VirusTotal for Investigators

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VirusTotal

This session will demonstrate methods for using VirusTotal data to deep dive into malware campaigns. We will begin by exploring the design and implementation of the newest tools introduced to the VirusTotal arsenal: VTGrep and Graph. The workshop will then progress into discussion around how best to leverage the data available to VT users. By better understanding the breadth and depth of malicious campaigns, researchers and law enforcement can better investigate and mitigate impact. Recently introduced improved relational metadata as well as expanded retroactive and proactive hunting capabilities allow investigators to dive deep into malware within a global data source.

Objective:
Users will learn:

1. How to use VirusTotal Graph to visualize malware campaigns.
2. How to use VirusTotal Intelligence to identify interesting malware metadata.
3. How to use Yara for proactive and retroactive visibility.

Goals

- Discussion and Practical Application of Tools
  - Static Data Pivots
  - Faceted Search
  - VTGrep
  - VTGraph
  - YARA + VirusTotal Externals
- Highlight APIv3 Functionality

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

1) One Click Pivots and Visual Similarity Pivoting
2) VTGrep technical dive and functionality
3) VTGraph Technical dive and functionality
4) Yara guided rule dev, key modules, and practical examples
5) APIv3 New Go Tool (commandline) and functions
6) TEASERS

www.virustotal.com/gui/

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/subscription/event/klsas19/join

00 VirusTotal Introduction

Introduction to VTE Functionality

What is VirusTotal Intelligence?

VTINTELLIGENCE

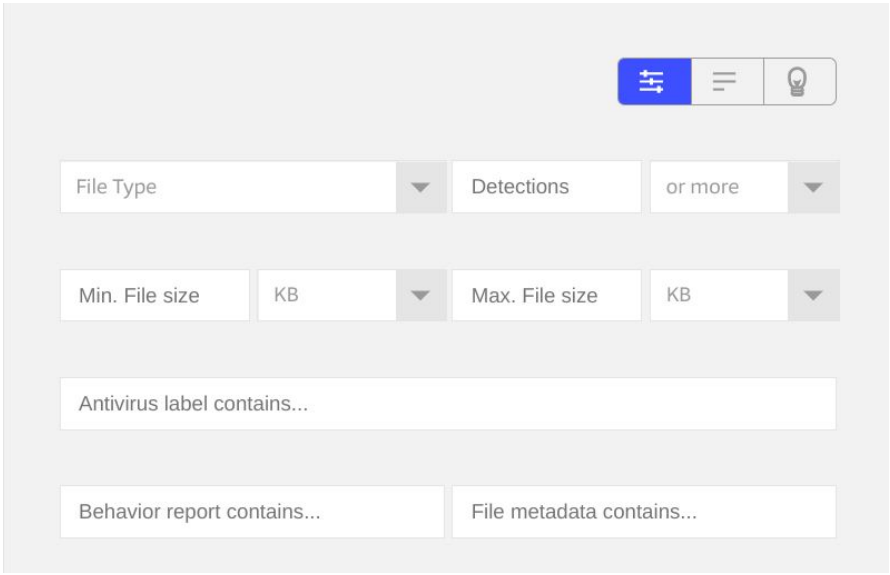
- VirusTotal Intelligence has been called the “Google of malware”
- VTI provides the ability to search through VT’s dataset using:
  - Binary properties
  - Detection verdicts/signatures
  - Static properties
  - Behavior patterns
  - Metadata
- Access via web interface or APIs

VirusTotal

01

Faceted Search

Query Builder



Existing Search Modifiers:
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence

Madlibs style guided query builder

Assumes all terms are AND

Faceted SEarches support OR queries as well!

Tips

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Practice: https://www.virustotal.com/wargame/

Supports logical “AND” “OR” “NOT”

Respects order of operations: ()

Ranges can be denoted with + or -

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Practice makes perfect: https://www.virustotal.com/wargame/

Example 1

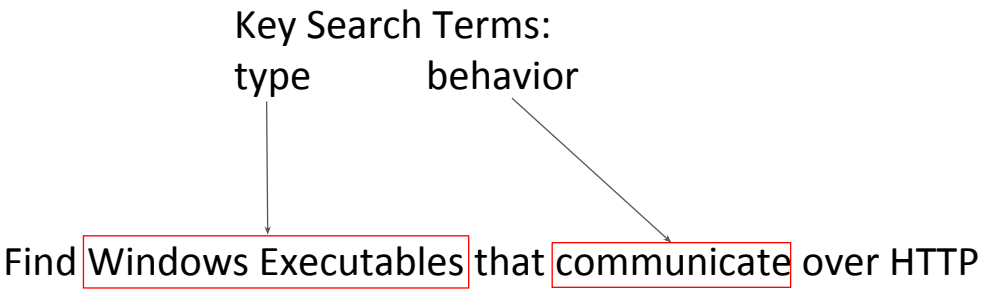
Find Windows Executables that communicate over HTTP

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

- Find Windows Executables that exhibit HTTP behaviors
  - (type:peexe OR type:pedll) behavior:http

Example 1

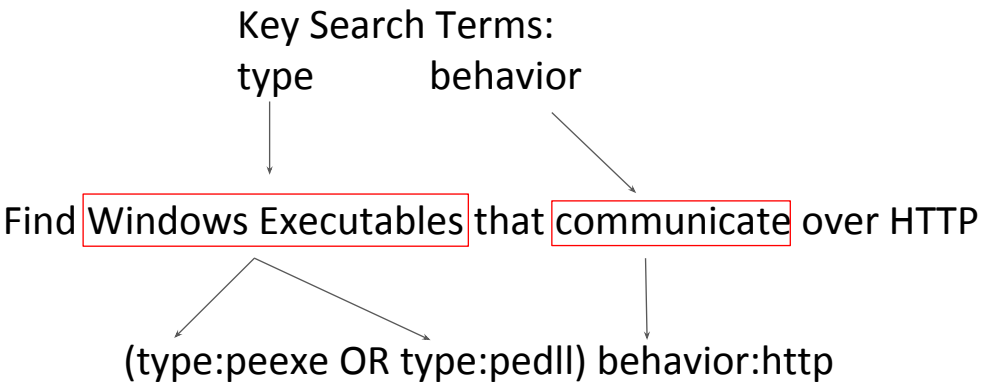


VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

- Find Windows Executables that exhibit HTTP behaviors
  - (type:peexe OR type:pedll) behavior:http

Example 1



VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/(type%253Apeexe%2520OR%2520type%253Apedll)%2520behavior%253Ahttp

- Find Windows Executables that exhibit HTTP behaviors
  - (type:peexe OR type:pedll) behavior:http

Example 2

Find poorly detected Executables that use “fre.php” in their URI

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example 2

Find poorly detected Executables that use “fre.php” in their URI

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
Poorly Detected => Positives Ratio
Executables => Type
Uses => Behavior

- type:peexe behavior:fre.php p:10-

Example 2: Solution [Lokibot]

Find poorly detected Executables that use “fre.php” in their URI

p:10- type:peexe behavior:fre.php

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Show Results:
https://www.virustotal.com/gui/search/p%253A10-%2520type%253Apeexe%2520behavior%253Afre.php/files

Example 3

Files named “invoice” from the US with macros and greater than 5 detections

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Show Results:
https://www.virustotal.com/gui/search/p%253A10-%2520type%253Apeexe%2520behavior%253Afre.php/files

Example 3

Files named “invoice” from the US with macros and greater than 5 detections

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
Named => name:
With Macros => tag (static facet of file analysis)
From: => Submitter
Detections => p (or positives)

- name:"invoice" tag:macros p:5+ submitter:US

Example 3: Solution

Files named “invoice” from the US with macros and greater than 5 detections

name:"invoice" tag:macros p:5+ submitter:US

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/name%253A%2522invoice%2522%2520tag%253Amacros%2520p%253A5%252B%2520submitter%253AUS/files

Key Terms:
Named => name:
With Macros => tag (static facet of file analysis)
From: => Submitter
Detections => p (or positives)

- name:"invoice" tag:macros p:5+ submitter:US

Example 4

Find files from domains containing “dropbox.com” or “box.com” with 10 or more detections

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
From Domains => itw
Detections => p

Example 4: Solution

Find files from domains containing “dropbox.com” or “box.com” with 10 or more detections

(itw:dropbox.com or itw:box.com) p:10+

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/(itw%253Adropbox.com%2520or%2520itw%253Abox.com)%2520p%253A10%252B/files

Key Terms:
From Domains => itw
Detections => p

- (itw:dropbox.com or itw:box.com) p:10+

Notice this shows all files, what if we want Windows Executables only?

Example 4a

Find Windows Executables from domains containing “dropbox.com” or “box.com” with 10 or more detections

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
Windows Executables => type
From Domains => itw
Detections => p

- (type:peexe OR type:pedll) (itw:dropbox.com or itw:box.com) p:10+

Example 4a: Solution

Find Windows Executables from domains containing “dropbox.com” or “box.com” with 10 or more detections

(type:peexe OR type:pedll) (itw:dropbox.com OR itw:box.com) p:10+

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/(type%253Apeexe%2520OR%2520type%253Apedll)%2520(itw%253Adropbox.com%2520or%2520itw%253Abox.com)%2520p%253A10%252B/files

Key Terms:
Windows Executables => type
From Domains => itw
Detections => p

- (type:peexe OR type:pedll) (itw:dropbox.com or itw:box.com) p:10+

Example 4b

Find all files OTHER than Windows Executables from domains containing “dropbox.com” or “box.com” with 10 or more detections

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
Windows Executables => type
From Domains => itw
Detections => p

- (NOT type:peexe OR NOT type:pedll) (itw:dropbox.com or itw:box.com) p:10+

Example 4b: Solution

Find Windows Executables from domains containing “dropbox.com” or “box.com” with 10 or more detections

(NOT type:peexe AND NOT type:pedll) (itw:dropbox.com or itw:box.com) p:10+

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/(NOT%2520type%253Apeexe%2520OR%2520NOT%2520type%253Apedll)%2520(itw%253Adropbox.com%2520or%2520itw%253Abox.com)%2520p%253A10%252B/files

Key Terms:
Windows Executables => type
From Domains => itw
Detections => p

- (NOT type:peexe AND NOT type:pedll) (itw:dropbox.com or itw:box.com) p:10+

- Technically the OR between the types is superfluous, because logic

Example 5

Find DLLs with Turla signature hits
first seen after March 1st, 2019

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Note we want to evaluate ALL engines for this signature string

Key Terms:
DLLs => type
signature hits => engines
First Seen = > fs

- engines:Turla type:pedll fs:2019-03-01+

If seeking from a specific AV scanner partner refer to the Full Vendor List:
a_squared
ad_aware
aegislab
agnitum
ahnlab
ahnlab_v3
alibaba
alyac
antivir
antivir7

antiy_avl
arcabit
authentium
avast
avast_mobile
avg
avira
avware
baidu
bitdefender
bkav
bytehero
cat_quickheal
clamav
cmc
commtouch
comodo
crowdstrike
cybereason
cylance
cyren
drweb
egambit
emsisoft
endgame
esafe
escan
eset_nod32
f_prot
f_secure
fortinet
gdata
ikarus
invincea
jiangmin
k7antivirus
k7gw
kaspersky
kingsoft
malwarebytes
max
mcafee
mcafee_gw_edition
microsoft
microworld_escan
nano_antivirus
nod32

norman
nprotect
paloalto
panda
pctools
prevx
prevx1
qihoo_360
rising
sentinelone
sophos
sunbelt
superantispyware
symantec
symantecmobileinsight
tencent
thehacker
totaldefense
trendmicro
trendmicro_housecall
trustlook
vba32
vipre
virobot
webroot
whitearmor
yandex
zillya
zonealarm
zoner

Example 5

Find DLLs with Turla signature hits first seen after March 1st, 2019

engines:Turla type:pedll fs:2019-03-01+

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/engines%253ATurla%2520type%253Apedll%2520fs%253A2019-03-01%252B/files

Key Terms:
DLLs => type
signature hits => engines
First Seen = > fs

- engines:Turla type:pedll fs:2019-03-01+

Full Vendor List:
a_squared
ad_aware
aegislab
agnitum
ahnlab
ahnlab_v3
alibaba
alyac
antivir

antivir7
antiy_avl
arcabit
authentium
avast
avast_mobile
avg
avira
avware
baidu
bitdefender
bkav
bytehero
cat_quickheal
clamav
cmc
commtouch
comodo
crowdstrike
cybereason
cylance
cyren
drweb
egambit
emsisoft
endgame
esafe
escan
eset_nod32
f_prot
f_secure
fortinet
gdata
ikarus
invincea
jiangmin
k7antivirus
k7gw
kaspersky
kingsoft
malwarebytes
max
mcafee
mcafee_gw_edition
microsoft
microworld_escan
nano_antivirus

nod32
norman
nprotect
paloalto
panda
pctools
prevx
prevx1
qihoo_360
rising
sentinelone
sophos
sunbelt
superantispyware
symantec
symantecmobileinsight
tencent
thehacker
totaldefense
trendmicro
trendmicro_housecall
trustlook
vba32
vipre
virobot
webroot
whitearmor
yandex
zillya
zonealarm
zoner

Example 6

Find all RTF files with metadata containing “Windows User” that are using a known/identified CVE and NOT macros

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
files => type
metadata => metadata
known/identified => engines or tag

- metadata:"Windows User" type:rtf (tag:cve or engines:exploit or engines:cve) NOT tag:macros

Example 6

Find all RTF files with metadata containing “Windows User” that are using a known/identified CVE and NOT macros

metadata:"Windows User" type:rtf (tag:cve or engines:exploit or engines:cve) NOT tag:macros

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/metadata%253A%2522Windows%2520User%2522%2520type%253Artf%2520(tag%253Acve%2520or%2520engines%253Aexploit%2520or%2520engines%253Acve)%2520NOT%2520tag%253Amacros/files

Key Terms:
files => type
metadata => metadata
known/identified => engines or tag

- metadata:"Windows User" type:rtf (tag:cve or engines:exploit or engines:cve) NOT tag:macros

Example 7

Find all document types using an exploit/or known CVE with RU lang encoding

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
files => type
known/identified => engines or tag
lang encoding => lang

- type:document (tag:cve or engines:exploit or engines:cve) lang:ru
  - Note: Lang is available for peexe/pedll and office file formats ONLY

Example 7

Find all document types using an exploit/or known CVE with RU lang encoding

type:document (tag:cve or engines:exploit or engines:cve) lang:ru

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/type%253Adocument%2520(tag%253Acve%2520or%2520engines%253Aexploit%2520or%2520engines%253Acve)%2520lang%253Aru%2520fs%253A2019-03-01%252B%2520ls%253A2019-03-15-/files

Key Terms:
files => type
known/identified => engines or tag
lang encoding => lang
first seen => fs

- type:document (tag:cve or engines:exploit or engines:cve) lang:ru
  - Note: Lang is available for peexe/pedll and office file formats ONLY

Example 8

Find all document types using an exploit/or known CVE with RU lang encoding first seen between March 1st and March 15th

type:document (tag:cve or engines:exploit
or engines:cve) lang:ru

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Key Terms:
files => type
known/identified => engines or tag
lang encoding => lang

- type:document (tag:cve or engines:exploit or engines:cve) lang:ru fs:2019-03-01+ fs:2019-03-15-
  - Note: Lang is available for peexe/pedll and office file formats ONLY

Example 8

Find all document types using an exploit/or known CVE with RU lang encoding first seen between March 1st and March 15th

type:document (tag:cve or engines:exploit or engines:cve) lang:ru fs:2019-03-01+ fs:2019-03-15-

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/type%253Adocument%2520(tag%253Acve%2520or%2520engines%253Aexploit%2520or%2520engines%253Acve)%2520lang%253Aru%2520fs%253A2019-03-01%252B%2520fs%253A2019-03-15-

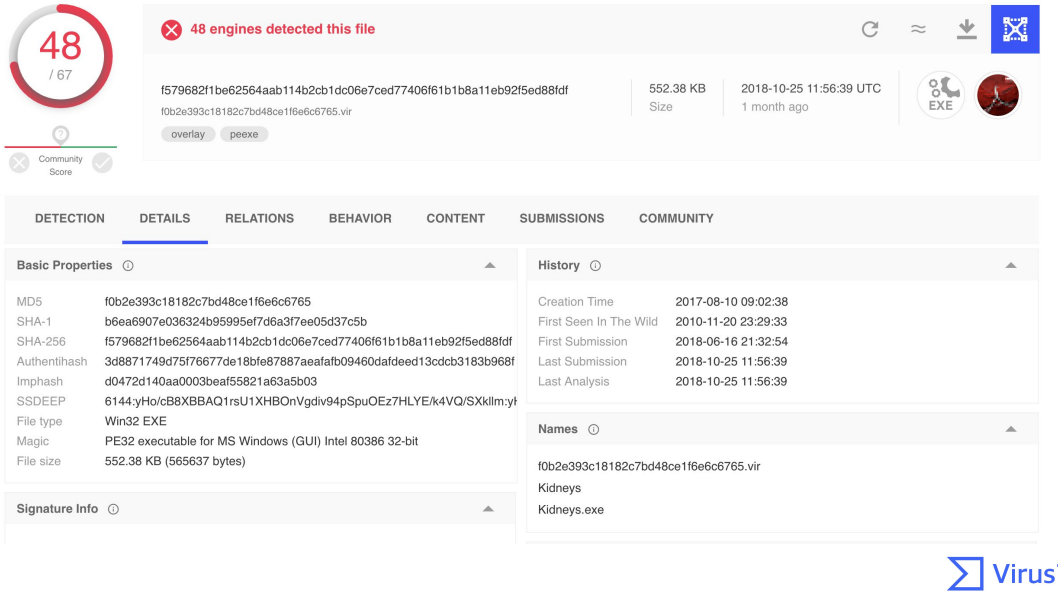
Key Terms:
files => type
known/identified => engines or tag
lang encoding => lang

- type:document (tag:cve or engines:exploit or engines:cve) lang:ru fs:2019-03-01+ fs:2019-03-15-
  - Note: Lang is available for peexe/pedll and office file formats ONLY

02

Static Data Pivoting

Assessing the “Details” Tab

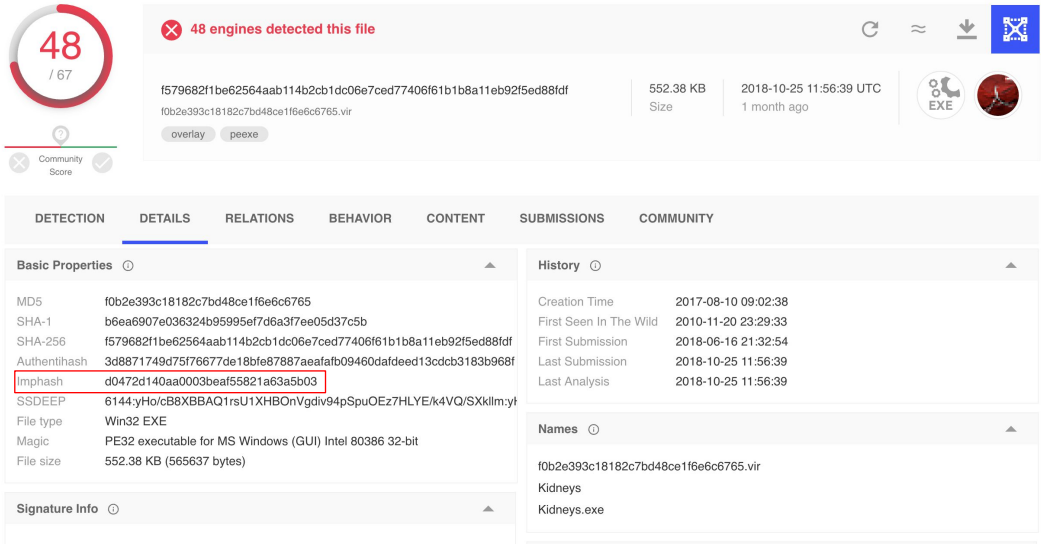


https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Let’s look at a Trickbot Sample:
f579682f1be62564aab114b2cb1dc06e7ced77406f61b1b8a11eb92f5ed88fdf

