Enterprise Computer Incident Response for Rapid Replicating Threats

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Brief History

- Six years in Information Security
- Stood up
  - CIRT
  - Vulnerability Management
  - Security Awareness programs
  - for Fortune 500 & international companies
- Reduced average per incident costs from $1M to $15K

The Agenda

- Define Rapid Replicating Threat
- Compare: Vuln Management vs CIRT
- CIRT for Rapid Response
  - The four R’s for rapidCIRT
- Final Thoughts

Rapid Replicating Threats

- Malicious code that spreads quickly through a network
  - Worms
  - Blended Threats
  - Botnets
- Most include tools: remote control, keylogging, others

Comparisons

Vulnerability Management

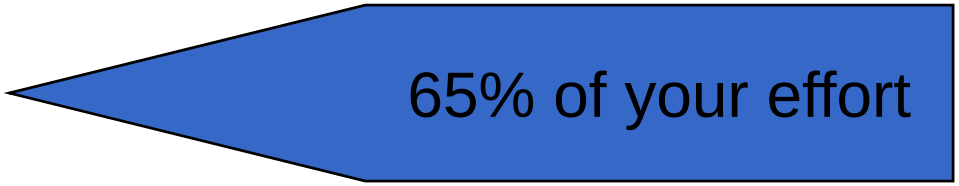
- Proactive
- Strategic
- Seeks to prevent damage
- Topic for another day

CIRT

- Reactive
- Tactical
- Seeks to minimize damage
- VM hammer
- Today’s topic

CIRT 101

- The Four R's of Incident Response
  - Readiness
  - Recognition
  - Response
  - Recovery



Readiness

Elements of RapidCIRT

- Authority
- Roles & Responsibilities
- Procedures
- Tools
- Awareness/Training/Practice

Authority

- Include the right players
  - Network
  - Server
  - Desktop
  - Security
  - Helpdesk
- Documented charter
  - Derived from company policy
  - In a nutshell: Minimize damage
- “ToMBin” Total Management Buy-in

Roles & Responsibilities

- Roles & responsibilities are always assigned as part of Readiness.
- This presentation will discuss R&R in Response.

Career Question

“At what point do you disconnect your entire company from the Internet during a rapid replicating computer incident?”

Procedures

- Procedures outline what to do when certain criteria are met
  - Steps: What do I do?
  - Criteria: When do I do it?
  - Escalation: Who do I tell?
- Detailed
  - Got checklists?
- Not unnecessarily detailed
  - Minimize “point here, click ok” detail
- Answers the Career Question

Readiness Tools

- Asset management
  - System purpose & criticality
  - System owner
  - Known vulnerabilities
- Collaboration
  - Internal E-mail
  - Secure Instant Messaging
  - Secure web conferencing
  - Phone (something out-of-band)

Training & Practice

- Training
  - rCIRT member role functions
  - Incident recognition
  - Evidence collection
- Practice
  - Tabletop exercises
  - Planned Drills

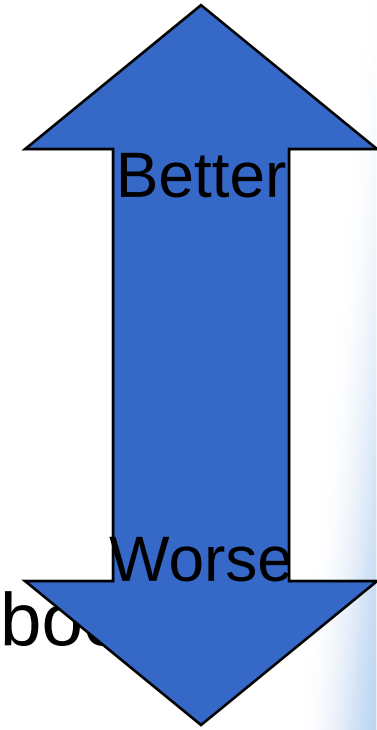
Recognition

Recognition

- Most of the time
  - Follow up on false positives & tune them out
  - Eyes on the dashboards
  - Finger on the “big red button”
- Weeks & weeks of boredom followed by several hours of intense excitement

Recognition Tools

- How will you see it coming?
  - Event correlation
  - Intrusion detection/prevention
  - Honey pots
  - Router ARP tables
  - Anti-virus alerts
  - E-mail server slows to a crawl
  - Users complain their desktops keep rebo



