



ENJOY SAFER TECHNOLOGY™

# Ransomware

Peter Stančík

Security Research & Awareness Manager



*"Cyber-criminals collected \$209 million in the first three months of 2016 by extorting businesses and institutions to unlock computer servers. At that rate, ransomware is on pace to be a \$1 billion a year crime this year. "*

*[FBI for money.CNN.com](#), April 2016*

C:\Documents and Settings\All Users\Documents\My Pictures\Sample Pictures

**Picture Tasks**

- View as a slide show
- Order prints online
- Print pictures
- Shop for pictures

**and Folder Tasks**

- Make a new folder
- Publish this folder to the Web
- Share this folder


!\_READ\_ME!.txt  
Text Document  
1 KB

Blue hills.jpg.\_CRYPT  
\_CRYPT File  
28 KB

Sunset.jpg.\_CRYPT  
\_CRYPT File  
70 KB

Water lilies.jpg.\_CRYPT  
\_CRYPT File  
82 KB

**ATTENTION !**

 Your files are encrypted with RSA-1024 algorithm. To recovery your files you need to buy our decryptor. To buy decrypting tool contact us at: [redacted]@yahoo.com

OK

## Computer is Blocked!

Your computer is blocked for viewing, copying and dissemination of video materials containing elements of pedophilia and rape of children. In order to remove the block You are required to pay a fine in the amount of 500 rubles to the (telephone) number 8-965-265-90-84. In case of payment of the sum equal to or greater the amount fine there will be an unblock code on the receipt. You'll need to enter the code in the lower portion of the window and press the "unblock" button. Once the block is removed you must delete all materials containing elements of rape and pedophilia. If you do not pay the fine within 12 hours, all information on your personal computer will be permanently deleted and the case will be sent to court for investigation in accordance to chapter 242 part 1 of the Penal Code of Russian Federation.

Rebooting or turning off of the computer will lead to prompt removal of all data, including the operating system and BIOS, without ability of further restoration.



INTERPOL



Útvár Osobitného Určenia  
Kriminalistický a Expertízny Ústav  
Policajného Zboru



INTERPOL

Zostávajúci čas: 47:56:09



**VAROVANIE! Váš osobný počítač je uzamknutý z bezpečnostných dôvodov by z nasledujúcich dôvodov:**

Ste obvinený z prezerania/skladovania a/alebo distribúcia pornografických materiálov zakázané obsahu (detská pornografia/zvierackosti atď.) Že ste porušil Všeobecnú deklaráciu o boji proti šíreniu detskej pornografie a obvinený z trestného činu podľa článku 161 trestného zákonníka Slovenskej republiky.

Článok 161 trestného zákonníka Slovenskej republiky ustanovuje ako trest odňatia slobody v trvaní 5-11 rokov.

Tiež ste osoba podozrivá z porušenia "zákon o autorskom práve a právach súvisiacich s právom" (sťahovanie pirátskej hudby, videa neletsenzionnogo softvér) a použitia a/alebo šírenie obsahu chráneného autorským právom. Tým ste osoba podozrivá z porušenia článku 148 trestného zákonníka Slovenskej republiky.

Článok 148 trestného zákonníka Slovenskej republiky, musí byť trest pokuta 150 až 550 základných jednotiek alebo odňatím slobody na dobu 3-7 rokov.

S počítačom došlo k neoprávnenému prístupu k obmedzenému prístupu verejnosti k informáciám a informáciám celoštátneho významu v Internete.

Neautorizovaný prístup si môžete dojednať zámerne z sebeckých motivov alebo neoprávneným prístupom môžu dôjsť bez vášho vedomia alebo súhlasu, ako váš osobný počítač môže byť

PIN kód

100

1 2 3 4 5 6 7 8 9 0

Odoslať

Kde môžem získať peňažné poukážku PaySafeCard?

Prehľad predajcov: PaySafeCard dostaneš v mnohých supermarketoch, trafikách. PaySafeCard dostaneš na viac ako 101 čerpacích staniách Agip a OMV, vo vybraných pobočkách stávkovej kancelárie Tipsport, všetkých predajných miestach GG Tabaku a vo CBA.



INTERPOL



INTERPOL



INTERPOL



INTERPOL



INTERPOL





Private key will be destroyed on  
**10/20/2013**  
**12:37 PM**

Time left  
**72 : 34 : 50**

## Your personal files are encrypted!

Your important files **encryption** produced on this computer: photos, videos, documents, etc. [Here](#) is a complete list of encrypted files, and you can personally verify this.

Encryption was produced using a **unique** public key [RSA-2048](#) generated for this computer. To decrypt the files you need to obtain the **private key**.

The **single copy** of the private key, which will allow you to decrypt the files, located on a secret server on the Internet; the server will **destroy** the key after a time specified in this window. After that, **nobody and never will be able** to restore files...

**To obtain** the private key for this computer, which will automatically decrypt files, you need to pay **300 USD / 300 EUR** / similar amount in another currency.

Click «Next» to select the method of payment.

**Any attempt to remove or damage this software will lead to the immediate destruction of the private key by server.**

2011: Reveton

Next >>



## Ransom32 - Stats

Address

Payout ratio 75%

Installs  0

Lockscreens  0

Paid  0

Paid BTC  0

## Client download

BTC amount to ask:

*Don't be too greedy or people will not pay*

Fully lock the computer

Low CPU usage

Show the lockscreen before encrypting

Show a message box

- Critical Error
- Yellow Exclamation
- White Information

Latent Timeout

- Days:

- Hours:

- Minutes:

[Download client.scr](#)

*Don't worry if the download "hangs". While the download bar is shown, Tor is receiving the file. Just wait.*



The harddisks of your computer have been encrypted with an military grade encryption algorithm. There is no way to restore your data without a special key. You can purchase this key on the darknet page shown in step 2.

