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Emerging Threats
Ransomware: The Rise, Death and Resurrection of Digital Extortion

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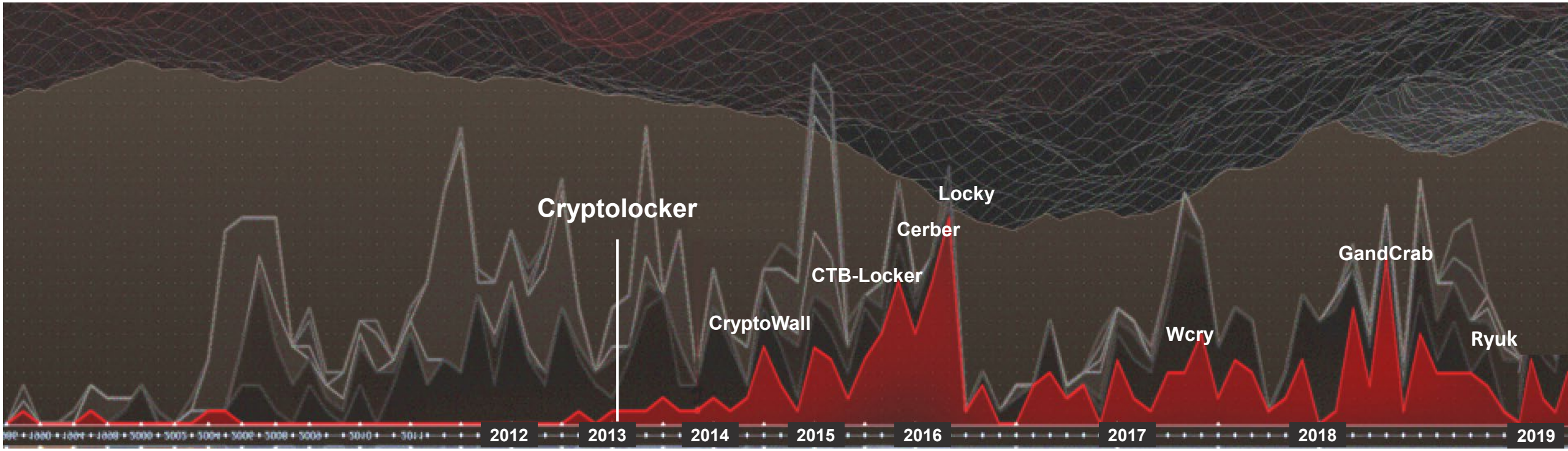
So what is on the Menu today?

- This session is primarily focused on Ransomware
  - The Rise, Death and Resurrection of Ransomware explained
  - Insights in one of our ransomware investigations
  - Prevention tips
  - Mitigation tips

