# Security and Business Continuity

Jamie Smith Lanetco Computer Networks Inc.

# Of 1,100 Solution Providers responding:



40 %

experienced six or more attacks in the last year 31 %

report multiple ransomware attacks in a single day amongst small business clients

# Less than 1 in 4 ransomware incidents are reported to the authorities



# 42% of report companies paid the ransom

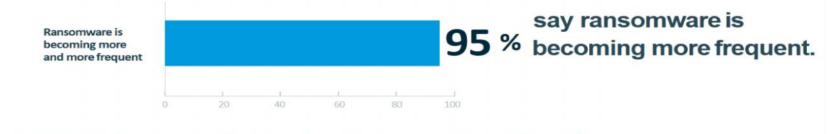


# 1 in 4 who did so never recovered the data

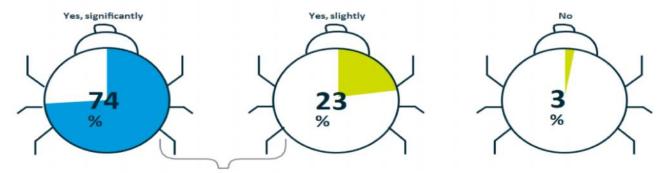


#### MAJORITY OF IT SERVICE PROVIDERS AGREE: RANSOM-WARE IS HERE TO STAY





Will the # of ransomware attacks continue to increase over the next 2 years?

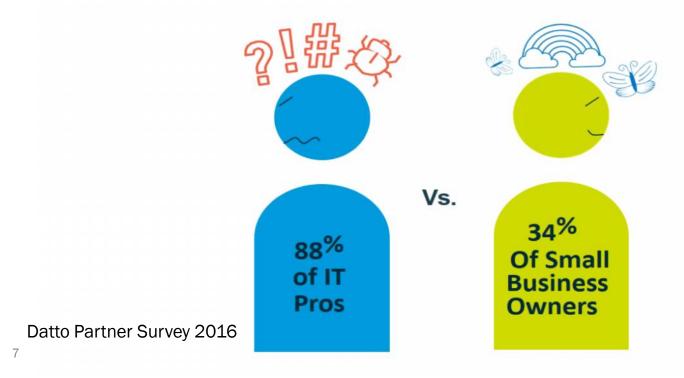


97% predict these incidents will continue to increase.

#### THE SIGNIFICANT DISCONNECT BETWEEN THE IT SERVICE PROVIDER AND THE CLIENT ON RANSOMWARE

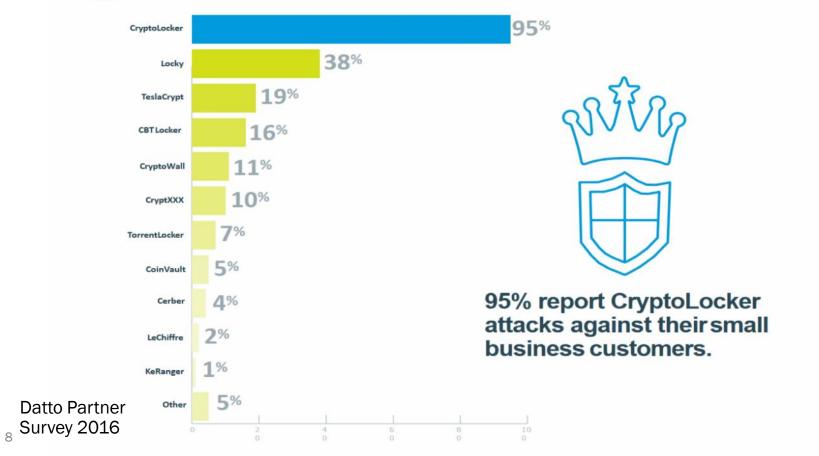
How concerned are you about the threat of ransomware? How concerned are your small business customers?

#### Who is "highly concerned" about the threat?



#### **CRYPTOLOCKER IS KING**

Have any of your customers fallen victim to one or more of the following strains of ransomware? (Check all that apply)



# SQL Application and Database Encryption

#### Cerber Ransomware switches to a Random Extension and Ends Database Processes

By Lawrence Abrams

🛗 October 4, 2016 🛛 06:20 PM 🛛 🜉 8

Late last week, a new version of Cerber Ransomware was released that included some new features. The most notable change is the switch from the static **.Cerber3** extension for encrypted files to a random 4 character extension, the use of a HTA file as the ransom note, and the termination of various database processes before encryption.

With this version, when a victim's files are encrypted, not only will the filename be scrambled, but the extension will be replaced as well. This means that a file that was previously encrypted as **5NgPiSr5zo.cerber3**, would now be encrypted to a name like **1xQHJgozZM.b71c**.