To purchase your key and restore your data, please follow these three easy steps:

1. Download the Tor Browser at "<https://www.torproject.org/>". If you need help, please google for "access onion page".
2. Visit one of the following pages with the Tor Browser:

<http://petya37h5tbhyvki.onion/>  
<http://petya5koahtsf7sv.onion/>

3. Enter your personal decryption code there:

If you already purchased your key, please enter it below.

Key: \_

# PROFIT FROM PETYA & MISCHA!

## HIGH INFECTION RATES

PETYA comes bundled with his little brother MISCHA. Since PETYA can't do his evil work without administrative privileges, MISCHA launches when those can't be obtained.

PETYA does a low level encryption of the disk, which is a completely new technique in ransomware. MISCHA acts as an traditional file-based ransomware. For more informations see our FAQ.

## PROVABLY FAIR

As professional cybercriminals, we know that you can't trust anyone. So we developed a payment system based on multisig addresses, where no one (including us) can rip you off.

For more informations see our FAQ.



- 犯罪者情報
- オフェンス情報
- ファインのお支払い
- 取扱説明の解除



注意！お使いのデバイスがロックされている、その理由を以下に示します

残り時間は、罰金を支払います

71:58:24

それ以外の場合はケースファイルは、裁判所に転送されます

履歴クエリは、国土安全保障省のデータベースに格納されています

犯罪者情報





## Ooops, your files have been encrypted!

English

### What Happened to My Computer?

Your important files are encrypted.

Many of your documents, photos, videos, databases and other files are no longer accessible because they have been encrypted. Maybe you are busy looking for a way to recover your files, but do not waste your time. Nobody can recover your files without our decryption service.

### Can I Recover My Files?

Sure. We guarantee that you can recover all your files safely and easily. But you have not so enough time.

You can decrypt some of your files for free. Try now by clicking <Decrypt>.

But if you want to decrypt all your files, you need to pay.

You only have 3 days to submit the payment. After that the price will be doubled.

Also, if you don't pay in 7 days, you won't be able to recover your files forever.

We will have free events for users who are so poor that they couldn't pay in 6 months.

### How Do I Pay?

Payment is accepted in Bitcoin only. For more information, click <About bitcoin>.

Please check the current price of Bitcoin and buy some bitcoins. For more information, click <How to buy bitcoins>.

And send the correct amount to the address specified in this window.

After your payment, click <Check Payment>. Best time to check: 9:00am - 11:00am

CMT from Monday to Friday

Payment will be raised on

5/16/2017 00:47:55

Time Left

02:23:57:37

Your files will be lost on

5/20/2017 00:47:55

Time Left

06:23:57:37

[About bitcoin](#)

[How to buy bitcoins?](#)

[Contact Us](#)



Send \$300 worth of bitcoin to this address:

12t9YDPgwueZ9NyMgw519p7AA8isjr6SMw

Copy

Check Payment

Decrypt

# EternalBlue & WannaCryptor

NSA tools  
leak

**AUG 2016**

**UNKNOWN**

Shadow Brokers  
put tools on  
auction

**14 MAR 2017**

Microsoft releases  
MS17-010 patch

EternalBlue is  
unveiled by Shadow  
Brokers

**14 APR 2017**

ESET adds  
EternalBlue  
network detection

**25 APR 2017**

WannaCryptor  
2.0 global  
outbreak

**12 MAY 2017**



**actual ransom** @actual\_ransom · Aug 2

Status of WannaCry wallets:

52.19666422 BTC (\$142,361.51)

338 payments, 0 withdraws

Last payment:

2017-07-24 at 10:07 AM ET



**actual ransom** @actual\_ransom · Aug 7

Final status of WannaCry wallets:

0 BTC (\$0)

345 payments, 6 withdraws

Last payment:

2017-07-24 at 10:07 AM ET



Petya

Chimera

NotPetya

TeslaCrypt

Crysis

Infinite

DMALocker

NanoLocker

ZeroLock

Rokku

CryptoWall

KeRanger

Tox

PadCrypt

TorrentLocker

CryptoLocker

Mischa

CryptVault

CTBLocker

CryptoJoker

SynoLocker

7ev3n

Locky

WannaCryptor

RotoCrypt

HydraCrypt

Ransom32

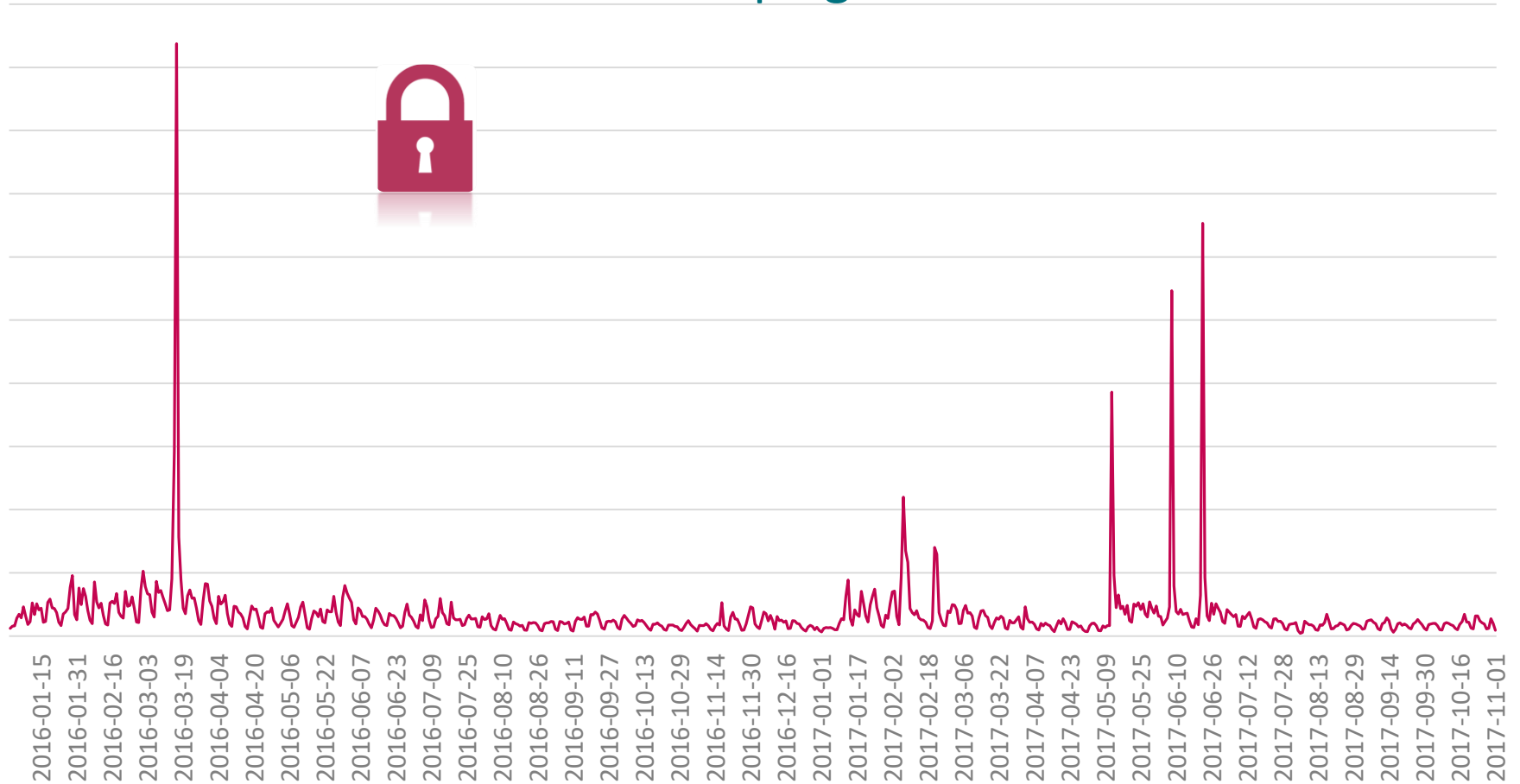
CryptoLocker

Cerber

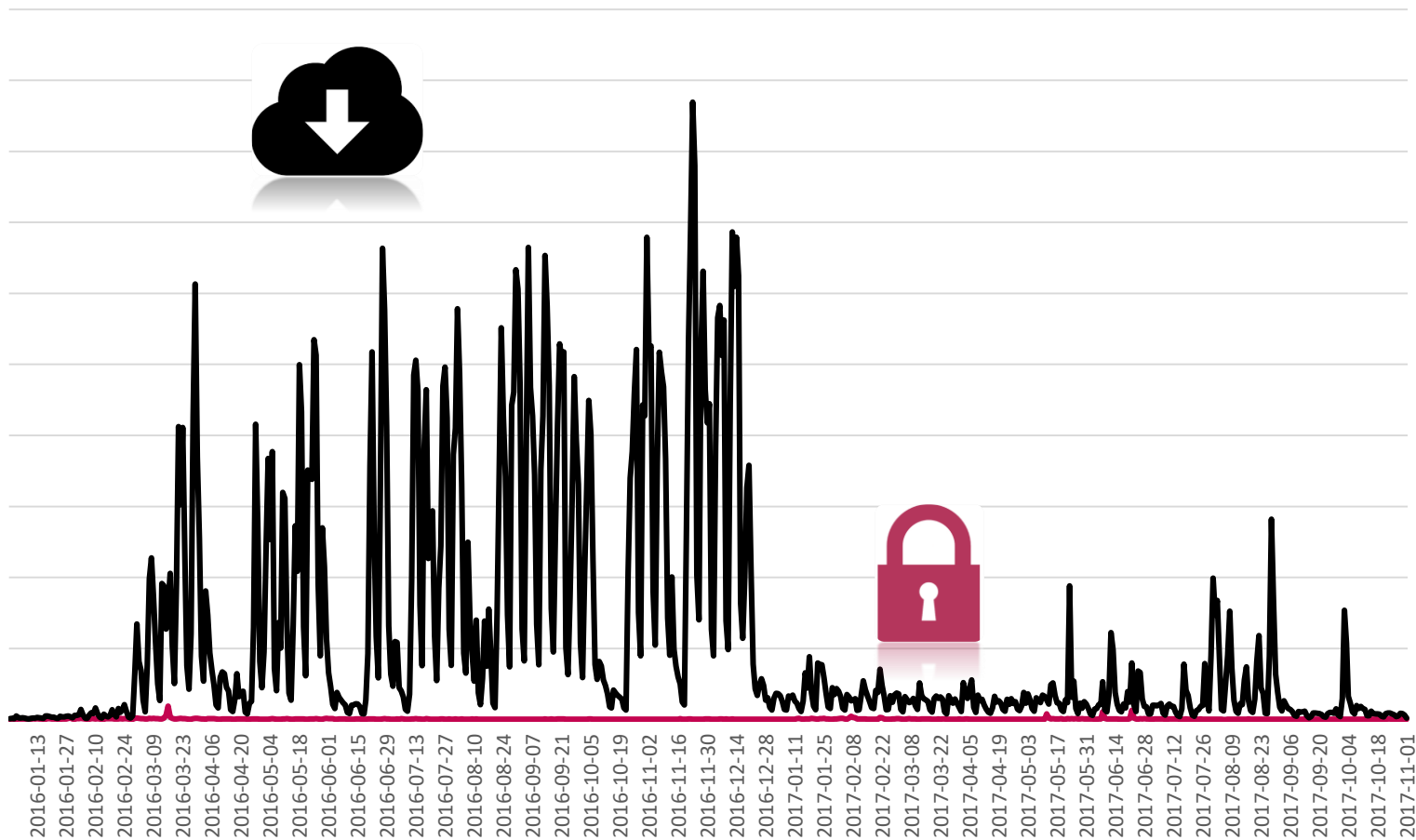
Hundreds of families !

