Advanced Threat Intel and Hunting (Using Virustotal)

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World-largest threat observatory

Massive amounts of data. instantaneous searching

Any kind of threat observable (files, URLs. domains. IPs)

Multi-angular characterization (AVs, whitelists, sandboxes, etc.)

- Diverse, global, **crowdsourced**. real-time
- Unparalleled history, going back to 2004

15 YEARS
OBSERVATIONS GOING BACK TO 2004

2.4B FILES
50B+ considering compressed bundles

2M analyses per day

600 M+ sandbox reports

232 countries submitting files

1.9 M users per month

4.6B URLS
6M+ URL analyses per day

1.6B DOMAINS

2.5B pDNS RESOLUTIONS

45/71
70+ Antivirus vendors
70+ URL blacklists
10+ Sandbox partners

Threat hunting - why

- Get as much visibility as we can from known malicious activity.
- Find new undetected threats.

Supercharge your security operations

VTAPI

Integrate VT into security tools

Automate workflows with VT

Programmatic enrichment of alerts

Any kind of threat observable

VTINTELLIGENCE

The “Google” of malware

PBs of data queryable in seconds

Download files for further scrutiny

Pivot to similar and related observables

VTHUNTING

Apply YARA rules to live uploads, get notifications

Run YARA rules back in time, track attackers

Generate automatic YARA rules for groups of files

Download matches for offline study

VTGRAPH

Explore VT’s dataset visually, map campaigns

Automatic commonality and pattern discovery

Share and collaborate on investigations

Assisted investigation and expansion playbooks

VIRUSTOTAL

Free public service | 70+ Antiviruses | Vet suspicious files | 1M+ new files per day

VirusTotal

01

Let’s start with a simple example

VTGrep (aka Content Search)

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

VTGrep: Example 1, ASCII Strings

DETECTION DETAILS RELATIONS BEHAVIOR CONTENT SUBMISSIONS COMMUNITY

STRINGS HEX

```
cmd.exe %s%s"
D:\MyProjects\secondWork\Anchor\Win32\Release\anchorInstaller_x86.pdb
kernel32.dll
ADVAPI32.dll
KERNEL32.dll
kernel32.dll
mscoree.dll
```

VirusTotal

VTGrep: Example 1, ASCII Strings

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

Help

FILES 6

	Detections	Size	First seen	Last seen	Submitters	
AFD791CDD82B35AB187BDE91924F458A2FC109D8F15670A1DCDE3DE994990CA9 peexe	49 / 70	394.50 KB	2019-04-15 22:19:30	2019-04-15 22:19:30	1	EXE
44EA51D773DD10117EF76744A36C72F5F23D00C20C0A0F6A4F4436F40EEFAB80 netxaufk.dll pedll	46 / 70	136.00 KB	2019-06-20 14:17:19	2019-06-20 14:17:19	1	DLL
B288C3B3F5886B1CD7B6600DF2B8046F2C0FD17360FB188ECFBCC8F6B7E552A5 b288c3b3f5886b1cd7b6600df2b8046f2c0fd17360fb188ecfbcc8f6b7e552a5.bin peexe	54 / 68	112.50 KB	2019-07-21 14:59:03	2019-12-12 09:16:33	3	EXE
DA0D22FD7448E34BE162D4DECF18B23C1F4A76CD7EE125A8C8102C8358E84F04 ded204da5371a2b8118998d8e8b704e7.virus peexe overlay	52 / 73	112.62 KB	2019-08-07 12:20:13	2019-08-07 12:20:13	1	EXE
9B76C53A4C231933191524DDA8509B8DAEF8F0B2207F74D115DDFF65F56AAC2E 8a8cc9552fcc974e843842e8a289f673.virus peexe overlay	49 / 71	112.62 KB	2019-08-09 12:25:03	2019-08-09 12:25:03	1	EXE
FD27782F9C0FA6E74099738EFFD723AE17FE023AD0470A4B67DB4E205B3F9149 dc6aeedd38279559df27c0043b3cc5ea.virus peexe overlay	49 / 71	112.62 KB	2019-08-10 12:26:33	2019-08-10 12:26:33	1	EXE

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VTGrep: Example 2, Wildcards