The fall (Death): Decline in new ransomware families 2018



Signature based approach

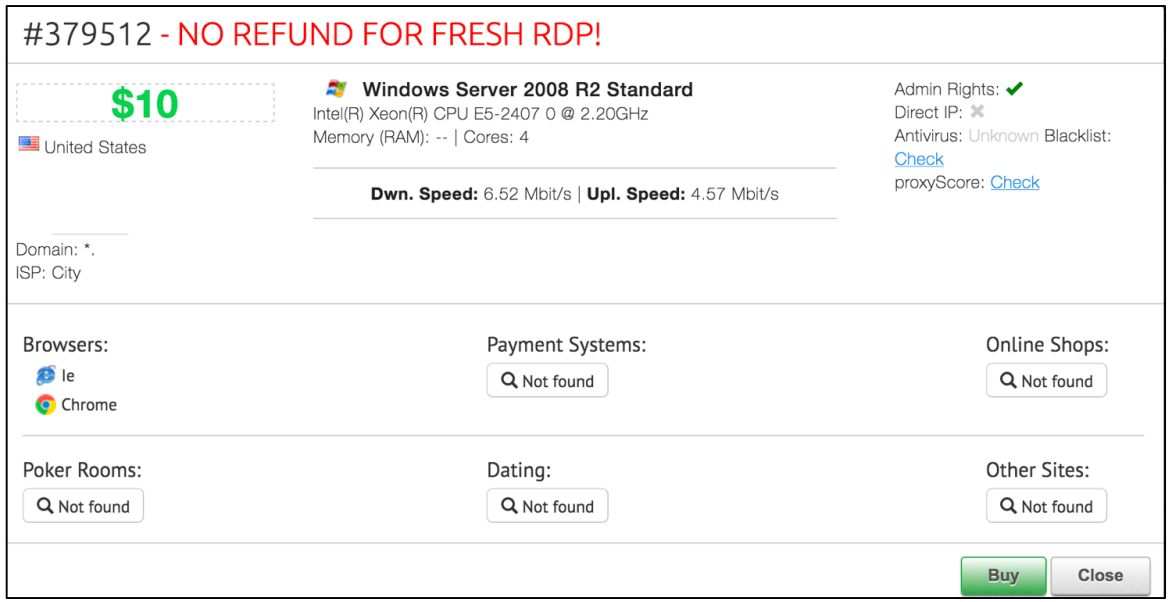
Anti-ransom technology

No More Ransom

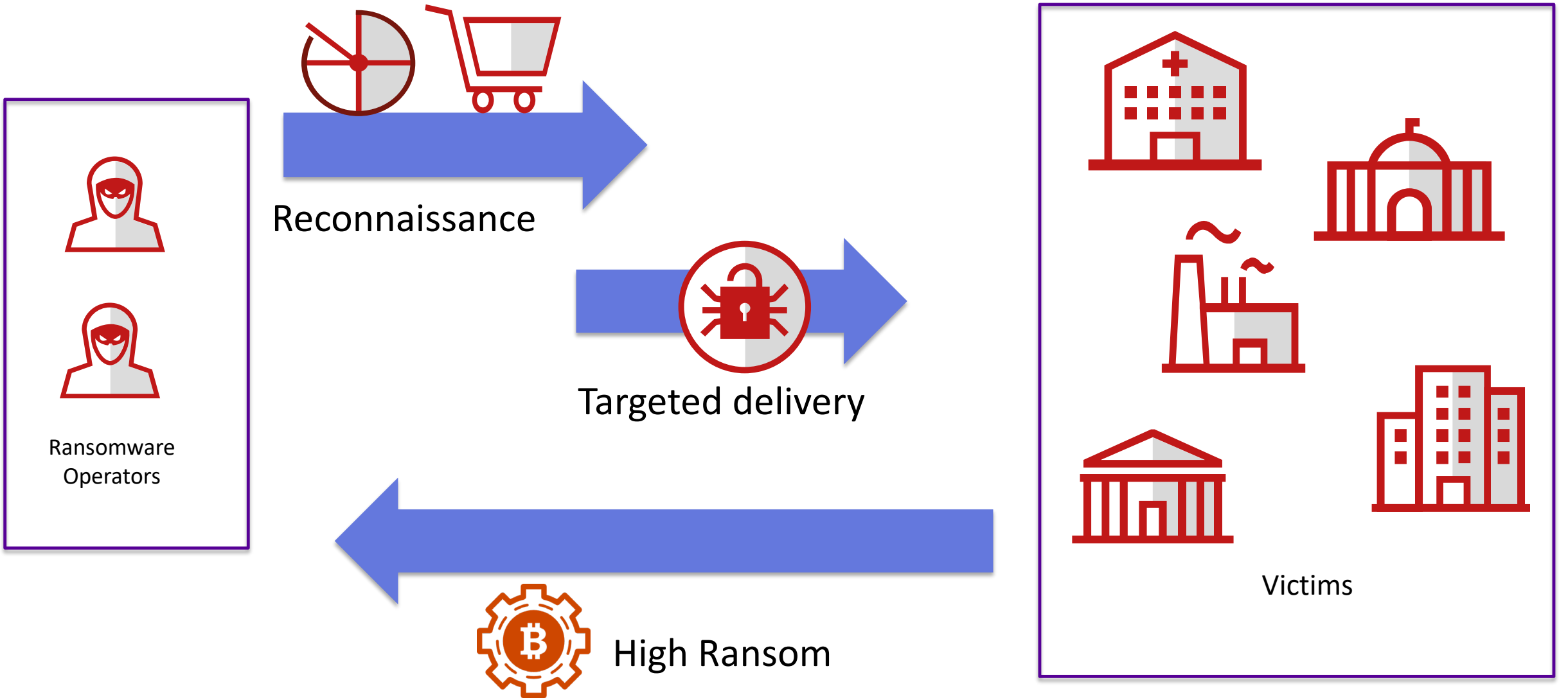
Ransomware Resurrected

From opportunistic to targeted

- RDP based attacks are increasingly favorable
- SAMSAM, Bitpaymer, Ryuk, GandCrab and now also Matrix ransomware