New family every day !

# Ransomware campaigns since 2016



# Ransomware(black) vs. downloaders(red)



# Trends in ransomware attacks

## **Users:**

- Emails with infected attachments (mostly executable .js, .vbs)

## **Businesses:**

- Misuse of Remote Desktop Protocol (RDP)
- Distribution via exploits: EternalBlue, EternalRomance, Eternal\*

# TeleBots





Cyber  
espionage



Cyber  
sabotage



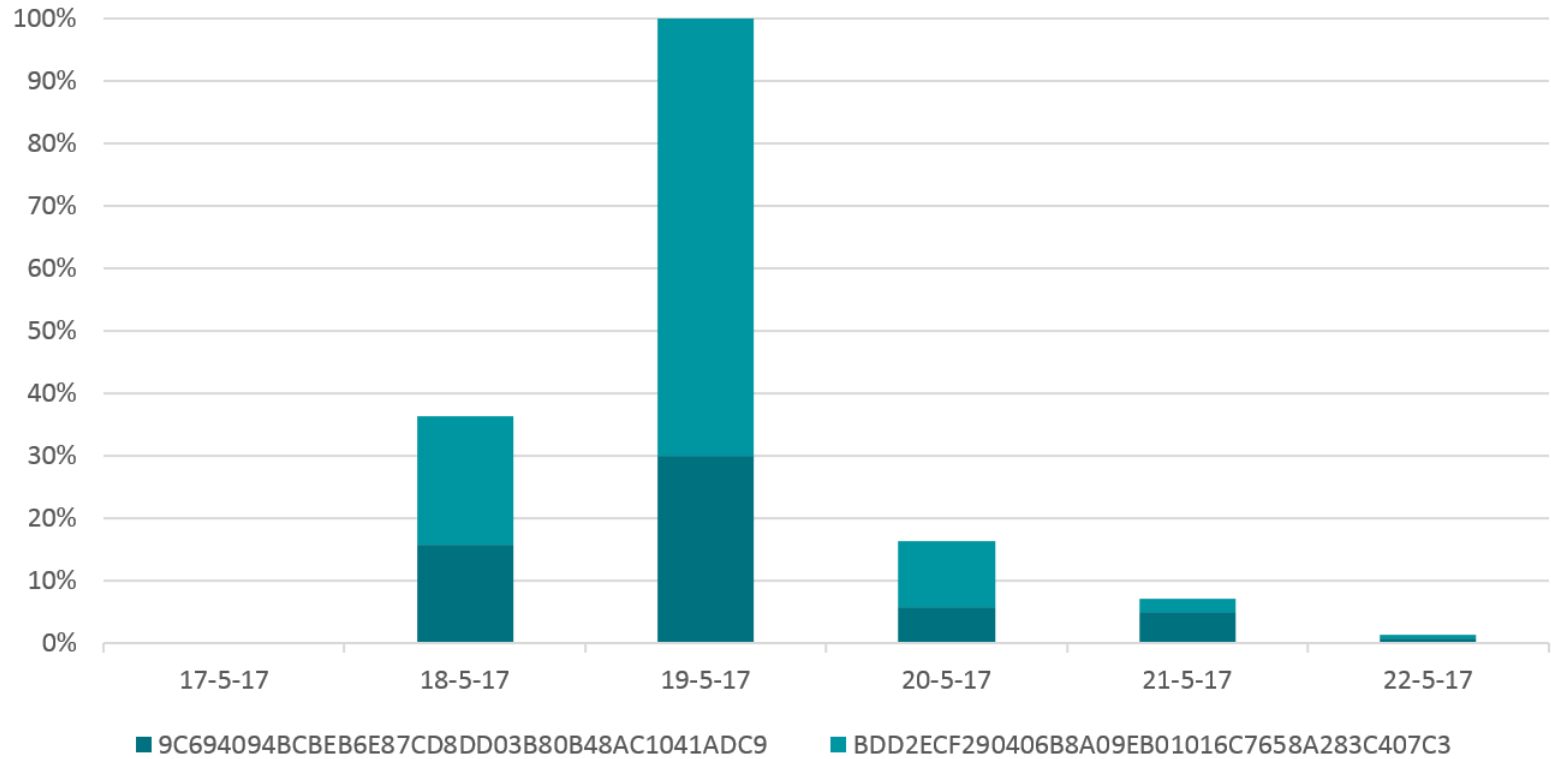
\*not financial  
profit

BlackEnergy a  
black

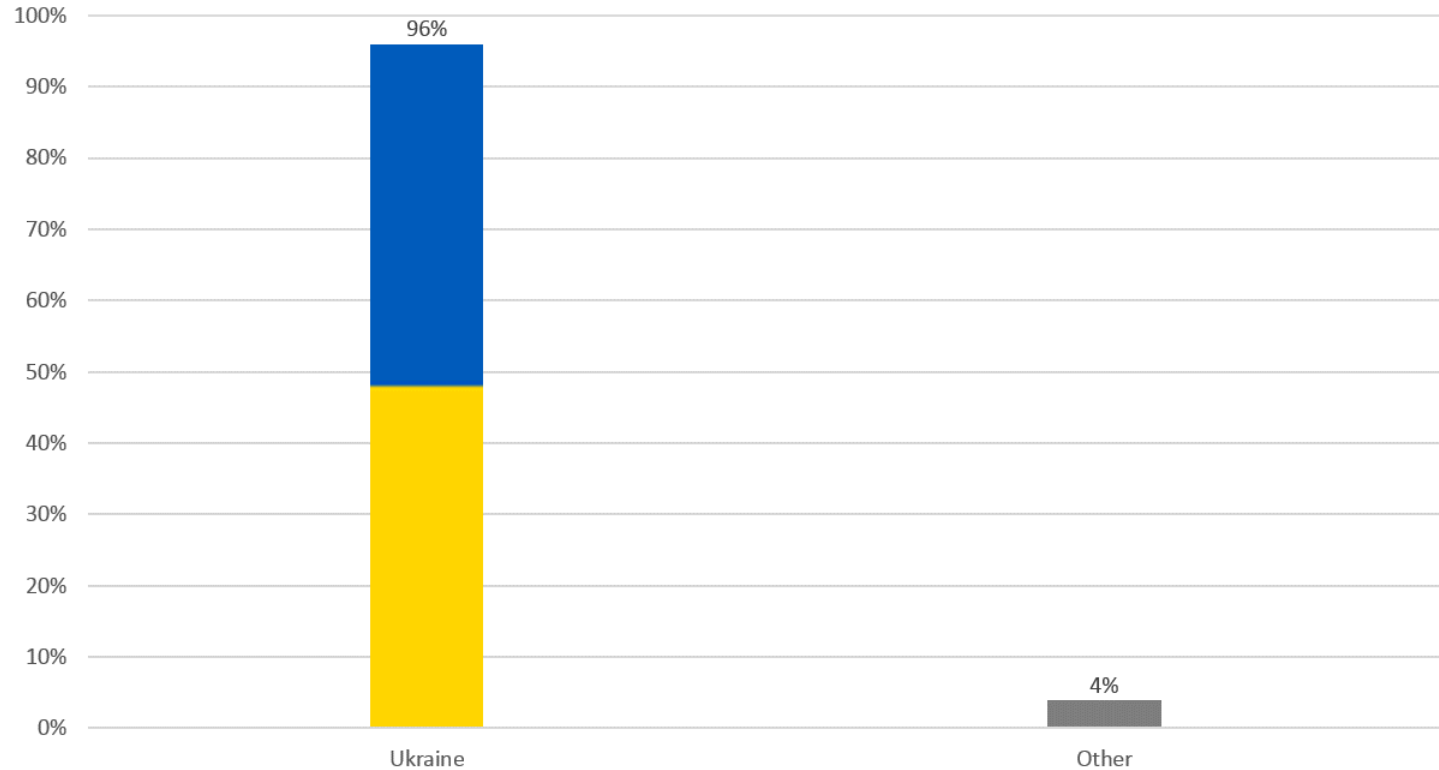
Doc

Dec 2

# XData ransomware outbreak detections



# Xdata ransomware outbreak detections



BlackEnergy attack causing blackout  
in Ivano-Frankivsk

Attacks on  
sea transportation sector

Supply chain attacks on M.E.Doc clients  
(AESNI.C/Xdata)

Dec 2016

March 2017

June 2017

Dec 2015

Jan 2017

May 2017

Attacks on financial institutions

Supply chain attacks on  
financial sector

Supply chain attacks on  
M.E.Doc clients and their partners  
(Diskcoder.C)

Diskcoder.C

(Petya, NotPetya)



Repairing file system on C:

The type of the file system is NTFS.