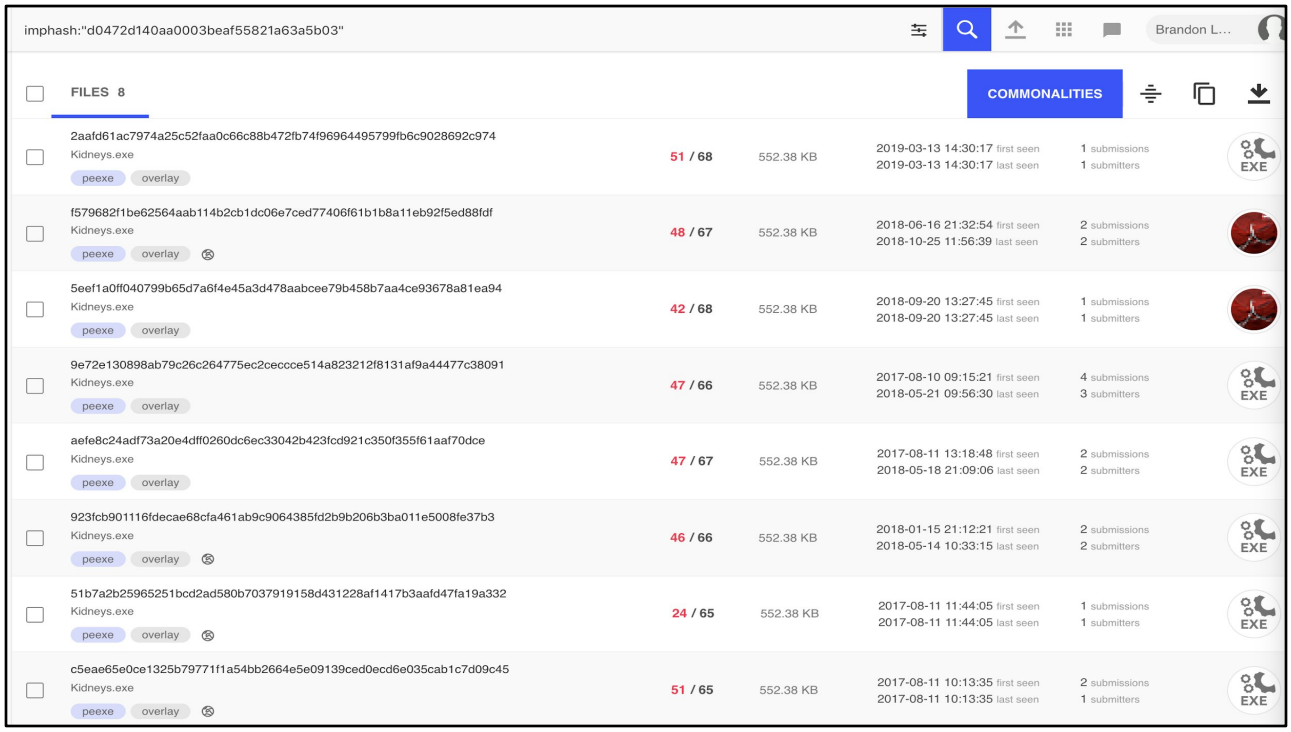
https://www.virustotal.com/gui/file/f579682f1be62564aab114b2cb1dc06e7ced77406f61b1b8a11eb92f5ed88fdf/detection

Example: Pivot on Imphash



imphash:"d0472d140aa0003beaf55821a63a5b03" (Anchor Trickbot)

https://www.virustotal.com/gui/search/imphash%253A%2522d0472d140aa0003beaf55821a63a5b03%2522/files



imphash:"d0472d140aa0003beaf55821a63a5b03" (Anchor Trickbot)

https://www.virustotal.com/gui/search/imphash%253A%2522d0472d140aa0003beaf55821a63a5b03%2522/files

Caveat: Imphash is NOT Always Reliable

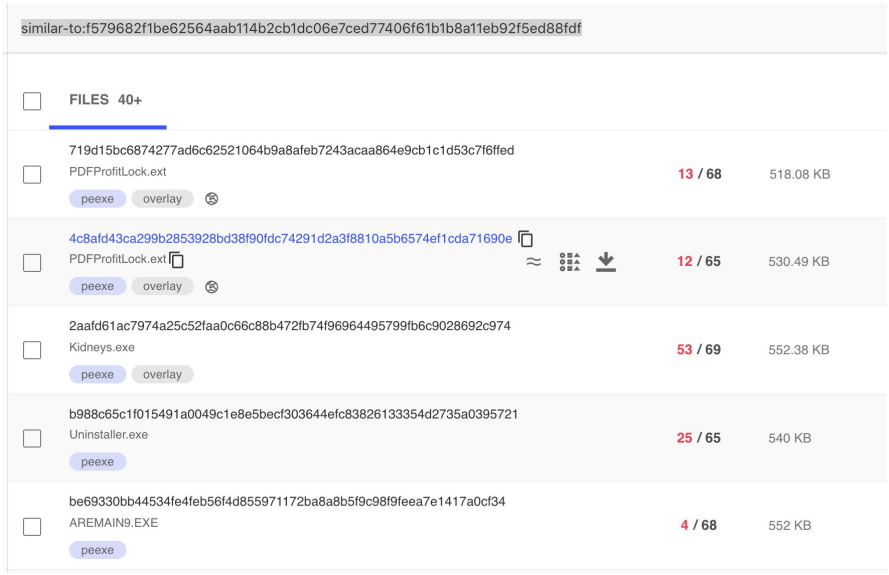
https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

- Example UPX packed files: section:upx1 section:upx0
- imphash:"7326001be3ced77b153640be93a8dff6"

Example:
175bafbcd5218e062619b16dd4c18279635ae3d621daa7aa559a3ca5882ebf1c
https://www.virustotal.com/gui/search/imphash%253A%25227326001be3ced77b153640be93a8dff6%2522/files

TLDR: You're actually matching the packer.

Similar-To (vhash)



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/search/similar-to%253Af579682f1be62564aab114b2cb1dc06e7ced77406f61b1b8a11eb92f5ed88fdf/files

Lets check out our trickbot sample that we explored imphash with: similar-to:f579682f1be62564aab114b2cb1dc06e7ced77406f61b1b8a11eb92f5ed88fdf

Notice how many more results there are?

Visual Similarity

Supports:

- Windows Executables (embedded)
- PDF
- Office Documents

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Julio To Talk about how it works

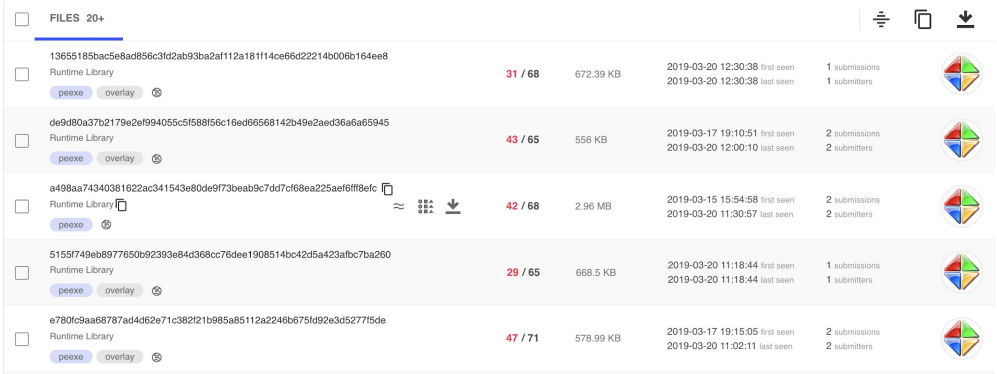
Trickbot EXE:
https://www.virustotal.com/gui/file/01c299e4895eb222d24ad9c6bbefe2a389bc3d54e37de8c7a8dc73a95a7f093b/detection
-alternative mechanism:
resource:"77073160cc8d0c6443a55cf6514f3606d979ca8ce78a1a9cc20ec71c57e392d6"

Emotet PDF:
https://www.virustotal.com/gui/file/8c15b770e32ff70527a4e17e1173d3f2ff91f7f27be17268f2a814c72d863859/detection

ADP Lure Doc:
https://www.virustotal.com/gui/file/2db7425c7c9efff9c87fb45719ac4a9c7b24722f2cf19de1ba7f1b9d1f59de45/detection

Visual Similarity: EXE

main_icon_dhash:b168c6a98ee460b2



VirusTotal

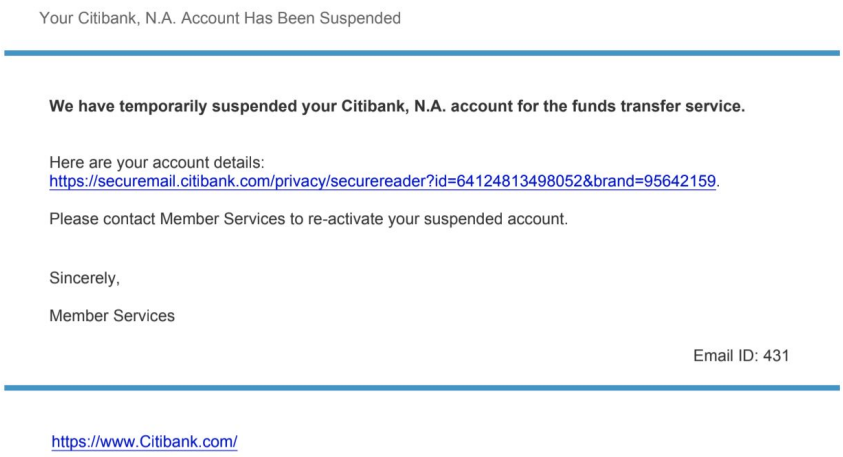
https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Trickbot EXE:
https://www.virustotal.com/gui/file/01c299e4895eb222d24ad9c6bbefe2a389bc3d54e37de8c7a8dc73a95a7f093b/detection
-alternative mechanism:
resource:"77073160cc8d0c6443a55cf6514f3606d979ca8ce78a1a9cc20ec71c57e392d6"

Emotet PDF:
https://www.virustotal.com/gui/file/8c15b770e32ff70527a4e17e1173d3f2ff91f7f27be17268f2a814c72d863859/detection

ADP Lure Doc:
https://www.virustotal.com/gui/file/2db7425c7c9efff9c87fb45719ac4a9c7b24722f2cf19de1ba7f1b9d1f59de45/detection

Visual Similarity: PDF



VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

PDF Preview Render

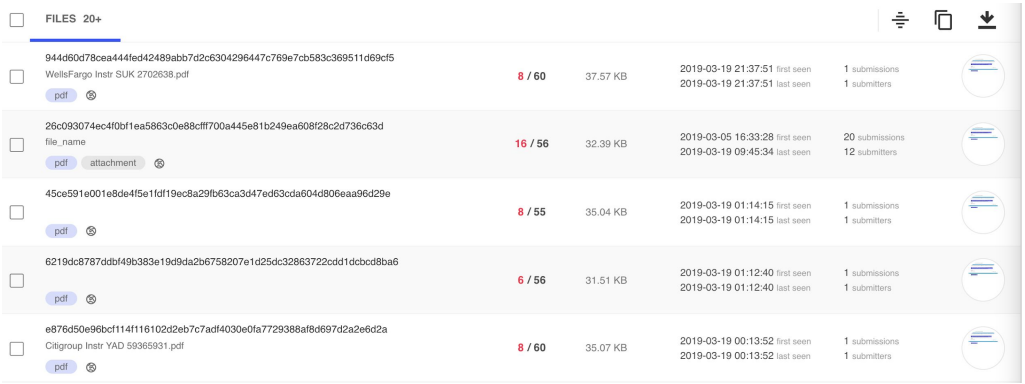
Trickbot EXE:
https://www.virustotal.com/gui/file/01c299e4895eb222d24ad9c6bbefe2a389bc3d54e37de8c7a8dc73a95a7f093b/detection

Emotet PDF:
https://www.virustotal.com/gui/file/8c15b770e32ff70527a4e17e1173d3f2ff91f7f27be17268f2a814c72d863859/detection

ADP Lure Doc:
https://www.virustotal.com/gui/file/2db7425c7c9efff9c87fb45719ac4a9c7b24722f2cf19de1ba7f1b9d1f59de45/detection

Visual Similarity: PDF

main_icon_dhash:2313230300020000



VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

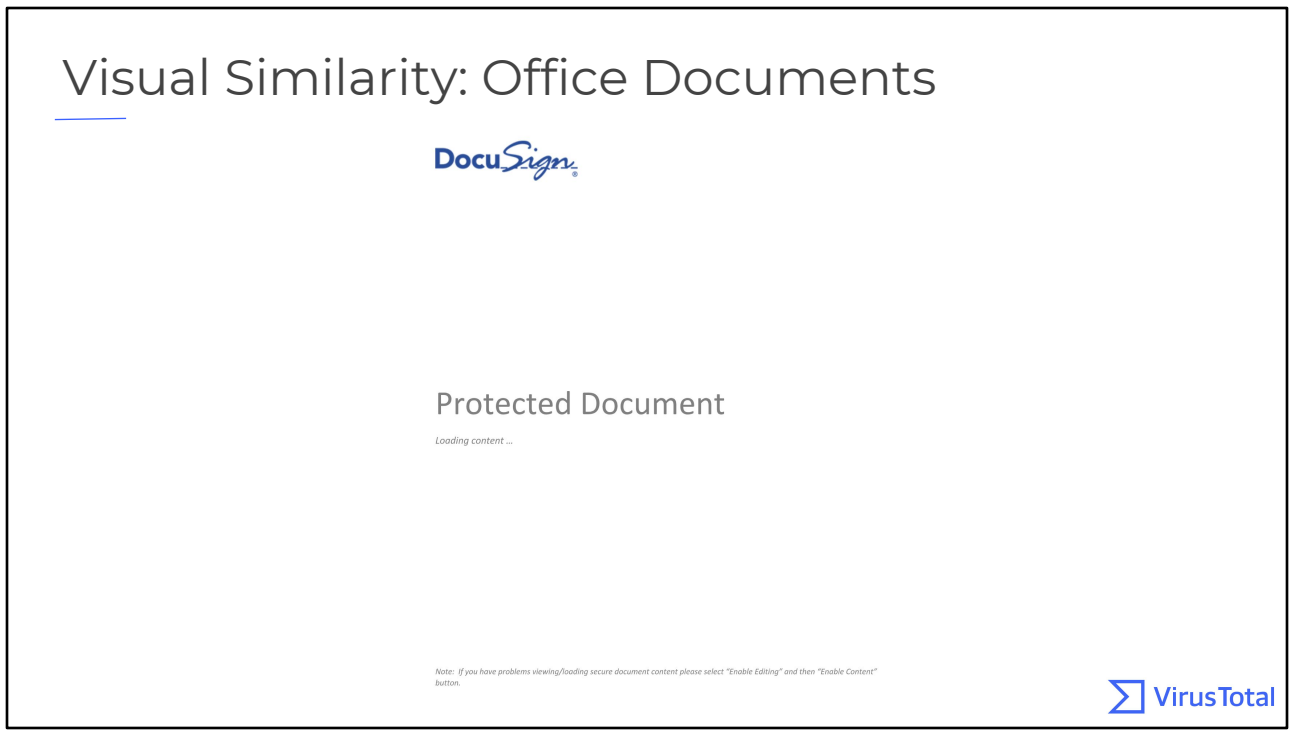
Pivoting on the PDF Visual Similarity

Trickbot EXE:
https://www.virustotal.com/gui/file/01c299e4895eb222d24ad9c6bbefe2a389bc3d54e37de8c7a8dc73a95a7f093b/detection

Emotet PDF:
https://www.virustotal.com/gui/file/8c15b770e32ff70527a4e17e1173d3f2ff91f7f27be17268f2a814c72d863859/detection

ADP Lure Doc:
https://www.virustotal.com/gui/file/2db7425c7c9efff9c87fb45719ac4a9c7b24722f2cf19de1ba7f1b9d1f59de45/detection

Visual Similarity: Office Documents



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Trickbot EXE:
https://www.virustotal.com/gui/file/01c299e4895eb222d24ad9c6bbefe2a389bc3d54e37de8c7a8dc73a95a7f093b/detection

Emotet PDF:
https://www.virustotal.com/gui/file/8c15b770e32ff70527a4e17e1173d3f2ff91f7f27be17268f2a814c72d863859/detection

ADP Lure Doc:
https://www.virustotal.com/gui/file/2db7425c7c9efff9c87fb45719ac4a9c7b24722f2cf19de1ba7f1b9d1f59de45/detection

Visual Similarity: Office Documents

main_icon_dhash:0103001101000301

FILES 2

85f7ab110807cf0352ada5582611cc64af0e13ad8f32561d3e2c2763a70659c3 doc macros obfuscated run-file	33 / 56	46.02 KB	2019-03-12 14:10:29 first seen 2019-03-12 14:10:29 last seen
2db7425c7c9efff9c87fb45719ac4a9c7b24722f2cf19de1ba7f1b9d1f59de45 ADP-Document-3810922.doc doc attachment macros obfuscated run-file	43 / 60	46 KB	2018-07-19 16:31:07 first seen 2018-07-30 04:48:49 last seen

VirusTotal

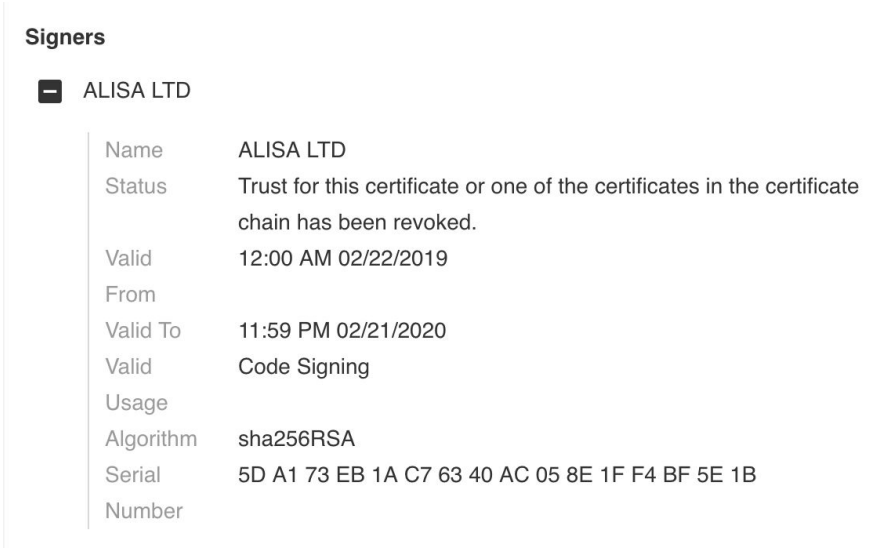
https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Trickbot EXE:
https://www.virustotal.com/gui/file/01c299e4895eb222d24ad9c6bbefe2a389bc3d54e37de8c7a8dc73a95a7f093b/detection

Emotet PDF:
https://www.virustotal.com/gui/file/8c15b770e32ff70527a4e17e1173d3f2ff91f7f27be17268f2a814c72d863859/detection

ADP Lure Doc:
https://www.virustotal.com/gui/file/2db7425c7c9efff9c87fb45719ac4a9c7b24722f2cf19de1ba7f1b9d1f59de45/detection

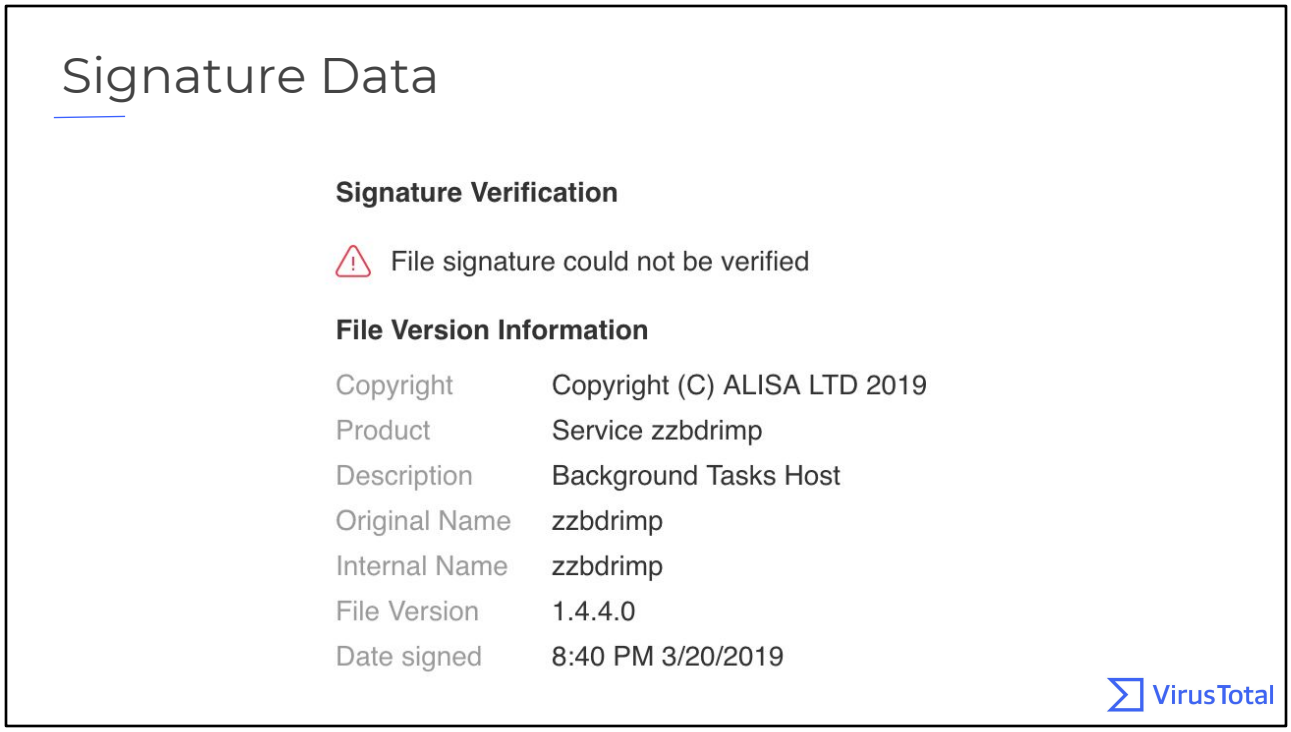
Signature Data



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

LockerGoga:
c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15
https://www.virustotal.com/gui/file/c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15/detection

Signature Data



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

LockerGoga:
c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15
https://www.virustotal.com/gui/file/c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15/detection

Signature Data

Pivot Options:

- Broad = signature:"ALISA LTD"
- Narrow = signature:"5D A1 73 EB 1A C7 63 40 AC 05 8E 1F F4 BF 5E 1B"

VirusTotal

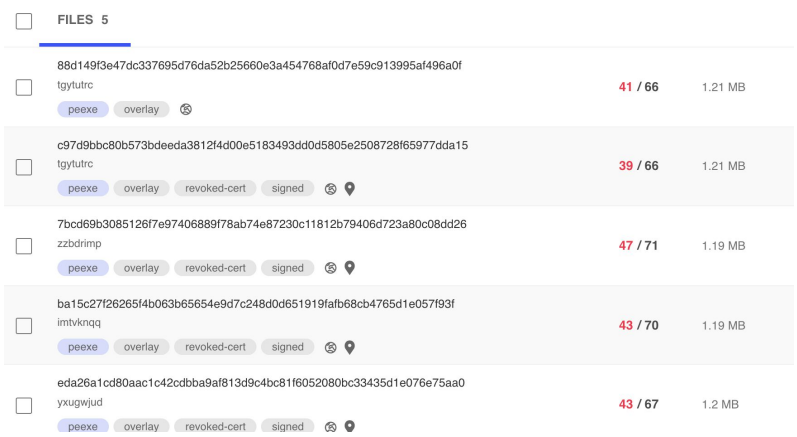
https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

LockerGoga:
c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15
https://www.virustotal.com/gui/file/c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15/detection

By Name of Signer:
Broad => signature:"ALISA LTD"
BY Cert Hash
Narrow => signature:"5D A1 73 EB 1A C7 63 40 AC 05 8E 1F F4 BF 5E 1B"

Signature Data

signature:"5D A1 73 EB 1A C7 63 40 AC 05 8E 1F F4 BF 5E 1B" OR signature:"ALISA LTD"



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

LockerGoga:
c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15
https://www.virustotal.com/gui/file/c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15/detection

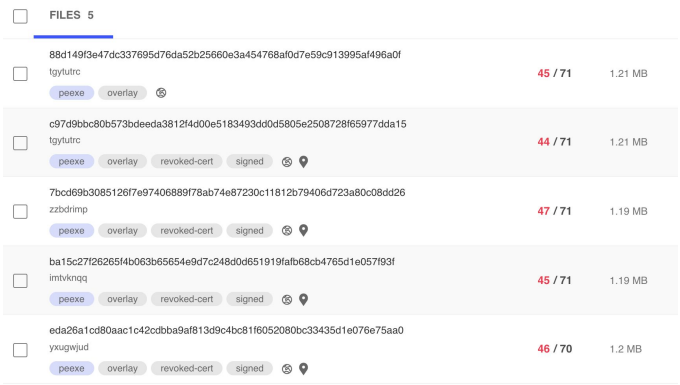
By Name of Signer:
Broad => signature:"ALISA LTD"
BY Cert Hash
Narrow => signature:"5D A1 73 EB 1A C7 63 40 AC 05 8E 1F F4 BF 5E 1B"

Combine the Two:
https://www.virustotal.com/gui/search/signature%253A%25225D%2520A1%252073%2520EB%25201A%2520C7%252063%252040%2520AC%252005%25208E%25201F%2520F4%2520BF%25205E%25201B%2522%2520OR%2520signature%253A%2522ALISA%2520LTD%2522/files

Note: In this instance the signer and hash were only used together, so you'll get the same results with either query.