Rise : targeted Ransomware



Rise : Ransomware-as-a-Service are growing stronger

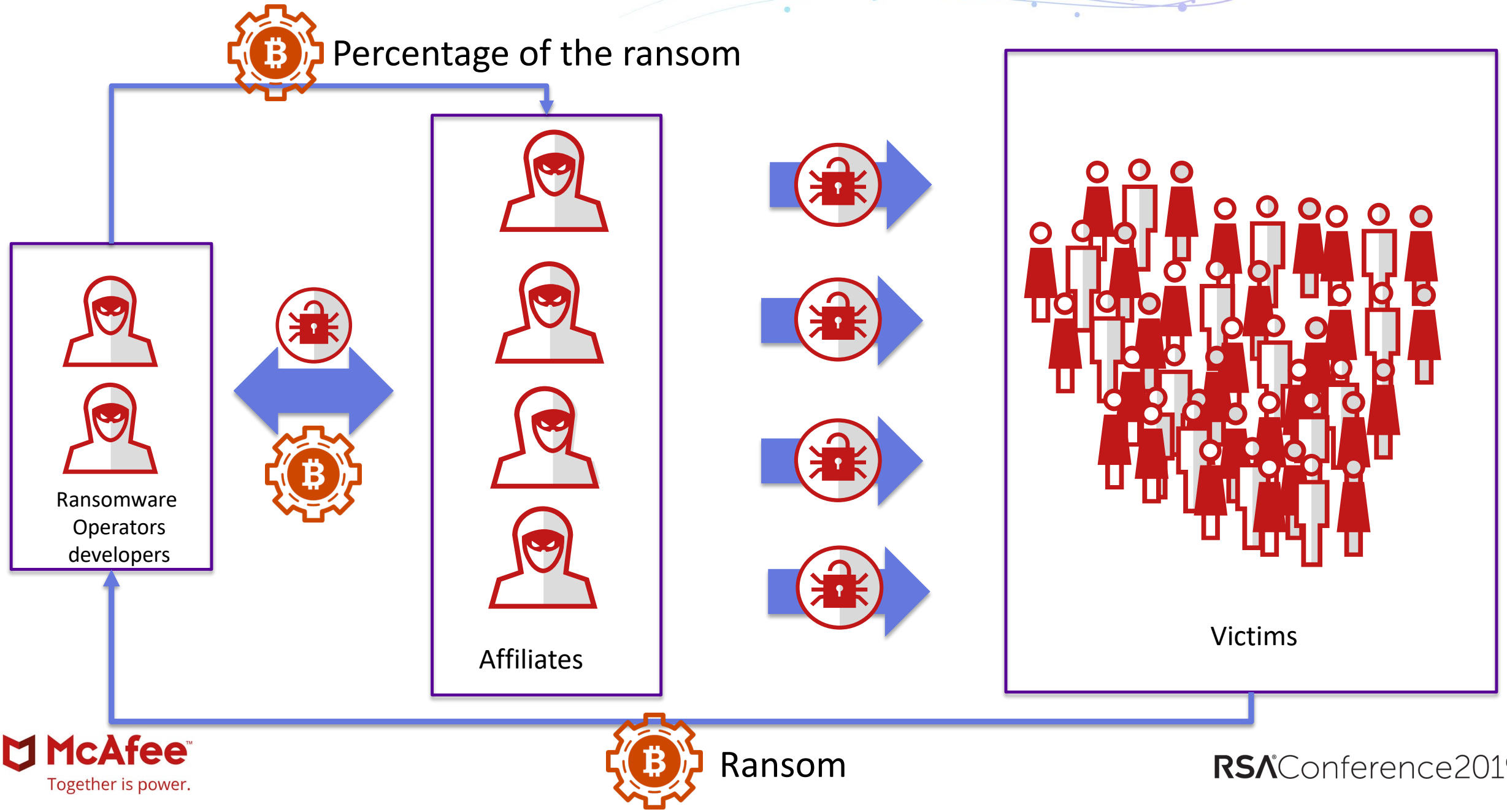
New Fallout Exploit Kit Drops GandCrab Ransomware or Redirects to PUPs

By Lawrence Abrams

September 6, 2018 06:24 PM 0

A new exploit kit called Fallout is being used to distribute the GandCrab ransomware, malware downloading Trojans, and other potentially unwanted programs (PUPs).