One of your disks contains errors and needs to be repaired. This process may take several hours to complete. It is strongly recommended to let it complete.

**WARNING: DO NOT TURN OFF YOUR PC! IF YOU ABORT THIS PROCESS, YOU COULD DESTROY ALL OF YOUR DATA! PLEASE ENSURE THAT YOUR POWER CABLE IS PLUGGED IN!**

CHKDSK is repairing sector 24704 of 87008 (28%)

Oops, your important files are encrypted.

---

If you see this text, then your files are no longer accessible, because they have been encrypted. Perhaps you are busy looking for a way to recover your files, but don't waste your time. Nobody can recover your files without our decryption service.

We guarantee that you can recover all your files safely and easily. All you need to do is submit the payment and purchase the decryption key.

Please follow the instructions:

1. Send \$300 worth of Bitcoin to following address:

1Mz7153HMuxXTuR2R1t78mGSdzaAtNbBWx

2. Send your Bitcoin wallet ID and personal installation key to e-mail [wowsmith123456@posteo.net](mailto:wowsmith123456@posteo.net). Your personal installation key:

STyBqm-UG8FAH-uJ4eND-J4ADoD-MwBN5f-uCgAfc-obXi6e-tn4np5-xvSTUQ-XDGRkK

If you already purchased your key, please enter it below.

