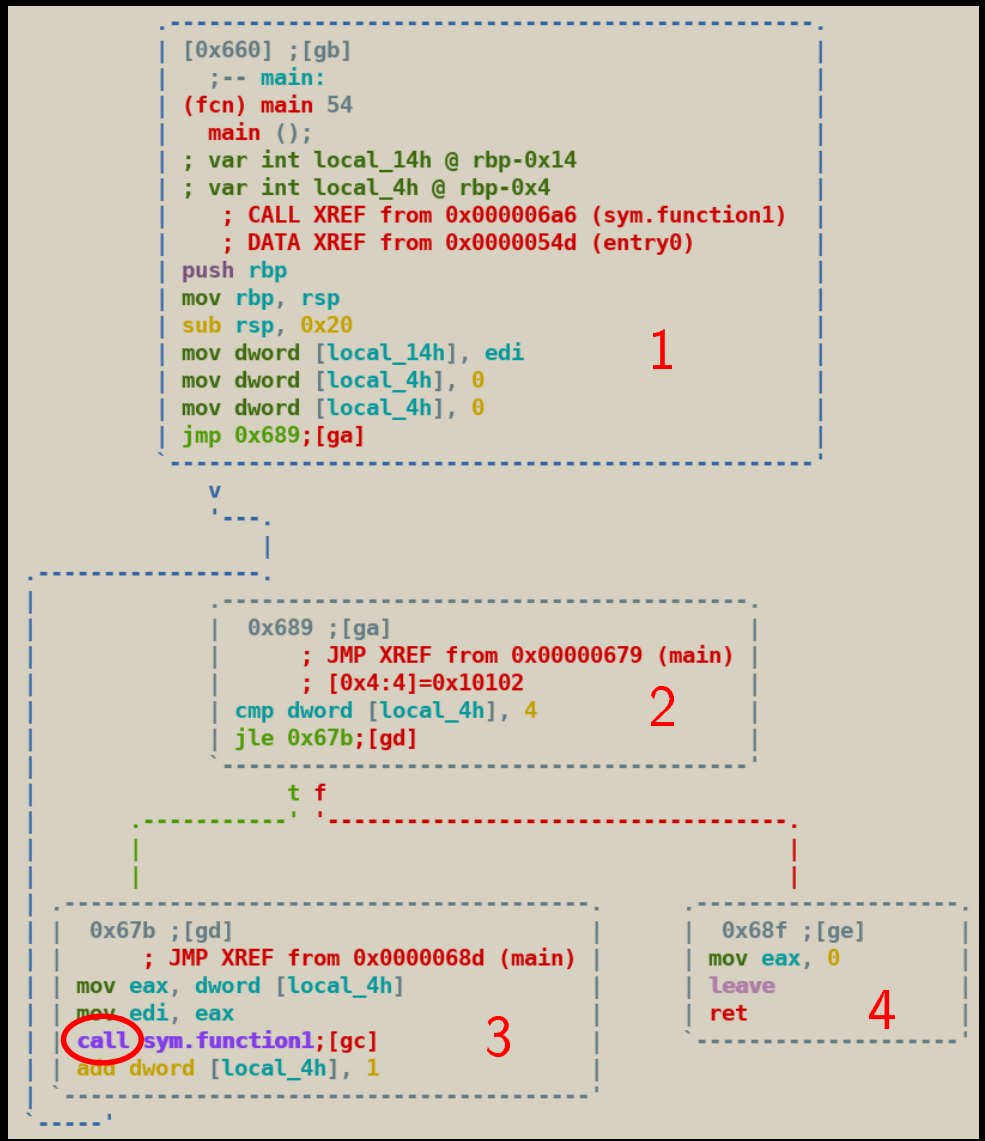
1. Blocks and call labelling
2. Translate to text:
   1:2;



