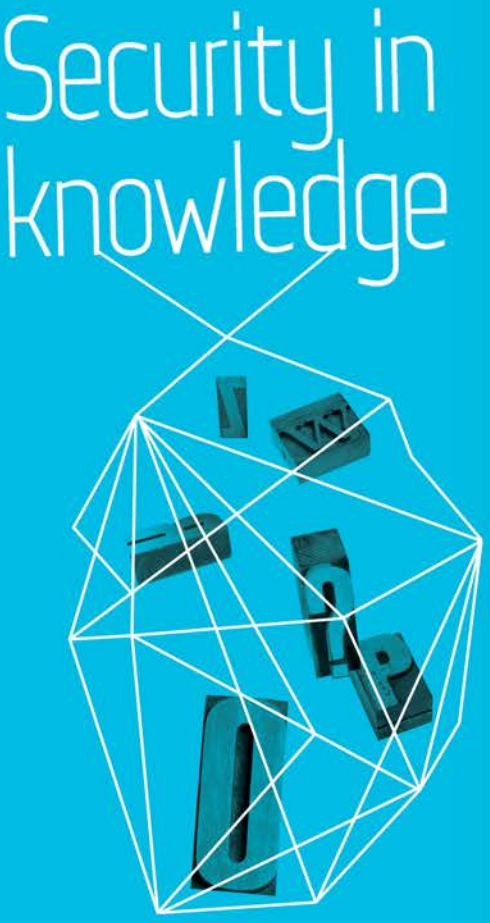
RSA CONFERENCE ASIA PACIFIC 2013

HACKING THE VIRTUALIZED WORLD



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Vice President Cloud Solutions
SafeNet Inc

Session ID: CLD-T04
Session Classification: Intermediate

Legal Disclaimer

ALWAYS GET PERMISSION IN WRITING

Performing “scans” against networked systems without permission is illegal. Password cracking too

You are responsible for your own actions!

If you go to jail because of this material it’s not my fault, although I would appreciate it if you dropped me a postcard. This presentation references tools and URLs - use them at your own risk and with permission

Accepted Security Principles

- **Confidentiality**
- **Integrity**
- **Availability**
- **Accountability**
- **Auditability**

HOW DO I ACHIEVE THIS IN A VIRTUAL WORLD?

Welcome to the next Generation

- 1st Age: Servers
  - Servers
  - FTP, Telnet, Mail, Web.
  - These were the things that consumed bytes from a bad guy
  - The hack left a foot print
- 2nd Age: Browsers:
  - Javascript, ActiveX, Java, Image Formats, DOMs
  - These are the things that are getting locked down
    - Slowly
    - Incompletely
- 3rd Age: Virtual Hacking: - **Simplest and getting easier**
  - Gaining someone's password is the skeleton key to their life and your business
  - Accessing data from the virtual world can be simple