Key: \_



love sex

**durex**®

**iNViSiBLE**  
extra thin

**EXTRA SENSITIVE**

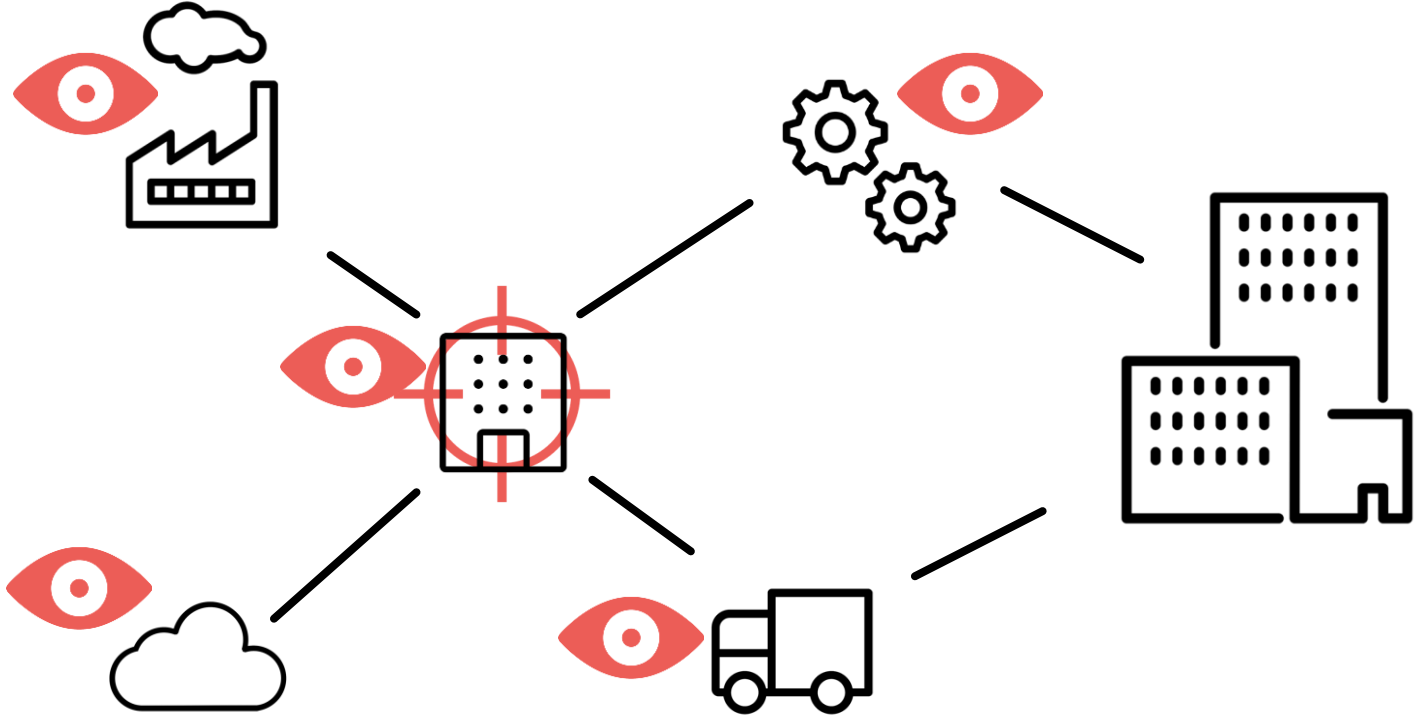
**3** óvszer • kondomy  
• prezervatív • kondoma