Signature Data

signature:"Copyright (C) ALISA LTD 2019"



VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

LockerGoga:
c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15
https://www.virustotal.com/gui/file/c97d9bbc80b573bdeeda3812f4d00e5183493dd0d5805e2508728f65977dda15/detection

THere is another option as well that leverages the structure within the PE itself with contains additiona signature information:

signature:"Copyright (C) ALISA LTD 2019"

https://www.virustotal.com/gui/search/signature%253A%2522Copyright%2520(C)%2520ALISA%2520LTD%25202019%2522/files

Metadata? MetaData? Meta-Data? Meta Data?

ExifTool File Metadata

AppVersion	16.0
Author	cobalt
CharCountWithSpaces	34
Characters	30
CodePage	Windows Latin 1 (Western European)
CompObjUserType	Document Microsoft Word 97-2003
CompObjUserTypeLen	32
CreateDate	2018:10:30 23:22:00
DocFlags	Has picture, 1Table, ExtChar
FileType	DOC
FileTypeExtension	doc
HeadingPairs	Titre, 1
HyperlinksChanged	No

VirusTotal

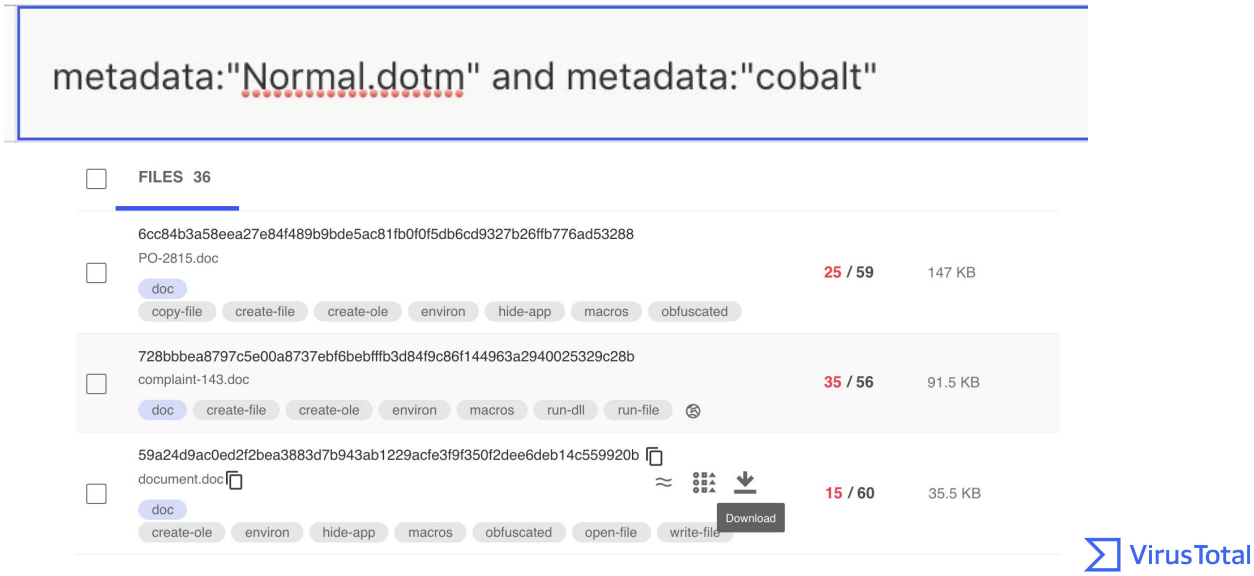
https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

I have no idea what the convention is for this word, ya'll know what I mean.

This is data generated from Exiftool.

EmpireMonkey:
d57f128afb4843b6f0072fadda8dd14046b31703098e365bc5a226e117090d44

Metadata? MetaData? Meta-Data? Meta Data?



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

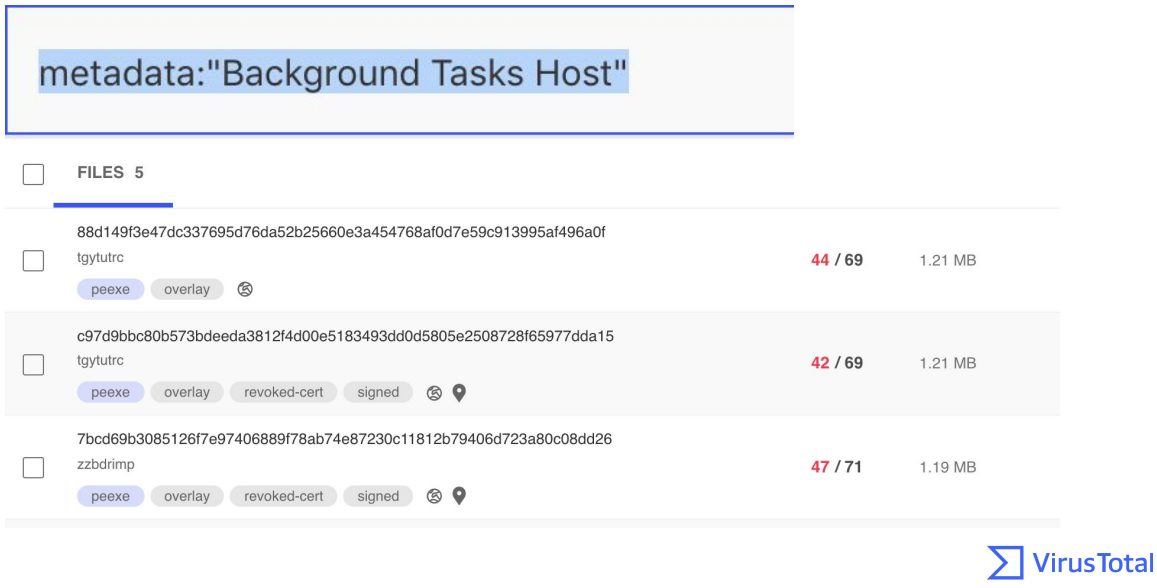
I have no idea what the convention is for this word, ya'll know what I mean.

This is data generated from Exiftool.

EmpireMonkey:
d57f128afb4843b6f0072fadda8dd14046b31703098e365bc5a226e117090d44

metadata:"Normal.dotm" and metadata:"cobalt"
https://www.virustotal.com/gui/search/metadata%253A%2522Normal.dotm%2522%2520and%2520metadata%253A%2522cobalt%2522/files

Metadata? MetaData? Meta-Data? Meta Data?



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

I have no idea what the convention is for this word, ya'll know what I mean.

This is data generated from Exiftool.

Example 2: LockerGoga,
https://www.virustotal.com/gui/file/88d149f3e47dc337695d76da52b25660e3a454768af0d7e59c913995af496a0f/detection

metadata:"Background Tasks Host"

https://www.virustotal.com/gui/search/metadata%253A%2522Background%2520Tasks%2520Host%2522/files

Imports and Exports

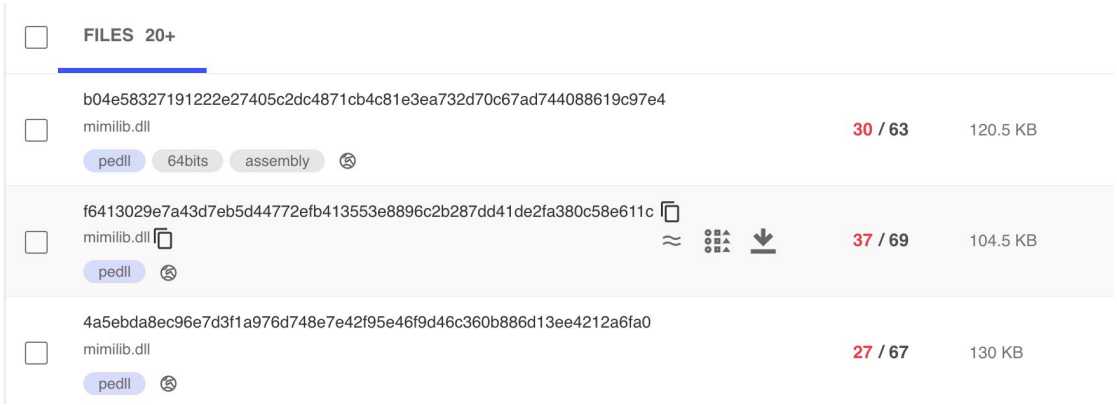
https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example: Mimikatz
b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4

https://www.virustotal.com/gui/file/b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4/detection

Imports and Exports

imports:NdrMesTypeFree2 imports:MesHandleFree imports:RtlStringFromGUID imports:GetOEMCP



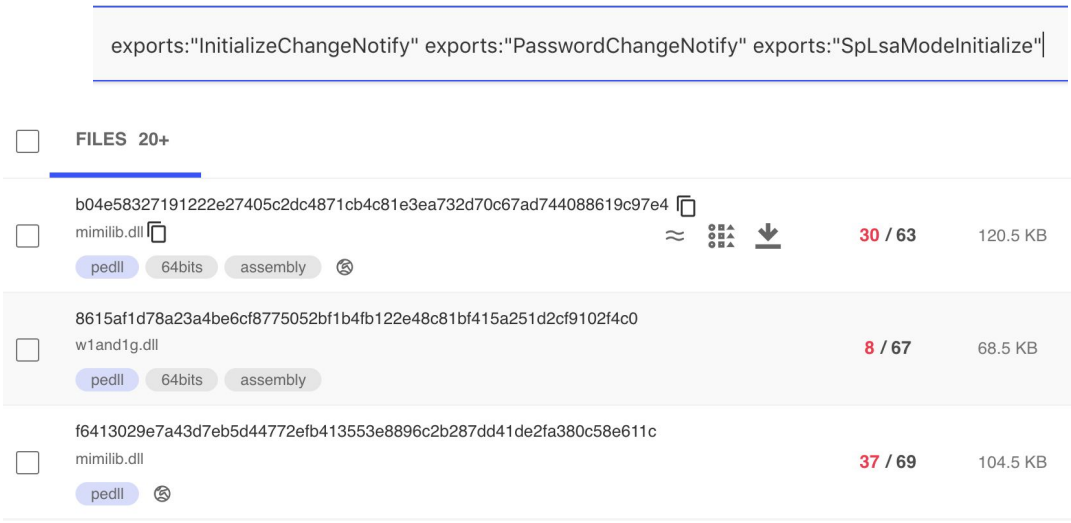
https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example: Mimikatz
b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4

https://www.virustotal.com/gui/file/b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4/detection

Imports=> imports:NdrMesTypeFree2 imports:MesHandleFree imports:RtlStringFromGUID imports:GetOEMCP
Exports => exports:"InitializeChangeNotify" exports:"PasswordChangeNotify" exports:"SpLsaModeInitialize"

Imports and Exports



https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example: Mimikatz
b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4

https://www.virustotal.com/gui/file/b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4/detection

Imports=> imports:NdrMesTypeFree2 imports:MesHandleFree imports:RtlStringFromGUID imports:GetOEMCP

Exports => exports:"InitializeChangeNotify" exports:"PasswordChangeNotify" exports:"SpLsaModeInitialize"

03 VTGrep

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

VTGrep (aka Content Search)

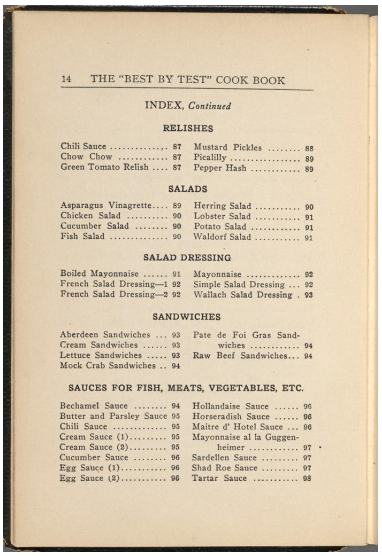
Use the “content:” search modifier to search for arbitrary hex or string patterns within files on VirusTotal

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

VTGrep (aka Content Search)

- VTGrep is an index of 32bit substrings to sample IDs (SHA256)
- It returns all the samples with the given content in less than 60 seconds
- It supports most YARA's string conditions
  - Wildcards, UTF-8, HEX, offsets, AND, OR, ...
  - No regexps, though :-(
- Great for prototyping Retrohunts
- It uses Google infrastructure to serve 1PB of compressed data (all samples uploaded to VT in a year)
  - Includes unpacked, OCR, macros, VBA code streams...



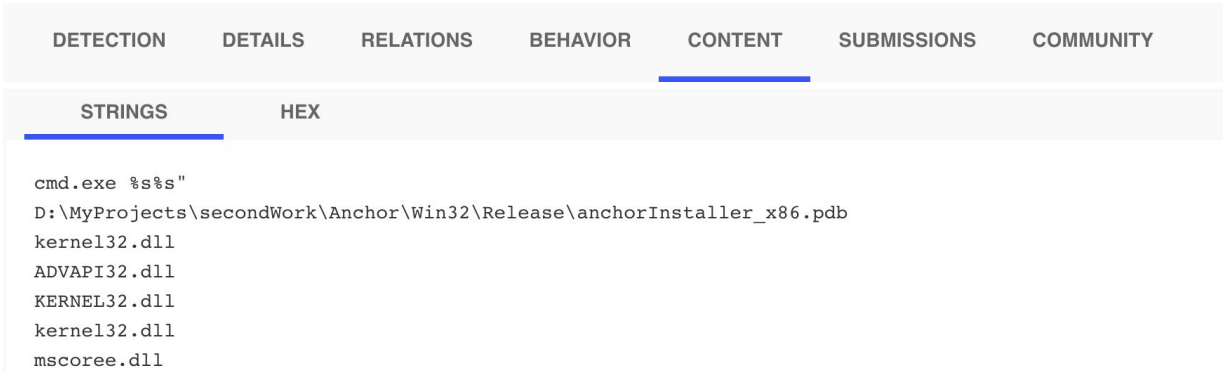
14 THE "BEST BY TEST" COOK BOOK

INDEX, *Continued*

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

VTGrep: Example 1, ASCII Strings



https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

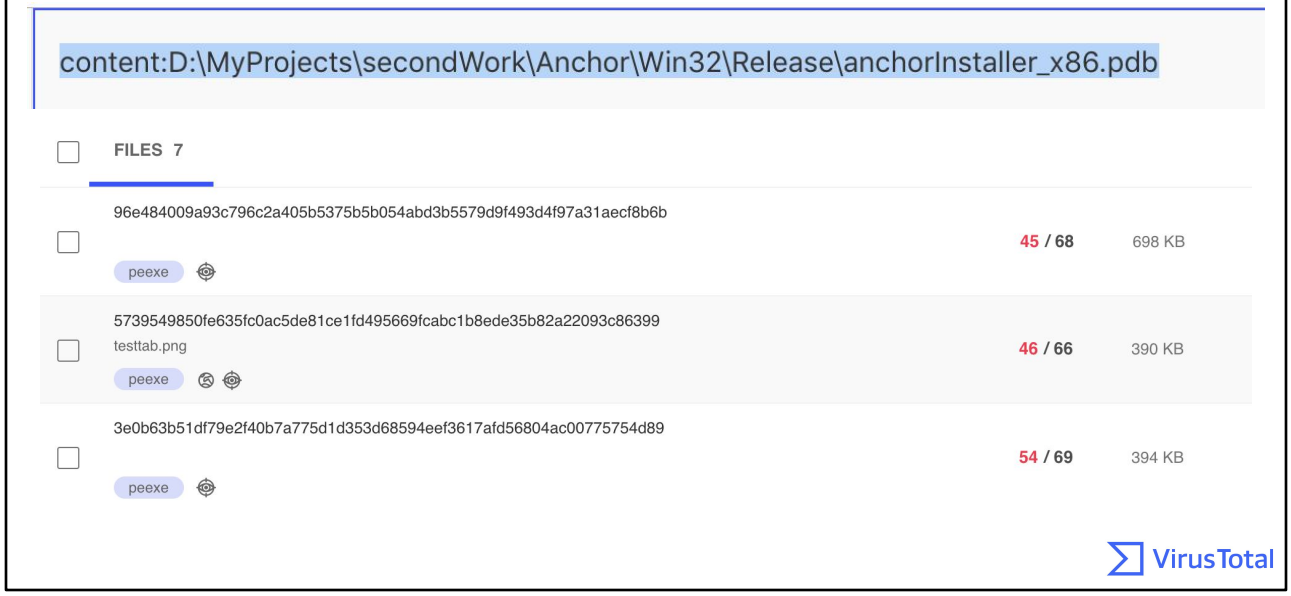
Trickbot: 5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399

https://www.virustotal.com/gui/file/5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399/detection

There appears to be a PDB! I love PDBs.
"Program database (**PDB**) is a proprietary file format (developed by Microsoft) for storing debugging information about a program (or, commonly, program modules such as a DLL or **EXE**). **PDB** files commonly have a .**pdb** extension. A **PDB** file is typically created from source files during compilation."

Wouldn't it be cool if we could find more samples that contain this PDB string? Maybe the attackers left something behind!

VTGrep: Example 1, ASCII Strings



https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Trickbot: 5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399

https://www.virustotal.com/gui/file/5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399/detection

Oho there appears to be a PDB! I love PDBs.
"Program database (**PDB**) is a proprietary file format (developed by Microsoft) for storing debugging information about a program (or, commonly, program modules such as a DLL or **EXE**). **PDB** files commonly have a .**pdb** extension. A **PDB** file is typically created from source files during compilation."

Wouldn't it be cool if we could find more samples that contain this PDB string? Maybe the attackers left something behind!

We can!
Two ways:

1) Click on the string in the "Content" tab to generate a query in Hex
   a) content:{443a5c4d7950726f6a656374735c7365636f6e64576f726b5c416e63686f725c57696e33325c52656c656173655c616e6

a) 3686f72496e7374616c6c65725f7838362e706462}

2) For an ASCII string search
   a) content:D:\MyProjects\secondWork\Anchor\Win32\Release\anchorInstaller_x86.pdb

These methods are functionally identical.