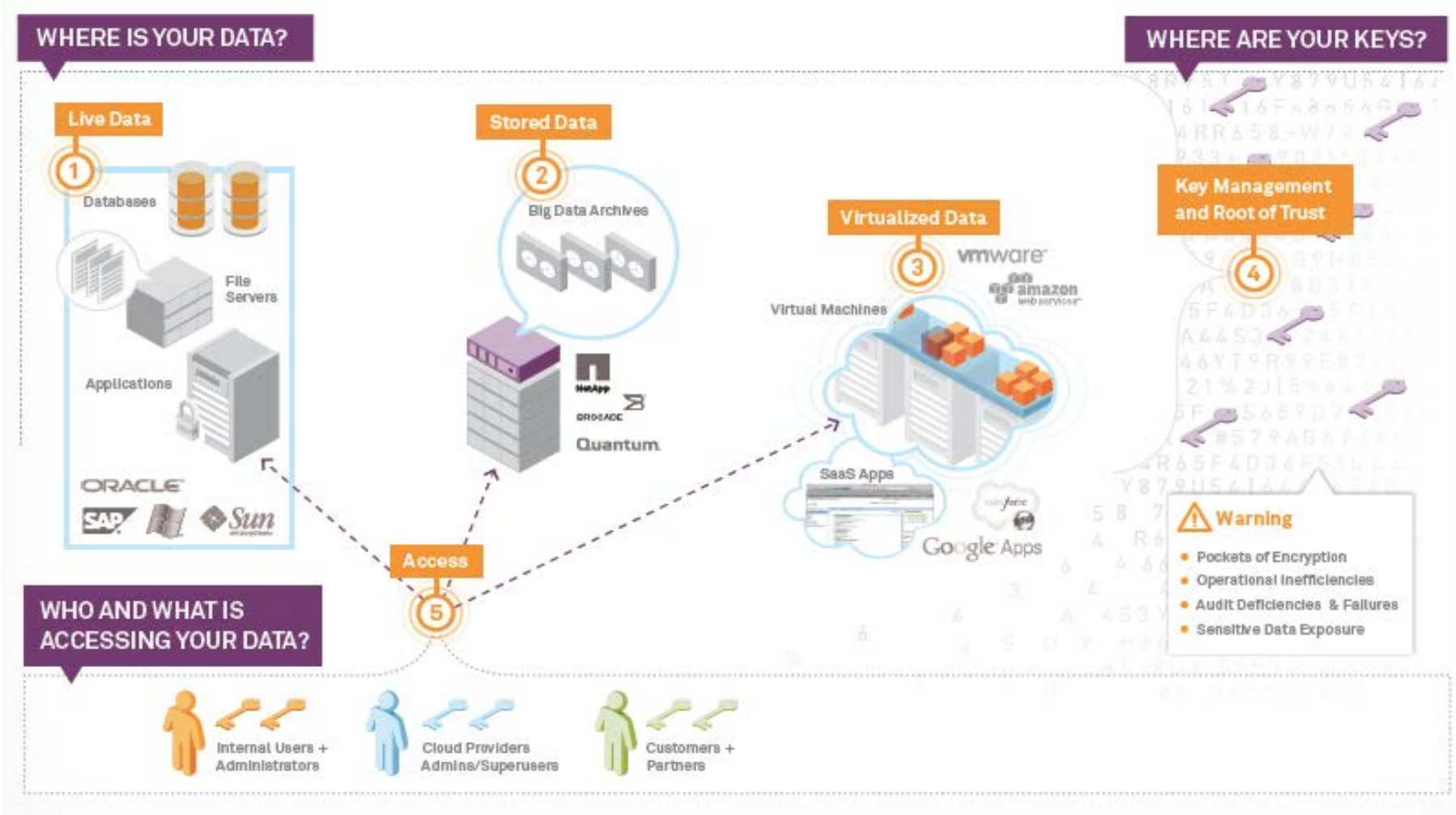
Virtual Word – With Virtual Back Doors

Welcome to the Future

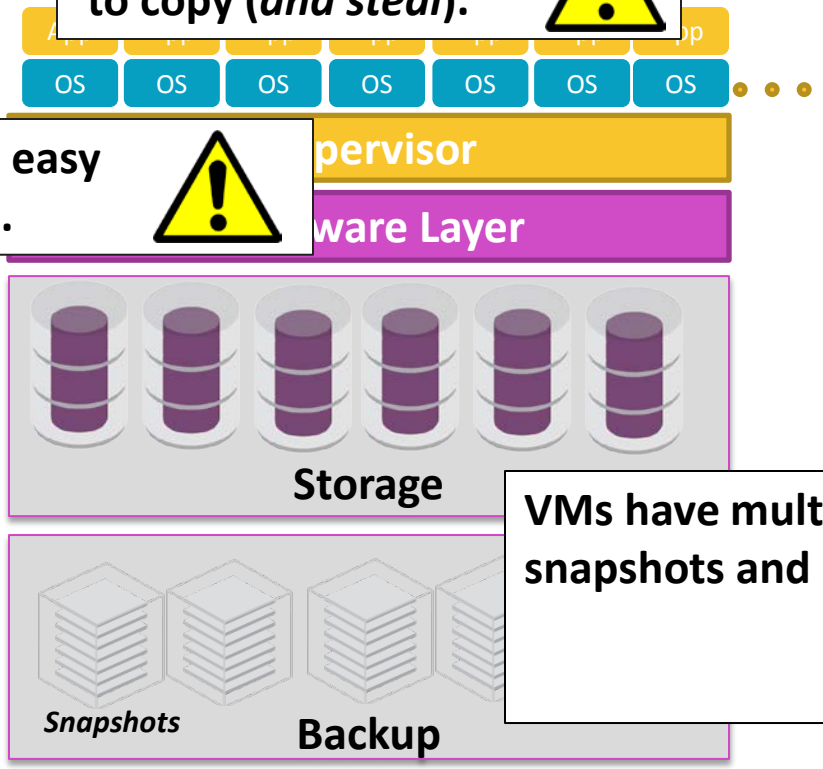
- Cloud Computing
- Virtual Environment
- With Virtual Security holes

During the past 15 years we “learnt” nothing

Sensitive Data is Everywhere



Security Gaps are Present



VMs are easy to copy (*and steal*).

VMs are easy to move.

VMs introduces a new class of privileged users and administrators - *server, storage, backup, and application* - all operating independently.

VMs have multiple snapshots and backups of data.

What do Auditors look for?

Type of Data?	•Classification
Who has access?	•Identity Management •Key Management
How is data protected?	•Encryption •Persistence •Key Management •Access SLA
When was it accessed?	•Meta Data •Encryption •Key Management
Where is stored?	•Lifecycle •Backups •Snapshots
How was it disposed?	•Data shredding •Key shredding