This version also includes a new ransom note called README.hta. When launched, the ransom note will appear in an application Window and display the normal ransom note. An example of the README.hta file can be found below.

# U.S. to establish new cybersecurity agency

BY WARREN STROBEL

WASHINGTON Tue Feb 10, 2015 10 12am EST

**Security Breaches** A New Headline Every Day



CEO heads may roll for security breaches in wake of Sony boss' exit, experts say

Brokerage Firms Worry About Breaches by Hackers, Not Terrorists

By MATTHEW GOLDSTEIN FEBRUARY 3, 2015 11:54 AM . 4 Comments

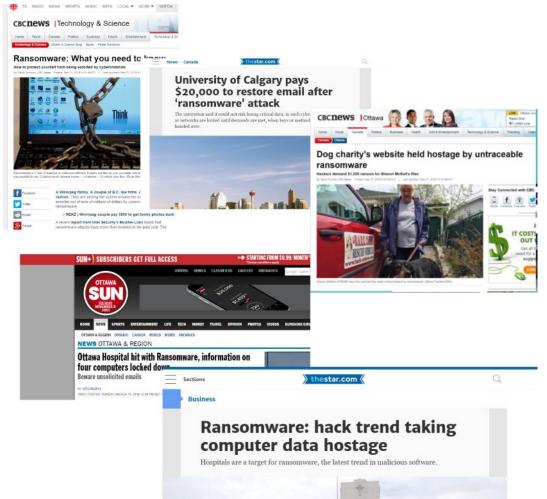
#### F.B.I. Says Little Doubt North Korea Hit Sony

By MICHAEL S. SCHMIDT, NICOLE PERLROTH and MATTHEW GOLDSTEIN JAN 7, 2015

### But Ransomware has taken over as the new real threat



# Ransomware Security Breaches



# Ransomware Under the hood

### Ransomware workflow



User Clicks an

Email Link or

Malvertising



Angler EK

Initial Exploit Typically Using



Malicious

Infrastructure



Ransomware Payload

#### **TACTIC** Emails are still popular and are getting better Trick SMB into FedEx Service <details@feedeex.com> August 13, 2012 6:54 AM Details opening link or FedEx delivery problem # Error ID4900 attachment N THE BUSINESS OF YOUR SUCCESS\* Federa Unfortunately we ADP Prompt Information package you have time because the Report ID: 85304 erroneous. October, 22 2013 Thu 26/03/2015 10:49 AM Valued ADP Client Please print out tl Santiago <Santiago 🖿 페 🧊 💵 com> Company with ID 43962 Complete Payroll Transfer from your ADP account recently. F collect the packag system: Santiago Henson - My resume Access Activity Report To Print a Please overview the following notes: Message Santiago Henson - My resume.zip (4 KB) · Please note that your bank account will be charged within one banking day for the sum sho Hi, my name is Santiago Henson · Please Not try to reply to this message, automative notification syste http://thetechguy I am herewith submitting my Resume under attachment for your perusal. Please Contact your ADP Benefits Authority. 7.37.58-AM.png Thank you, This note was sent to current users in your system that access ADP Netsecure. Santiago

# How email is used in Ransomware

Link to Exploit Kit Drive by Download site

Dropper as Attachment Ransomware Binary as attachment

# Malvertising Overtakes Porn for Web Infections

"We found that at least 27 percent of the Alexa 1000 websites were delivering malware via malicious advertisements."

**Bromium Labs** Endpoint Exploitation Trends 2015 H2

# Malvertising on the Rise

How does malvertising work?

- 1. Set up a website with exploit kit
- 2. Run an ad on Yahoo, AOL or other ad network, with legitimate company creative
- 3. Ad server runs remote Flash exploits or redirects users to exploit kit site
- 4. User gets infected

Attn: NYTimes.com readers: Do not click pop-up box warning about a virus -- it's an unauthorized ad we are working to eliminate.

#### **The New York Times**

Top websites deliver CryptoWall ransomware via malvertising...