Bonus:
we can actually find more of this by shortening the string to not be SO specific:

- content:D:\MyProjects\secondWork\Anchor\Win32\Release

VTGrep: Example 2 Wildcards

content:D:\MyProjects\secondWork\Anchor\Win32\Release\anchorInstaller_x86.pdb

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Wildcarding
Trickbot: 5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399

https://www.virustotal.com/gui/file/5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399/detection

D:\MyProjects\secondWork\Anchor\Win32\Release\anchorInstaller_x86.pdb

What if we weren't sure about that D:\ path or the target compile platform

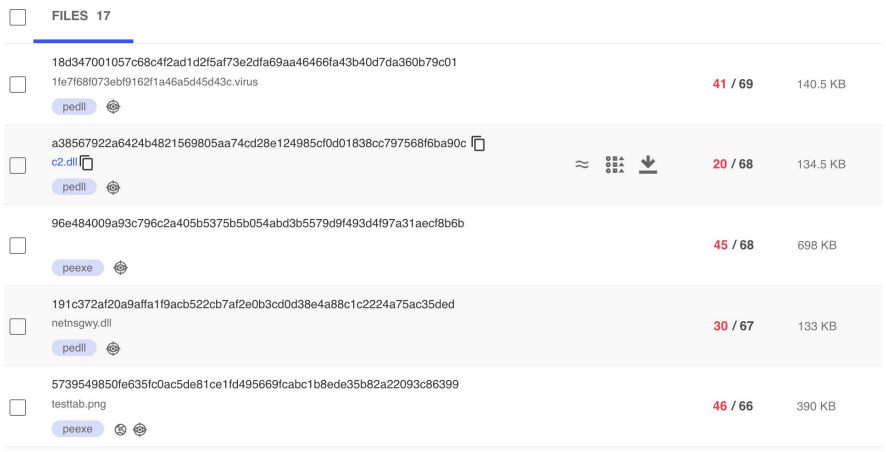
{??3a5c4d7950726f6a656374735c7365636f6e64576f726b5c416e63686f725c57696e????5c52656c656173655c}

We'll truncate it a bit more to remove the very specific build path:
?:\MyProjects\secondWork\Anchor\Win??\Release\

where ? represents a single character value

VTGrep: Example 2, Wildcards

content:{??3a5c4d7950726f6a656374735c7365636f6e64576f726b5c416e63686f725c57696e????5c52656c656173655c}



https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Wildcarding
Trickbot: 5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399

https://www.virustotal.com/gui/file/5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399/detection

D:\MyProjects\secondWork\Anchor\Win32\Release\anchorInstaller_x86.pdb

What if we weren't sure about that D:\ path or the target compile platform

{??3a5c4d7950726f6a656374735c7365636f6e64576f726b5c416e63686f725c57696e????5c52656c656173655c}

We'll truncate it a bit more to remove the very specific build path:
?:\MyProjects\secondWork\Anchor\Win??\Release\

where ? represents a single character value

VTGrep: Example 3, Unicode

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Unicode
Bookworm: b2737192ea1c912daa3ca4c43224fb6afcc878c5e3303e86a459de06df7af33f

https://www.virustotal.com/gui/file/5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399/detection

`"%s",AfxGetHttpRequastMgr %s => string of interest… but its in Unicode`

Full String
content:{22002500730022002c00410066007800470065007400480074007400700052006500710075006100730074004d00670072002000250073007300}

https://www.virustotal.com/gui/search/content:%7B22002500730022002c00410066007800470065007400480074007400700052006500710075006100730074004d00670072002000250073007300%7D/files

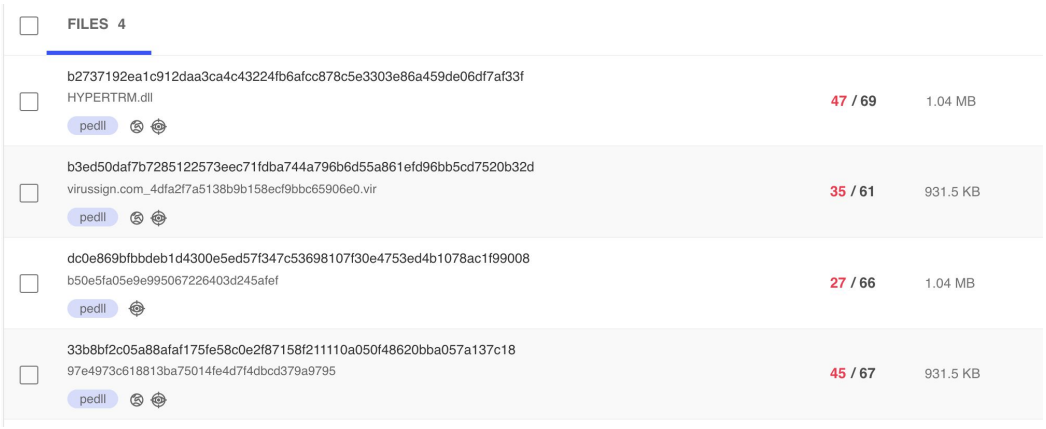
Common strings at the beginning and end will typically be skipped:

Fixed
content:{4100660078004700650074004800740074007000520065007100750061007
30074004d00670072}

https://www.virustotal.com/gui/search/content%253A%257B41006600780047006500
74004800740074007000520065007100750061007300740004d00670072%257D

VTGrep: Example 3, Unicode

content:{22002500730022002c00410066007800470065007400480074007400700052006100710075006500730074004d0067007200}



VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Unicode
Bookworm: b2737192ea1c912daa3ca4c43224fb6afcc878c5e3303e86a459de06df7af33f

https://www.virustotal.com/gui/file/5739549850fe635fc0ac5de81ce1fd495669fcabc1b8ede35b82a22093c86399/detection

```
"%s",AfxGetHttpRequastMgr %s => string of interest… but its in Unicode
```

We can just click on the string :-)

Full String
content:{22002500730022002c00410066007800470065007400480074007400700052006100710075006500730074004d0067007200}

https://www.virustotal.com/gui/search/content:%7B22002500730022002c00410066007800470065007400480074007400700052006500710075006100730074004d0067007200%7D/files

Fixed content:{4100660078004700650074004800740074007000520065007100750061007300740004d00670072}

https://www.virustotal.com/gui/search/content%253A%257B4100660078004700650074004800740074007000520065007100750061007300740004d00670072%257D

VTGrep: Example 4, Logical “AND”

```
logout.log    CPU: %s(%d)  RAM: %lld Mb
WS2_32.dll    cmd /c %s
logout.log    %s %s: %s
ntdll.dll     %s %s: %s
cbomb.dat     GET /%s
data.dat      Host:%s
```

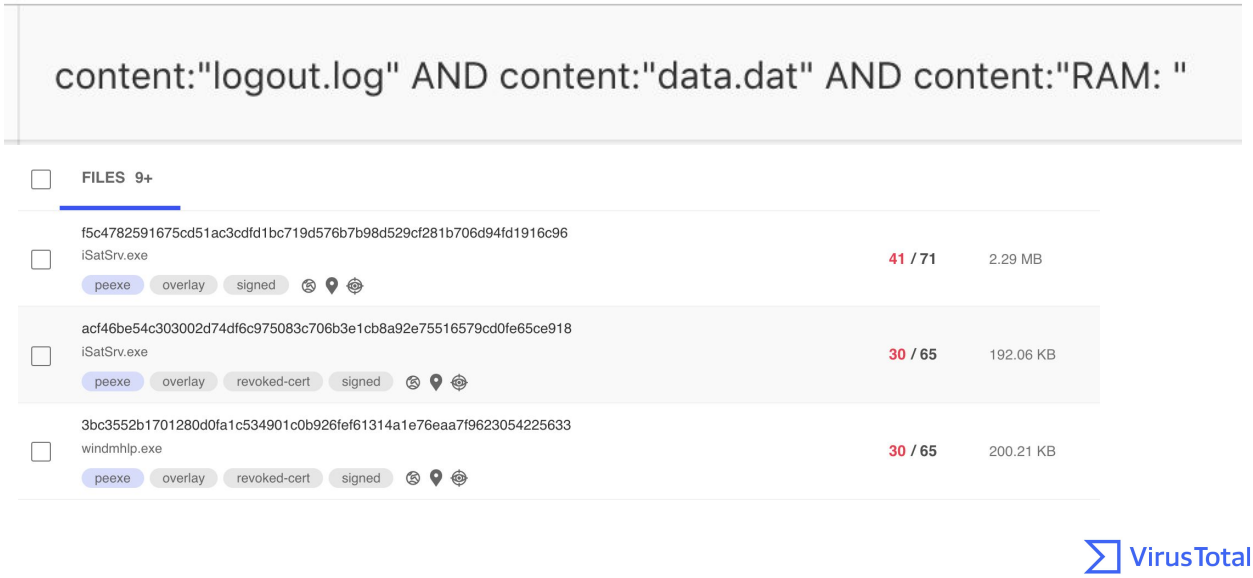
VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Example:
Rietspoof:
f5c4782591675cd51ac3cdfd1bc719d576b7b98d529cf281b706d94fd1916c96 (bot)

These strings seem to be relatively common on their own… Can we combine them somehow?

VTGrep: Example 4, Logical “AND”



https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Note: The “AND” is implied by spaces and is present by convention in this example. It is not necessary to specific AND between terms.

Example:
Rietspoof:
f5c4782591675cd51ac3cdfd1bc719d576b7b98d529cf281b706d94fd1916c96 (bot)

These strings seem to be relatively common on their own… Can we combine them somehow?

Yup we can!
content:"logout.log" AND content:"data.dat" AND content:"RAM: "
(content:{52 41 4d 3a 20} AND content:{64 61 74 61 2e 64 61 74} AND content:{6c 6f 67 6f 75 74 2e 6c 6f 67})

VTGrep: Example 5, Logical “OR”

FirstStageDropper.dll is responsible for injecting SecondStageDropper.dll into another process to execute it. While the shellcode payload only contains code to search for and bypass EMET, FirstStageDropper.dll also contains code for Kaspersky and Bitdefender. In case of EMET, it searches the loaded modules for emet.dll and emet64.dll, for Kaspersky it searches for klsihk.dll, and for Bitdefender it searches for avcuf32.dll and avcuf64.dll. It also collects and sends encrypted user system and process information data together with a unique hardcoded ID to the attacker's server. The data is sent to URLs that contain “/home/” and “/log/” directories and for encryption it uses the Rijndael algorithm. As the attacker server did not respond at the time of our analysis, we guess a command is sent back to execute the SecondStageDropper.dll.

VirusTotal

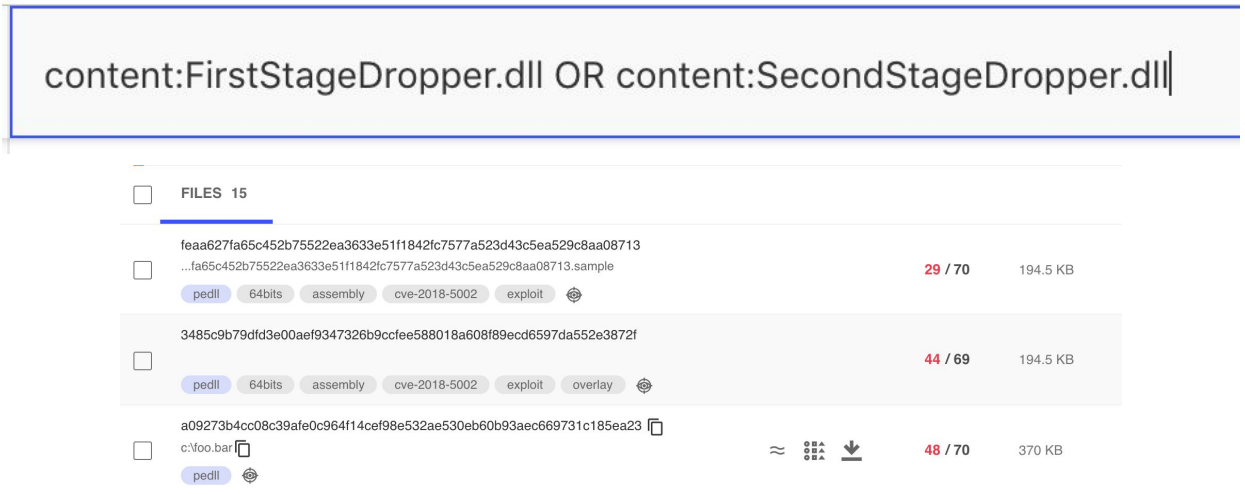
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Chainshot:
https://unit42.paloaltonetworks.com/unit42-slicing-dicing-cve-2018-5002-payloads-new-chainshot-malware/

Can we use the data from this report to find samples of Chainshot?

Yup we can!

VTGrep: Example 5, Logical “OR”



https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Chainshot:
https://unit42.paloaltonetworks.com/unit42-slicing-dicing-cve-2018-5002-payloads-new-chainshot-malware/

Can we use the data from this report to find samples of Chainshot?

Yup we can!

- CHAINSHOT Dropper Stages
  - content:{466972737453746167654472 6F707065722E646C6C} OR content:{5365636F6E64537461676544726F707065722E646C6C}
  - content:FirstStageDropper.dll OR content:SecondStageDropper.dll

VTGrep: Example 6, Combine Logical Operators

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Rietspoof (loader)

No PDB: f5c4782591675cd51ac3cdfd1bc719d576b7b98d529cf281b706d94fd1916c96

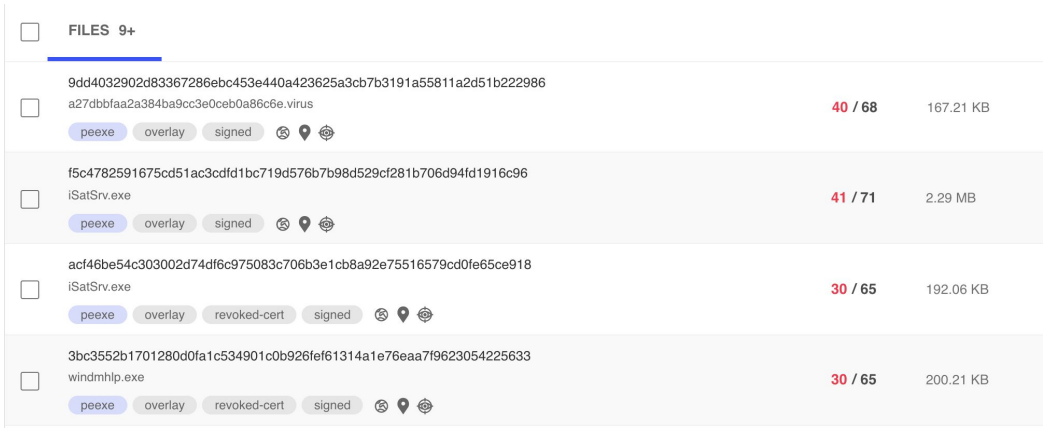
PDB: 9dd4032902d83367286ebc453e440a423625a3cb7b3191a55811a2d51b222986

https://www.virustotal.com/gui/search/f5c4782591675cd51ac3cdfd1bc719d576b7b98d529cf281b706d94fd1916c96%250A9dd4032902d83367286ebc453e440a423625a3cb7b3191a55811a2d51b222986/files

It looks like Rietspoof's loader occasionally has a PDB left in it… Sometimes it doesn't. Can we account for that?

VTGrep: Example 6, Combine Logical Operators

```
(content:{52 41 4d 3a 20}  AND content:{64 61 74 61 2e 64 61 74} AND content:{6c 6f 67 6f 75 74 2e 6c 6f 67}) OR content:"G:\Work\Dr.Dre\hivez\new\load
```



VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Rietspoof (loader)

No PDB: f5c4782591675cd51ac3cdfd1bc719d576b7b98d529cf281b706d94fd1916c96

PDB: 9dd4032902d83367286ebc453e440a423625a3cb7b3191a55811a2d51b222986

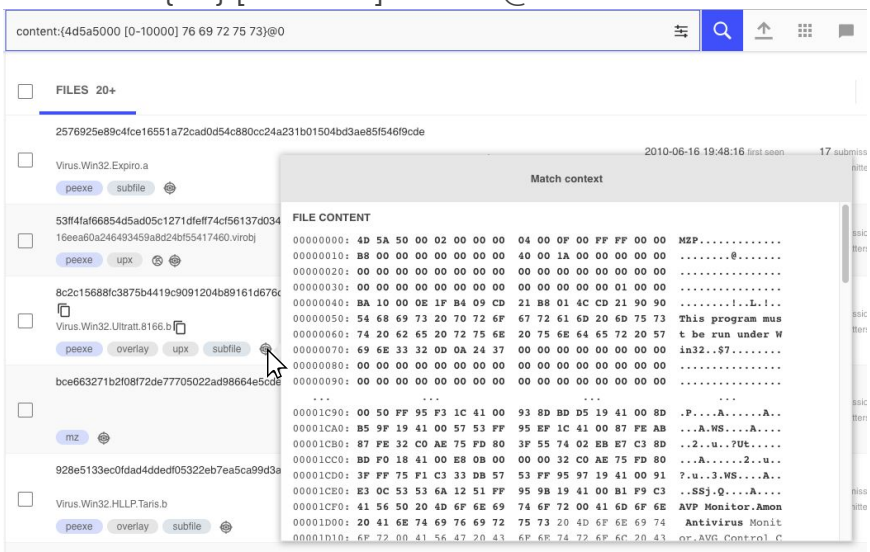
It looks like Rietspoof's loader occasionally has a PDB left in it… Sometimes it doesn't. Can we account for that?

By combining logical operators, we can!

(content:{52 41 4d 3a 20} AND content:{64 61 74 61 2e 64 61 74} AND content:{6c 6f 67 6f 75 74 2e 6c 6f 67}) OR
content:"G:\Work\Dr.Dre\hivez\new\loader\Release\loader.pdb"

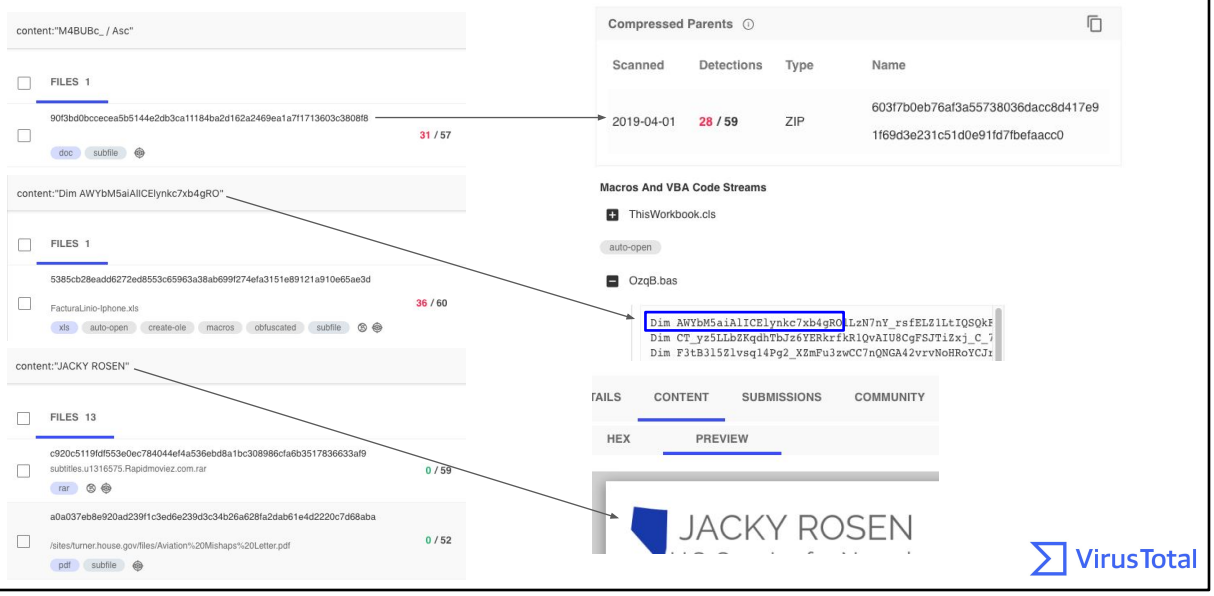
VTGrep: Example 7, Search at offset with range

"MZP" {00} [0-10000] "virus" @0



content:{4d5a5000 [0-10000] 7669727573}@0

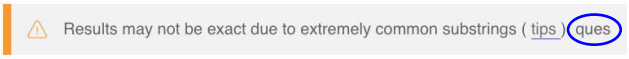
VTGrep: Example 8, Unpacked, OCR, macros, ...