Organizations have to prove ownership and control of their data

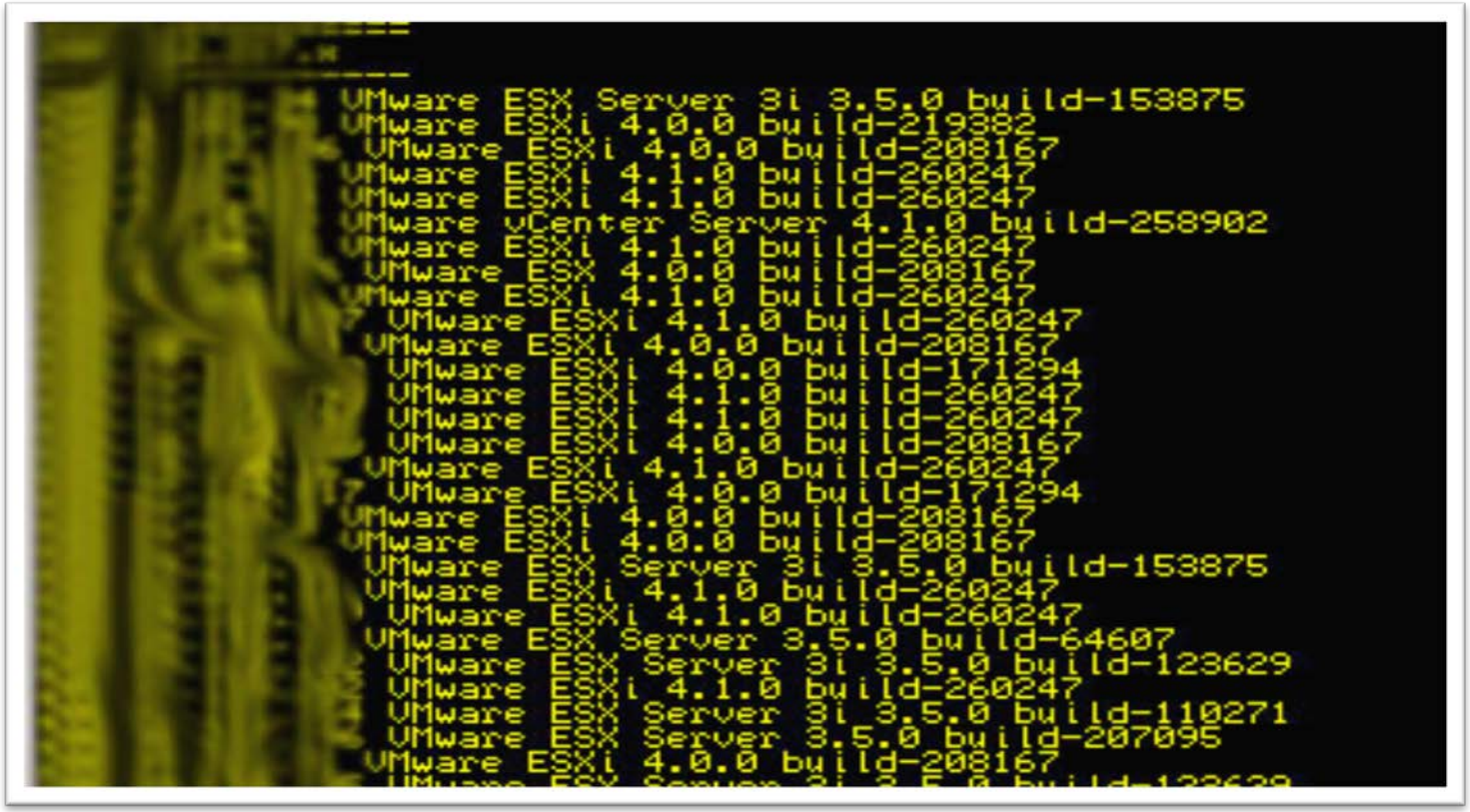
Back to Basics – PLEASE

- **Confidentiality**
- **Integrity**
- **Availability**
- **Accountability**
- **Auditability**

HOW DO I ACHIEVE THIS IN A VIRTUAL WORLD?

Lets Start

vCenter servers directly connected to the web....WOW

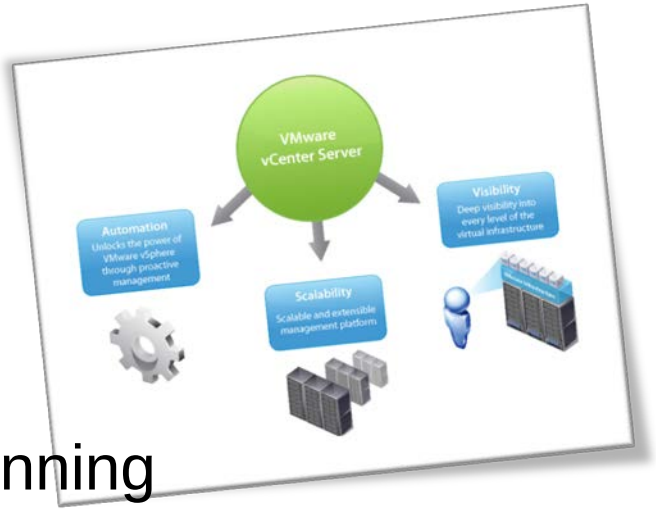


How do the hackers hack VMware vCenter in 60 seconds?

The Target

Vmware vCenter Version 4.1 update 1 .....

- Services running:
  - Update Manager
  - vCenter Orchestrator
  - Chargeback



- Each Service has a web server running

Web Attack 101 .....History repeating

The Attack

vCenter Orchestrator attack vector 1.....

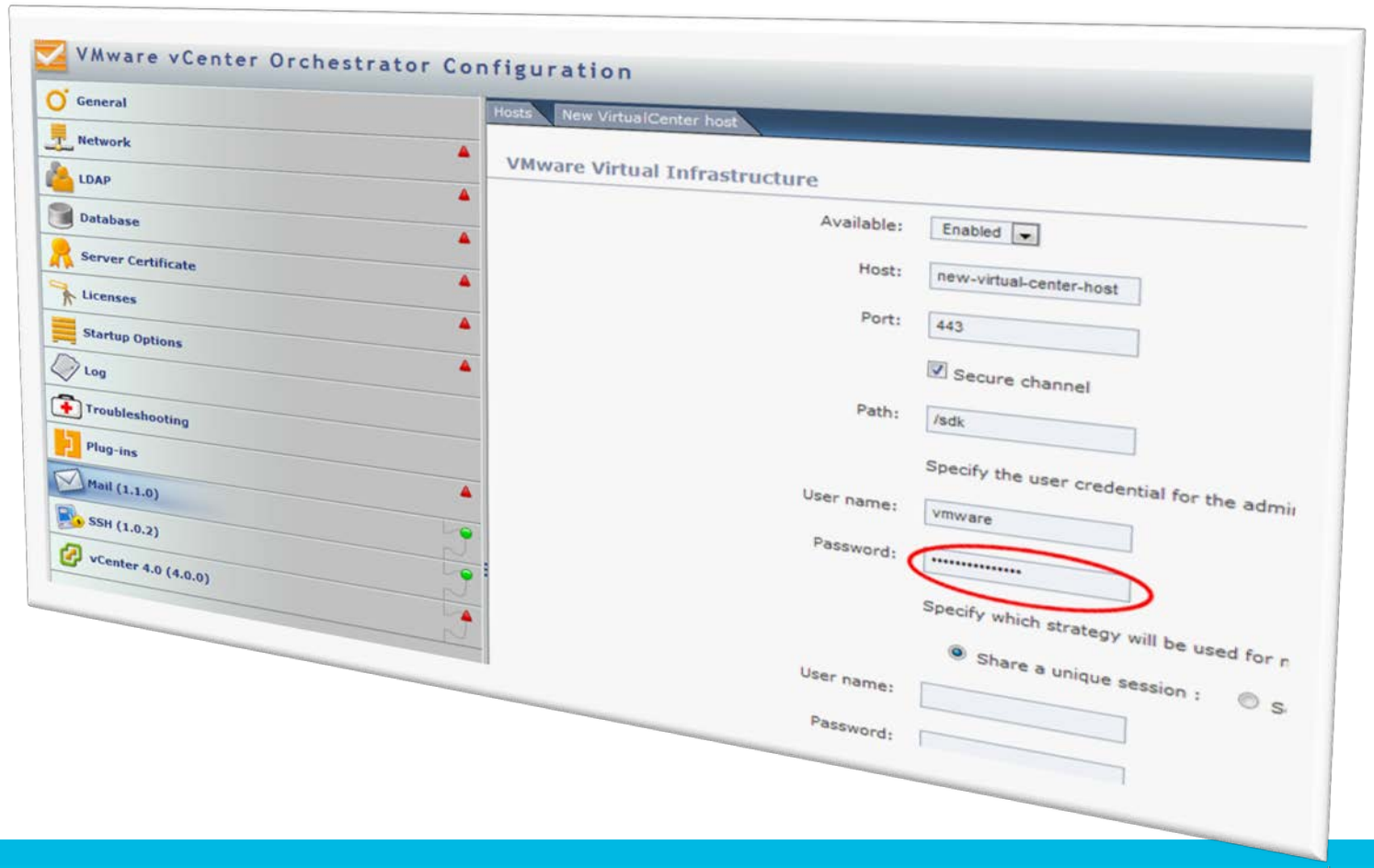
Installed by default within vCenter is an very interesting file:

C:\Programfiles\VMware\Infrastructure\Orchestrator\configuration\jetty\etc\passwd.properties

This file contains md5 passwords and can easily be bruteforced using rainbow tables

We are in

After bruteforcing the MD5.....