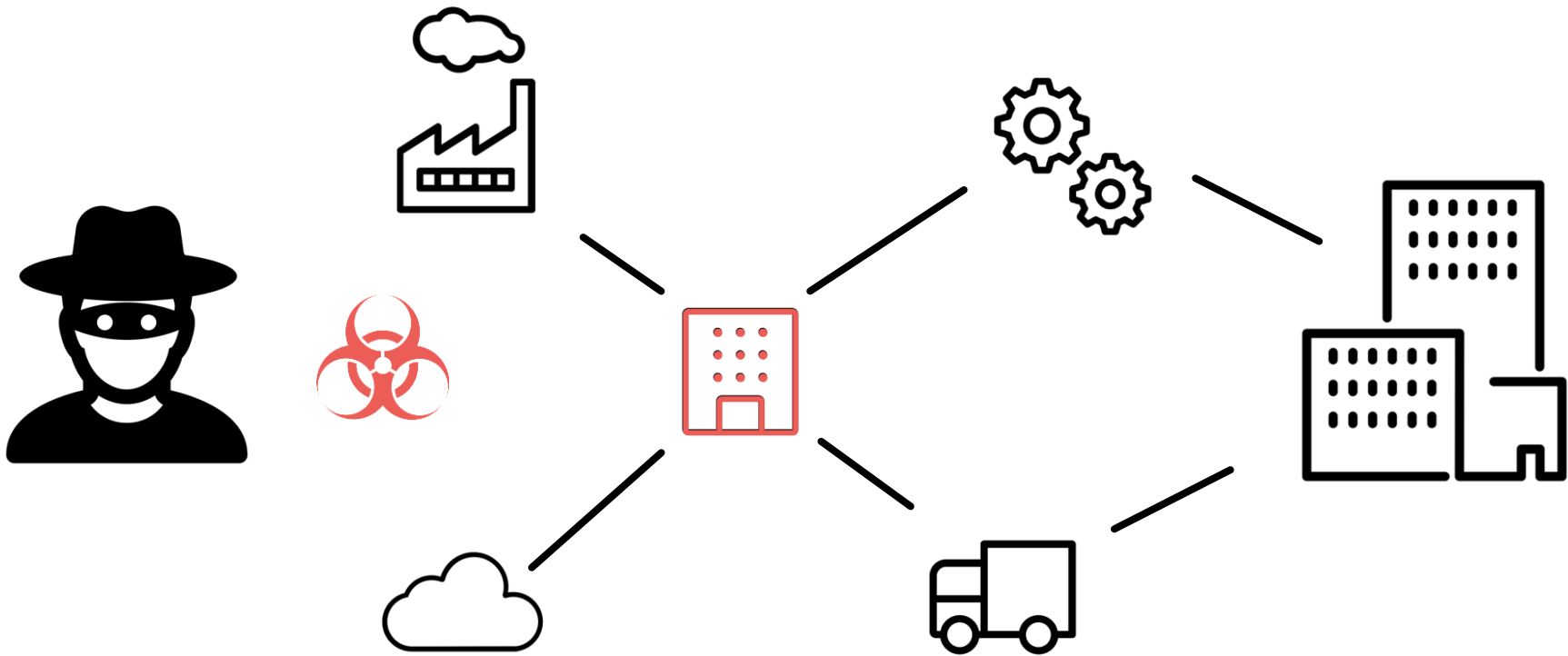
Pety...ent Zero

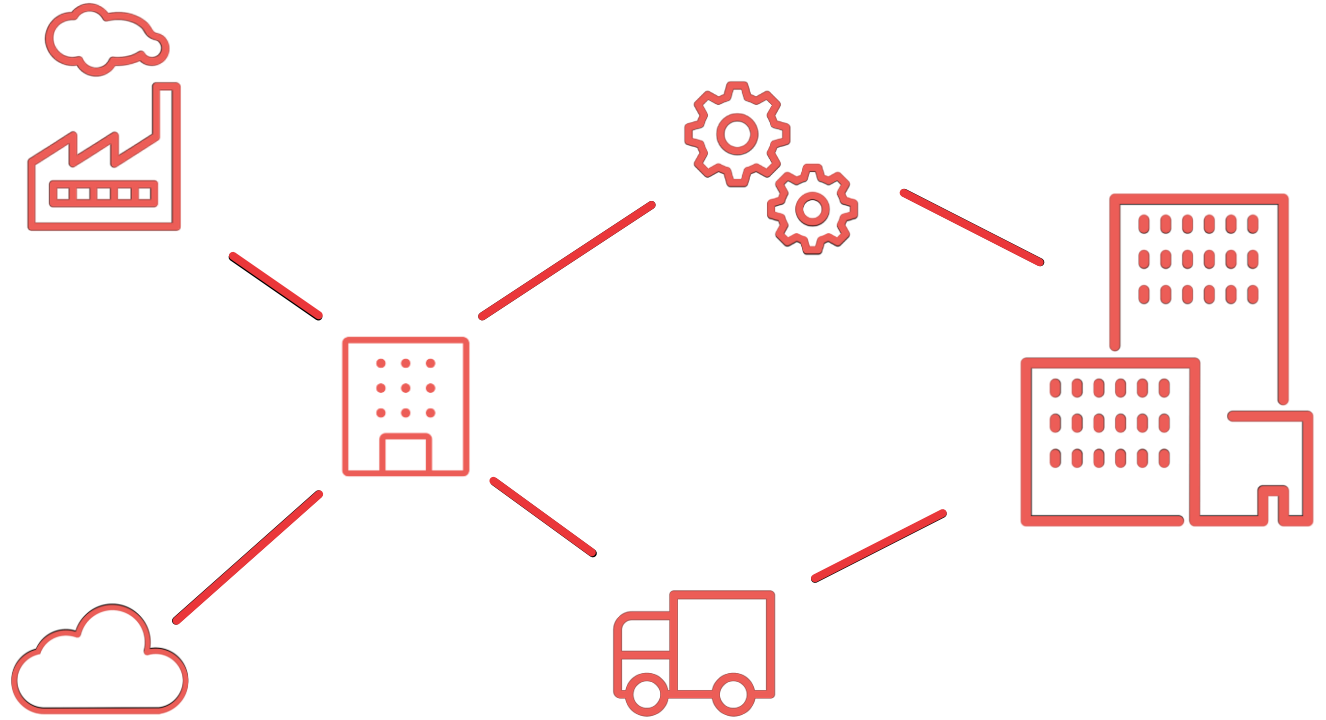
## Supply-chain attack

**An attack** that seeks to damage an organization **by targeting** less-secure or vulnerable **elements in the supply network.**









**NETFLIX**

**Mars**



**Deutsche Post**

**HBO**



**NETSARANG**  
COMPUTER

## Initial vector

Discovered by ESET  
malware researcher  
**Anton Cherepanov**

(won Pwnie Award 2017  
at Black Hat USA)



## Initial vector

Attacks were always in close proximity to an update of popular Ukrainian accounting software



# 14 M.E.Doc UPDATES



April 14<sup>th</sup>



May 14<sup>th</sup>



June 22<sup>nd</sup>

AESNI.C  
XDATA

DISKCODER.C  
PETYA

- ManageRolesDataMgr
- ManageUsersDataMgr
- MeCom
- MessageMarker
- MinInfo
- MobiSign2Impl
- MobiSignImpl
- MonthPersMgr
- NakiManager
- NalRiskList

- ManageRolesDataMgr
- ManageUsersDataMgr
- MessageMarker
- MobiSign2Impl
- MobiSignImpl
- MonthPersMgr
- NakiManager
- NalRiskList
- NalRisks
- NBUStatMgr

## BACKDOORED

- UniImpManager
- UpdaterUtils
- UpgFromPrev
- UpgFromPrevManager
- UpgOperation
- UserManager
- WebGateMgr
- WebSupportMgr
- Worker
- ZApplicationVBImp
- ZDocSigningVBImp

## CLEAN

- UniImpManager
- UpdaterUtils
- UpgFromPrev
- UpgFromPrevManager
- UpgOperation
- UserManager
- WebGateMgr
- WebSupportMgr
- ZApplicationVBImp
- ZDocSigningVBImp
- ZDocumentImpl