Adam Greenberg SC Times

### Malvertising Using Hijacked Images to Target SMBs



Image: http://news.softpedia.com/news/CryptoWall-2-0-Delivered-Through-Malvertising-On-Yahoo-and-Other-Large-Sites-462970.shtml#sgal\_0

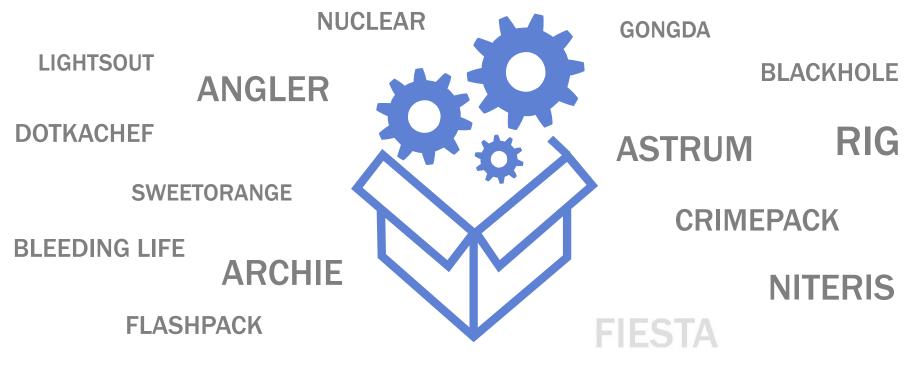
# **Recent examples of malvertisers hijaking legitimate ads**



# What's an exploit kit?

# Explosion in SaaS/CaaS Plug-and-Play Marketplace

Kits cost as little as \$200



23

Black hole <sup>β</sup>	S	STATISTICS	5 THI	IREADS	FILES	SECURITY	PREFERENCES				<u>Loqout</u> →[
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## **Exploit Kits Are Getting Better**

http://krebsonsecurity.com/2010/10/java-a-gift-to-exploit-pack-makers/

### 14 'Blackhole' Exploit Kit Author Gets 7 Years

APR 16

A Moscow court this week convicted and sentenced seven hackers for breaking into

"According to Russian security firm Group-IB, Paunch had more than **1,000 customers** and was **earning \$50,000 per month** from his illegal activity."

then 27-year-old along with an enc cybercriminals who work and profit from Blackhole.

was arrested m of other sell, develop

According to Russian security firm Group-IB, Paunch had more than 1,000 customers and was earning \$50,000 per month from

it. Once an extremely popular crimeware-as-a-service years responsible for a large percentage of malware tials, and likely contributed to tens of millions of dollars esses over several years.