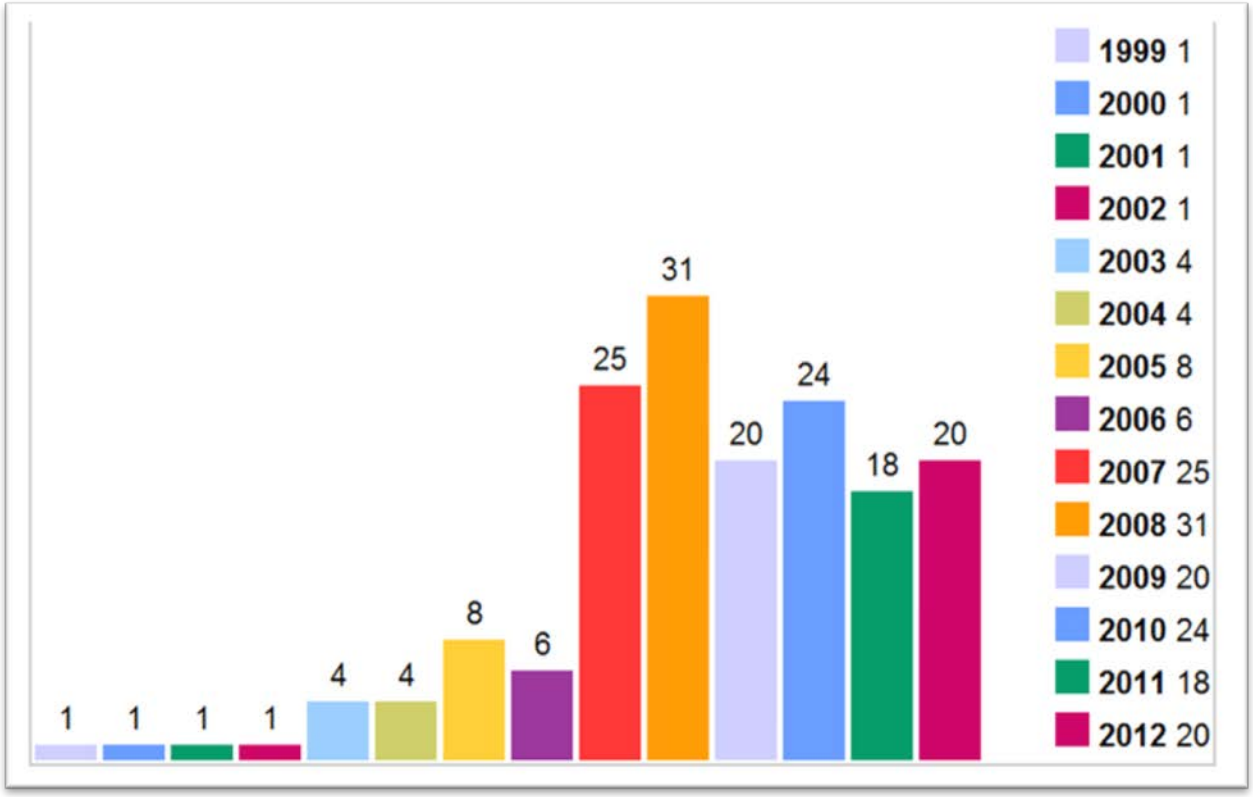
Point & Click

Any one can do .....

This module will log into the Web API of VMWare and try to enumerate all the login sessions

Look

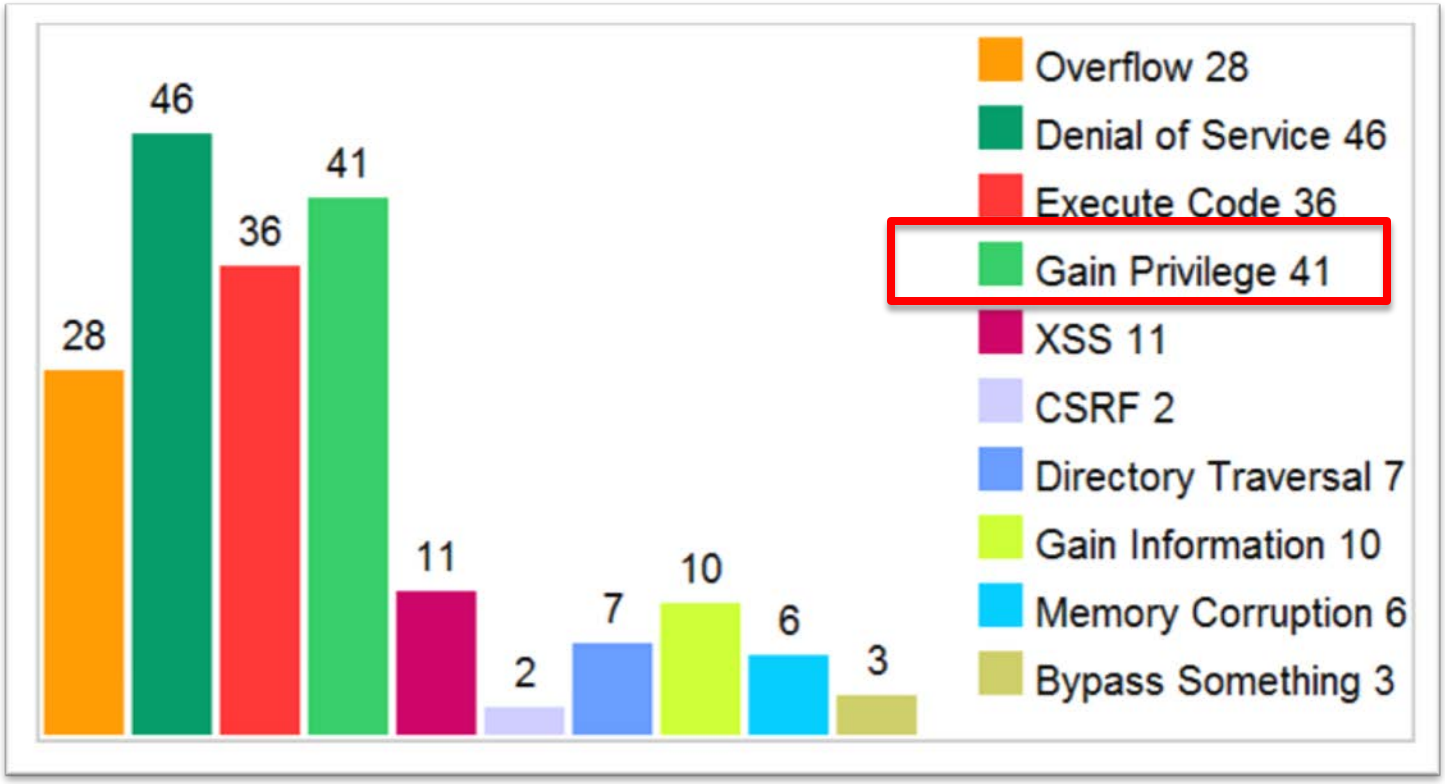
More and More Vulnerabilities..by Year....