Data exfiltrated via M.E.Doc backdoor

**EDRPOU\*:**

Unique legal identifier of every business in Ukraine

**Proxy settings and email settings\*:**

Username and passwords

\*Collected information stored into the Windows registry



Wireshark · Follow TCP Stream (tcp.stream eq 2) · backdoor\_communication

```
GET /last.ver?rnd=86bd86f07faf4eda879069c57a4dc572 HTTP/1.1
User-Agent: medoc1001189
Host: upd.me-doc.com.ua

HTTP/1.1 200 OK
Server: nginx/1.2.7
Date: Sun, 02 Jul 2017 14:01:17 GMT
Content-Type: application/octet-stream
Content-Length: 7
Last-Modified: Wed, 21 Jun 2017 21:35:04 GMT
Connection: keep-alive
Accept-Ranges: bytes

1001189GET /last.ver?rnd=0e5ae4fbc9904d81987586e496edf281 HTTP/1.1
Cookie: EDRPOU=11112222;; un=Admin
User-Agent: medoc1001189
Host: upd.me-doc.com.ua
```

Packet 26. 5 client pkt(s), 5 server pkt(s), 7 turn(s). Click to select.

Entire conversation (1039 bytes) Show and save data as ASCII Stream 2

Find:

Command	Purpose
0 – RunCmd	Executes supplied shell command
1 – DumpData	Decodes supplied Base64 data and saves it to a file
2 – MinInfo	Collects machine information (OS version, architecture, CPU, memory, disk space, user name, user SID, user GUID, user name (64), current privileges, UAC settings, proxy settings, email settings including login and password)
3 – GetFile	Collects file from the remote computer
4 – Payload	Decodes supplied Base64 data, saves it to an executable file
5 – AutoPayload	Same as previous but the supplied file should be a DLL and it will be dropped and executed from the Windows folder using rundll32.exe. In addition, once executed, it attempts to overwrite that dropped DLL and delete it.

Perfectly matches the way in which DiskCoder.C was initially executed on the infected machines.

Diskcoder.D (aka  
BadRabbit)

# Суть Событий

- Наши ленты:
- #Главная
  - #Вся
  - #ЖЕЛТАЯ
- 23.10.18:41 # ЕленаСкрынник, ДмитрийБелоносов  
В соцсетях обсуждают снимок гламурного мужа бывшего министра Елены Скрынник
- 23.10.18:25 # Марьянов  
Глава рецентра впервые рассказала, как Марьянов провел у нее свои последние дни
- 23.10.18:11 # ЧулпанХаматова, АлександрШейн  
Актриса Чулпан Хаматова разводится со вторым мужем
- 23.10.18:25 # МаксимГалкин  
В Сети обсуждают продукты на тарелках "золотых детишек" Гарри и Лизы Галкиных

#ГЛАВНАЯ #НАШИ ПУБЛИКАЦИИ #ЗДОРОВЬЕ #КУЛЬТУРА #ШОУБИЗ #ЖЕЛТЫЙ РАЗДЕЛ #ТЕХНО #ТУРИЗМ #НАУКА #ТАТАРСТАН #ОПРОСЫ

**Поиск по сайту**

- Юлиу Рутберг назвал все операции, которые преобразили Юлию Рутберг до неузнаваемости
- Адвокат рассказал, сколько квартир теперь принадлежит молодой жене
- Бывшая жена Марата Башарова унизила известную певицу на показе модной коллекции
- Молодая жена Ивана Краско назвала жизнь с ним "нищобродством"

**An update to Adobe® Flash® Player is available.**  
This update includes improvements in usability, online security and stability, as well as new features which help content developers deliver rich and engaging experiences.  
Did you know...

- The top 10 Facebook
- Most of the top
- Flash Player

Note: If you have selected to allow Adobe to install update, this update will be installed on your system automatically.

REMIND LATER      INSTALL



Масштабный проект Филиппа Киркорова посетили также его дети: Алла-Виктория и Мартин пришли в сопровождении двух нянь, дедушки Бедроса и мамы.

Алла-Виктория и Мартин Киркоровы смотрели палино представление "Я" в

Кремлевском дворце на первом ряду. Рядом с ними были дедушка Бедрос Киркоров, две няни и женщина, которую они называют мамой. Правда, она предпочла не фотографироваться, и всячески скрывала свою персону от журналистов.

На концерте, который поставил для Филиппа Киркорова знаменитый режиссер Франко Драгоне (автор знаменитых представлений Cirque de Soleil, а также шоу Cirque du Soleil в Давосе)

**Чтобы помириться, нужно поссорить!**  
detective1997.ru  
Поссорим Вашего близкого человека, для того чтобы Вы смогли с ним помириться.

**Как похудеть без диеты?**  
silavoli24.ru  
Стройное тело без диет и изнуряющих тренировок! Онлайн курс Ляйсан Утяшевой!

**Упражнения для красивой фигуры.**  
krasgmu.pw  
Как сделать подтянутую фигуру в дома, затрачивая 15 минут. Читай на krasgmu.pw.

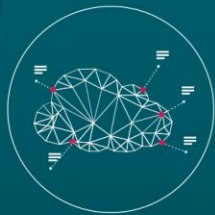
Girls, Women and



NETWORK ATTACK  
PROTECTION



REPUTATION  
& CACHE



CLOUD BASED  
PROTECTION SYSTEM



ADVANCED  
MEMORY SCANNER



EXPLOIT  
BLOCKER



BOTNET  
PROTECTION



ADVANCED  
HEURISTICS

# ESET Ransomware Shield





Will it go away soon?





# Peter Stančík

Security Research & Awareness Manager

[stancik@eset.sk](mailto:stancik@eset.sk)

[www.eset.com](http://www.eset.com) | [www.welivesecurity.com](http://www.welivesecurity.com)