Techniques, Tools and Processes to Help Service Providers Clean Malware from Subscriber Systems

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October 22, 2012, Baltimore, Maryland, USA
M³AAWG Training Video Series

Techniques, Tools and Processes to Help Service Providers Clean Malware from Subscriber Systems

(more than 2.25 hours of training)

This is Segment 5 of 6

The complete series is available at: https://www.m3aawg.org/activities/maawg-training-series-videos

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Remediating Violated Customers
Segment 5 of 6

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October 22, 2012, Baltimore, Maryland, USA
Barry Greene has over 30 years industry experience including having served as president of the ISC (Internet Systems Consortium). He is a pioneer in service provider security and operational security reaction teams.

Barry is currently a participant on the U.S. Federal Communications Commission’s (FCC’s) Communications Security, Reliability and Interoperability Council (CSRIC).
Remediating Violated Customers
Time for Remediation Action

• The cyber-civic society will be expecting all parties to do their part to protect against cyber-threats.
• This includes Service Providers.
• This module is based on the work in the IETF RFC 6561 Recommendations for the Remediation of Bots in ISP Networks (http://tools.ietf.org/html/rfc6561)
Your Customers are Not the Problem!

• There was a time where “users” and “customers” were blamed for doing dumb things to get their systems infected.
• When users who have up to date hardware, operating systems, software, anti-virus, anti-malware, and is mindfully doing the right think still getting infected, then we have to consider that the real problem is beyond the user!
This is your Network!

Victimization Cost


**TIME AND MONEY LOST TO CYBERCRIME**

- **$114 BILLION**
  - Cybercrime cost in cash in 12 months

- **$274 BILLION**
  - Total loss of time for victims in 24 countries over the past 12 months

Extrapolated costs over the last 12 months – see [http://norton.com/cybercrimereport](http://norton.com/cybercrimereport) for more details. All figures are rounded.
Normal Malware Cycle

- Remediation
- Discovery
- Victimization
- Replication
- Activation
- Creation
Remediation Shortens the Cycle

- **Remediation**: Shortens the cycle by minimizing replication and assimilation, crucial in damage control.
- **Creation** leads to **Activation**, then to **Discovery**.
- **Quarantine**: Contains infection early.
- **Proactive Detection**: Discovers infection in its early stages.
- **Minimizing Replication and Assimilation**: Is key to damage control.
Principles of Remediation

• No one party can remediate a violated customer.
• It takes a team that involves the entire eco-system of operating system vendors, application providers, on-line content, anti-virus vendors, service providers, professional computer repair organizations, and the user of the device.
Expectations of Remedation

- No way guarantee the remediation of all bots.
- Bot removal is potentially a task requiring specialized knowledge, skills and tools, and may be beyond the ability of average users.
- Attempts at bot removal may frequently be unsuccessful, or only partially successful, leaving the user's system in an unstable and unsatisfactory state or even in a state where it is still infected.
- Attempts at bot removal can result in side effects ranging from a loss of data to partial or complete loss of system usability.

*When a customer’s computer gets infected, we ask them to go buy a new PC. We’re in Hong Kong. New PCs are cheaper than trying to clean up our customer’s computer.* (Anonymous CTO in an SP)
Detecting BOTNET & Malware

- Service Providers have a range that gives them insight into which of their customers are infected.
  - Reports (free and subscription) from external parties.
  - Service Provider Telemetry.
  - Partnership with Anti-Virus Vendors
  - Helpdesk calls
Where to Start

- We currently have a multitude of organizations who will provide detailed and traceable (i.e. through account logs and NATs) reports.
  - Arbor - Atlas, see http://atlas.arbor.net/
  - Internet Systems Consortium - Secure Information Exchange (SIE), see https://sie.isc.org/
  - Microsoft - Smart Network Data Services (SNDS), see https://postmaster.live.com/snds/
  - SANS Institute / Internet Storm Center - DShield Distributed Intrusion Detection System, see http://www.dshield.org/about.html
  - ShadowServer Foundation, see http://www.shadowserver.org/
  - Spamhaus - Policy Block List (PBL), see http://www.spamhaus.org/pbl/
  - Spamhaus - Exploits Block List (XBL), see http://www.spamhaus.org/xbl/
  - Team Cymru - Community Services, see http://www.team-cymru.org/
Alerting Violated Customers

• Communicating with customers is core to modern customer experience.
• Customer persistence and stickiness is core to reducing churn.
• Any rational SP strategy to reduce churn will have customer communications tools that include:
  • Email
  • Phone
  • Walled Garden
  • IM
  • Web Alert
  • Home Page Alert
  • SMS
  • TV Screen Alerts
Alerting Violated Customers

• If you know that a customer has been violated, then there are civic society expectations to let them know they are being victimized.