news ov was rs in a o13, the arrested of other develop



25

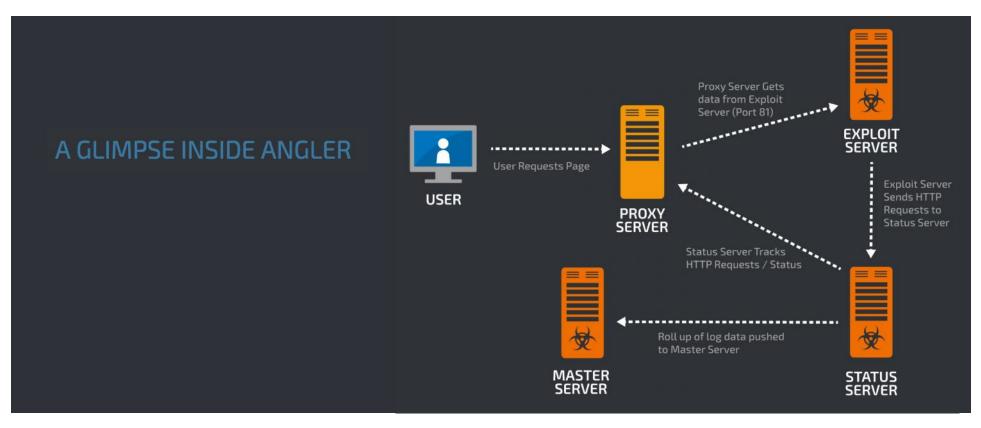
# **Cisco Umbrella DNS**

Diverse Set of Data & Global Internet Visibility

**80B** Requests Per Day 160+ Countries de

65 Daily Active Users **10K** Enterprise Customers

### Angler Exploit Kit has taken over — especially for ransomware



### Angler has truly exploded in volume





# 9,000

observed served exploits in a single day



40%

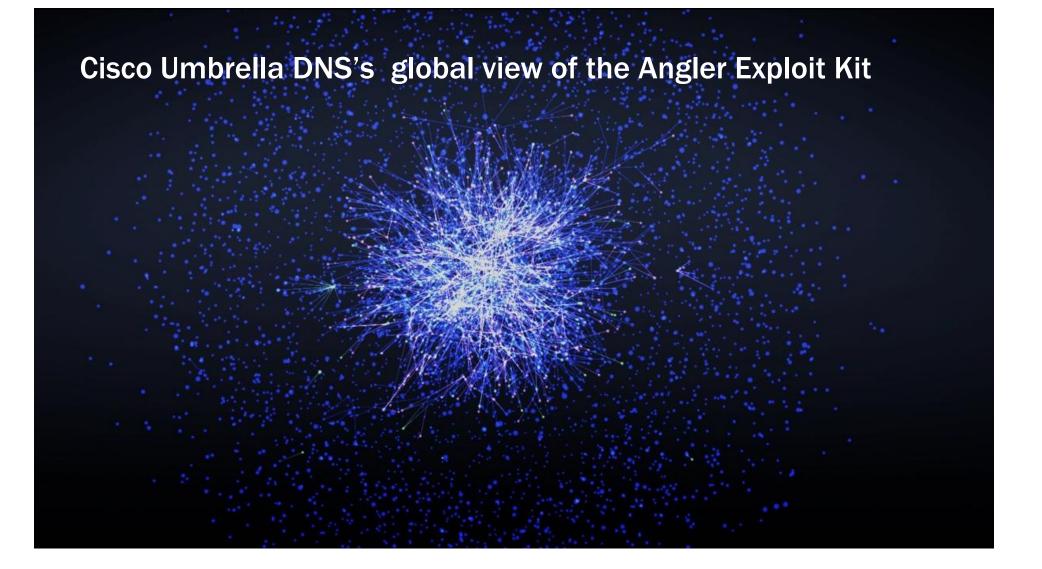
of users being served exploits were compromised



62%

of Angler infections delivered Ransomware "The average life of an Angler server is one day - in that day we found ~9,000 unique IP addresses with around 3600 compromised users. The average amount per user that pays the ransom is \$300, leading to an annual revenue of more than \$34 Million activity associated with the adversaries."

Angler Exposed Cisco Talos and OpenDNS labs





# Intermediate step: Dropper Malware

### **Increasingly Common Step: Dropper**

**Increasingly Common Option for Ransomware** 

# **TACTIC**

Malware that installs other malware

Bad actor gets a piece of malware on computer

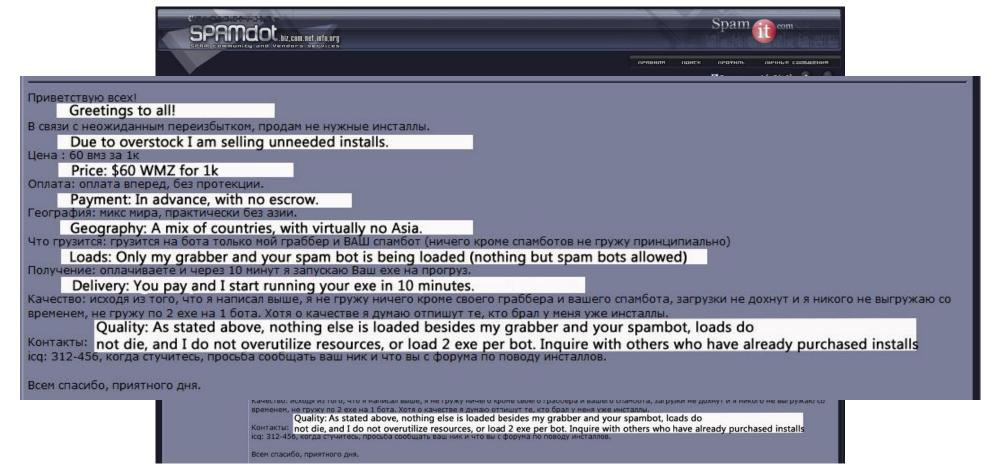
Malware sits quietly and just phones home; not the flashy/noisy malware Bad actor sells or rents ability to infect computer

3

- Malware phones home
- Installs main payload: Ransomware, Keylogger, Spambot

If contract ends or more capacity, install more malware

Neutrino bot 🛛 🖀 Task	Statistics 👤 Clients	s 🔳 Files	🗈 Logs 🗢 Settings	ළු Logout						
			4 Show	v filter options						
				No. 20 Parts						
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lot ID	Bot name	IP address	OS	Serial key	Antivirus	Country	Version	Quality	Status	Actio
d93cc2243542e6af53bced4ae029240	380DDB1701933E80	D	Windows 7 Ultimate (x64)			2	2.4		online	С×
5248c10b9928704048fc999129ff5fd	51E0VOCKAZ1N6C1	78	Windows 8 (x64)			10	2.4		online	C ×
8e908e7632d1821c3460590766f7475	CQEDH9893KF031K		Windows 7 (x32)			-	2.4		online	C×
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ed05e0b0c1e8b9dac920bab8261c1d2	8DHPUI9JXI2XOC0	5	Windows XP (x64)				2.4		online	C×
http://malware.dontneedc	1H7LV7UBD2U0697		Windows Z (v64)			-	24	000	opline	RX.