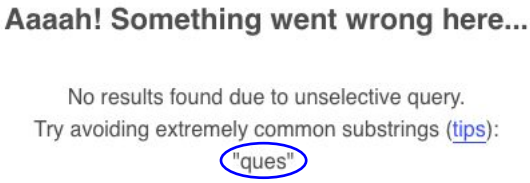


content:"M4BUBc_ / Asc"
content:"Dim AWYbM5aiAlICElynkc7xb4gRO"
content:"JACKY ROSEN"

VTGrep: Pro tips

Prefer rare substrings.
Avoid long common substrings.
Particularly at the extremes.





content:{**00 00 00 00**} content:{**CAFE** 00 00 00 00 **CAFE**}
content:{CAFE **00 00 00 00 00** CAFE} content:{CAFE 00 00 **??** 00 00 CAFE}
content:"**http://www.**virustotal**.com**" content:"virustotal.co"

VirusTotal

04 VTGraph

https://support.virustotal.com/hc/en-us/articles/360000298637-VirusTotal-Graph
https://www.virustotal.com/graph/

VTGraph

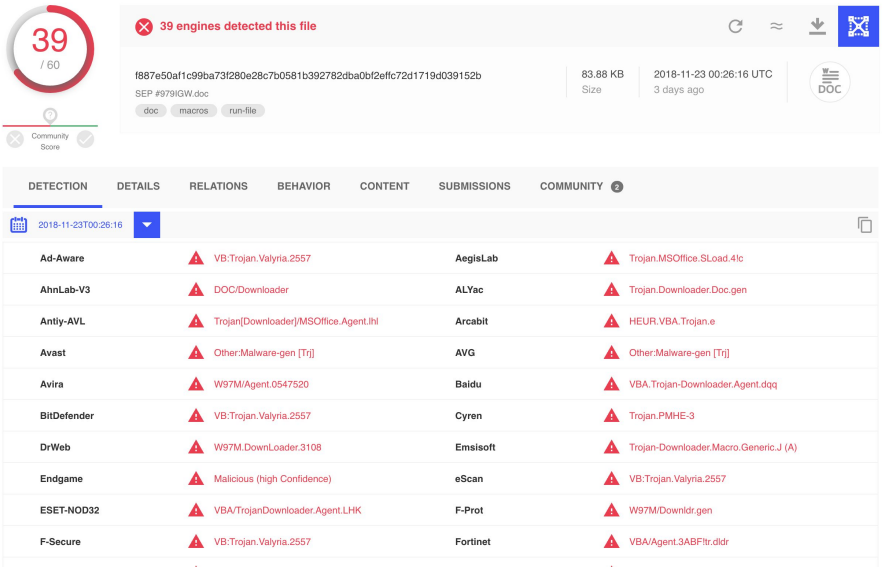
A visualization tool built on top of VirusTotal's data set. It understands the relationship between files, URLs, domains and IP addresses and it provides an easy interface to pivot and navigate over them

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#content-search

Start with f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b

A [Near] Daily Occurrence: Emotet Droppers

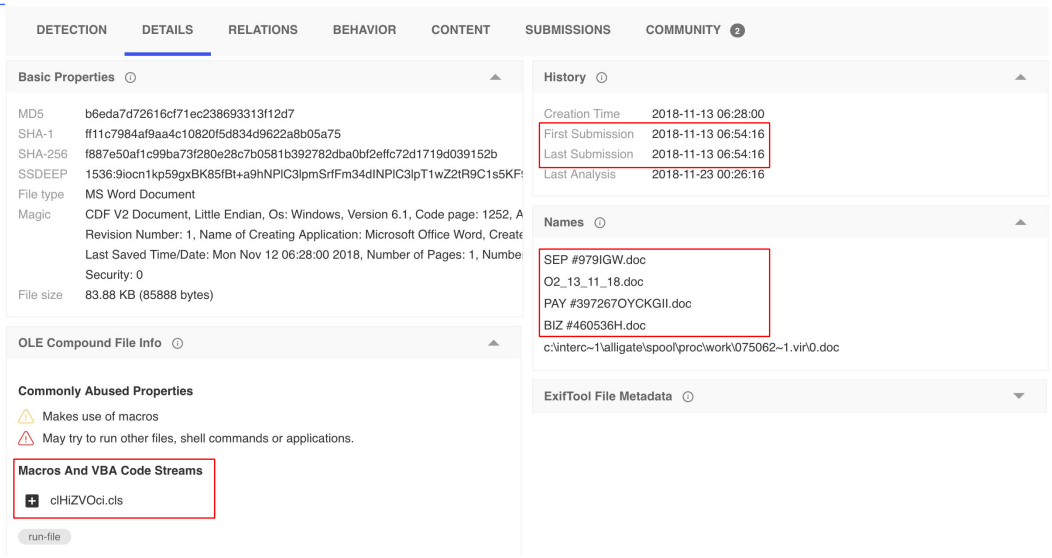


T1/SOC/ANALYST POV

Or

EmotetDoc: `f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b`

A [Near] Daily Occurrence: Emotet Droppers

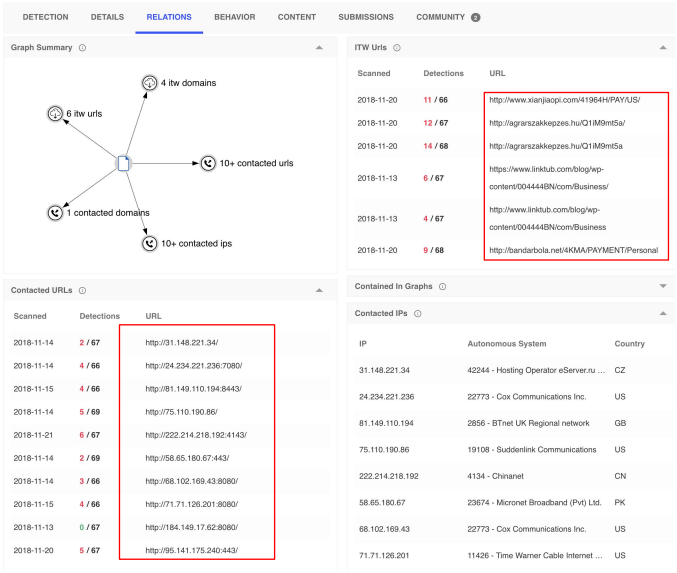


T1/SOC/ANALYST POV

Or

EmotetDoc: `f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b`

A [Near] Daily Occurrence: Emotet Droppers



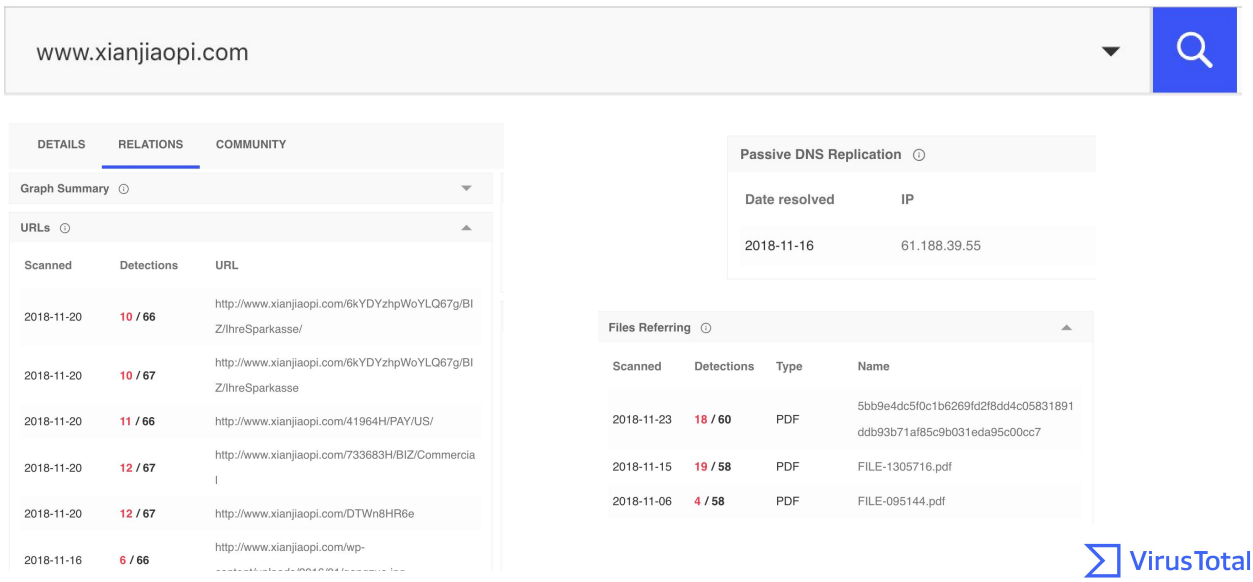
VirusTotal

T1/SOC/ANALYST POV

Or

EmotetDoc: `f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b`

Pivot on Domain ITW Domain



Central Pivot, First Document Observed:
f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b

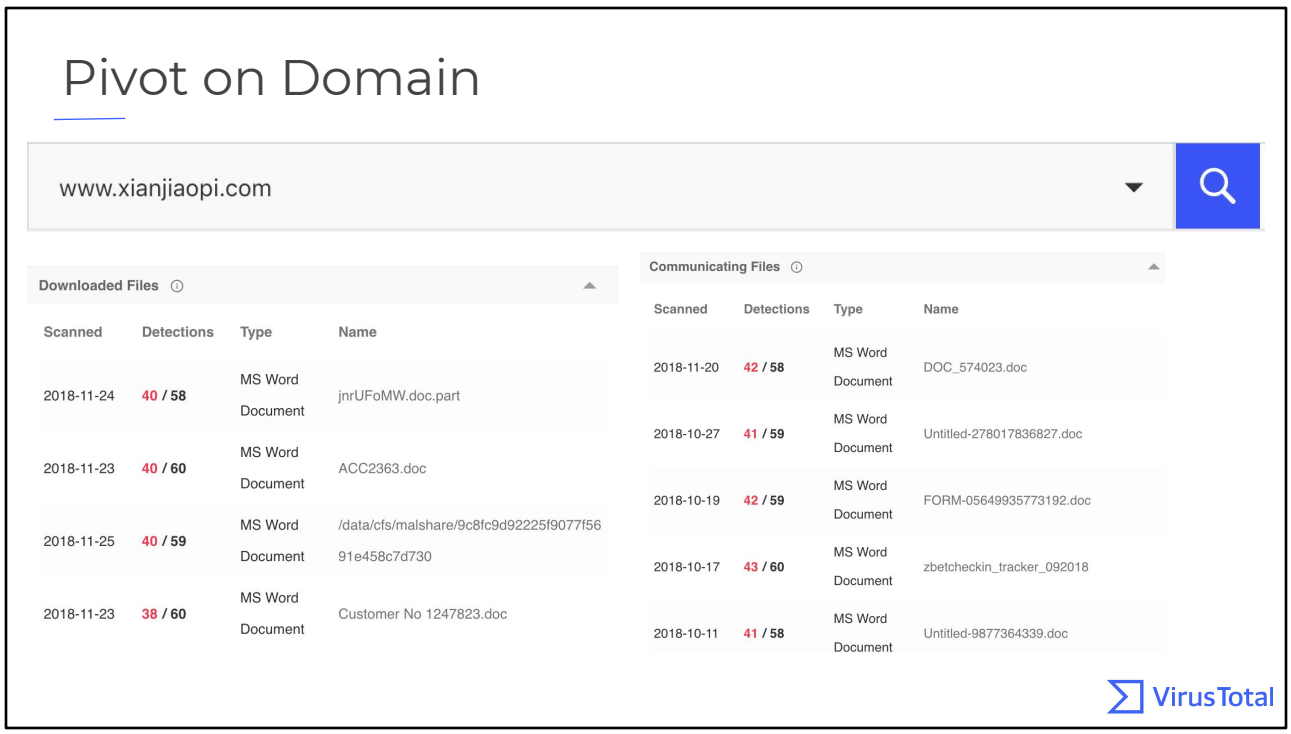
Full context around campaigns and indicators
IR POV

search for the Emotet C2: itw: www.xianjiaopi.com (expand graph too?) [Graph is a different perspective]
virustotal.com/graph

These campaigns are typically pretty broad, let's figure out the full scope, you can miss stuff when relying on just one view!

- Private graph for internal investigations

Pivot on Domain



Central Pivot, First Document Observed:
f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b

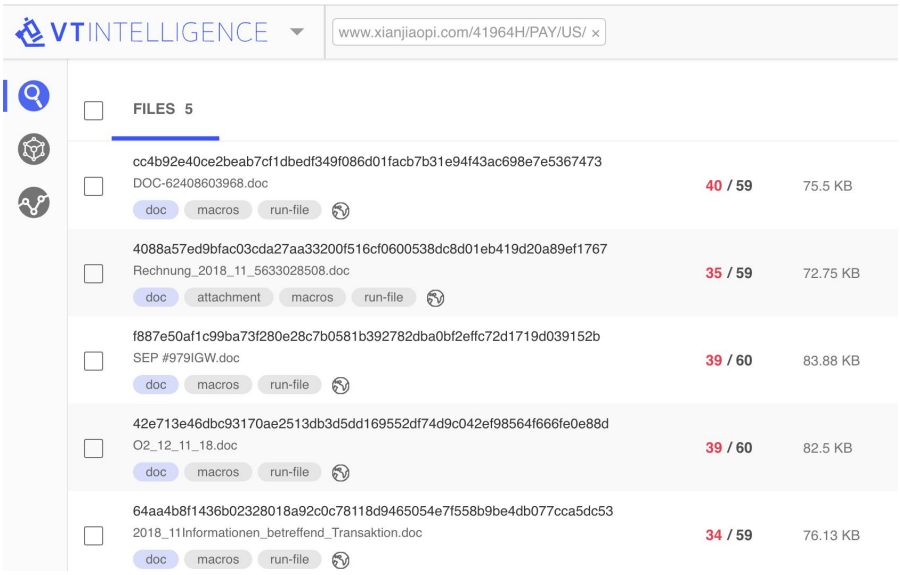
Full context around campaigns and indicators
IR POV

search for the Emotet C2: itw: www.xianjiaopi.com (expand graph too?) [Graph is a different perspective]
virustotal.com/graph

These campaigns are typically pretty broad, let's figure out the full scope, you can miss stuff when relying on just one view!

- Private graph for internal investigations

Pivot on URI



Central Pivot, First Document Observed:
f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b

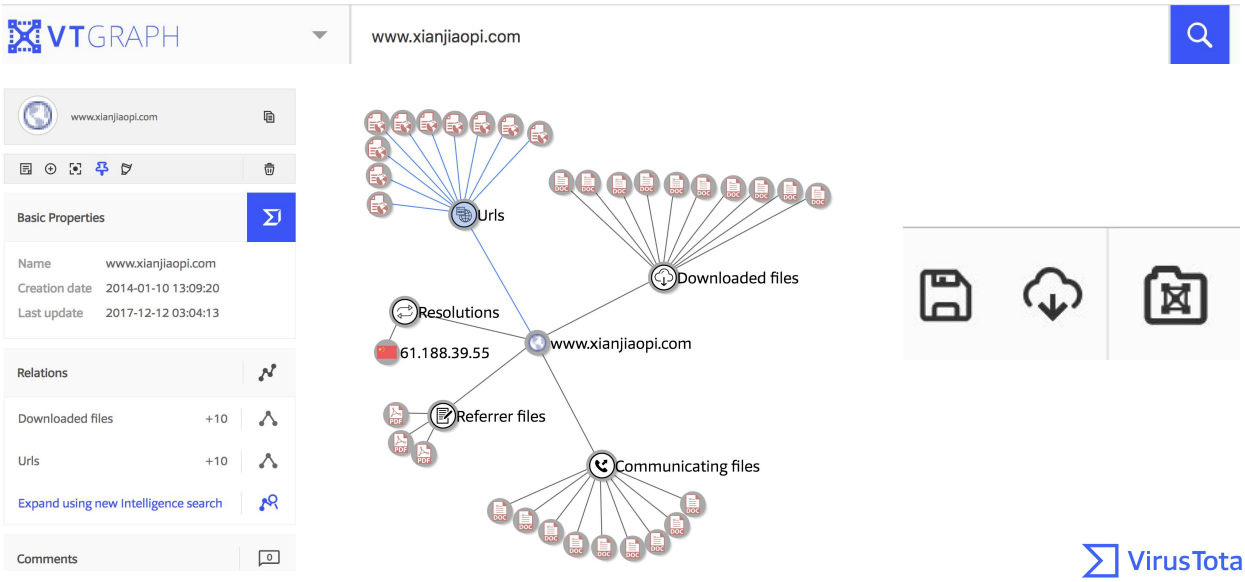
Full context around campaigns and indicators
IR POV

search for the Emotet C2: itw: www.xianjiaopi.com (expand graph too?) [Graph is a different perspective]
virustotal.com/graph

These campaigns are typically pretty broad, let's figure out the full scope, you can miss stuff when relying on just one view!

- Private graph for internal investigations

Expand With Graph



Central Pivot, First Document Observed:
f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b

Full context around campaigns and indicators
IR POV

search for the Emotet C2: itw: www.xianjiaopi.com (expand graph too?) [Graph is a different perspective]
virustotal.com/graph

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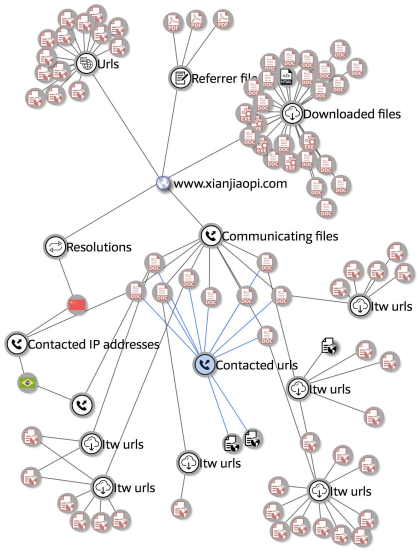
- Private graph for internal investigations

Expand With Graph



VirusTotal

Central Pivot, First Document Observed:
f887e50af1c99ba73f280e28c7b0581b392782dba0bf2effc72d1719d039152b

Full context around campaigns and indicators
IR POV

search for the Emotet C2: itw: www.xianjiaopi.com (expand graph too?) [Graph is a different perspective]
virustotal.com/graph

These campaigns are typically pretty broad, let's figure out the full scope, you can miss stuff when relying on just one view!

- Private graph for internal investigations

Try it Yourself!

VirusTotal

Let’s escape from slide hell for a little bit!

https://www.virustotal.com/graph/

Image source: https://www.youtube.com/watch?v=Iug0OAUDz7M

- Single Point Expansion: Gameradon [**Power of Visual Pivot**]
  - 195[.]62.53.126
  - https://www.virustotal.com/graph/g17f21463fdf54396a0bf05fff61385788cb4951a3b694c1c895fc1105b725dab
- OSINT Reporting
  - Option 1: Farseer, https://unit42.paloaltonetworks.com/farseer-previously-unknown-malware-family-bolsters-the-chinese-armoury/
  - Option 2: Babyshark, https://unit42.paloaltonetworks.com/new-babyshark-malware-targets-u-s-national-security-think-tanks/
    - https://www.virustotal.com/graph/g1766a5d086d84a6d859f1c598620f704925844d218584cdb81e6c57363485283

        - Option 3: GreyEnergy Overlaps with Sofacy, https://securelist.com/greyenergys-overlap-with-zebrocy/89506/
        - Option 4: Bronze Union (APT27/LuckyMouse), https://www.secureworks.com/research/a-peek-into-bronze-unions-toolbox
            - https://www.virustotal.com/graph/gde1e0f5c8a3d41ef8f456d40df09c3b978e1e5f380034dfcad8adf4b9be2ca1a
        - Option 5: AutoIT Zebrocy, https://www.vkremez.com/2019/01/lets-learn-progression-of-apt28-autoit.html
            - https://www.virustotal.com/graph/g7781518d548f4726aa4d70d9189b5a6d12d01c88fc494fc78d187056974da545
    - Messy/Large Campaigns - Emotet
        - 459397a134b2b4a201c2855bbb2ed4d1eeda9cc7637d7c65201e0a78217a8780
          C060ca7e926c137d2a9b90d0182b288b86117430f8a7614a1bff92b722ee1fa6
            - Source: https://paste.cryptolaemus.com/emotet/2019/03/14/emotet-malware-IoCs_03-14-19.html
        - Emotet dropping Trickbot, https://www.malware-traffic-analysis.net/2019/03/13/index.html
    - Manual Expansion Using VTI Queries
        - Chainshot: https://unit42.paloaltonetworks.com/unit42-slicing-dicing-cve-2018-5002-payloads-new-chainshot-malware/
        - VTI Query - content:FirstStageDropper.dll OR content:SecondStageDropper.dll

05 YARA

https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

What is YARA?