• SPs doing this today find that it is a tool to increase customer loyalty and decrease churn.

• Tracking violated customers means that the Service Provider must update their customer tracking & support system to know which are identified as victimized and which have been notified.
Alerting Violated Customers

- **Email Notification** – E-mail with customers sometimes work – but with all the SPAM, how do they know it is from you? Email notification with another approach to validate the source works best.

- **Telephone Call Notification** – A simple phone call does wonders. But also needs a secondary source to validate (fake support phone calls do happen).

- **Postal Mail Notification** – People do look at mail from their service provider. The notification letter can have all the information needed to help the violated customers start their remediation work.
Alerting Violated Customers

- **Walled Garden Notification** – Violated customers who are not paying attention or may be other devices in the residence/business may need to be put into a walled garden to notify. Careful attention is needed to insure collateral impact to other devices in the residence/business are not impacted (i.e. medial monitoring or emergency services).

- **Instant Message Notification** – Many people live on chat. A chat pop-up can be a way to get the attention of a violated customer.

- **Short Message Service (SMS) Notification** – Mobile phone operators can send free SMS – asking the violated customer to go to a site and run a security check.

- **Web Browser Notification** – In Social Media –
Alerting Violated Customers

- **Web Browser Notification** – If the browser is where the customer lives, then explore tools that help interact at the browser level (i.e. plugins or toolbars).

- **Social Media** – A large majority of customers live in social media. The same tools can be used to get the word out to violated customers.
Notification Factor

- **Notification to Public Access Points.** Alerting violated customers that are tracked from a public WIFI point may or may not be the best time to notify. A coffee shop would not be a good place to try to recover your system from a malware infection.

- **Shared IP addresses.** Many residence and businesses are behind NAT with no logging (or they will have not clue about “NAT logging”). Tools to help them figure out which computer, device, or appliance is infected will be needed.
  - Q. How do you remediate a violated Internet connected refrigerator?
  - Q. How do you remediate a violated diabetic monitoring device?

- **Law Enforcement Lessons on how to help a Victim of Crime are useful.** The SP’s support team can draw on lesson used in the LE community to help people productively cope.
I’ve checked everything!

- Customer: “I’ve checked all my computers, my kids computers, my phones, my tables, my X-box, my Tivo, my printers, my furnace, my light controls, my home security system, my health monitoring system, my electric vehicle charging station, my solar panel monitoring system .... Everything is patched and fixed – why are you still saying I’m infected with malware!?”

- Support Team “Have you checked to see if your neighbors are using your wireless?”

- Customer: “How do I do that?”
Walled Garden Systems do Work

- Several major providers now have ½ a decade of experience with production walled garden/quarantine systems.
- These systems work, they have not turn off customers, and have been updated to work with E.911 and medical devices.
Walled Gardens are Everyday Encounters

• We, as an industry, know how to set up our AAA to trigger a interactive user response.

• This is now an every day activity. There no longer a surprise factor with end-users.
Remediation Guidelines

• Three approaches:
  – **Self Help** – Point customers to a self-help site or create your own security landing page.
  – **Professional Help** – Ask for the user to use a professional service to clean up the malware. The professional service might offer help with the other consequence of the violation (i.e. identity theft or some other crime).
  – **Get a new computer or device** – Unfortunately, we could see malware evolving to the point where the hardware is violated and the only remediation is to get a new device (ask the industry for consumer capable re-imaging).
Consequences of In-Action

• We as an industry are at a stage where Service Providers need to play their part in the remediation eco-system.

• Cyber-Civic society will drive for action through:
  – Government Guidelines, Regulation, and Laws
  – Through market forces (customer churn)
  – Through civic legal action
  – Through insurance underwriters demanding actions that reduce the overall risk to a system.
Homework

• Read through the IETF draft IETF RFC 6561 Recommendations for the Remediation of Bots in ISP Networks (http://tools.ietf.org/html/rfc6561)

• Talk to your peers at operations meeting like NANOG, RIPE, APRICOT, etc to find out what they are doing.

• Join the SP Security effort that will document, build, and teach remediation techniques that work.
  – E-mail bgreene@senki.org for more information or go to http://confluence.senki.org and select “SP Security.”
Bot Mitigation for ISPs – Link to Materials

http://confluence.senki.org/display/SPSec/MAAWG+26+-+Workshop
This has been the fifth of six video segments

View the entire

*Techniques, Tools and Processes to Help Service Providers Clean Malware from Subscriber Systems*

from the public training video pages on the M³AAWG website at:
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Messaging, Malware and Mobile Anti-Abuse Working Group

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