Source: http://www.cvedetails.com/vendor/252/Vmware.html

Total

Current Vulnerabilities todate by .... Type



Source: http://www.cvedetails.com/vendor/252/Vmware.html

CVSS Scores Greater Than: 0 1 2 3 4 5 6 7 8 9

Sort Results By : Cve Number Descending Cve Number Ascending CVSS Score Descending Number Of Exploits Descending

#	CVE ID	CWE ID	# of Exploits	Vulnerability Type (s)	Publish Date	Update Date	Score	Gained Access Level	Access	Complex ity	Authen tication	C
20	CVE-2009-1147			+Priv	2009-04-06	2010-08-21	7.2	None	Local	Low	Not required	C
Unspecified vulnerability in vmci.sys in the Virtual Machine Communication Interface (VMCI) in VMware Workstation 6.5.1 and earlier, VMware Player 2.5.1 and earlie VMware Server 2.0.x before 2.0.1 build 156745 allows local users to gain privileges via unknown vectors.												
21	CVE-2008-4915	264		+Priv	2008-11-10	2010-08-21	6.9	Admin	Local	Medium	Not required	C
The CPU hardware emulation in VMware Workstation 6.0.5 and earlier and 5.5.8 and earlier; Player 2.0.x through 2.0.5 and 1.0.x through 1.0.8; ACE 2.0.x through 2. 1.0.7; Server 1.0.x through 1.0.7; ESX 2.5.4 through 3.5; and ESXi 3.5, when running 32-bit and 64-bit guest operating systems, does not properly handle the Trap fl OS users to gain privileges on the guest OS.												
22	CVE-2008-4281	22		+Priv Dir. Trav.	2008-11-10	2010-08-21	9.3	None	Remote	Medium	Not required	C
Directory traversal vulnerability in VMWare ESXi 3.5 before ESXe350-200810401-O-UG and ESX 3.5 before ESX350-200810201-UG allows administrators with the Dat gain privileges via unknown vectors.												
23	CVE-2008-4279	264		+Priv	2008-10-06	2009-09-08	6.8	Admin	Local	Low	Single system	C
The CPU hardware emulation for 64-bit guest operating systems in VMware Workstation 6.0.x before 6.0.5 build 109488 and 5.x before 5.5.8 build 108000; Player 2.0 before 1.0.8; Server 1.x before 1.0.7 build 108231; and ESX 2.5.4 through 3.5 allows authenticated guest OS users to gain additional guest OS privileges by triggerin CPU to perform an indirect jump to a non-canonical address.												
24	CVE-2008-3698	264		+Priv	2008-09-03	2009-01-29	7.2	None	Local	Low	Not required	C
Unspecified vulnerability in the OpenProcess function in VMware Workstation 5.5.x before 5.5.8 build 108000, VMware Workstation 6.0.x before 6.0.5 build 109488, VM 108000, VMware Player 2.x before 2.0.5 build 109488, VMware ACE 1.x before 1.0.7 build 108880, VMware ACE 2.x before 2.0.5 build 109488, and VMware Server b allows local host OS users to gain privileges on the host OS via unknown vectors.												
25	CVE-2008-2097	119		Overflow +Priv	2008-06-05	2011-06-20	9.0	Admin	Remote	Low	Single system	C
Buffer overflow in the openwsman management service in VMware ESXi 3.5 and ESX 3.5 allows remote authenticated users to gain privileges via an "invalid Content-												
26	CVE-2008-1363	264		+Priv	2008-03-19	2011-06-24	7.2	Admin	Local	Low	Not required	C
VMware Workstation 6.0.x before 6.0.3 and 5.5.x before 5.5.6, VMware Player 2.0.x before 2.0.3 and 1.0.x before 1.0.6, VMware ACE 2.0.x before 2.0.1 and 1.0.x be before 1.0.5 on Windows allow local users to gain privileges via an unspecified manipulation of a config.ini file located in an Application Data folder, which can be used												
27	CVE-2008-1362	264		DoS +Priv	2008-03-19	2008-09-05	7.2	Admin	Local	Low	Not required	C
VMware Workstation 6.0.x before 6.0.3 and 5.5.x before 5.5.6, VMware Player 2.0.x before 2.0.3 and 1.0.x before 1.0.6, VMware ACE 2.0.x before 2.0.1 and 1.0.x be before 1.0.5 on Windows allow local users to gain privileges or cause a denial of service by impersonating the authd process through an unspecified use of an "insecu vulnerability than CVE-2008-1361.												
VMware Workstation 6.5.x before 6.5.3 build 185404, VMware Player 2.5.x before 2.5.3 build 185404, VMware ACE 2.5.x before 2.5.3 build 185404, VMware Server 1 2.x before 2.0.2 build 203138, VMware Fusion 2.x before 2.0.6 build 196839, VMware ESXi 3.5 and 4.0, and VMware ESX 2.5.5, 3.0.3, 3.5, and 4.0, when Virtual-8086												