> YARA is an acronym for: YARA: Another Recursive Acronym, or Yet Another Ridiculous Acronym. Pick your choice.
>
> -- *Victor M. Alvarez (@plusvic)*

- Tool to assist malware researchers identify and classify malware
- Identify malware in string or binary patterns
- YARA rule = strings + condition
- Useful to catalog threat actors and associated IOCs

VirusTotal

YARA is a tool aimed at (but not limited to) helping malware researchers to identify and classify malware samples. With YARA you can create descriptions of malware families (or whatever you want to describe) based on textual or binary patterns.

https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

What is a YARA Rule?

```
sample-rule {

     strings:

          $a = “malicious_string”

          $b = {56 54 59}


     condition:

          $a or $b

}
```

INDICATORS

LOGIC

VirusTotal

By default strings are considered ASCII

Crafting a Custom YARA Rule

Malware family: **CobInt**

- PE file
- Typically < 30kb in size
- Specifically Named for an embedded DLL string
- *OPTIONAL:* Imphash Might be shared
- *OPTIONAL:* Interesting Function Calls

VirusTotal

Crafting a Custom YARA Rule (2)

Sample #1

STRINGS HEX

```
KERNEL32.dll
IPHLPAPI.DLL
ADVAPI32.dll
WININET.dll
urlmon.dll
int.dll
<assembly xmlns='urn:schemas-microsoft-com:asm.v1' manifestVersion='1.0'>
<requestedExecutionLevel level='asInvoker' uiAccess='false' />
<trustInfo xmlns="urn:schemas-microsoft-com:asm.v3">
xml version='1.0' encoding='UTF-8' standalone='yes'
This program cannot be run in DOS mode.
ReflectiveLoader@@YGKPAX@Z
InitializeCriticalSection
</requestedPrivileges>
DeleteCriticalSection
ObtainUserAgentString
<requestedPrivileges>
EnterCriticalSection
LeaveCriticalSection
InternetQueryOptionA
```

Sample #2

STRINGS HEX

```
KERNEL32.dll
IPHLPAPI.DLL
ADVAPI32.dll
WININET.dll
urlmon.dll
int.dll
<assembly xmlns='urn:schemas-microsoft-com:asm.v1' manifestVersion='1.0'>
<requestedExecutionLevel level='asInvoker' uiAccess='false' />
<trustInfo xmlns="urn:schemas-microsoft-com:asm.v3">
xml version='1.0' encoding='UTF-8' standalone='yes'
This program cannot be run in DOS mode.
ReflectiveLoader@@YGKPAX@Z
InitializeCriticalSection
</requestedPrivileges>
DeleteCriticalSection
ObtainUserAgentString
<requestedPrivileges>
EnterCriticalSection
LeaveCriticalSection
InternetQueryOptionA
```

VirusTotal

Sample 1: 9540c062e1aefdb78e1f3f0b40c7f9d7f1a7c7fe90f2748e369a7d2e6fe4a6bb
Sample 2: 2f7b5219193541ae993f5cf87a1f6c07705aaa907354a6292bc5c8d8585e8bd1

Crafting a Custom YARA Rule (4)

Both Samples

Imports

- ADVAPI32.dll
- IPHLPAPI.DLL
- KERNEL32.dll
- WININET.dll
- urlmon.dll

Basic Properties

MD5	616199072a11d95373b3c38626ad4c93
SHA-1	57201d6d3a8b1585f5855e7d3927542c281b1494
Authentihash	46a3defc737d9160d0cf201aa0c02c2946c716415051798930424abc80d92fe0
Imphash	9fd476779121c8ccabe0e029935bcbcb
SSDEEP	192:/puE9/Cgv6sln1TeqopZ7quwnd7eV8pP:RZHiRpdqukB48pP
File type	Win32 DLL
Magic	PE32 executable for MS Windows (DLL) (GUI) Intel 80386 32-bit
File size	10.5 KB

VirusTotal

Crafting a Custom YARA Rule (5)

```
strings:
            // interesting strings
            $s1 = "int.dll"
            $s2 = "ReflectiveLoader"
            $s3 = "ObtainUserAgentString"
```

VirusTotal

Crafting a Custom YARA Rule (8)

```
import "pe"
rule apt_win_cobint_dll : Cobalt_Group
{
      strings:

      // interesting strings
            $s1 = "int.dll"
            $s2 = "ReflectiveLoader"
            $s3 = "ObtainUserAgentString”


      condition:
            uint16(0)==0x5a4d
            and (
                  all of them
            or
                  pe.imphash()== "9fd476779121c8ccabe0e029935bcbcb"
                  )
            and filesize < 30KB

}
```

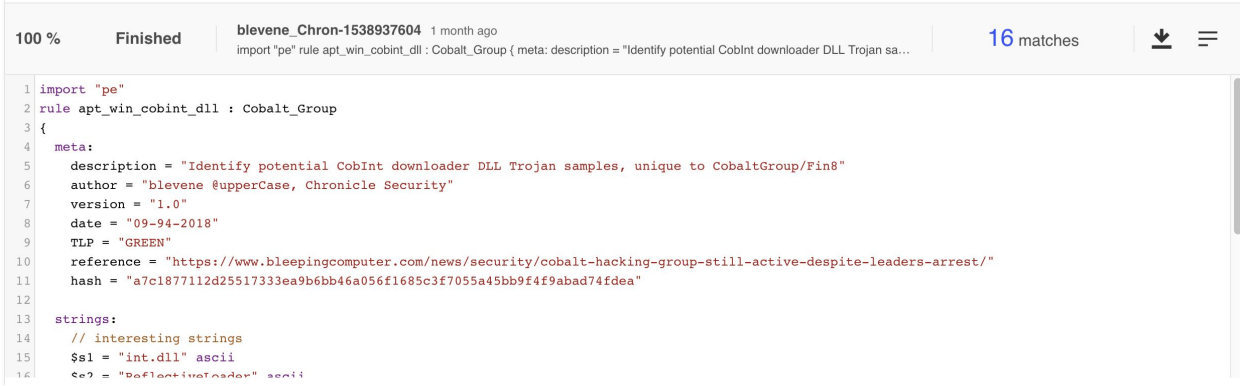
VirusTotal

Strings are assumed to be ASCII by default.

if you want to indicate strings are unicode, use the wide modifier

If you want to include both ASCII and Unicode strings, use the two modifiers, ascii unicode, after your closing quote.

Retrohunt Results



VirusTotal

Hunter/Researcher POV

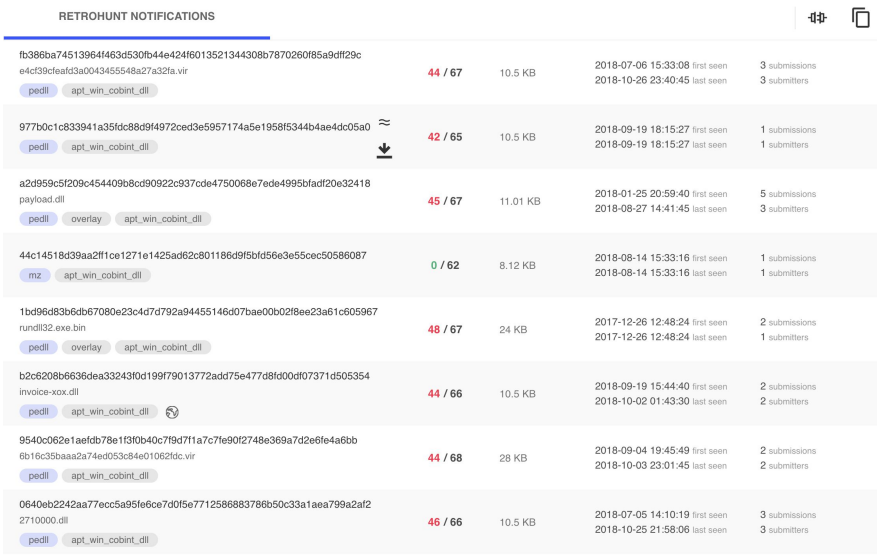
Demo hunt UI = forward looking https://www.virustotal.com/intelligence/hunting/
Retrohunt = retrospective

Search old Notifications UI for “Cobalt_Group” to get CobInt notifications. Retrohunt should be done as well.

If people are interested show rule for pivoting on:
DHS Cosmos Backdoor:
820ca1903a30516263d630c7c08f2b95f7b65dffceb21129c51c9e21cf9551c6

Embedded Resource Pivoting:
a76c79a4146cfd5cc1fb99ee7fce96da94d2dca00c029056bc1b7683058c02e3 (ursnif)
=> rsrc image pivot => Yara Rule

Retrohunt Results



VirusTotal

LiveHunt Results

https://www.virustotal.com/gui/hunting/notifications/cobalt_group

But, CobInt doesn't use int.dll anymore!

```
import "pe"
rule apt_win_cobint_dll : Cobalt_Group
{
      strings:

      // interesting strings
            $s1 = "/[a-zA-Z]{3}\.dll/ ascii"
            $s2 = "ReflectiveLoader"
            $s3 = "ObtainUserAgentString"


      condition:
            uint16(0)==0x5a4d
            and (
                  all of them
            or
                  pe.imphash()== "9fd476779121c8ccabe0e029935bcbcb"
                  )
            and filesize < 30KB

}
```

VirusTotal

Regex!

Basic Rule Dev 1:
I want to use all the strings

VirusTotal

https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

Rietspoof (bot):
8ea856534561e1fbfe8c13c8901cdc9c8f7eb6139e76ef5eea8f9137c2295199
https://www.virustotal.com/gui/file/8ea856534561e1fbfe8c13c8901cdc9c8f7eb6139e76ef5eea8f9137c2295199/submissions

---I'm going to have to do this in a notepad I think, the rule is too big to be visible in slides---

```
rule trojan_win_rietspoof_bot : commodity
{
      meta:
            description = "Identify Reitspoof Bot"
```

```
            author = "blevene@chronicle.security"
            date = "20-02-2019" //dd-mm-yyyy
            reference =
"https://www.bleepingcomputer.com/news/security/multi-stage-r
ietspoof-malware-drops-multiple-malicious-payloads/"
            hash01 =
"8ea856534561e1fbfe8c13c8901cdc9c8f7eb6139e76ef5eea8f9137c229
5199"

      strings:

            $ = "cbomb.dat" wide
            $ = "Secur32.dll" wide
            $ = "CreatePipe"
            $ = "PeekNamedPipe"
            $ = "WS2_32.dll"

      condition:
            uint16(0)==0x5a4d
            and  all of them
}
```

Basic Rule Dev 2:
I need to employ more selective logic for my strings

VirusTotal

https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

Rietspoof (loader)

No PDB: f5c4782591675cd51ac3cdfd1bc719d576b7b98d529cf281b706d94fd1916c96
PDB: 9dd4032902d83367286ebc453e440a423625a3cb7b3191a55811a2d51b222986

---Again, going to have to do this in a Notepad---

```
rule trojan_win_rietspoof_loader : commodity
{
      meta:
            description = "Identify Reitspoof Loader Phase"
            author = "blevene@chronicle.security"
            date = "20-02-2019" //dd-mm-yyyy
            reference =
```

```
"https://www.bleepingcomputer.com/news/security/multi-stage-r
ietspoof-malware-drops-multiple-malicious-payloads/"
            hash01 =
"f5c4782591675cd51ac3cdfd1bc719d576b7b98d529cf281b706d94fd191
6c96"
            hash02 =
"d7a15001a45c6157f0b2ed728a88cc9db09ed39e733310e76bd906ccdf52
7a4e"

      strings:

            $s1 = "CPU: %s(%d)"
            $s2 = "data.dat"
            $s3 = "Host:%s"
            $s4 = "logout.log"
            $s5 = "RAM: "
            $s6 = "WScript"

            //old PDB
            $pdb =
"G:\\Work\\Dr.Dre\\hivez\\new\\loader\\Release\\loader.pdb"

      condition:
            uint16(0)==0x5a4d
            and ( all of ($s*) or $pdb)

}
```

Modules

Modules are the method YARA provides for extending its features. They allow you to define data structures and functions which can be used in your rules to express more complex conditions.

VirusTotal

YARA is a tool aimed at (but not limited to) helping malware researchers to identify and classify malware samples. With YARA you can create descriptions of malware families (or whatever you want to describe) based on textual or binary patterns.

https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

Important => https://yara.readthedocs.io/en/v3.9.0/modules.html
Writing your own modules => https://yara.readthedocs.io/en/v3.9.0/writingmodules.html#writing-modules (Its in C)

Modules: PE

```
import "pe"

rule single_section
{
    condition:
        pe.number_of_sections == 1
}

rule control_panel_applet
{
    condition:
        pe.exports("CPlApplet")
}

rule is_dll
{
    condition:
        pe.characteristics & pe.DLL
 }
```

VirusTotal

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https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

https://yara.readthedocs.io/en/v3.9.0/modules/pe.html

“The PE module allows you to create more fine-grained rules for PE files by using attributes and features of the PE file format. This module exposes most of the fields present in a PE header and provides functions which can be used to write more expressive and targeted rules.”

Modules: Hash

```
import "pe"
import "hash"
rule trojan_win_ursnif_resource : Commodity
{
    meta:
          description = "Identify Ursnif/Gozi/ISFB samples seen on 10/26/2018"
          author = "blevene@chronicle.security"
          hash01 =
"a76c79a4146cfd5cc1fb99ee7fce96da94d2dca00c029056bc1b7683058c02e3"
    condition:
          uint16(0)==0x5a4d
          and filesize < 600KB
          and for any i in (0..pe.number_of_resources - 1):
               (hash.sha256(pe.resources[i].offset, pe.resources[i].length) ==
"059f9bf1cded9a989daeecde2df32db54318347d3975f343aaf8d123d0ca517d")

}
```

VirusTotal

YARA is a tool aimed at (but not limited to) helping malware researchers to identify and classify malware samples. With YARA you can create descriptions of malware families (or whatever you want to describe) based on textual or binary patterns.

https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

https://yara.readthedocs.io/en/v3.9.0/modules/hash.html

The Hash module allows you to calculate hashes (MD5, SHA1, SHA256) from portions of your file and create signatures based on those hashes.

Bonus, we are a looping!

https://yara.readthedocs.io/en/v3.9.0/writingrules.html#iterating-over-string-occurrences

Sample:
https://www.virustotal.com/gui/file/a76c79a4146cfd5cc1fb99ee7fce96da94d2dca00c029056bc1b7683058c02e3/detection

Modules: Math

```
rule trojan_win_atmos : Commodity
{
      meta:
            hash1 =
"16ce22397e8261714a272d82627bb3a55b65d7f4e65e0d54acfb3c5ed37e68cc"
            author = "blevene"
            date = "2016-11-10"
            description = "Identify Atmos samples, Zeus/Citadel Variant"
            reference =
“https://www.kaspersky.com/blog/atmos-yet-another-zeus-variant-is-threate
ning-businesses/5476/”

      condition:
            uint16(0) == 0x5a4d
            and math.entropy(pe.sections[1].raw_data_offset,
pe.sections[1].raw_data_size) > 7.8
            and for any i in (0..pe.number_of_sections -1):
              (pe.sections[i].name == ".sock")
}
```

VirusTotal

YARA is a tool aimed at (but not limited to) helping malware researchers to identify and classify malware samples. With YARA you can create descriptions of malware families (or whatever you want to describe) based on textual or binary patterns.

https://yara.readthedocs.io/
https://github.com/InQuest/awesome-yara
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals.
https://support.virustotal.com/hc/en-us/articles/360000347157-VT-Intelligence#search-modifiers

math.entropy(offset,filesize) => Returns the entropy for *size* bytes starting at *offset*

“The Math module allows you to calculate certain values from portions of your file and create signatures based on those results.”

Bonus: Looping in Yara!
https://yara.readthedocs.io/en/v3.9.0/writingrules.html#iterating-over-string-occurrences

atmos = Zeus Variant
https://www.virustotal.com/gui/file/16ce22397e8261714a272d82627bb3a55b65d7f4e65e0d54acfb3c5ed37e68cc/detection

Practical Applications 1

Mimikatz

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example:
b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4
(mimikatz)
https://github.com/gentilkiwi/mimikatz

Practical Applications 1

Mimikatz, Option 1
Strings Only

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example:
b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4 (mimikatz)
https://www.virustotal.com/gui/file/b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4/detection

Ref: https://github.com/gentilkiwi/mimikatz

---Will do in a notepad---

Option 1, strings only

```
rule hacktool_win_mimikatz_dll_option1_strings : hacktool
{
   meta:
      description = "Identify stock Mimikatz DLL. Example rule."
      author = "blevene@chronicle.security"
      date = "03/15/2019" //mm/dd/yyyy
      hash =
```

```
"b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4"
    strings:

        //exports
        $e1 = "InitializeChangeNotify" ascii fullword
        $e2 = "PasswordChangeNotify" ascii fullword
        $e3 = "SpLsaModeInitialize" ascii fullword

        //imports
        $i1 = "NdrMesTypeFree2" ascii fullword
        $i2 = "MesHandleFree" ascii fullword
        $i3 = "RtlStringFromGUID" ascii fullword
        $i4 = "GetOEMCP" ascii fullword

    condition:
        /* option 1:
        all of them
        */
        /*option 2:
        all of ($e*) and all of ($i*)
        */
}
```

Practical Applications 1

Mimikatz, Option 2
PE Exports

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example:
b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4 (mimikatz)
https://www.virustotal.com/gui/file/b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4/detection

Ref: https://github.com/gentilkiwi/mimikatz

---Will do in a notepad---

```
import "pe"
rule hacktool_win_mimikatz_dll_option2_exportsonly : hacktool
{
   meta:
      description = "Identify stock Mimikatz DLL. Example rule."
      author = "blevene@chronicle.security"
      date = "03/15/2019" //mm/dd/yyyy
      hash =
"b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4"
```

```
    condition:
        pe.exports("InitializeChangeNotify")
        and pe.exports("PasswordChangeNotify")
        and pe.exports ("SpLsaModeInitialize")
}
```

Practical Applications 1

Mimikatz, Option 3
PE Imports

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

Example:
b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4
(mimikatz)
https://www.virustotal.com/gui/file/b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4/detection

Ref: https://github.com/gentilkiwi/mimikatz

---Will do in a notepad---

```
import "pe"
rule hacktool_win_mimikatz_dll_option3_importsonly : hacktool
{
   meta:
      description = "Identify stock Mimikatz DLL. Example rule."
      author = "blevene@chronicle.security"
      date = "03/15/2019" //mm/dd/yyyy
      hash =
"b04e58327191222e27405c2dc4871cb4c81e3ea732d70c67ad744088619c97e4"
```

```
    condition:
        pe.imports("RPCRT4.dll", "MesHandleFree")
        and pe.imports("RPCRT4.dll", "NdrMesTypeFree2")
        and pe.imports("ntdll.dll", "RtlStringFromGUID")
        and pe.imports ("KERNEL32.dll", "GetOEMCP")
}
```

Practical Applications 2

DustSquad
“Octopus” Implant

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

2d5f3edc4132f463cb6efe6379fda46e00fb7225f51a9fb69d2b11161c43faa6
2af44715d4f0655bd50d30d46b01336b7f7743ade6b78e2e7650a8d60dc35858
caaf10e6f65d630130c04453160596eada9a5b78167c934e9ea3e8baffa2c345

https://www.virustotal.com/gui/search/2d5f3edc4132f463cb6efe6379fda46e00fb7225f51a9fb69d2b11161c43faa6%250A2af44715d4f0655bd50d30d46b01336b7f7743ade6b78e2e7650a8d60dc35858%250Acaaf10e6f65d630130c04453160596eada9a5b78167c934e9ea3e8baffa2c345/files

---Will do in a notepad---

```
import "pe"
rule apt_win_octopus : DustSquad {
   meta:
      description = "Identify potential DustSquad 'octopus' implants"
      graph =
"https://www.virustotal.com/graph/g4c327ce3e88e43f99191d7618b1b74e4eefee8ccd2e44451ae8aa49ac1a36e47"
```

```
        date = "10-16-2018"
        author = "blevene@chronicle.security"
        hash01 =
"2d5f3edc4132f463cb6efe6379fda46e00fb7225f51a9fb69d2b11161c43faa6"
        hash02 =
"2af44715d4f0655bd50d30d46b01336b7f7743ade6b78e2e7650a8d60dc35858"
        hash03 =
"caaf10e6f65d630130c04453160596eada9a5b78167c934e9ea3e8baffa2c345"

    strings:

        //unicode strings
        $u1 = "Download:" wide
        $u2 = "Remove:" wide
        $u3 = "Embaracdero" wide
        $u4 = "php?check" wide


    condition:
        uint16(0)==0x5a4d
                    and (
                                all of them
                    or
                                pe.imphash()== "65ffe87ad21cc53609d3db7bc15603b0"
        or
           vhash == "0360b6666d5c0d5d151c003232z5e002c025z8035z23z303cz1"
                                )
                    and filesize < 5MB
        }
```

Practical Applications 3

LuckyCat
“ExileRat” Implant

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

3eb026d8b778716231a07b3dbbdc99e2d3a635b1956de8a1e6efc659330e52de
https://www.virustotal.com/gui/file/3eb026d8b778716231a07b3dbbdc99e2d3a635b1956de8a1e6efc659330e52de/detection

---Will do in a notepad---

```
rule apt_win_exilerat : LuckyCat
{
        meta:
                description = "Identify ExileRat as described by Talos"
                author = "blevene@chronicle.security"
                date = "04-02-2019" //dd-mm-yyyy
                reference =
"https://blog.talosintelligence.com/2019/02/exilerat-shares-c2-with-luckycat.html"
                hash01 =
"3eb026d8b778716231a07b3dbbdc99e2d3a635b1956de8a1e6efc659330e52de"

        strings:
```

```
        //filewrites
        $f1 = "prepare to write file %s, %d, %d"
        $f2 = "end write file %s, %d"

        //pdb
        $pdb= "D:\\proj\\proj.vs2015\\scout\\Release\\scout.pdb"

        //hardcoded IPs
        $ip1 = "27.126.188.212"
        $ip2 = "192.100.106.207"

    condition:
        uint16(0)==0x5a4d
        and (
            all of ($f*)
            or $pdb
            or 1 of ($ip*)
            )

}
```

Practical Applications 4

Lazarus
“RisingSun” Implant

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

37b04dcdcfdcaa885df0f392524db7ae7b73806ad8a8e76fbc6a2df4db064e71
https://www.virustotal.com/gui/file/37b04dcdcfdcaa885df0f392524db7ae7b73806ad8a8e76fbc6a2df4db064e71/detection

---Will do in a notepad---

```
rule apt_win_RisingSun : Lazarus
{
        meta:
                description = "Identify RisingSun Implant which Mcafee Aleeges is related to Lazarus' Duuzer"
                author = "blevene@chronicle.security"
                date = "12-12-2018" //dd-mm-yyyy
                reference = "https://www.mcafee.com/enterprise/en-us/assets/reports/rp-operation-sharpshooter.pdf"
                hash01 =
```

```
"37b04dcdcfdcaa885df0f392524db7ae7b73806ad8a8e76fbc6a2df4db064e71"

        strings:

                $ = "Accept-Language: en-us;q=0.8;q=0.6,en-us;q=0.4,en;q=0.2" wide
                $ = "charset={[A-Za-z0-9\\-_]+}" wide
                $ = "Content-Length: {[0-9]+}" wide
                $ = "Location: {[0-9]+}" wide
                $ = "q(\"[^\"]*\")|('[^']*')" wide
                $ = "Set-Cookie:\\b*{.+?}\\n" wide
                $ = "%s%d&page=result%s%d" ascii

                $uri = "%s%d&page=" ascii

        condition:
                uint16(0)==0x5a4d
                and #uri > 3
                and all of them
}
```

Practical Applications 5

CobaltGang
“ShapesMacro” Dropper

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

2a8c62c4e167f9f52c2c5a4fe5be96df53d1f6015dd793747391775e34d16fbf
https://www.virustotal.com/gui/file/2a8c62c4e167f9f52c2c5a4fe5be96df53d1f6015dd793747391775e34d16fbf/detection