Security Awareness

- Security-aware users provide a human Intrusion Detection System
- The best security awareness provides some Intrusion Prevention
- Provides marketing for rCIRT
- Implement a Security Awareness Program

Response

Roles & Responsibilities

- rCIRT Lead
- Research
- Monitors
- Sweepers
- Cleaners
- Communications

rCIRT Lead

- Executive decision maker when procedures fail & management is unavailable
- Organizes overall effort
- Ensures processes & procedures are followed
- Keeps “big picture” focus
- Keeps management informed of status
- Maintains “meeting minutes” of incident in progress
- Drafts final reports

Research

- Gathers information about the threat
  - From infected systems
  - From security websites
  - From security vendors
    - Anti-virus
    - IDS/IPS

Monitors

- Watches for incoming events
- Reports suspicious & infected systems to rCIRT
- Updates recognition tools with signatures
- Updates scorecard

Sweepers

- Use scorecard to remove threats
- Remove the threat from production network
  - Quarantine network
  - Shut down the switch port
- Sometimes shares the monitor role if the rCIRT is using more sophisticated tools

Cleaners

- Removes malicious code or reimages victim system
  - Local system touch
  - Quarantine network touch
- Apply necessary patches & AV signatures to prevent reinfection

Communications

- Contact impacted users & business units
- Not very glamorous, but critical
  - Prevents infected users from troubleshooting & putting infected host back on network
  - Lets users know when they can expect their system back

Communicate

- Keep management informed
- Keep users informed
- Define Service Level Objectives in procedures
  - What to tell them
  - When & how often to tell them
- Makes special requests easier

Response Tools

- Quarantine network
  - Easier for Research to investigate
  - Less expensive for Cleaners to fix victims
  - Harder for victims that require data recovery
- Vulnerability Scanners
  - Find vulnerable & infected systems quickly
  - VM hammer
- Automated Software Delivery
  - Patch deployment
  - System reimaging
  - AV signatures

Recovery

Restore or Preserve?

- The charter says “minimize damage”
  - Translation: Get back to production ASAP
  - Preserving evidence takes time
- Gathering evidence has its own rewards
  - Was data compromised?
  - Dormant botnet?
  - Possible prosecution?
  - Possible insurance benefits?

The Compromise

- Accurate recordkeeping
- Quick system snapshots
  - Volatile data (memory)
  - File system
  - Windows registry
- Similar to a house break-in
  - Thieves may never be caught but
  - Strong documentation allows you to recover stolen property

Keep It Quick

- Save the binary analysis for CSI
  - Collect a sample for your AV vendor
- Perfect a reimaging process
  - Quick OS, app & data restore keeps users productive
  - Productive users keep managers happy

Keep It Clean

- Patch cleaned hosts before putting back on production network
- Install latest AV signatures
- Software firewalls are still difficult to manage in an enterprise

Reporting Inside

- Root Cause Analysis
  - Fix the problem, not the blame
  - Well, rarely the blame
  - Keep the scope enterprise-wide
    - Vulnerabilities exploited
    - Vulnerability time window
    - Attack surfaces of impacted hosts
    - Recurring points of entry

Reporting Outside

- Interested entities
  - CERT
  - FBI
  - Media - no comment!
- Consult your company decision makers first!
- Roll into procedures
- California rCIRTs: It may not be up to you to interpret SB1386

Gather Metrics

- Metrics prove its working
- Metrics justify future business cases
- Some sample metrics
  - Cost of incident (devise your formula)
  - Number of incidents annually
  - Time between vulnerability announcement & first infection
  - Exploited vulnerability
  - Repeat offenders from last incident

Final Thoughts

- Automate it
  - Computers respond faster than humans
  - Automate repetitive tasks
- Never over-automate it
  - Rapid replicating threats can be emulated
  - Keep humans on the trigger
- My old vision
  - A rapid replicating incident should be like a computer game the rCIRT can’t wait to play
- My new vision
  - A rapid replicating incident should be a boring affair that is resolved quickly & effortlessly

Don’t Panic!

Resources

- CERT
  - http://www.cert.org
- CIRT - Framework and Models
  - http://www.securitydocs.com/library/2964
- NIST
  - http://www.nist.gov
- SANS
  - http://www.sans.org
- Forum of IR & Security Teams
  - http://www.first.org/