Rise : Ransomware-as-a-Service (RaaS) Model



Gandcrab 09/27/2018 6:16 PM Sent # 128

GC Ransomware

No More Ransom

Group: Seller
Messages: 279
Registration: 12/18/2017
User No: 84 324
Activity: Virology

Reputation: 52
(6% is good)

Despite all the storms and storms, our crab steadfastly and proudly walks like a cruiser along the fairway.
Undoubtedly, I would like to thank you, dear adverts. It is your job that helps us go forward, look for unique solutions and be the flagship in our niche.
Our monthly income with you is more than 1 million dollars. And this figure will constantly grow. We invest most of our revenue into development — new **exploits** , new methods, **integration** with other services, and so on.
When we updated the crab for version 4, we thought that this would be the most global update of its entire existence and the coming months. But no. I dare to assure you that the new update is comparable in scale to the 4th version, and somewhere even surpasses.
I present you the 5 version of GandCrab.
What's new?
1. Added a PowerShell script builder in admin panel. Many people appreciate him because he allows him to pass where even the most top-notch LoadPE of crypts passes, and the ordinary one cannot even crawl to a cannon shot.
The PowerShell script allows you to pass antivirus protection like butter, while not leaving traces in the system. Thus, everyone can now independently build and use.

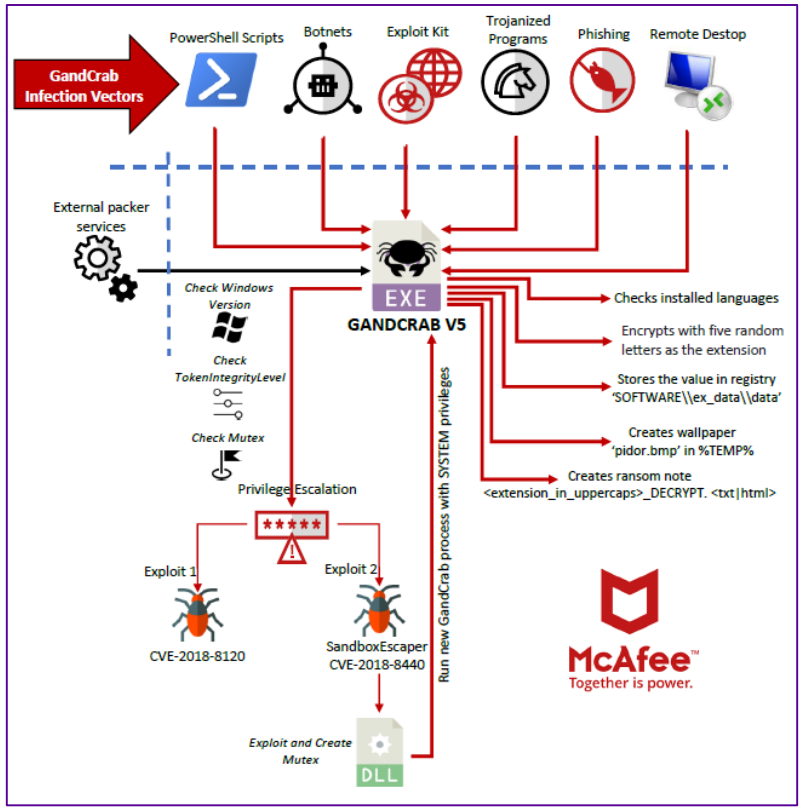
How to prepare a crab?