---Will do in a notepad---

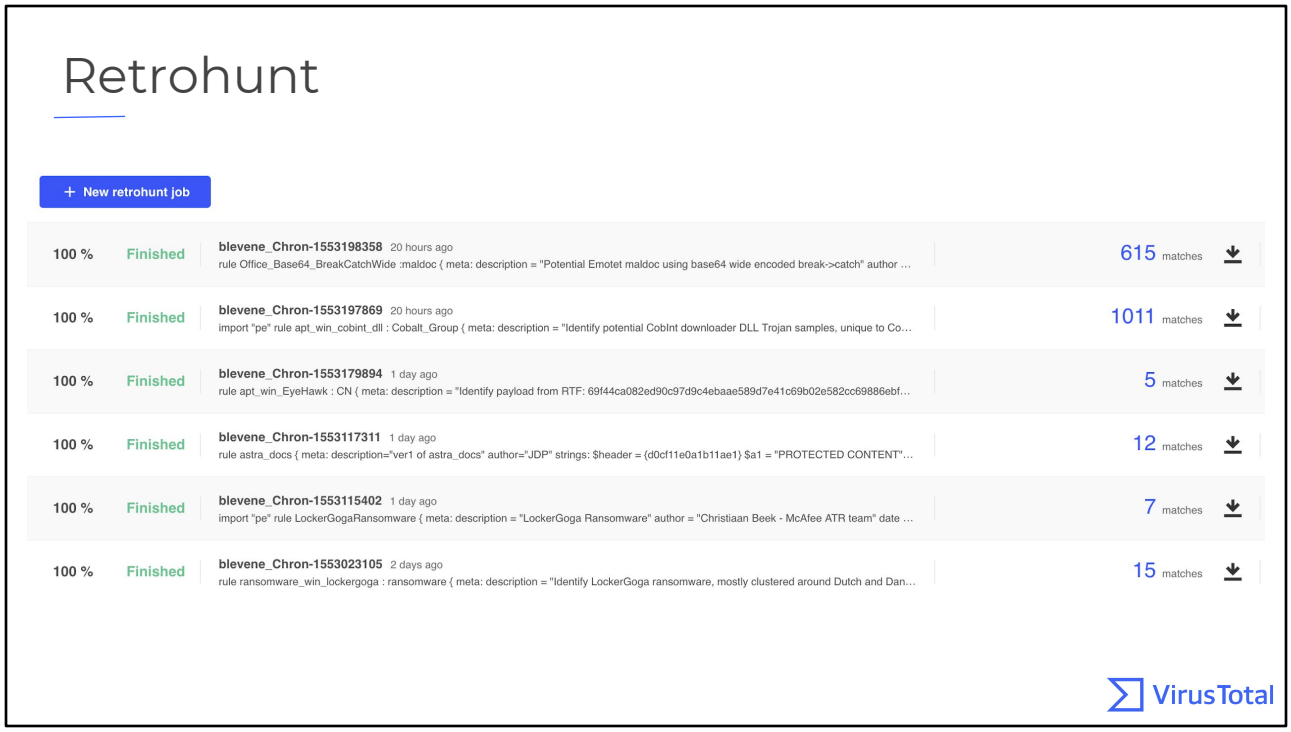
```
rule apt_win_shapesmacro_cobaltdropper : Cobalt_Gang
{
        meta:
                description = "Identify malicious office documents which abuse the Shapes function"
                author = "blevene@chronicle.security"
                date = "20-12-2018" //dd-mm-yyyy
                reference = "https://twitter.com/dissectmalware/status/1064977287915950080?lang=en"
                hash01 = "2a8c62c4e167f9f52c2c5a4fe5be96df53d1f6015dd793747391775e34d16fbf"
```

```
        strings:

                $office = { D0 CF 11 E0 A1 B1 1A E1 }


                $s1 = "ThisProject.ThisDocument.AutoOpen" wide nocase
                $s2 = "Shapes" ascii nocase
                $s3 = "Shell" ascii nocase
                $s4 = "TextFrame" ascii
                $s5 = "TextRange" ascii
                $s4 = "ThisProject" ascii


                $var = "var" ascii nocase

        condition:
                $office at 0
                and #var > 8
                and all of ($s*)
}
```

06

YARA Tools on VT

https://www.virustotal.com/gui/hunting/retrohunt

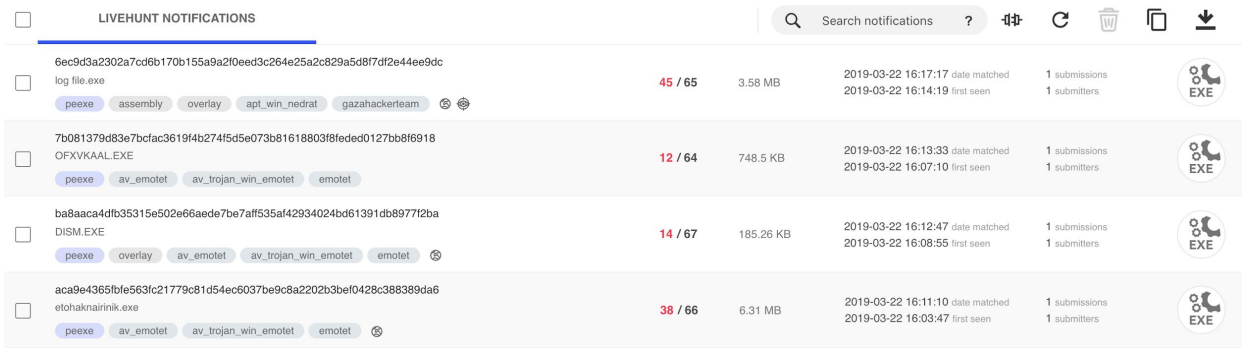


https://support.virustotal.com/hc/en-us/articles/360000347157-VirusTotal-Intelligence

https://www.virustotal.com/gui/hunting/retrohunt

Beside hunting for files in real time as they arrive to VirusTotal, you can also apply your YARA rules to files sent in the past with the Retrohunt feature. The concept is plain simple: just put your YARA rules in the provided text box, launch your Retrohunt job and you'll get a list of files matching your rules. The process can take a few hours, as it scans multiple terabytes of data, but you can provide an email address in order to be notified when the scanning finishes.
However, notice that none of the Malware Hunting-specific features will work with Retrohunt, including rules based on the number of positives, antivirus signatures, tags, file type and Cuckoo's behaviour reports. Only pure YARA rules will work.

LiveHunt



https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting

https://www.virustotal.com/gui/hunting/notifications
https://www.virustotal.com/gui/hunting/rulesets

Livehunt allows you to hook into the stream of files submitted to VirusTotal and get notified whenever one of them matches a certain rule written in the YARA language. Applying YARA rules to the files submitted to VirusTotal you should be able to get a constant flow of malware files classified by family, discover new malware files not detected by antivirus engines, collect files written in a given language or packed with a specific run-time packer, create heuristic rules to detect suspicious files, and, in general, enjoy the benefits of YARA's versatility acting on the huge amount of files processed by VirusTotal every day.

LiveHunt: VirusTotal Externals

AntiVirus Detection Externals

```
rule av_externals_example

{

  condition:

      signatures contains “Trojan”
      or
      eset_nod32 contains “Backdoor”

}
```

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting

https://www.virustotal.com/gui/hunting/notifications
https://www.virustotal.com/gui/hunting/rulesets

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#antivirus-externals

In malware hunting your rules can take into account not only the contents of the file itself, but also the signatures generated by the different antivirus engines that scanned the file, which means that you can construct rules stating: *"give me the files containing the strings 'foo' and 'bar', and detected by more than two antivirus vendors"* or *"give me the files detected by antivirus X"* or *"give me new files that antivirus X detects as 'baz'"*.

LiveHunt: VirusTotal Externals

VirusTotal Tags

```
rule VT_Tags_example

{

  condition:

      tags contains “nsrl” or tags
contains “trusted”

}
```

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting

https://www.virustotal.com/gui/hunting/notifications
https://www.virustotal.com/gui/hunting/rulesets

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#tag-externals
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#file-types

In malware hunting your rules can take into account not only the contents of the file itself, but also the signatures generated by the different antivirus engines that scanned the file, which means that you can construct rules stating: *"give me the files containing the strings 'foo' and 'bar', and detected by more than two antivirus vendors"* or *"give me the files detected by antivirus X"* or *"give me new files that antivirus X detects as 'baz'"*.

LiveHunt: VirusTotal Externals

VirusTotal Externals

```
rule VT_Tags_example

{

  condition:

      file_type contains “document”
      and file_name contains “invoice”
      and new_file

}
```

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting

https://www.virustotal.com/gui/hunting/notifications
https://www.virustotal.com/gui/hunting/rulesets

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#tag-externals
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#file-types

In malware hunting your rules can take into account not only the contents of the file itself, but also the signatures generated by the different antivirus engines that scanned the file, which means that you can construct rules stating: *"give me the files containing the strings 'foo' and 'bar', and detected by more than two antivirus vendors"* or *"give me the files detected by antivirus X"* or *"give me new files that antivirus X detects as 'baz'"*.

LiveHunt: VirusTotal Externals Example 2

```
rule mueller_report_lures : current_event
{
      meta:
            description = "Identify mueller report lures"

  condition:
      (file_type contains "document" or file_type contains
"email") and new_file and

    ( file_name contains "mueller"
    or file_name contains "mueller report"
    or (file_name contains "mueller" and file_name
contains "report")
    )

}
```

VirusTotal

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting

https://www.virustotal.com/gui/hunting/notifications
https://www.virustotal.com/gui/hunting/rulesets

https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#tag-externals
https://support.virustotal.com/hc/en-us/articles/360000363717-VT-Hunting#file-types

In malware hunting your rules can take into account not only the contents of the file itself, but also the signatures generated by the different antivirus engines that scanned the file, which means that you can construct rules stating: *"give me the files containing the strings 'foo' and 'bar', and detected by more than two antivirus vendors"* or *"give me the files detected by antivirus X"* or *"give me new files that antivirus X detects as 'baz'"*.

07

APIv3 - VTCLI

https://asciinema.org/a/179696

https://developers.virustotal.com/v3.0/reference

https://github.com/VirusTotal/vt-cli

Helpful Tool for APIv3

https://github.com/VirusTotal/vt-cli

VirusTotal

https://asciinema.org/a/179696

https://developers.virustotal.com/v3.0/reference

https://github.com/VirusTotal/vt-cli

APIv3 - Query File Information

```
blevene@blevene-imacpro ~ vt file b331ae16014d6219f1e2e3a2e2d568e7836bfbb0e6b40ec081a3c71edd508a37
- file <b331ae16014d6219f1e2e3a2e2d568e7836bfbb0e6b40ec081a3c71edd508a37>:
    bundle_info:
      extensions:
        bin: 1
        jpg: 1
        xml: 14
      file_types:
        JPG: 1
        Microsoft Office: 1
        XML: 18
      highest_datetime: "1980-01-01 00:00:00"
      lowest_datetime: "1980-01-01 00:00:00"
      num_children: 20
      type: "DOCX"
      uncompressed_size: 149149
      vhash: "7905a57c5a030c4ad3a9e777cc1bd352"
    creation_date: 1553645460  # 2019-03-26 20:11:00 -0400 EDT
```

VirusTotal

Displayed output is abbreviated in the slide (it doesn't all fit)

Truncated the results in the raw output as well, ya'll get the point, hopefully.

blevene@blevene-imacpro ~ vt file
b331ae16014d6219f1e2e3a2e2d568e7836bfbb0e6b40ec081a3c71edd508a37
- file
<b331ae16014d6219f1e2e3a2e2d568e7836bfbb0e6b40ec081a3c71edd508a37>:
  bundle_info:
    extensions:
      bin: 1
      jpg: 1
      xml: 14
    file_types:
      JPG: 1
      Microsoft Office: 1
      XML: 18
    highest_datetime: "1980-01-01 00:00:00"
    lowest_datetime: "1980-01-01 00:00:00"
    num_children: 20
    type: "DOCX"
    uncompressed_size: 149149

```
  vhash: "7905a57c5a030c4ad3a9e777cc1bd352"
creation_date: 1553645460  # 2019-03-26 20:11:00 -0400 EDT
downloadable: true
exiftool:
  AppVersion: "16.0"
  Application: "Microsoft Office Word"
  Characters: "3"
  CharactersWithSpaces: "3"
  Company: "VPS2day"
  CreateDate: "2019:03:27 00:11:00Z"
  Creator: "VPS2day"
  DocSecurity: "None"
  FileType: "DOCM"
  FileTypeExtension: "docm"
  HeadingPairs: "Title, 1"
  HyperlinksChanged: "No"
  LastModifiedBy: "VPS2day"
  Lines: "1"
  LinksUpToDate: "No"
  MIMEType: "application/vnd.ms-word.document.macroEnabled"
  ModifyDate: "2019:03:31 19:23:00Z"
  Pages: "1"
  Paragraphs: "1"
  RevisionNumber: "31"
  ScaleCrop: "No"
  SharedDoc: "No"
  Template: "Normal.dotm"
  TotalEditTime: "1.8 hours"
  Words: "0"
  ZipBitFlag: "0x0006"
  ZipCRC: "0x2a6675f6"
  ZipCompressedSize: "445"
  ZipCompression: "Deflated"
  ZipFileName: "[Content_Types].xml"
  ZipModifyDate: "1980:01:01 00:00:00"
  ZipRequiredVersion: "20"
  ZipUncompressedSize: "1900"
first_submission_date: 1554194217  # 2019-04-02 04:36:57 -0400 EDT
last_analysis_date: 1554194217  # 2019-04-02 04:36:57 -0400 EDT
last_analysis_results:
    <---TRUNCATED--->
```

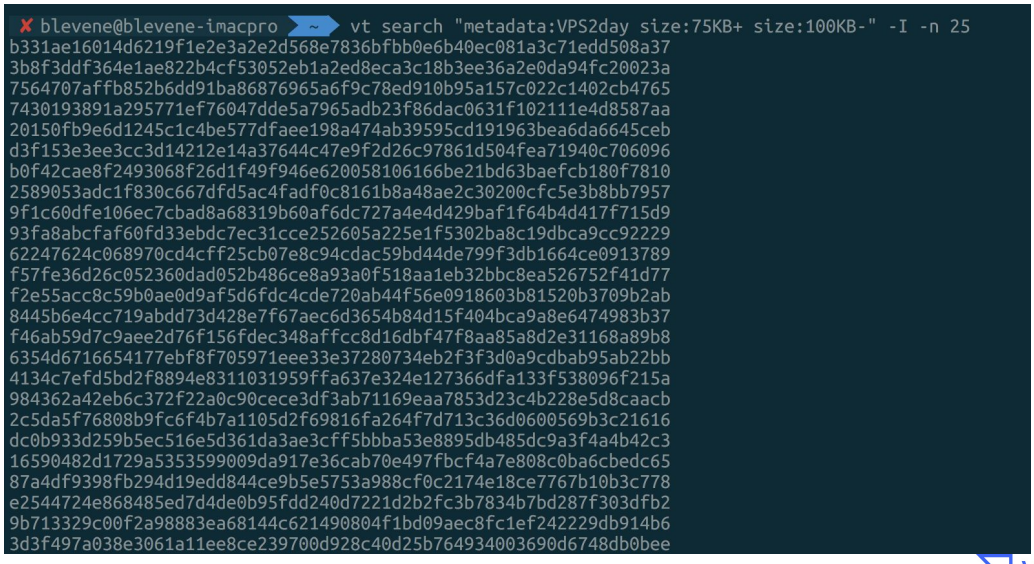
APIv3 - URL Data w/Filter

```
blevene@blevene-imacpro ~/Malware_Stuff vt url -i first_submission_date virustotal.com
- url <a354494a73382ea0b4bc47f4c9e8d6c578027cd4598196dc88f05a22b5817293>:
    first_submission_date: 1276681241  # 2010-06-16 05:40:41 -0400 EDT
```

VirusTotal

blevene@blevene-imacpro ~/Malware_Stuff vt url -i first_submission_date virustotal.com
- url <a354494a73382ea0b4bc47f4c9e8d6c578027cd4598196dc88f05a22b5817293>:
first_submission_date: 1276681241 # 2010-06-16 05:40:41 -0400 EDT

APIv3 - Search VTI



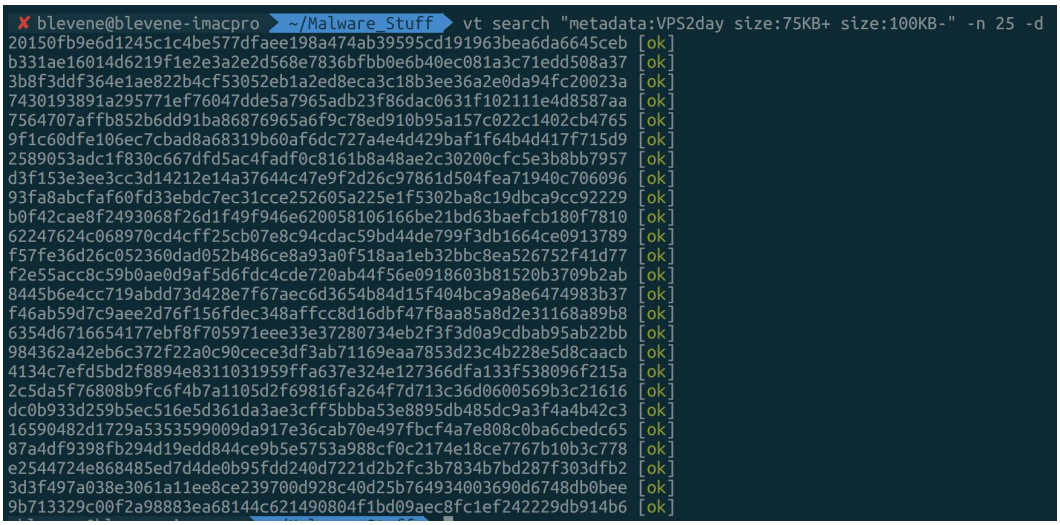
Where -I is identifiers only (hashes) and -n is number of results

✘ blevene@blevene-imacpro ~ vt search "metadata:VPS2day size:75KB+ size:100KB-" -I -n 25
b331ae16014d6219f1e2e3a2e2d568e7836bfbb0e6b40ec081a3c71edd508a37
3b8f3ddf364e1ae822b4cf53052eb1a2ed8eca3c18b3ee36a2e0da94fc20023a
7564707affb852b6dd91ba86876965a6f9c78ed910b95a157c022c1402cb4765
7430193891a295771ef76047dde5a7965adb23f86dac0631f102111e4d8587aa
20150fb9e6d1245c1c4be577dfaee198a474ab39595cd191963bea6da6645ceb
d3f153e3ee3cc3d14212e14a37644c47e9f2d26c97861d504fea71940c706096
b0f42cae8f2493068f26d1f49f946e620058106166be21bd63baefcb180f7810
2589053adc1f830c667dfd5ac4fadf0c8161b8a48ae2c30200cfc5e3b8bb7957
9f1c60dfe106ec7cbad8a68319b60af6dc727a4e4d429baf1f64b4d417f715d9
93fa8abcfaf60fd33ebdc7ec31cce252605a225e1f5302ba8c19dbca9cc92229
62247624c068970cd4cff25cb07e8c94cdac59bd44de799f3db1664ce0913789
f57fe36d26c052360dad052b486ce8a93a0f518aa1eb32bbc8ea526752f41d77
f2e55acc8c59b0ae0d9af5d6fdc4cde720ab44f56e0918603b81520b3709b2ab
8445b6e4cc719abdd73d428e7f67aec6d3654b84d15f404bca9a8e6474983b37
f46ab59d7c9aee2d76f156fdec348affcc8d16dbf47f8aa85a8d2e31168a89b8
6354d6716654177ebf8f705971eee33e37280734eb2f3f3d0a9cdbab95ab22bb
4134c7efd5bd2f8894e8311031959ffa637e324e127366dfa133f538096f215a
984362a42eb6c372f22a0c90cece3df3ab71169eaa7853d23c4b228e5d8caacb

2c5da5f76808b9fc6f4b7a1105d2f69816fa264f7d713c36d0600569b3c21616
dc0b933d259b5ec516e5d361da3ae3cff5bbba53e8895db485dc9a3f4a4b42c3
16590482d1729a5353599009da917e36cab70e497fbcf4a7e808c0ba6cbedc65
87a4df9398fb294d19edd844ce9b5e5753a988cf0c2174e18ce7767b10b3c778
e2544724e868485ed7d4de0b95fdd240d7221d2b2fc3b7834b7bd287f303dfb2
9b713329c00f2a98883ea68144c621490804f1bd09aec8fc1ef242229db914b6
3d3f497a038e3061a11ee8ce239700d928c40d25b764934003690d6748db0bee