Source: krebsonsecurity.com

### **Price Per Infection/Infection as a service**

Region	2015 Average Price per 1,000 Infections	2015 Average Price per install
US	\$70	\$0.07
Europe	\$105	\$0.11
Asia	\$140	\$0.14
Australia	\$140	\$0.14

Data from Trend Micro Report: "Russian Underground 2.0"

# Ransomware payload

## **Typical Ransomware Infection**

At a high level



		Encryp	tion C&C		Payment MSG
NAME	DNS	IP	NO C&C	TOR	PAYMENT
Locky					DNS
SamSam			•		DNS (TOR)
TeslaCrypt	0				DNS
CryptoWall	0				DNS
TorrentLocker	•				DNS
PadCrypt	0				DNS (TOR)
CTB-Locker				•	DNS
FAKBEN	0				DNS (TOR)
PayCrypt	0				DNS
KeyRanger					DNS

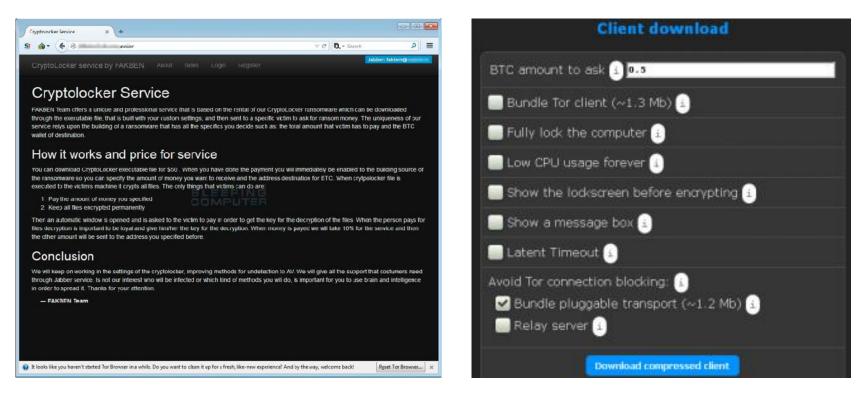
# Your files are encrypted!



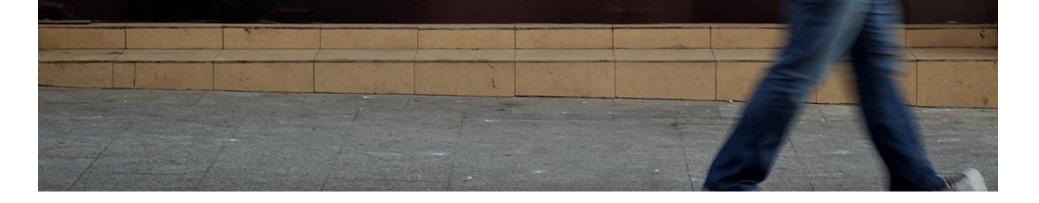
And you are asked for a ransom to get them back

### Now available as a reseller model!

### Non techie cybercriminals can partner and keep 80% of revenue



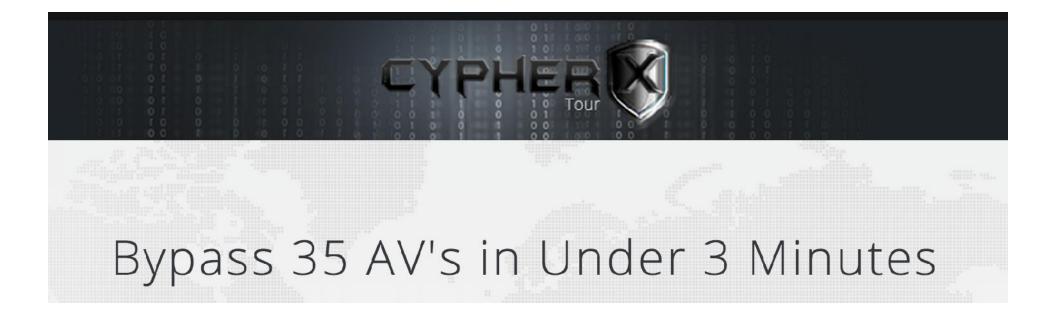
# Why isn't my AV catching this?



"Signature-based tools (antivirus, firewalls, and intrusion prevention) are only effective against 30–50% of current security threats."

IDC November 2011

### **Getting Around Signatures: Crypters**



### **Getting Around Signatures: Crypters**

## **Protect your files and remove false detections!**

We provide encryption software to protect files against

invaders and remove false positive detections. We are leading the market with multiple FUD Crypters and cryptography solutions.