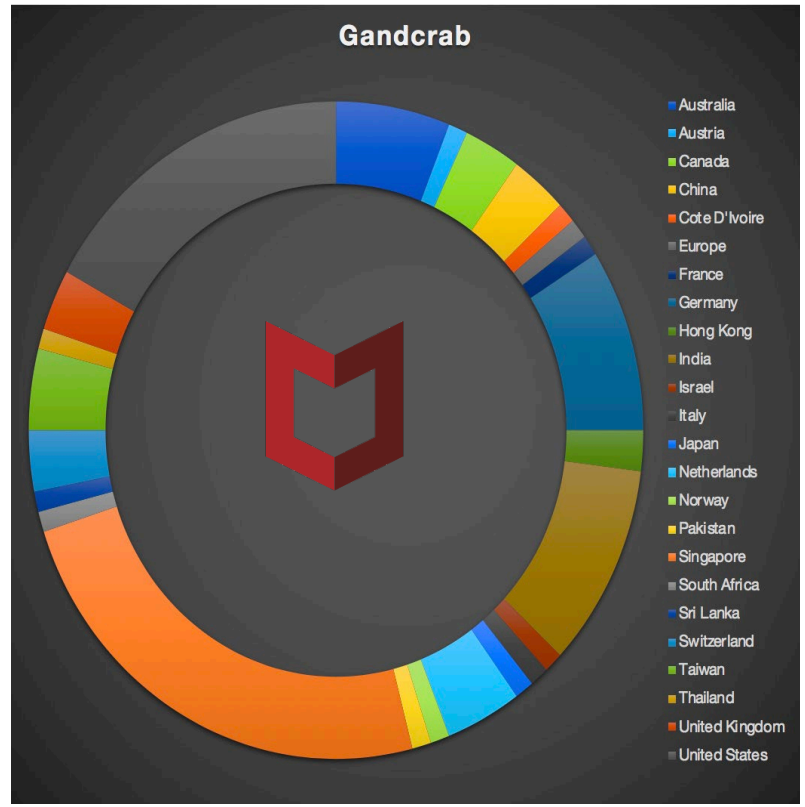
Breaking GandCrab's shell

Pulling it apart, building detection Understanding the details Finding victims

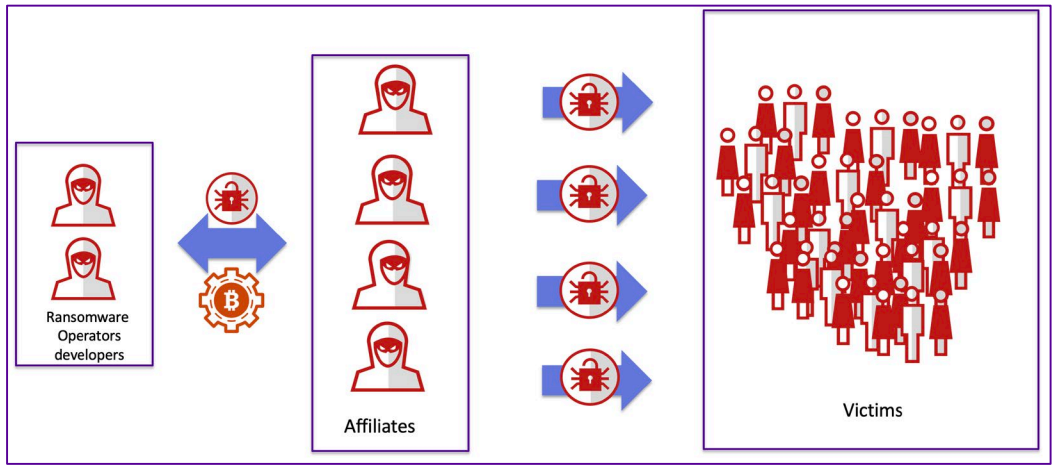
```
                xor     eax, eax
                mov     [ebp-1BCh], ax
                push    0
                lea     eax, [ebp-2Ch]
                push    eax
                lea     eax, [ebp-260h]
                push    eax
                push    0
                push    0
                push    dword ptr [ebp-274h]
                push    0
                push    0
                lea     eax, [ebp-1D4h]
                push    eax
                lea     eax, [ebp-254h]
                push    eax
                call    ds:StartXpsPrintJob
                mov     [ebp-264h], eax
                cmp     dword ptr [ebp-2Ch], 0
                jz      short loc_40B5A7
                mov     eax, [ebp-2Ch]
                mov     eax, [eax]
                push    dword ptr [ebp-2Ch]
                call    dword ptr [eax+14h]

loc_40B5A7:                             ; CODE XREF: .text:0040B59A↑j
                call    ds:CoUninitialize
                push    2710h
                push    dword ptr [ebp-268h]
                call    ds:WaitForSingleObject
                cmp     dword ptr [ebp-264h], 0
                jl      short loc_40B5CC
                xor     eax, eax
                inc     eax
                jmp     short loc_40B5CE
```