1. Blocks and call labelling
2. Translate to text:
   1:2;2:3,4;



1. Blocks and call labelling
2. Translate to text:
   1:2;2:3,4;3:c,2;



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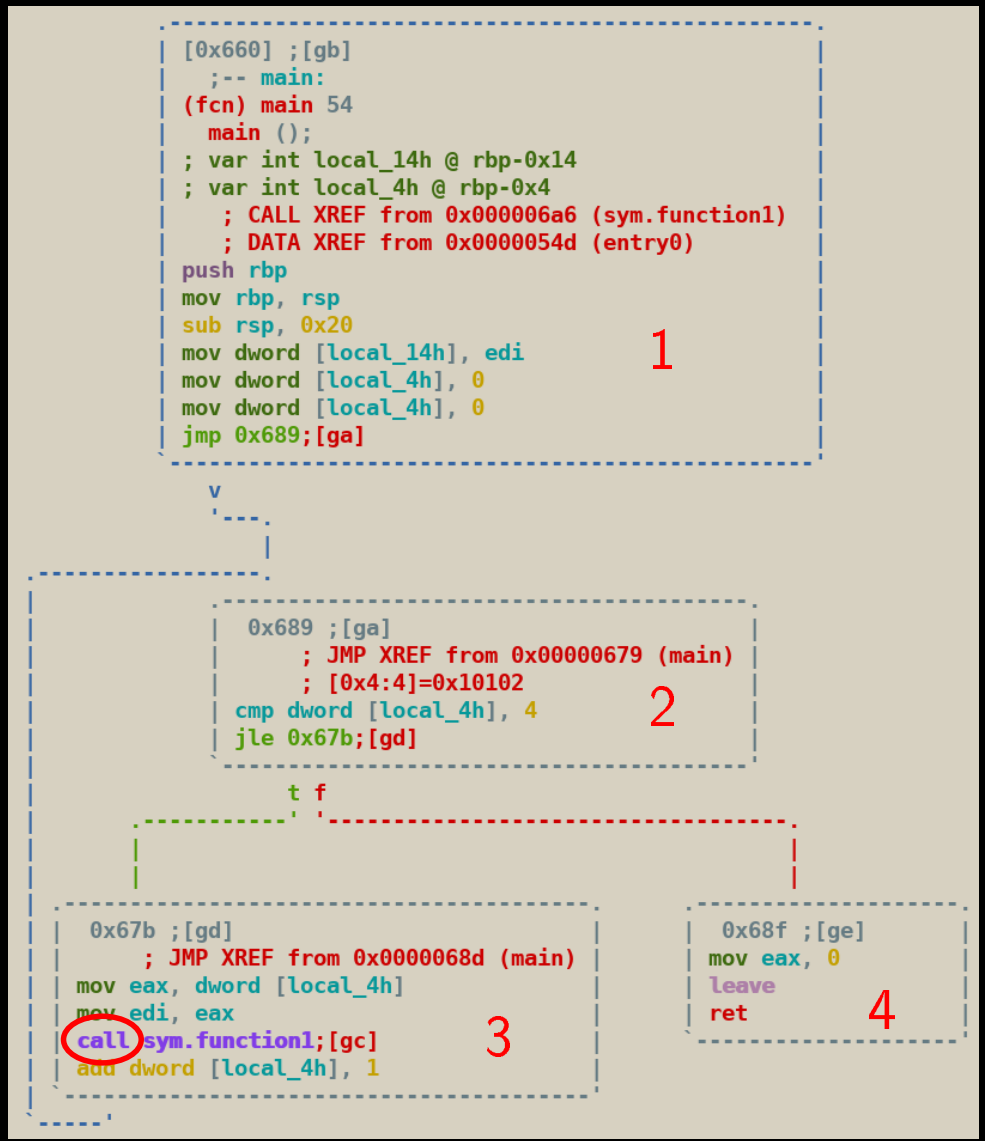
   1:2;2:3,4;3:c,2;4:;