Attacking the Virtual World

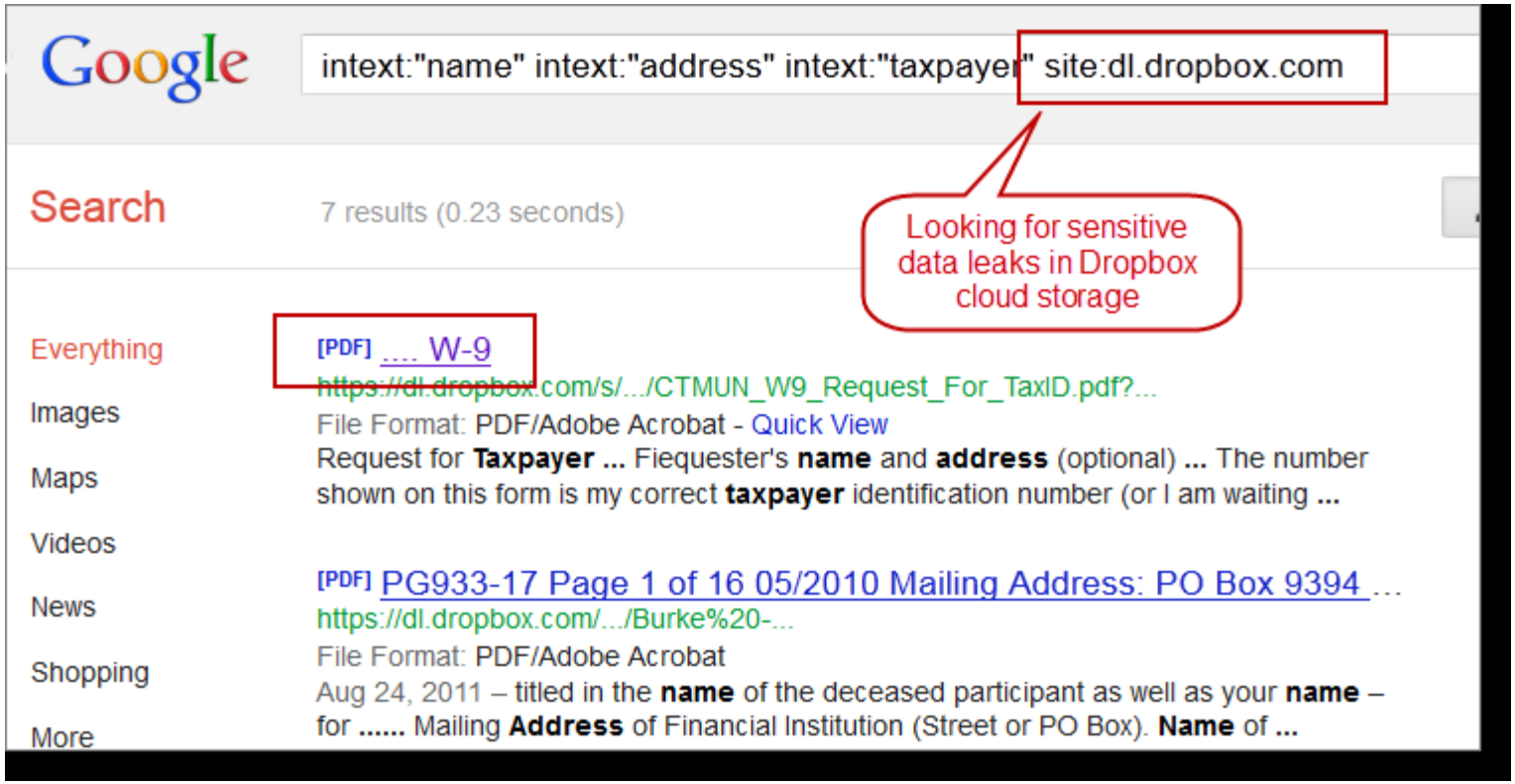
```
43823 50:ea:d6:91:bc:93 172.16.42.103 isiks-iPhone 01:50:ea:d6:91:bc:93
43799 c8:bc:c8:ea:59:13 172.16.42.215 GhostMAC 01:c8:bc:c8:ea:59:13
43735 a8:6a:6f:ca:c8:c0 172.16.42.163 BLACKBERRY-E7B4 01:a8:6a:6f:ca:c8:c0
43663 28:6a:ba:1a:6d:fc 172.16.42.224 Mr-Macs-ipad 01:28:6a:ba:1a:6d:fc
43647 d0:23:db:41:de:8a 172.16.42.100 Martins-iPhone 01:d0:23:db:41:de:8a
43642 00:16:e3:8f:75:a1 172.16.42.177 swlpt 01:00:16:e3:8f:75:a1
43634 00:1d:fe:dc:e1:85 172.16.42.117 * *
43634 0c:60:76:65:d5:a8 172.16.42.112 FLDLP114B 01:0c:60:76:65:d5:a8
43661 14:8f:c6:c4:ba:06 172.16.42.107 Scotts-Phone 01:14:8f:c6:c4:ba:06
43626 f0:cb:a1:5e:ed:93 172.16.42.127 * 01:f0:cb:a1:5e:ed:93
43619 90:21:55:b7:a0:b0 172.16.42.170 Android_352212047584847 *
43602 78:a3:e4:e9:ac:f0 172.16.42.138 * 01:78:a3:e4:e9:ac:f0
43602 18:20:32:a8:e4:c7 172.16.42.219 iPad 01:18:20:32:a8:e4:c7
43562 24:ab:81:4d:56:5f 172.16.42.237 * 01:24:ab:81:4d:56:5f
43585 d0:23:db:2f:74:79 172.16.42.111 Jasonhs-iPhone 01:d0:23:db:2f:74:79
43444 38:e7:d8:78:f3:c1 172.16.42.225 android_20014688ba37b875 *
43407 a0:88:b4:c5:d3:fc 172.16.42.162 20141-lap 01:a0:88:b4:c5:d3:fc
43371 40:6a:ab:fd:54:59 172.16.42.227 BLACKBERRY-393E 01:40:6a:ab:fd:54:59
43697 00:26:ff:74:88:9e 172.16.42.232 BLACKBERRY-305B 01:00:26:ff:74:88:9e
43360 00:1e:65:18:e1:98 172.16.42.166 uk812211 01:00:1e:65:18:e1:98
43346 0c:74:c2:d5:05:c2 172.16.42.178 * 01:0c:74:c2:d5:05:c2
43342 90:84:0d:ae:36:ef 172.16.42.115 Nicole 01:90:84:0d:ae:36:ef
43319 00:21:6a:7f:a1:fc 172.16.42.190 UK813411 01:00:21:6a:7f:a1:fc
43673 cc:08:e0:be:d7:99 172.16.42.147 Burzuj 01:cc:08:e0:be:d7:99
43283 00:21:6a:83:ba:e0 172.16.42.128 UK813682 01:00:21:6a:83:ba:e0
43452 30:7c:30:5e:28:09 172.16.42.181 BLACKBERRY-C9B6 01:30:7c:30:5e:28:09
43652 00:23:14:2d:17:a0 172.16.42.202 uk783613 01:00:23:14:2d:17:a0
43550 4c:ed:de:60:33:c6 172.16.42.106 Jason-TOSH 01:4c:ed:de:60:33:c6
43697 18:3d:a2:1c:a9:68 172.16.42.156 uk827790 01:18:3d:a2:1c:a9:68
43270 00:1e:65:42:6b:8e 172.16.42.124 uk814617 01:00:1e:65:42:6b:8e
43665 a0:88:b4:06:e7:68 172.16.42.150 UK833187 01:a0:88:b4:06:e7:68
```