Accounting is crucial for successful RaaS criminals



The Big Picture

- Hunting for Samples
  - Yara rules
  - Custom software
  - More than 280 samples
  - Hunting Detections
  - Building an overview

Da	VERSION	ID	Sub_ID	HASH
1992-06-19	VERSION: 5.04	140	SUBID: 720	8ec87fd3ea777fa8d5160dc957e6683e
1992-06-19	VERSION: 5.04	140	SUBID: 763	9916e107b3d501c60d4baaf1b8f8a77a
2011-07-03	VERSION: 4.3	163	SUBID: 535	03915be56034b6ad7f66b5cfe1974f5e
2011-07-03	VERSION: 4.3	163	SUBID: 535	5abcf4fea45e090ecda76cb5a56dafbc
2018-06-29	VERSION: 4.0	117	SUBID: 397	8d604e3c567aab3c8cfa2d2c424c09c4
2018-06-30	VERSION: 4.0	9	SUBID: 9	cbdb4aebbb984096ee54c9eb2b1c128c
2018-06-30	VERSION: 4.0	15	SUBID: 15	9be5102484d60f074499a8fd4403819c
2018-06-30	VERSION: 4.0	15	SUBID: 15	77a7573a20dbf141a0ff1e5fade2eae0
2018-06-30	VERSION: 4.0	41	SUBID: 62	19aa2a0f61f8b928b44de28d16f31174
2018-07-03	VERSION: 4.1	9	SUBID: 9	946aa4b8273be8d4984e14d6c8c9d3b4
2018-07-03	VERSION: 4.1	15	SUBID: 15	86613ae664b74c3a464f473408352635
2018-07-03	VERSION: 4.1	44	SUBID: 83	3eed6f11720e53756db16de1b9a8d561
2018-07-03	VERSION: 4.1	106	SUBID: 363	b6d06a87b35d15a1b3d9d76aced96f4e
2018-07-03	VERSION: 4.1	114	SUBID: 383	7fd94b59280d80bcfdd1b3970c4189ed
2018-07-04	VERSION: 4.1	15	SUBID: 15	fd602a6ae269d8fbc3b2c996678825b7
2018-07-04	VERSION: 4.1	95	SUBID: 331	2212fac7fcded7f06042d0a0ca67898f
2018-07-04	VERSION: 4.1	100	SUBID: 411	903f8718a1c3c12042fc44bac6a4c786
2018-07-04	VERSION: 4.1	106	SUBID: 363	c24b3cf9336e7e994625d223fa7b5f4f
2018-07-04	VERSION: 4.1	122	SUBID: 403	340117038ae2ef8d07c90c614d652934
2018-07-05	VERSION: 4.1	110	SUBID: 374	9a680a7ff23746d92f4bb274c50be4a5
2018-07-05	VERSION: 4.1.1	41	SUBID: 62	24fdd71ded0b9ffecfe3387002f7d361
2018-07-05	VERSION: 4.1.1	73	SUBID: 414	ef50f5c2d6d8d10d8adc1efb840518d0
2018-07-05	VERSION: 4.1.1	99	SUBID: 386	cce23a33a5a78b24ef7f5ced7d715d95
2018-07-05	VERSION: 4.1.1	99	SUBID: 386	f876735f6d4f076dfb148c63c4ba5a3a
2018-07-05	VERSION: 4.1.1	99	SUBID: 386	9b785e93d9ce42f6213d2c2a1ecc8293
2018-07-05	VERSION: 4.1.1	99	SUBID: 417	c6b0fbf5190d3850b212c53e6ed56886
2018-07-05	VERSION: 4.1.1	99	SUBID: 417	9c973702f8b40793c3ab60329dad7263
2018-07-05	VERSION: 4.1.1	99	SUBID: 417	62fd133df8be543900aabe64b707896b
2018-07-05	VERSION: 4.1.1	124	SUBID: 413	a74c335c0ee5958929b99cb14726cd9a
2018-07-05	VERSION: 4.1.1	128	SUBID: 423	e8e19525aa73d1714f15552d166aaa84
2018-07-06	VERSION: 4.1.1	111	SUBID: 375	6b8872624f0427deaf8df292038e657a
2018-07-13	VERSION: 4.1.2	41	SUBID: 62	75f215c1f086c47ee45392bd188909d0
2018-07-13	VERSION: 4.1.2	57	SUBID: 133	0301296543c91492d49847ae636857a4
2018-07-13	VERSION: 4.1.2	57	SUBID: 133	2aad5ce883a44154e7d7a9d982bb286c
2018-07-13	VERSION: 4.1.3	57	SUBID: 133	3cef3301e48135dc3159181aa500bfe8
2018-07-19	VERSION: 4.1.2	15	SUBID: 15	5c3bed3feaea533d2eb537850aa7079c
2018-07-19	VERSION: 4.1.2	15	SUBID: 15	b8381b2b78d8e4088aca4f3c1535fea2
2018-07-19	VERSION: 4.1.2	41	SUBID: 62	2d617c60478949d900cf37d3dfaf527a
2018-07-19	VERSION: 4.1.2	79	SUBID: 250	9ec04ede383aad5a6774696a361d515b
2018-07-19	VERSION: 4.2	41	SUBID: 438	2f09d9e81aa3c7ff0437625f976510ca
2018-07-19	VERSION: 4.2	41	SUBID: 62	38a803baf56ec45e8b7db3ce610afac2
2018-07-19	VERSION: 4.2	79	SUBID: 250	0b216cdb07d901c41514a7baabfbf055
2018-07-19	VERSION: 4.2	95	SUBID: 332	0d97b152305de1324901dbeebe644506
2018-07-19	VERSION: 4.2	99	SUBID: 448	2c79b1c6565616109cd38bd13e1b6019
2018-07-19	VERSION: 4.2	99	SUBID: 448	4893880bce579d21085eacea2f6d2b8e
2018-07-19	VERSION: 4.2	131	SUBID: 432	9f59740a5d45cf545e2fd591b9ba0428
2018-07-19	VERSION: 4.2	136	SUBID: 443	3b74163ebab14e3736424a4d83077bf7