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

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

FILES 6

	Detections	Size	First seen	Last seen	Submitters	
AFD791CDD82B35AB187BDE91924F458A2FC109D8F15670A1DCDE3DE994990CA9 peexe	49 / 70	394.50 KB	2019-04-15 22:19:30	2019-04-15 22:19:30	1	EXE
44EA51D773DD10117EF76744A36C72F5F23D00C20C0A0F6A4F4436F40EEFAB80 netxaufk.dll pedll	46 / 70	136.00 KB	2019-06-20 14:17:19	2019-06-20 14:17:19	1	DLL
B288C3B3F5886B1CD7B6600DF2B8046F2C0FD17360FB188ECFBCC8F6B7E552A5 b288c3b3f5886b1cd7b6600df2b8046f2c0fd17360fb188ecfbcc8f6b7e552a5.bin peexe	54 / 68	112.50 KB	2019-07-21 14:59:03	2019-12-12 09:16:33	3	EXE
DA0D22FD7448E34BE162D4DECF18B23C1F4A76CD7EE125A8C8102C8358E84F04 ded204da5371a2b8118998d8e8b704e7.virus peexe overlay	52 / 73	112.62 KB	2019-08-07 12:20:13	2019-08-07 12:20:13	1	EXE
9B76C53A4C231933191524DDA8509B8DAEF8F0B2207F74D115DDFF65F56AAC2E 8a8cc9552fcc974e843842e8a289f673.virus peexe overlay	49 / 71	112.62 KB	2019-08-09 12:25:03	2019-08-09 12:25:03	1	EXE
FD27782F9C0FA6E74099738EFFD723AE17FE023AD0470A4B67DB4E205B3F9149 dc6aeedd38279559df27c0043b3cc5ea.virus peexe overlay	49 / 71	112.62 KB	2019-08-10 12:26:33	2019-08-10 12:26:33	1	EXE

rusTotal

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 samples, OCR, macros, VBA code streams...

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VTGrep: content-experimental

Allows several operators (positives; size; type; and more)

Available to all Intelligence users

content-experimental → content :)

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02

I found nothing unique, still I need some context

How to calculate similarity

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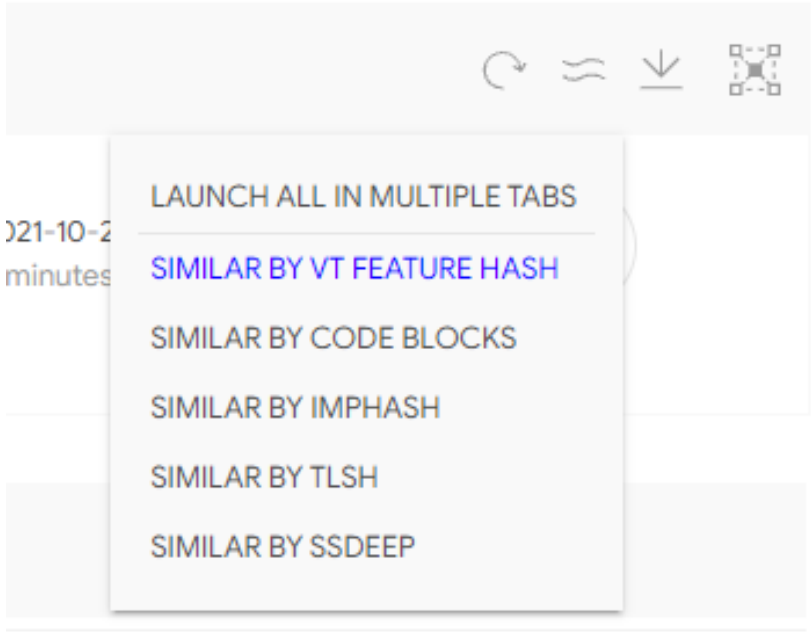
How is this useful



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03

Finding related artefacts and infrastructure

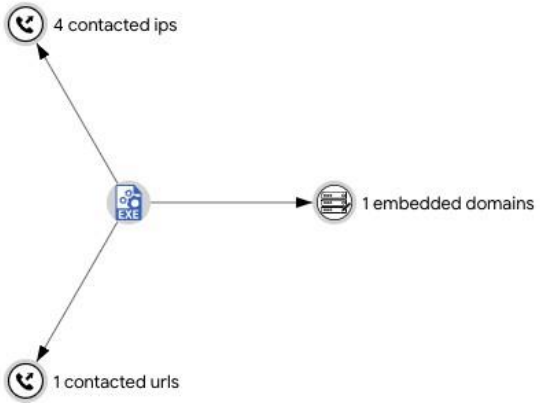
Static analysis

Find artefacts inside the binary

Embedded Domains

Domain	Detections	Created	Registrar
gmail.com	0 / 97	1995-08-13	MarkMonitor Inc.