Live Attack

Against the Virtual World . . . . ARP Attack

Virtual World

With Virtual access by any one ……. With only a click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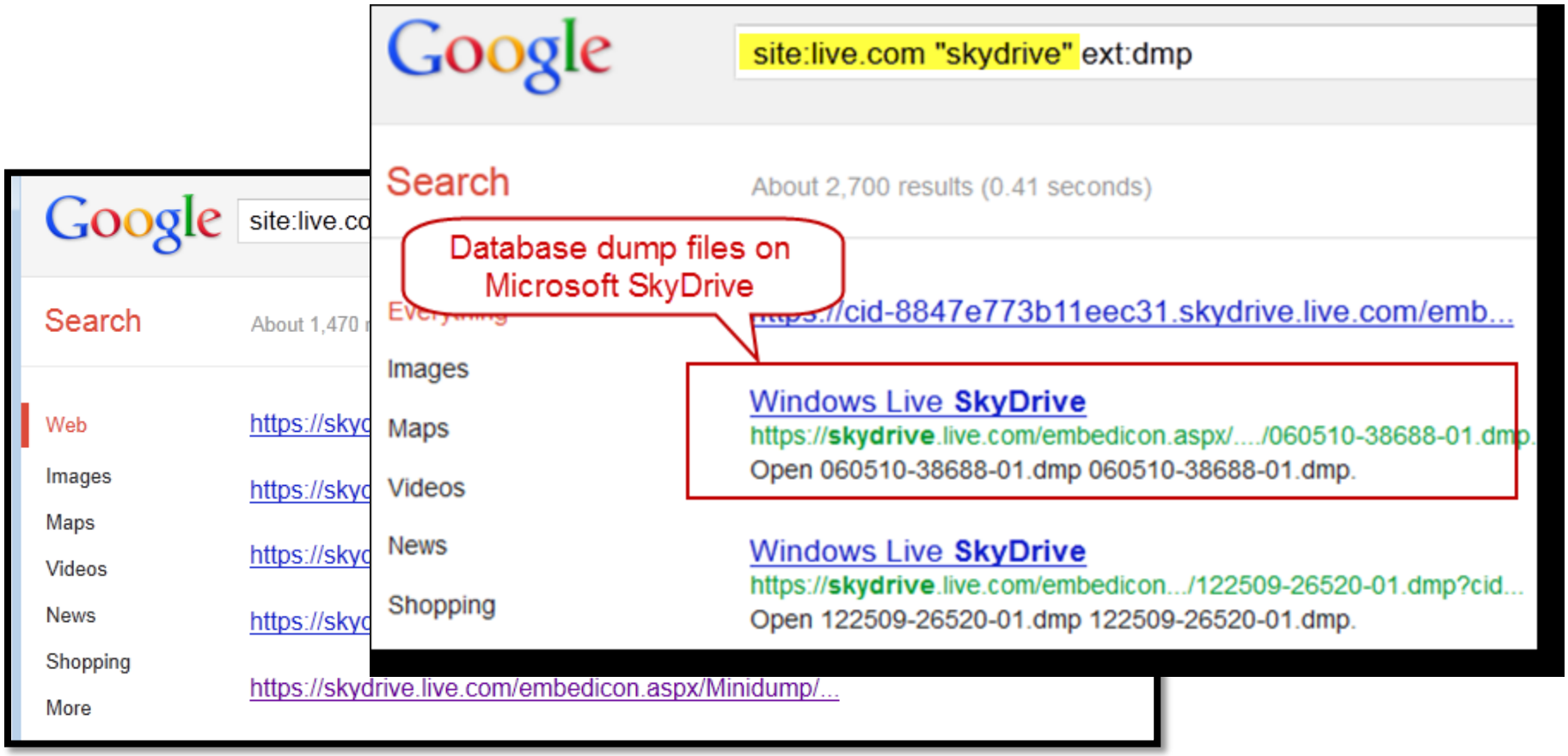

