HTCIA2015
Identifying Lateral Movement

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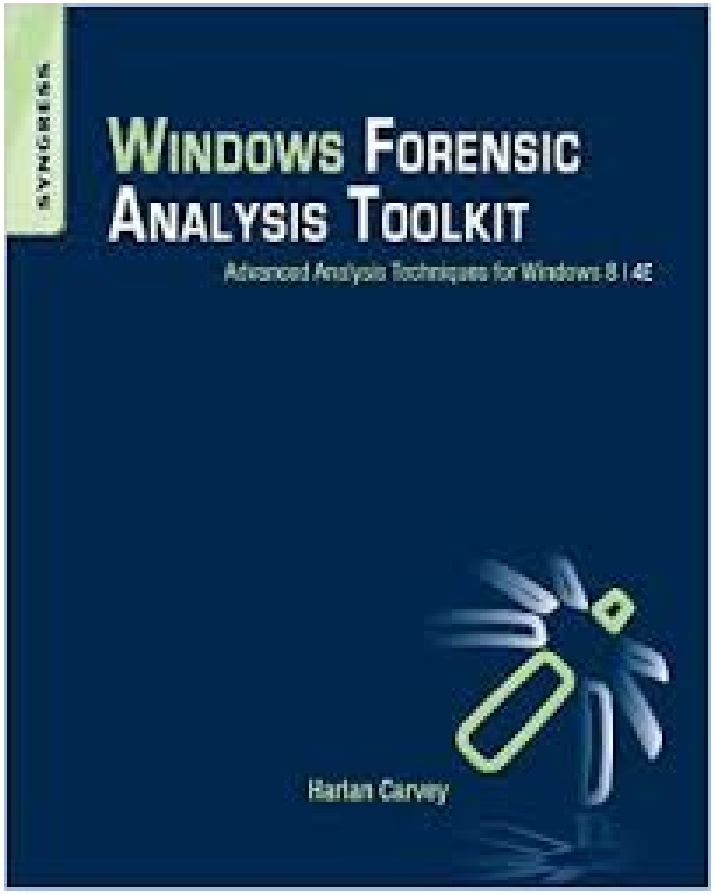
Introduction

- Sr Infosec Researcher @ DSWRX CTU-SO team
- Former Marine Officer
- Infosec since ‘89, DFIR since ’00
- Prolific author (books, blog)

- Let’s talk lateral movement…



Lateral Movement

- Occurs as part of Actions on Objectives
- Occurs *AFTER* credentials have been acquired

- Techniques are via CLI - detected via endpoint monitoring for process creation

By The Numbers…

- Why does *ANY* of this matter?
- Annual Security reports
  - % external notification
  - Median days to detection
- M-Trends 2015
  - 69%
  - 205
  - Longest persistence: 2,982 days (8+ yrs)
- TrustWave GSR 2015
  - 81%
  - 86 days
- What does this mean?

First Steps

- Common aspects of lateral movement
  - Involves both source & destination systems
  - Commands executed to move between systems

- How does adversary access source system?
  - Load ***web shell*** on vulnerable web server
  - Get ***RAT*** on system via phish, SWC, etc.
  - Remote access (VPN) via RDP

- How do they then move to destination system?
  - Maps shares (i.e., "net use \\...\ipc$", etc.)
  - ***Scheduled Tasks*** – recon, launch RAT installer, etc.
  - Browser (access intranet sites, OWA, etc.)

Web Shells

- Seen used to gain access to an infrastructure
- Access web server, then move to internal systems
- Come in a variety of formats, depending upon web server, apps, etc.
- Ex: Windows server running Apache + WordPress
  - Content.php => GIF image file, with “special content”
  - Included “<?php preg_replace(“/….”
- Ex: IIS Server
  - Created .aspx page on system
  - “<%@ Page Language="Jscript"%><%eval(Request.Item["…"],"unsafe");Response.StatusCode = 404;%>"
- Very often left in place in case other means of access are detected

Web Shell Example

Web Server

SQL Server

Xp_cmdshell…

- Threat actor had RDP access to both systems
- Installed web shell on web server
- Accessed web shell in IE, “hxxp://localhost/a.aspx”
- Created a user account on the SQL Server

Scheduled Tasks

- Popular means of lateral movement
- Requires Admin privs to create a task, task runs with System privs
- At.exe is most commonly seen; have seen use of schtasks.exe
- File(s) to be executed need to be copied over first, ***if not native****
- Can be set to run at some time in the future

Scheduled Tasks – Indicators, pt. 1

- Source System
  - "at \\<target> 2:15pm C:\Windows\Temp\users.bat"
  - Prefetch file (**?**) for at.exe
- Key to detection: process creation monitoring
  - Get full command line
  - Update systems, enable approp. Auditing, set Registry key to get full command line, or…
  - Install Sysmon (from MS/SysInternals)…or…
  - Install Carbon Black (from Bit9)
  - Works even when adversary uses anti-forensics techniques, such as "at \\<target> /del"

Scheduled Tasks – Indicators, pt. 2

- Destination System
  - Files and Registry key associated with task (can be removed via “at \\<target> /del” command)
  - WEVTX records
    - MS-Security-Auditing/4624 type 3 login event (Security Event Log)
    - Microsoft-Windows-TaskScheduler/106, 140 events (Task Scheduler Event Log)
    - At#, At#.job files created in file system, \At# Registry key created
    - Microsoft-Windows-TaskScheduler/141 event (if anti-forensics employed)
  - May be used to install RAT
    - Service Control Manager/7045 event (System Event Log)
    - Service Control Manager/7035, 7036 events (System Event Log)
    - Persistence: Windows service Registry key, others

Key points

- Detection
  - Look for clusters of indicators, not just individual artifacts
  - Starting with destination system (i.e., good place to start)
    - Microsoft-Windows-TaskScheduler/106, 140 events (Task Scheduler Event Log)
    - Pivot to At#, At#.job files created in file system, \At# Registry key created
    - Pivot to MS-Security-Auditing/4624 type 3 login event (Security Event Log) – get source system
  - From source system:
    - Pivot to commands run (Prefetch files, process creation monitoring, etc.)
    - Pivot to malware persistence (Windows service, "Run" key, etc.)
    - Look for other indications of tools adversary may have used (SysInternals, etc.)

File Copy – i.e.,"Sleeper Agent"

- Appeared in Dell SecureWorks Research blog post, 7 Jan 2015
- Threat actor was using RAT installer with C2 config A, via Scheduled Tasks (at.exe)
- Copied RAT installer with C2 config B to user's StartUp folder on a system
- Installer launched/system infected when user logged in; no other interaction required
- Indicator – file in user's StartUp folder
  - Scan using native or system mgmt tools
  - Scan using CTU-SO targeted threat hunting (TTH) process

Prevention & Detection

- Reduce/minimize attack surface
- Mitigate by detecting as early as possible
- Scan systems using threat intelligence
  - Targeted hunting
- Endpoint monitoring for process creation
  - Ex: MS Sysmon + SEIM/Splunk
  - Ex: AETD/Carbon Black
  - Record command line, in an off-system location
  - Monitor

Source: Rebloggy.com

Questions?

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