Graph Summary



Dynamic analysis

Find relationships through sandbox detonation

Contacted URLs

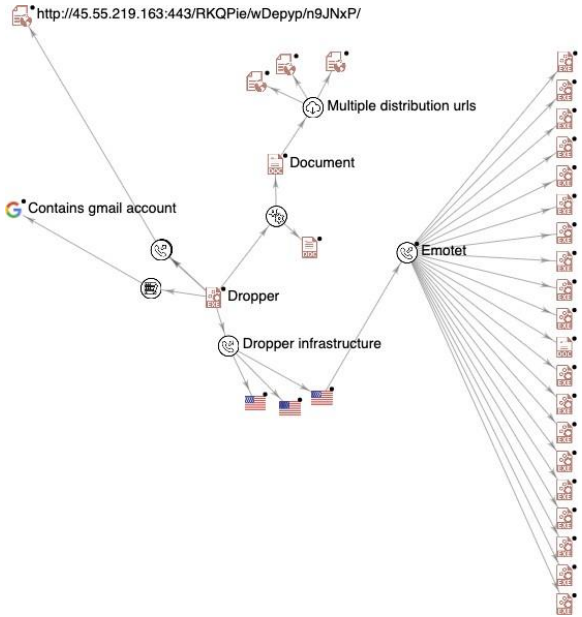
Scanned	Detections	URL
2020-11-18	7 / 82	http://62.30.7.67:443/8Iy7Q4G1EitRXhpS/I5Q31Eyh2hDq/H0edPIVkL2rq0/

Contacted IPs

IP	Detections	Autonomous System	Country
107.5.122.110	9 / 85	7922	US
45.55.219.163	8 / 85	14061	US
199.101.86.6	6 / 96	26128	US
62.30.7.67	13 / 85	5089	GB

ITW infrastructure

We have a good visibility of how this was distributed



04

Once we have all the data, let’s drop it into VTGraph

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

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VTGraph

DEMO

VirusTotal

LiveHunt

LIVEHUNT NOTIFICATIONS

Search notifications ?

6ec9d3a2302a7cd6b170b155a9a2f0eed3c264e25a2c829a5d8f7df2e44ee9dc log file.exe peexe assembly overlay apt_win_nedrat gazahackerteam	45 / 65	3.58 MB	2019-03-22 16:17:17 date matched 2019-03-22 16:14:19 first seen	1 submissions 1 submitters	EXE
7b081379d83e7bcfac3619f4b274f5d5e073b81618803f8feded0127bb8f6918 OFXVKAAL.EXE peexe av_emotet av_trojan_win_emotet emotet	12 / 64	748.5 KB	2019-03-22 16:13:33 date matched 2019-03-22 16:07:10 first seen	1 submissions 1 submitters	EXE
ba8aaca4dfb35315e502e66aede7be7aff535af42934024bd61391db8977f2ba DISM.EXE peexe overlay av_emotet av_trojan_win_emotet emotet	14 / 67	185.26 KB	2019-03-22 16:12:47 date matched 2019-03-22 16:08:55 first seen	1 submissions 1 submitters	EXE
aca9e4365fbfe563fc21779c81d54ec6037be9c8a2202b3bef0428c388389da6 etohaknairinik.exe peexe av_emotet av_trojan_win_emotet emotet	38 / 66	6.31 MB	2019-03-22 16:11:10 date matched 2019-03-22 16:03:47 first seen	1 submissions 1 submitters	EXE

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05

TOOLS FOR HUNTING

Name this Yara!

```
rule MW_neuron2_dotnet_strings : Turla APT
{
    meta:
        description = "Rule for detection of the .NET payload for Neuron2 based on strings used"
        author = "NCSC"
        family = "Turla"
        reference = "https://www.ncsc.gov.uk/alerts/turla-group-malware"
        date = "2018-01-18"
        hash1 = "83d8922e7a8212f1a2a9015973e668d7999b90e7000c31f57be83803747df015"
    strings:
        $dotnetMagic = "BSJB" ascii
        $s1 = "http://*:80/W3SVC/" wide
        $s2 = "https://*:443/W3SVC/" wide
        $s3 = "neuron2.exe" ascii
        $s4 = "D:\\Develop\\sps\\neuron2\\neuron2\\obj\\Release\\neuron2.pdb" ascii
    condition:
        (uint16(0) == 0x5A4D and uint16(uint32(0x3c)) == 0x4550) and $dotnetMagic and 2 of ($s*)
}
```