Connecting the dots..

From samples to affiliates to victims

D	VERSION	ID	Sub_ID	HASH
1992-06-19	VERSION: 5.04	140	SUBID: 720	8ec87fd3ea777fa8d5160dc957e6683e
1992-06-19	VERSION: 5.04	140	SUBID: 763	9916e107b3d501c60d4baaf1b8f8a77a
2011-07-03	VERSION: 4.3	163	SUBID: 535	03915be56034b6ad7f66b5cfe1974f5e
2011-07-03	VERSION: 4.3	163	SUBID: 535	5abcf4fea45e090ecda76cb5a56dafbc
2018-06-29	VERSION: 4.0	117	SUBID: 397	8d604e3c567aab3c8cfa2d2c424c09c4
2018-06-30	VERSION: 4.0	9	SUBID: 9	cbdb4aebbb984096ee54c9eb2b1c128c
2018-06-30	VERSION: 4.0	15	SUBID: 15	9be5102484d60f074499a8fd4403819c
2018-06-30	VERSION: 4.0	15	SUBID: 15	77a7573a20dbf141a0ff1e5fade2eae0
2018-06-30	VERSION: 4.0	41	SUBID: 62	19aa2a0f61f8b928b44de28d16f31174
2018-07-03	VERSION: 4.1	9	SUBID: 9	946aa4b8273be8d4984e14d6c8c9d3b4
2018-07-03	VERSION: 4.1	15	SUBID: 15	86613ae664b74c3a464f473408352635
2018-07-03	VERSION: 4.1	44	SUBID: 83	3eed6f11720e53756db16de1b9a8d561
2018-07-03	VERSION: 4.1	106	SUBID: 363	b6d06a87b35d15a1b3d9d76aced96f4e
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2018-07-05	VERSION: 4.1.1	73	SUBID: 414	ef50f5c2d6d8d10d8adc1efb840518d0
2018-07-05	VERSION: 4.1.1	99	SUBID: 386	cce23a33a5a78b24ef7f5ced7d715d95
2018-07-05	VERSION: 4.1.1	99	SUBID: 386	f876735f6d4f076dfb148c63c4ba5a3a
2018-07-05	VERSION: 4.1.1	99	SUBID: 386	9b785e93d9ce42f6213d2c2a1ecc8293
2018-07-05	VERSION: 4.1.1	99	SUBID: 417	c6b0fbf5190d3850b212c53e6ed56886
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2018-07-05	VERSION: 4.1.1	99	SUBID: 417	62fd133df8be543900aabe64b707896b
2018-07-05	VERSION: 4.1.1	124	SUBID: 413	a74c335c0ee5958929b99cb14726cd9a
2018-07-05	VERSION: 4.1.1	128	SUBID: 423	e8e19525aa73d1714f15552d166aaa84
2018-07-06	VERSION: 4.1.1	111	SUBID: 375	6b8872624f0427deaf8df292038e657a
2018-07-13	VERSION: 4.1.2	41	SUBID: 62	75f215c1f086c47ee45392bd188909d0
2018-07-13	VERSION: 4.1.2	57	SUBID: 133	0301296543c91492d49847ae636857a4
2018-07-13	VERSION: 4.1.2	57	SUBID: 133	2aad5ce883a44154e7d7a9d982bb286c
2018-07-13	VERSION: 4.1.3	57	SUBID: 133	3cef3301e48135dc3159181aa500bfe8
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2018-07-19	VERSION: 4.1.2	41	SUBID: 62	2d617c60478949d900cf37d3dfaf527a
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2018-07-19	VERSION: 4.2	41	SUBID: 438	2f09d9e81aa3c7ff0437625f976510ca
2018-07-19	VERSION: 4.2	41	SUBID: 62	38a803baf56ec45e8b7db3ce610afac2
2018-07-19	VERSION: 4.2	79	SUBID: 250	0b216cdb07d901c41514a7baabfbf055
2018-07-19	VERSION: 4.2	95	SUBID: 332	0d97b152305de1324901dbeebe644506
2018-07-19	VERSION: 4.2	99	SUBID: 448	2c79b1c6565616109cd38bd13e1b6019
2018-07-19	VERSION: 4.2	99	SUBID: 448	4893880bce579d21085eacea2f6d2b8e
2018-07-19	VERSION: 4.2	131	SUBID: 432	9f59740a5d45cf545e2fd591b9ba0428
2018-07-19	VERSION: 4.2	136	SUBID: 443	3b74163ebab14e3736424a4d83077bf7