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Data Loss In The News

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Cloud Security

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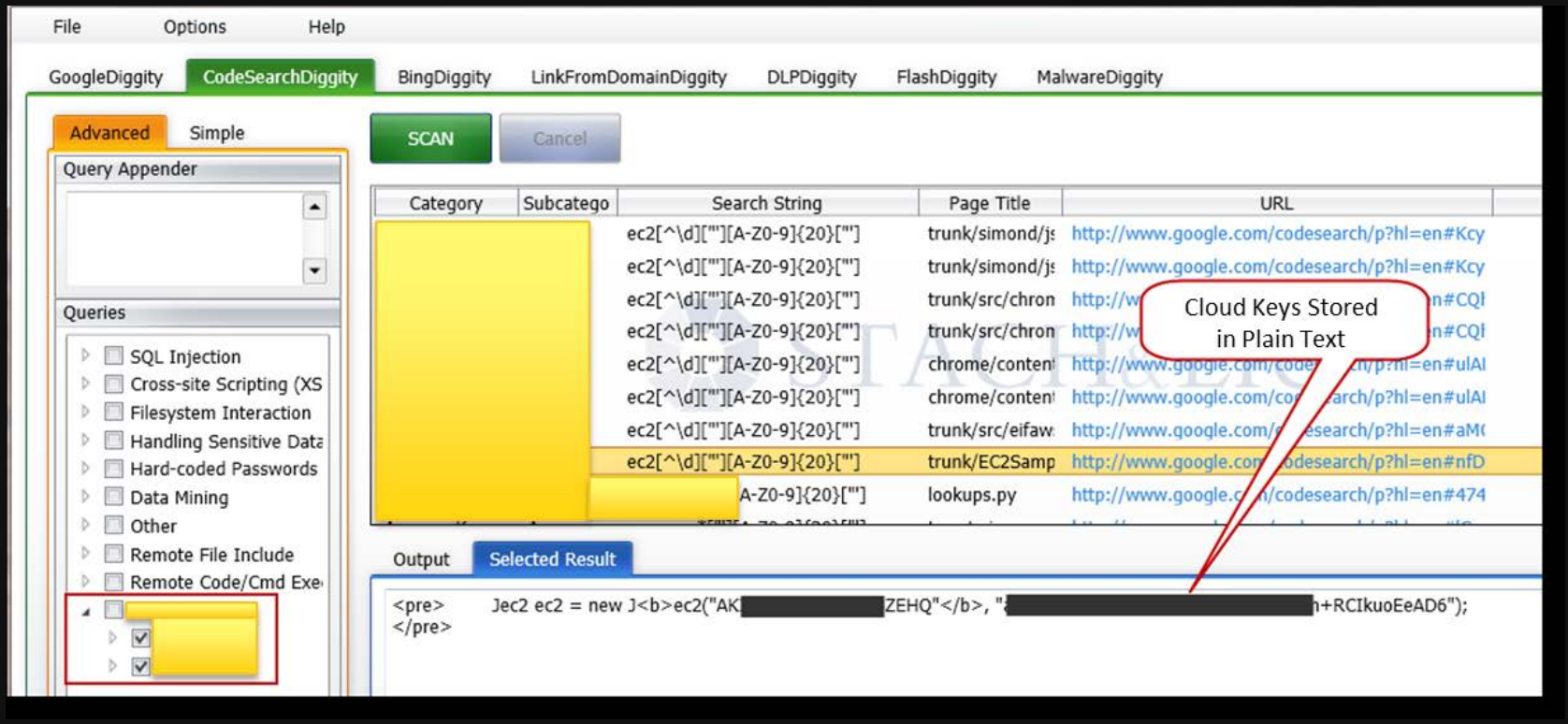

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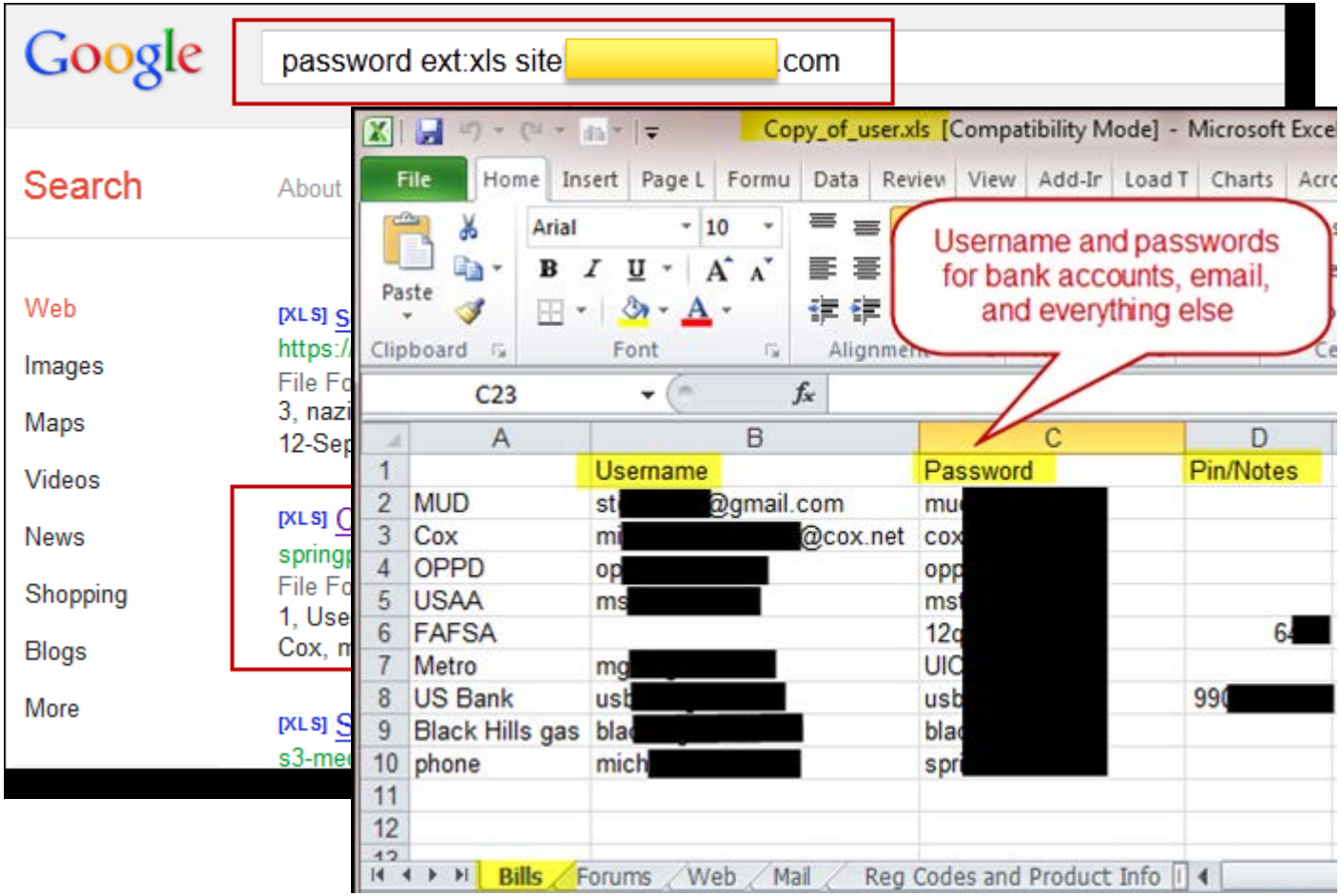
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The Battle
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Thank You

Jason Hart CISSP CISM
VP Cloud Solutions

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