MORE WITH:
vt search 'metadata:VPS2day size:75KB+ size:100KB-' --identifiers-only=true
--limit=25
--cursor=NMvJrqPKAQDQfT7jSr1KeBeKydXSVWQmAzaDAYONIiFGM48Fpojy71m03vIs
zn-_blXffP3-KhEal9_f35_P56-tmtcFDShu_0qH7jseq--N_q56lLdt9c77NP9e8nhOy3-n67
wM80-uY6ppwTbV70fZE071ujFG2qa-LCzo_vD927tEqsQk5tP0u_Yotp1cQWaxlXNYFHa
gShZUPw9B0nhyd_MyCkuWveSgPbfSqspxSjKCMdPaEGS5VkoZWVukdwfa0Pox0HuqG
MreCKeIHFJLa5JxW5H2ZpmX4yfAXBLHAn11zwrDg9QibBHh2adccCKgFh14RcFSbC_XP
1nAygxZOElRyIkvzbt1OpEQGjtjyOndCcYY8jg7K-dFOLxDZNnIkJ5zyog6TzYLJ-78O7eWtxl
ttTFBZj-6A2NuXj0TlCARP1HM6AXLO8qy7usBTpeGupeLs3Fre76h_ALFyk2UeCrC5LNdL
GjatmMOV9yPVC2wF11Wkq2Xe0hRMoMe1SeUilK835phuoh1b54Iutu7cXxvoag9FW0
g9pdNvTNfJK7XgjimQ84r6SrjklxwaR6paB9PlT7PgWbSQjrKF_GN7GJHemTuH_zZ5XSJX
OUjjnQF4TiZ5LXNqGZUuWufokJwkZ4aAd31XLDRawzIx_F0H-jRoSivWbNzDJmgzbWDJ
Kwz-5D2U7qgzmcdmD6vSj9Wx4gL52lALzxPvWvS3TbP2XK6uF1wuzZH7S-UgQNz0qHr
4bC5jhY5b-MNVIMDHRzO2UuicOj0IRVFXBR9mNifBMGKiz3gx8fDERVN8cM5kqfPbtnh
XMzE-dzrlVZITJHAHTPtVfKsmoVGnfGjwoxcTwcxB3g0RMASONuS3bS-Oc-R4TRMXPxM
OXzZSPwAH1xV2wnrqLBIGO-In5SEYTT6nk06-EVcGx5CrOqEWvbzzQ1u0oW_z4rc3h88
T3gi3ygh1AWA7h9-QAgwT25iO5Ufq-15yOyp52uhnz3iZaqhvUXVuEDCB9uLqS7QZQOx
NyTK30vx8Yj1PZ02VelUl0WArzGncmzPb0oyOq5_P-13_h4UV00oZqG-cIFqRumRNpczn
byJW2ShUwHYtuDCkpwjsER4VIFR1SbNmJJIM5CvA3AOK1bVwEFSWhNyqN4uy6p33V
B5c_Cu8AQmqo4Zjm7NCbK9h-BbCOiN3ZxVbIqP3A1s__7PSpKAm9Z8xj9djuIsRvEv-uzb
Lshi_M-lOvJf9Jlnr8IvIPxNiiSvAvGntlVXoR_A_lGWL-lcjWiYl2joW_yD5jX_-teXVRRLjr5-k_
_7x_8DAAD_

APIv3 - Search and Download VTI



VirusTotal

Where -d is download and -n is number of results

✘ blevene@blevene-imacpro ~/Malware_Stuff vt search "metadata:VPS2day size:75KB+ size:100KB-" -n 25 -d
20150fb9e6d1245c1c4be577dfaee198a474ab39595cd191963bea6da6645ceb [ok]
b331ae16014d6219f1e2e3a2e2d568e7836bfbb0e6b40ec081a3c71edd508a37 [ok]
3b8f3ddf364e1ae822b4cf53052eb1a2ed8eca3c18b3ee36a2e0da94fc20023a [ok]
7430193891a295771ef76047dde5a7965adb23f86dac0631f102111e4d8587aa [ok]
7564707affb852b6dd91ba86876965a6f9c78ed910b95a157c022c1402cb4765 [ok]
9f1c60dfe106ec7cbad8a68319b60af6dc727a4e4d429baf1f64b4d417f715d9 [ok]
2589053adc1f830c667dfd5ac4fadf0c8161b8a48ae2c30200cfc5e3b8bb7957 [ok]
d3f153e3ee3cc3d14212e14a37644c47e9f2d26c97861d504fea71940c706096 [ok]
93fa8abcfaf60fd33ebdc7ec31cce252605a225e1f5302ba8c19dbca9cc92229 [ok]
b0f42cae8f2493068f26d1f49f946e620058106166be21bd63baefcb180f7810 [ok]
62247624c068970cd4cff25cb07e8c94cdac59bd44de799f3db1664ce0913789 [ok]
f57fe36d26c052360dad052b486ce8a93a0f518aa1eb32bbc8ea526752f41d77 [ok]
f2e55acc8c59b0ae0d9af5d6fdc4cde720ab44f56e0918603b81520b3709b2ab [ok]
8445b6e4cc719abdd73d428e7f67aec6d3654b84d15f404bca9a8e6474983b37 [ok]
f46ab59d7c9aee2d76f156fdec348affcc8d16dbf47f8aa85a8d2e31168a89b8 [ok]
6354d6716654177ebf8f705971eee33e37280734eb2f3f3d0a9cdbab95ab22bb [ok]
984362a42eb6c372f22a0c90cece3df3ab71169eaa7853d23c4b228e5d8caacb [ok]
4134c7efd5bd2f8894e8311031959ffa637e324e127366dfa133f538096f215a [ok]

2c5da5f76808b9fc6f4b7a1105d2f69816fa264f7d713c36d0600569b3c21616 [ok]
dc0b933d259b5ec516e5d361da3ae3cff5bbba53e8895db485dc9a3f4a4b42c3 [ok]
16590482d1729a5353599009da917e36cab70e497fbcf4a7e808c0ba6cbedc65 [ok]
87a4df9398fb294d19edd844ce9b5e5753a988cf0c2174e18ce7767b10b3c778 [ok]
e2544724e868485ed7d4de0b95fdd240d7221d2b2fc3b7834b7bd287f303dfb2 [ok]
3d3f497a038e3061a11ee8ce239700d928c40d25b764934003690d6748db0bee [ok]
9b713329c00f2a98883ea68144c621490804f1bd09aec8fc1ef242229db914b6 [ok]

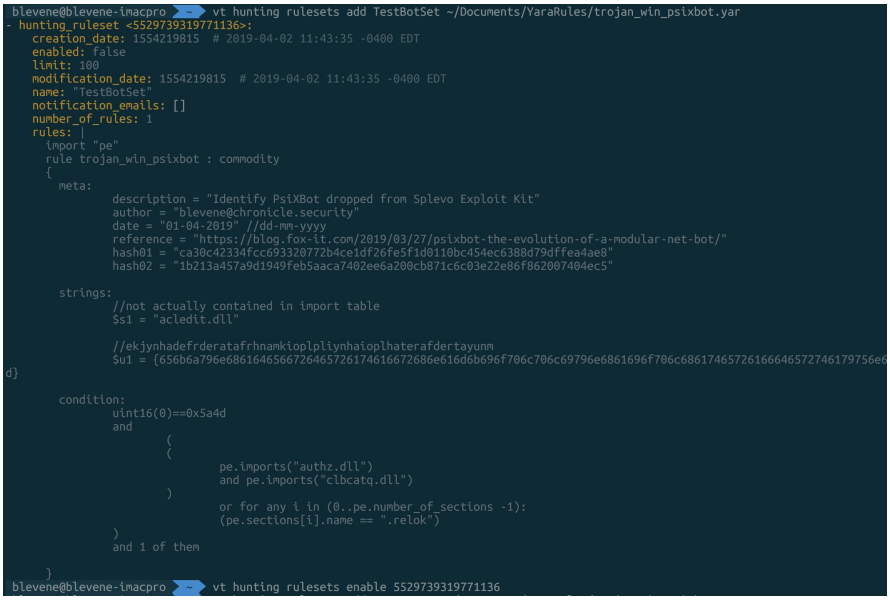
APIv3 - VTGrep

VirusTotal

Where -I is identifiers only (hashes)

blevene@blevene-imacpro ~ vt search "content:FirstStageDropper.dll OR content:SecondStageDropper.dll" -I
feaa627fa65c452b75522ea3633e51f1842fc7577a523d43c5ea529c8aa08713
3485c9b79dfd3e00aef9347326b9ccfee588018a608f89ecd6597da552e3872f
a09273b4cc08c39afe0c964f14cef98e532ae530eb60b93aec669731c185ea23
a09273b4cc08c39afe0c964f14cef98e532ae530eb60b93aec669731c185ea23
43f7ae58e8e5471917178430f3425061d333b736974f4b2784ca543e3093204b
a260d222dfc94b91a09485647c21acfa4a26469528ec4b1b49469db3b283eb9a
a260d222dfc94b91a09485647c21acfa4a26469528ec4b1b49469db3b283eb9a
2d7cb5ff4a449fa284721f83e352098c2fdea125f756322c90a40ad3ebc5e40d
a63437a044d3ad01c52b0b18016bfdb8af2338067a4216be2dcaa04ec8ecee97
bf38bea3f89a697b0be13413b0fb1db2154b3dc79fffbee238014e4adeb0b880

APIv3 - Upload A Rule



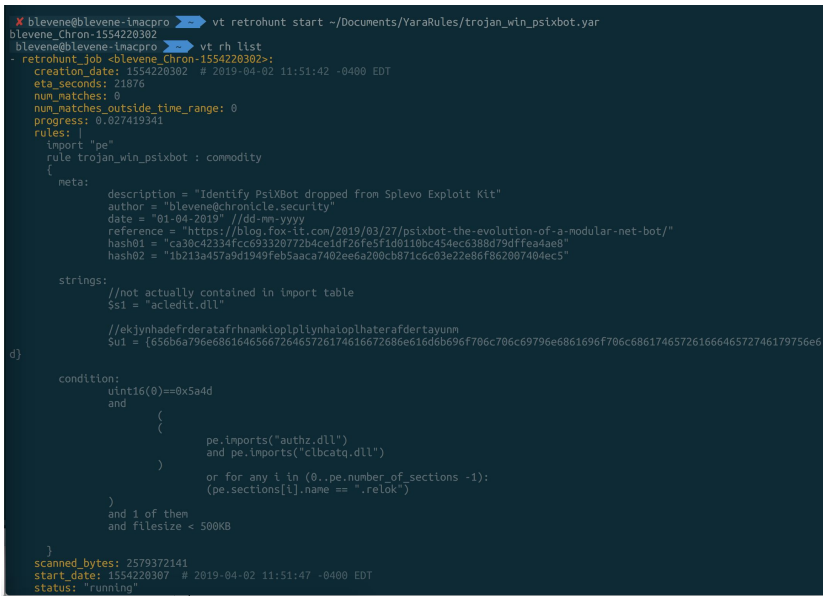
VirusTotal

Full Console Output

```
blevene@blevene-imacpro  ~  vt hunting rulesets add TestBotSet
~/Documents/YaraRules/trojan_win_psixbot.yar
- hunting_ruleset <5529739319771136>:
   creation_date: 1554219815  # 2019-04-02 11:43:35 -0400 EDT
   enabled: false
   limit: 100
   modification_date: 1554219815  # 2019-04-02 11:43:35 -0400 EDT
   name: "TestBotSet"
   notification_emails: []
   number_of_rules: 1
   rules: |
    import "pe"
    rule trojan_win_psixbot : commodity
    {
          meta:
                description = "Identify PsiXBot dropped from Splevo Exploit Kit"
                author = "blevene@chronicle.security"
                date = "01-04-2019" //dd-mm-yyyy
                reference =
"https://blog.fox-it.com/2019/03/27/psixbot-the-evolution-of-a-modular-net-bot/"
                hash01 =
```

```
"ca30c42334fcc693320772b4ce1df26fe5f1d0110bc454ec6388d79dffea4ae8"
        hash02 =
"1b213a457a9d1949feb5aaca7402ee6a200cb871c6c03e22e86f862007404ec5"

    strings:
        //not actually contained in import table
        $s1 = "acledit.dll"

        //ekjynhadefrderatafrhnamkioplpliynhaioplhaterafdertayunm
        $u1 =
{656b6a796e6861646566726465726174616672686e616d6b696f706c706c69796e68
61696f706c6861746572616664657274617 9756e6d}

    condition:
        uint16(0)==0x5a4d
        and
            (
            (
                pe.imports("authz.dll")
                and pe.imports("clbcatq.dll")
            )
                or for any i in (0..pe.number_of_sections -1):
                (pe.sections[i].name == ".relok")
        )
        and 1 of them

}
blevene@blevene-imacpro ~ vt hunting rulesets enable 5529739319771136
```

APIv3 - Start a Retrohunt



VirusTotal

Full Console Output

✘ blevene@blevene-imacpro ~ vt retrohunt start ~/Documents/YaraRules/trojan_win_psixbot.yar
blevene_Chron-1554220302
blevene@blevene-imacpro ~ vt rh list
- retrohunt_job <blevene_Chron-1554220302>:
creation_date: 1554220302 # 2019-04-02 11:51:42 -0400 EDT
eta_seconds: 21876
num_matches: 0
num_matches_outside_time_range: 0
progress: 0.027419341
rules: |
import "pe"
rule trojan_win_psixbot : commodity
{
meta:
description = "Identify PsiXBot dropped from Splevo Exploit Kit"
author = "blevene@chronicle.security"
date = "01-04-2019" //dd-mm-yyyy
reference = "https://blog.fox-it.com/2019/03/27/psixbot-the-evolution-of-a-modular-net-bot/"
hash01 =

```
"ca30c42334fcc693320772b4ce1df26fe5f1d0110bc454ec6388d79dffea4ae8"
        hash02 =
"1b213a457a9d1949feb5aaca7402ee6a200cb871c6c03e22e86f862007404ec5"

    strings:
        //not actually contained in import table
        $s1 = "acledit.dll"

        //ekjynhadefrderatafrhnamkioplpliynhaioplhaterafdertayunm
        $u1 =
{656b6a796e6861646566726465726174616672686e616d6b696f706c706c69796e68
61696f706c6861746572616664657274617 9756e6d}

    condition:
        uint16(0)==0x5a4d
        and
            (
            (
                pe.imports("authz.dll")
                and pe.imports("clbcatq.dll")
            )
                or for any i in (0..pe.number_of_sections -1):
                (pe.sections[i].name == ".relok")
        )
        and 1 of them
        and filesize < 500KB

  }
 scanned_bytes: 2579372141
 start_date: 1554220307  # 2019-04-02 11:51:47 -0400 EDT
 status: "running"
```

APIv3 - Retrohunt Matches

VirusTotal

Where -I is the file identifier (sha256 only) and -n is number of results (to auto iterate over pages)

blevene@blevene-imacpro ~ vt retrohunt matches blevene_Chron-1554220302 -I -n 50
2644cd4a843e35b807271aeff9ec17a48a7b3214fc052b625dba89796822a240
a7490c93e8423909cf1c53571697b260c17e0b0661bfa538754d72daf965a156
1b213a457a9d1949feb5aaca7402ee6a200cb871c6c03e22e86f862007404ec5
68102340ddf132808aa231e8884b3426bc430136ac5119228217edd2adc0d83b
c8d2af690ee697a4cb2e3cf81c75227151ed6b96c763892858c47f87677c2807
0252e1e82ce3992e48b6dabc90f33188183ac5029b8d5049f47d087bfdb5bcab
6fb4b6a4e5367ce4bff82fdadb3b3ef64a393b9ee86e677ebaec658606310bd0
ef363c3be4fe16411dcfb52599c9242ef0377daa8742c1e672ace0055f3c88d8
15049d944375f2022a5b3f31dcd0ea9c02f517a6153d9cfc4d8c841d7efe2248
fd35b23d2c02bdd57245acf109fb6961bfaa205a91083983b80898ff2ab5c14d
3736b350803dbac08691679556a35216c318ddd5e10722c5279118d812e721c0
e66a2a247964480415d75b1f524f13f14081c737cdfdca39559a706bd808e8b7
8e13b9d80a746203d2a0e768491c62ee550402e17274e022453adcc7ef1ffbde
9c644b4cabc14cccc485c2656c291a1089fffe9e0bc6f07d2c17db2bf578095d
ca30c42334fcc693320772b4ce1df26fe5f1d0110bc454ec6388d79dffea4ae8
253c4cbf357de49e240ba1695570e20667586dbdeccd820a2d94e773e85b1889
d0a48a5b3faf5e9a531b8fcf2c0be676b20975dfceec624109fec560c4a240aa
21c4e6dfb9017b6de79676649b69de5962883eba8315c0ceef6523bb16d11e72

e985706257e2c9f781723aee5007ccc3bfd16671302e0a53cda1164023cab94e
4f582ecdd2c8d27e78e774e928a81e9e2f825a90bf2a47659da69810487cb9ee
98d56ba99a8ac192c0cdfed04d989dd60c16e2a8213fc9958be2a6de55696694
e1f459ebd4092ab0b452f3ad6de821d216bd5dc284c497c8c598d01e5543de3f
b2c46f10674f5896b5286607eedf7926dc041e9d12b714df5e9c47cf68ac53d5
cd80b1f027bd4b60b9ff07f66de99d8fcd94dd8efa831bf6671d12c1a2f64c8d
c819375b811d44d9b4df8a60abb1d172e5bbe6ca9aaab69d32e1fddd731cc956
d8235ef57a807f41a4fe10638556b0b190c288ec7dbdb3caa7051daed36d4c89
117a74639b66dc02c05bb001fd56fe7ac9bee3e455da4f610512ae2da266863a
af69fa9caa8854bc3925dad5d3b44e5703a229327239c904aa7ecf5b41ec00e4
c5d5e51532eed12cb9d86dfe9db390bc1d11b5b6f0d87e554b66f925bec5aa56
cb0f11d274f1afa6b165f083e4bfc16bc180b1973c19af2cf682907e43fd1dc9
ebfa7d124cea4879272fbd573905f8ab2c26ca8726456b6729934cdd137e5413
560698ec061d49e68641ddc7540b41dbb51e92ec95d313227ed3c60c62f4753d
49c183642a00ef798febc3863dc81152088edc1ad564dd48f500991dcbe3531b
832ea36a11d13e0ce5f6fcd527627c777428f2d44efd0b4ad54ca8fa5a6cd035
3036fae7550f78c47af3d8d9e9f241cb0a84da9c48c71d9ed849830c1fa53311
ecdbfa957b07ed7f07b614e2e3a2a75925ef05540bdee6e03827516b4ae09611
a880bc28ca5d5ce380e8a577cc238e0d917515ebcc07b352bb43db54d858b2dd
bb90f394332450601dbb10c539d68cb8ad9d03ddc25efc41b81e4e8bafd90aee
ffc7533231c9c6cb6f8ce6b3b0d9a9d1b66046650bf67c36d3d38111f84b61c8
5deb49db0a16cd1588a0b3d8ceea97d9d6cf73ca83814a32c540947359994b4a
39ade6f3e847ba1c2918920743e85fbc71642a2eac731a3ab1387cb8e491b038
39ade6f3e847ba1c2918920743e85fbc71642a2eac731a3ab1387cb8e491b038
b3fd922d6e9b405ec4415aac4927e53f173d2b8c91f105f516d1f147f42412e6
4f5cc216cb3f6a77c14ecf803095ca44003dcb1ce54944209c859ace9e02e535
31d1194936842cfca74d2526cbc75f0801ce54eeab9a85bb107fd3d5b627d055
9054f32c2bb375fea99bced0b9ea0654d724b6b53a48ca03c3f8d1b379160fcd
893fef03eb3ab0afb9193858f7fa7a34c847d5b18ef2ca89ba97f57515d9894f
c0e6ecc25387d5d537bf24110acd31232028d1c2bff7e3cdef67c28218f3da6b
7e2dc01cd6f14c57d95fe9421f5120b2bbe858028a3330fb1f3f3c1909bbc45d
f64f5f11a5c0d2a6983607b4b8789b6be3ab0dd1ba7114e876fcb5ab2c8d8585

APIv3 - Hunting Notifications

```
blevene@blevene-imacpro ~ vt hunting notifications list --cursor=JM3PTsIwHADgu4_RxJvSysQFEmLmKGQCMxDDYDEh3dbRn-va2T9b1PjuHrh9t-8XbUA1aIaEc52dYTwMw6gH463TjslRqVvMOsB9gL3lxuJC8p4rfo6F0QoLrxyoy1lpBzWUzIFW9tlweZWAzs5rkPzDEzJ-Kr2x2szj5nFNd5rmqyXJ98lrvOV1uP05WU5j-nn4osf0vmrld3VMSRHsRbFKbREcmhKiDRVpUmUTwrKJem-nhGV5dxovCcumfpXEUZiG67DbbRYvlyiJ6G2wuNYSWnDzB4Lu0FtdW-7QjPzd_AcAAP__
```

```
- hunting_notification <5223863694327808>:
    body: ""
    date: 1554217750  # 2019-04-02 11:09:10 -0400 EDT
    file: "1a7a99b970fdbe2c8321398be15c30a0367fc66d7d36c72f7e3e3cca332c556f"
    subject: "AV_trojan_win_Emotet: Emotet"
    tags:
    - "emotet"
    - "av_trojan_win_emotet"
    - "1a7a99b970fdbe2c8321398be15c30a0367fc66d7d36c72f7e3e3cca332c556f"
    - "av_emotet"
```

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Full Console Output

blevene@blevene-imacpro ~ vt hunting notifications list --cursor=JM3PTsIwHADgu4_RxJvSysQFEmLmKGQCMxDDYDEh3dbRn-va2T9b1PjuHrh9t-8XbUA1aIaEc52dYTwMw6gH463TjslRqVvMOsB9gL3lxuJC8p4rfo6F0QoLrxyoy1lpBzWUzIFW9tlweZWAzs5rkPzDEzJ-Kr2x2szj5nFNd5rmqyXJ98lrvOV1uP05WU5j-nn4osf0vmrld3VMSRHsRbFKbREcmhKiDRVpUmUTwrKJem-nhGV5dxovCcumfpXEUZiG67DbbRYvlyiJ6G2wuNYSWnDzB4Lu0FtdW-7QjPzd_AcAAP__

- hunting_notification <5223863694327808>:
  body: ""
  date: 1554217750 # 2019-04-02 11:09:10 -0400 EDT
  file: "1a7a99b970fdbe2c8321398be15c30a0367fc66d7d36c72f7e3e3cca332c556f"
  subject: "AV_trojan_win_Emotet: Emotet"
  tags:
  - "emotet"
  - "av_trojan_win_emotet"
  - "1a7a99b970fdbe2c8321398be15c30a0367fc66d7d36c72f7e3e3cca332c556f"
  - "av_emotet"

APIv3 - ASCII Cinema

https://asciinema.org/a/179696

VirusTotal

https://asciinema.org/a/179696

Thank you.

info@virustotal.com
virustotal.com/learn