Fighting back,

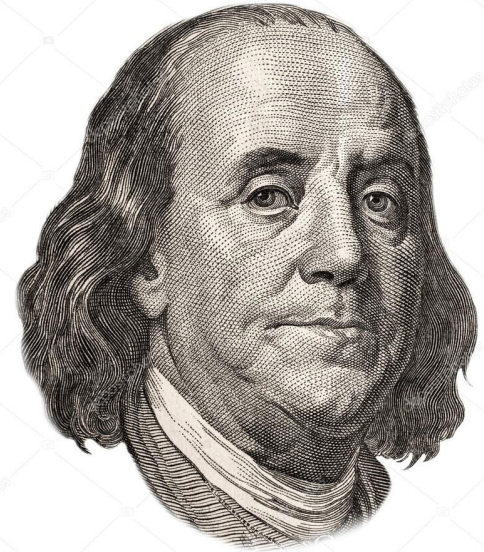
Private sector and Law Enforcement together

- Public-private initiative
- Nr.1 portal for decryption tools
- Thousands computers unlocked
- More than 22 million USD saved

Prevention Tips

"An ounce of prevention is worth a pound of cure"

- **Back-up! Back-up! Back-up!**
- **Use robust Endpoint security software**
- **Network segmenting**
- **Robust identity management**
- **Keep all the software on your computer up to date**
- **Show file extensions**
- **Consider setting up a software restriction Policy (SRP)**



Mitigation Tips

- Don’t turn off or reboot the computer
- Disconnect it immediately from the internet or other network connections, when infected
- Create a memory dump
- DO NOT delete any files (inc. Ransom notes)
- Take pictures for evidence
- Make copy of the encrypted drive
- Try to recover files with forensic tools like PhotoRec

- Don’t pay, but check NoMoreRansom.org for a possible decryptor
- If you decide to pay except the risk of losing everything and seek professional advice

Apply What You Have Learned Today

- After this talk you should have:
  - A better understanding of the Ransomware threat landscape
  - Identify the different types of Ransomware
- Next week you should:
  - Identify your Ransomware security posture
- In the first three months you should:
  - Set-up a plan and to roll-out the necessary prevention methods
  - Develop a ransomware mitigation strategy

Key take-aways

- Back-ups
- Don’t pay

RSAConference2019

Thank you!!

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