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From similarity to Yara

DEMO

Retrohunt

+ New retrohunt job

100 %	Finished	**blevene_Chron-1553198358** 20 hours ago rule Office_Base64_BreakCatchWide :maldoc { meta: description = "Potential Emotet maldoc using base64 wide encoded break->catch" author …	615 matches	
100 %	Finished	**blevene_Chron-1553197869** 20 hours ago import "pe" rule apt_win_cobint_dll : Cobalt_Group { meta: description = "Identify potential CobInt downloader DLL Trojan samples, unique to Co…	1011 matches	
100 %	Finished	**blevene_Chron-1553179894** 1 day ago rule apt_win_EyeHawk : CN { meta: description = "Identify payload from RTF: 69f44ca082ed90c97d9c4ebaae589d7e41c69b02e582cc69886ebf…	5 matches	
100 %	Finished	**blevene_Chron-1553117311** 1 day ago rule astra_docs { meta: description="ver1 of astra_docs" author="JDP" strings: $header = {d0cf11e0a1b11ae1} $a1 = "PROTECTED CONTENT"…	12 matches	
100 %	Finished	**blevene_Chron-1553115402** 1 day ago import "pe" rule LockerGogaRansomware { meta: description = "LockerGoga Ransomware" author = "Christiaan Beek - McAfee ATR team" date …	7 matches	
100 %	Finished	**blevene_Chron-1553023105** 2 days ago rule ransomware_win_lockergoga : ransomware { meta: description = "Identify LockerGoga ransomware, mostly clustered around Dutch and Dan…	15 matches	

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LiveHunt: “VT” Module

```
import “vt”

rule yara_on_steroids_demo

{
  condition:

          vt.metadata.analysis_stats.malicious > 1
     and
     vt.metadata.file_type ==
     vt.FileType.PE_EXE  and
          vt.metadata.new_file
     and
     vt.metadata.submitter.country == "CN"
     and
          for any engine, signature in
vt.metadata.signatures :
     (
                    signature contains "zbot"
          )
}
```

VirusTotal

“VT” Module - Behaviour

```
import “vt”

rule yara_on_steroids_demo_behaviour

{
  condition:

for any file_dropped in vt.behaviour.files_dropped : (
                    file_dropped.path contains
"foo.exe"
)
or
for any mutex in vt.behaviour.mutexes_created : (
          mutex == "HGL345"
)
or
for any trait in vt.behaviour.traits : (
     trait == vt.BehaviourTrait.PERSISTENCE
)
}
```

VirusTotal

Searches into Yara Livehunts

type:docx and p:10+ and s:3+ and tag:macros and fs:2020-09-15T16:59:22+

```
import "vt"

rule new_potential_droppers
{

 condition:

vt.metadata.analysis_stats.malicious> 10          and
vt.metadata.times_submitted>3                     and
for any t in vt.behaviour.traits : (
          t == vt.BehaviourTrait.MACRO_POWERSHELL
)
          and
vt.metadata.file_type ==                          and
vt.FileType.DOCX  for any tag in
vt.metadata.tags : (
)     tag == "macros"
          and
vt.metadata.first_submission_date > 1600191396

}
```

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06

IDA PLUGIN

VT-IDA plugin

- Search for a sequence of bytes or similar code, directly from the IDA Pro interface.
  - Disassembly and Debugging windows.
  - Strings window.
  - Follow VTGrep syntax when creating queries.
- v0.10 includes IDA Pro 7.5 support.
  - https://github.com/VirusTotal/vt-ida-plugin

Search for similar code

```
55                          push    ebp
8B EC                       mov     ebp, esp
68 04 01 00 00              push    104h
6A 00                       push    0
68 B0 EC 24 01              push    offset byte_124ECB0
E8 FC F7 FF FF              call    sub_1193080
83 C4 0C                    add     esp, 0Ch
A1 E8 E0 24 01              mov     eax, off_124E0E8
8B 48 04                    mov     ecx, [eax+4]
51                          push    ecx             ; lpString2 = 0 --> Genera excepción
68 B0 EC 24 01              push    offset byte_124ECB0 ; lpString1
FF 15 28 50 23 01           call    ds:lstrcpyA     ; LPSTR lstrcpyA(
                                                    ;   LPSTR  lpString1,
                                                    ;   LPCSTR lpString2
                                                    ; );
68 10 27 00 00              push    10000           ; dwMilliseconds = 10 segundos
FF 15 44 50 23 01           call    ds:GetCurrentThread
50                          push    eax             ; hHandle
FF 15 40 50 23 01           call    ds:__imp_WaitForSingleObject
E8 4E D7 FF FF              call    Create_New_IAT
E8 89 F7 FF FF              call    Collect_Info_From_Registry
E8 F4 FA FF FF              call    Create_Report
```

content:{558bec68040100006a0068[9]83c40ca1[4]8b48045168[10]6810270000ff15[26]33c05dc21000}