Aegis Crypter 5.4	
Main FilePath StubPath IconPath EnKey Mutex Add Ico Results	Feature (recommendation)         Anti-Virtual Machine(WM   VPC   VBOX)         Anti-SandBox(Sandboxie   More)         Bypass UAC(Win7/8 32bit)         Disable Firewall         Hide Directory         Hide File         Add Startup         Inject Default browser         Enable EOF (Bots)         Add Junk Code (Encryption)         Resource Data (Encryption)         EOF Data (Encryption)
Crypter Scanner Binder Spoofer Attribu	Loginer te UPX Donation Update

### **Getting Around Signatures**

http://buy.aegiscrypter.com/

### **Test Against Signature Based Tools**

Choose & 😌 C Scan Done

	File name: 34.exe (156 KB) Result: 2/39	Started at: 15-04-15 08:12:17 UTC 				
		show by files				
×.	Anthrina -	Results 🦯				
$\square$	Ad-Aware Pro	Clean				
	AhnLab V3 Internet Security	Clean				
$\overline{\mathbb{Z}}$	ArcaVir Antivirus 2014	Clean				
	avasti Internet Security	Clean				
	AVG Arti-Virus	Clean				
Ø	Avira Antivirus Suita	Clean				
1	Bitdefender Antivirus Plus 2015	Ciwan				
	BullGuard Antivirus	Clean				
	Ciam AntiVirus	Clean				
	COMODO Antivirus	Clean				
	Dr.Web Anti-virus	Clean				
Ø	Emsisoft Acti-Malware	Clean				
	eScan Antivirua	Clean				
Ø	ESET NOD32 Antivirus	Clean				
	F-PROT Antivirus for Windows	Clean				
	F-Secure Internet Security 2014	Clean				
M	FortiClient Lite	Clean				
R	G Data AntiVirus	MSIL Trojan Stimilik B (Engine B)				
Ø	KARUS and virus	Clean				
R	Jiangmin Antivirus 2011	Clean				
	K7 UltimateSecurity	Clean				
M	Kaspersky Anti-Virus 2015	Clean				
M	Malwarebytes Anti-Malware	Clean				
	McAfee VirusScen Enterpice	Clean				
R	Microsoft Security Essentials	Clean				
R	Nano Antivirus	Clean				
Ø	Norman Security Suite	Clean				
R	Outpost Antivirus Pro	Clean				
R	Panda Global Protection 2014	Clean				
M	Quick Heal Internet Security	Clean				
M	Sophos Anti-Virus	Mai/MSIL-KC				
M	Symantec Endpoint Protection	Clean				
N	Total Defence Anti-Virus 2011	Clean				
Ø	Trend Micro Titanium IS	Clean				
N	TrustPort Antivirus	Clean				
	Twister Antivirus	Clean				
N	VBA32 Anti-Virus	Clean				
	VIDA32 Anti-Virus VIPRE Internet Security 2015	Clean				
V	Zilyal Internet Security	Cien				

http://www.aegiscrypter.com/

New Malware executable is tested against AV and UTMs.

If detected, crypter runs again to create zero-day FUD (Fully UnDetectable)

#### Why is CypherX The Best Crypter to Buy?

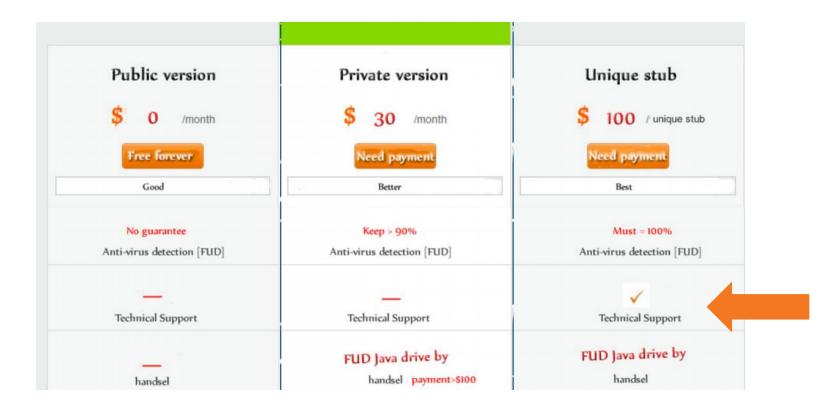
nent and testing for over 3 years. During this period we have pushed the limits with undetectable softwa s an advantage that allows us to more effectively keep files fully undetected from analysis, reverse engin

Download CypherX now and make files undetectable from:



Type link or choose file

BEST FUR riefes Dubles Contest Cont		Festure Anti-Virtual Nachine(XMI I VPC) Anti-Sandbox(Bandbox) (Antro) Bysass UAC(Virta   Win7) Disable Firewall Disable Firewall Disable Fire Add Junk Code Add Startup Dispect Default Browser		ris Crypter Main Fea Anti-Virtual Machine Anti-SandBox Add Startup Inject browser Bypass UAC	<ul> <li>Stub Update</li> <li>UPX Compression</li> <li>Spoof Extension</li> <li>Files Binder</li> <li>More</li> </ul>
Uşdate	Cryst	Lope Spool	Enter	Purchase	
Put \$	Oversion 0 /month vee forever	Logo	Private vers	sion	Unique stub \$ 100 / unique stub Need payment



# Won't the government protect me?

### **Government Guidance: Put better locks on your door**

#### Leadership and IT Professionals

- Implement Defence-in-Depth: layered defence strategy includes technical, organizational, and operational controls.
- Establish clear policies and procedures for employee use of your organization's information technologies.
- Implement Technical Defences: firewalls, intrusion detection systems, and internet content filtering.
- Update your anti-virus software daily.
- Regularly download and install vendor security "patches" for all of your software.
- Change the manufacturer's default passwords on all your software.
- Monitor, log, analyze, and report successful and attempted intrusions to your systems and networks.

If you have not paid ransom, call the Canadian Anti-Fraud Centre 1-888-495-8501 If you have paid ransom, you can report to your local police force

Government of Canada	Gouvernement du Canada			Canada.ca Ser	vices Departmen	ts   Français
ublic Safe	ty Canada		*	Search Ca		nadä Search
tional Security 🗸	Border Strategies 🗸	Countering Crime 🗸	Emergency Management 🗸	Resources 🖌		
Counter-Terroris	(0	anadian Cy CCIRC)	ber Incident R	esponse Ce	entre	
Strategy Countering Viol	CC cyt		coordination centre responsible for 's key systems and services. The	se systems,	Report A Cyber Incident	

"The ransomware is that good... To be honest, we often advise people just to pay the ransom."

Joseph Bonavolonta Special Agent, FBI Cyber Intelligence

# "Paying the ransom does not guarantee the release of files."

CCIRC CCIRC AL16-005 "...results in unauthorized disclosure of personal information...statutory breach reporting obligation..."

Alberta Privacy Commission March 2016 – Alberta Personal Information Protection Act "Breach reporting obligations...added to CFPIPEDA, but those provisions are not yet in force."

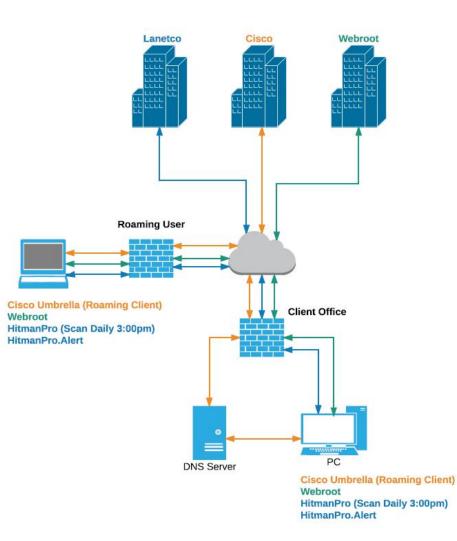
**Borden Ladner Gervais** 

# Reducing risk of Ransomware

# **PREVENT:** Malware

- Protect users across the full infection chain
  - NOT JUST AN EXECUTABLE OR SIGNATURE
- Block sites with exploit kits at the network layer
  - Whether it's a whole site or an embedded ad
- Protect users from phishing attacks
  - To prevent breaches
- Block malicious links in emails and applications
  - Because the browser is not the only path of infection

# **PREVENT:** Malware

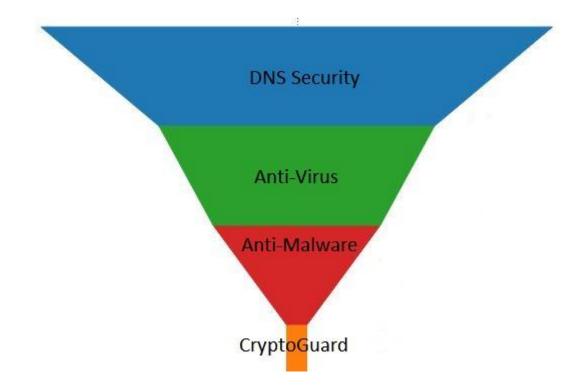


# **CONTAIN:** the new prevention

Prevent "Phoning home"

- Block "droppers" from getting malware
  - Whether it's ransomware, keyloggers, spam senders or DDoS bots
- Stop Spyware/Keyloggers from uploading data
- Prevent Ransomware from getting an Encryption Key
- Alert and have team respond to alert

## **Contain: the new prevention**



## **TRAINING:** educate

What we're doing today is important

- Help employees understand the threat and the need to be vigilant
- Explain the cybercrime business you aren't too small to be targeted
- If you see something strange, raise your hand!
- Tell others!