Machoke

Machoke algorithm



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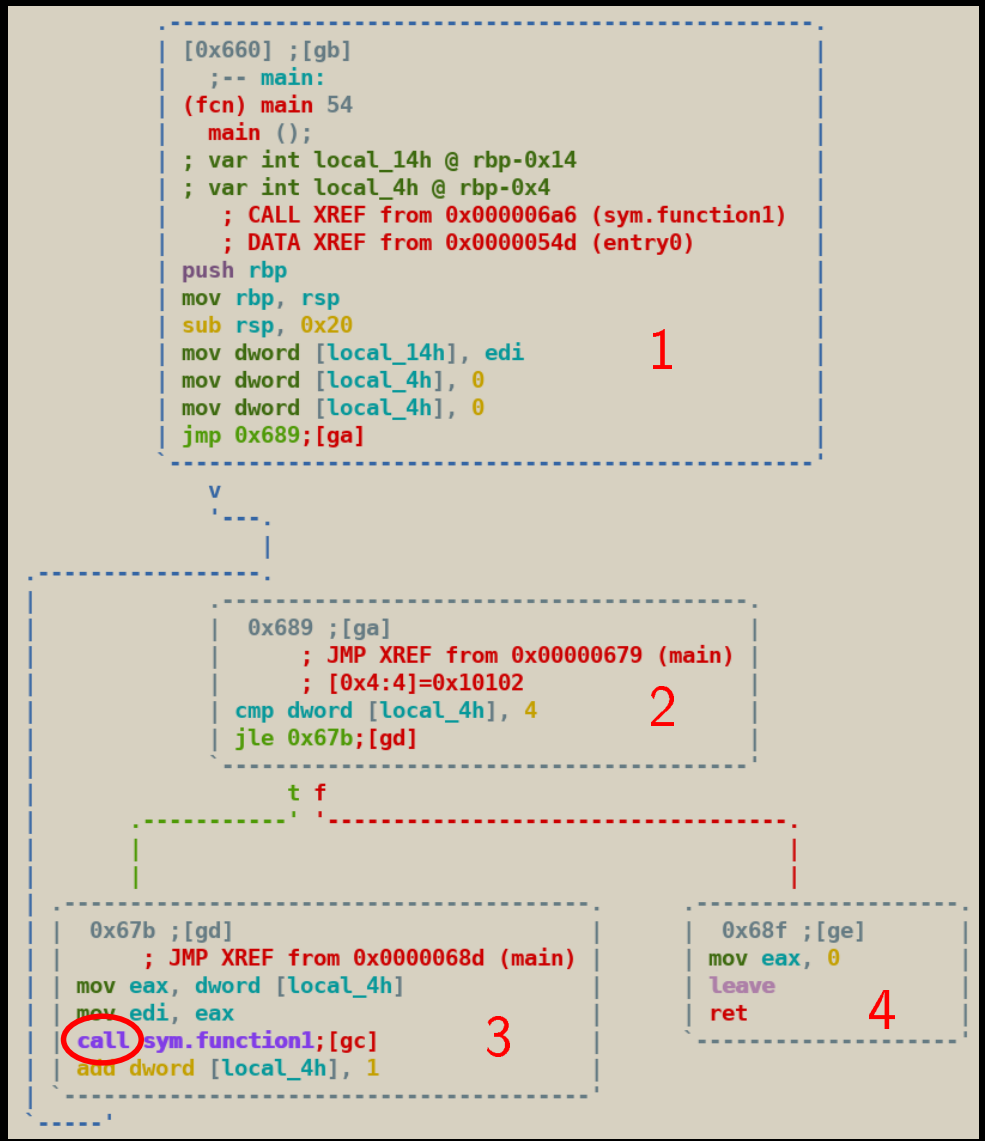
2. Translate to text: 1:2;2:3,4;3:c,2;4:;
3. Murmurhash3: e38a5cbb



1. Blocks and call labelling
2. Translate to text: 1:2;2:3,4;3:c,2;4:;
3. Murmurhash3: e38a5cbb
4. Repeat for each function in sample, concatenate hashes

Machoke

r2 commands used

1. aa
2. ilj
3. aflj
4. agj

First analysis on a collection of samples classified by Yara rules (21915 samples):

1. 21915 unique MD5/SHA256 (as expected)

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3. Only 4674 unique machoke hashes

Second analysis on the BUSURPER tool family from the shadow broker leak:

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1. 80 differents samples (80 differents md5/sha*)
2. Only 3 differents machoke hashes for all the 80 versions of the tool

1. Adding ability to "machoke" functions of malware
2. Integrate machoke inside other tools (MISP, viper etc.)
3. Build correlation/clusterisation tools on top of it

https://github.com/conix-security/machoke