## **TRAINING:** educate

- Employee security training. Provides online, engaging, security awareness training and testing, confirming that your staff have completed the curriculum.
- Enhanced breach prevention. Testing by sending simulated phishing scams and ransomware to your employees. Weekly micro-training videos. Monthly security letters to employees. Written and easy to understand employee policies and procedures.

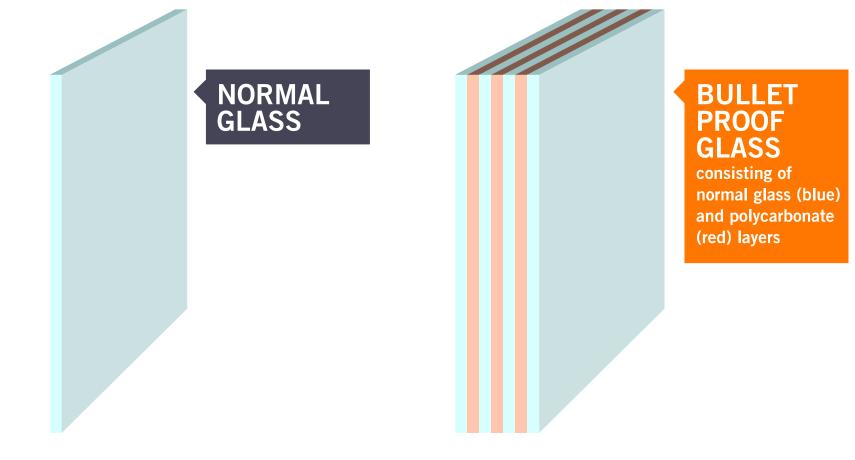
# **Backup: the final layer**

- Backup of data
- Multiple backup copy retention
- Offsite copies
- End user mobile File Sync and Share

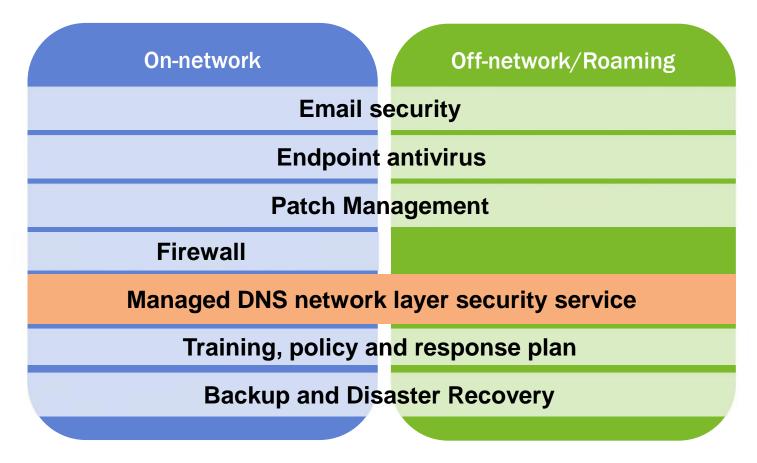
# **Backup: the final layer**

- Lanetco uses Backup and Disaster Recovery devices.
- Image based backup
- Local and offsite copy
- 12 month retention (5 daily, 4 weekly, 12 monthly)
- Built in Ransomware detection
  - Not an anti-virus or anti-malware tool
  - If files did exist and now drop to 0 (deletion)
  - Evaluate entropy of randomly selected files (if you had 1000 files with extension .PDF and now have 0)
  - Evaluate modification time vs create time on MBR
- End user File Sync and Share





### Security is about managing risk through layers



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### **General Best-Practices**

- Solid patch management
- Users run as non-privileged users (no admin)
- Disable RDP
- Firewall enabled on endpoints
- Segmented and secured backups (tested)

### For your home use:

- Install Windows, Java, Flash and Adobe Updates <u>FREE</u>!
- Install an anti-malware tool such as Malwarebytes.com (freemium) FREE!
- Install a DNS management tool such as OpenDNS.com (freemium) <u>FREE!</u>
- Sign up for, install and save your documents to a File Sync and Share (OneDrive, GoogleDrive, Syncplycity, DattoDrive, etc.) <u>FREE!</u>
- Use PassKey to store and create your passwords (different password per website) <u>FREE!</u>
- Upgrade the version of your anti-virus, and use a PAID FOR A/V
- Update your anti-virus daily

# **Thank You!**

# **Questions?**