

DumpsterFire Toolset

Generating Network & System Shenanigans
to Manipulate Blue Teams

Presenter: TryCatchHCF



@TryCatchHCF

Presenter Background

Principal Security Researcher & Red Team member at a Fortune 500

Prior roles: Principal Infosec Engineer, Pentest Lead, AppSec Team Lead, Shrubber of Fine Shrubberries

Former USMC intelligence analyst, counterintelligence specialist

Cmdr. Sisko was best Star Trek leader (Fight me)

Bachelors - Cognitive Science; Masters - Information Assurance

Certs - Various Acronyms, some of which hit me up for money each year

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Presentation Roadmap

- Background: Red Team Goals & Operations
- Challenges & Roadblocks
- Shenanigans / Examples
- DumpsterFire Toolset Walkthrough

Background

Red Team Goals & Operations

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Red Team Tasks

- Simulate full range of attackers
 - From loud “skiddie at the gates” to advanced “low and slow” pivoting & exfiltration, extended campaigns (months) as well as “smash & grab”
- Simulate “Errant Users”
 - Downloading, installing, and running unauthorized apps (file sharing, scanning tools, “malicious” utilities)
 - Running unauthorized services (FTP, Web servers, etc.)
- Purple Team
 - Tabletop exercises, coordinated SIEM config validation
- Physical security (not covered here)

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Red Team Tasks (cont.)

- Focus on rank-prioritized threats per analysis of organization's risk profile
- All for the purpose of helping Blue Team improve security (defenses, policies, procedures)
 - SIEM (Security Information & Event Management) tools
 - Tuning for best signal-to-noise ratios
 - Prioritizing alerts by type & volume
 - Identify gaps in detection, collection, alerting (settings & tools)
 - SOC/CIRT Response
 - Policies and procedures
 - Drills for teams & individuals (training & assessment)

Challenges & Roadblocks

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Red Team Dilemmas

- So much attack surface
 - So little time
 - So few resources
- Most organizations don't have Red Teams
 - Those that do, usually have small teams in high operational demand
- Difficult to scale Red Team even when you have one

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Red Team Dilemmas

- Common for corporate assets to be located worldwide
 - Multiple timezones to support
- SOCs are 24/7 with multiple shifts / teams
 - How to provide live exercise support for all shifts?
- Providing consistent, repeatable engagements
 - Want to compare “apples to apples” to track improvements & identify chronic problem areas

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Caffeine can only help so much.

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Not Just Red Team's Dilemmas

- 3rd-party pentesters suffer similar constraints
 - Limited windows of engagement
 - Often small team (or just one person)
 - Need to show maximum return on engagement
 - Single path to DC is useful, but limited
- Blue Teams don't have expertise in creating attacks
 - And even if they did... time & resource limitations
 - Internal bias towards existing configs & experiences

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Blue Team Dilemmas

- Orgs without Red Teams leave their Blue Teams untested
 - Stuck with “Annual 3rd-Party Nessus Assessment”
 - Tabletop exercises
 - Only test policy & procedures
 - Typically only one or two scenarios
 - No realtime operational tests of sensor thresholds or incident response edge cases

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SOC/CIRT Reaction:



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SOC/CIRT Reaction (cont.)

“Hey! I’m tested every single day with real world scenarios!”

- Sure, but missing some key things
 - Repeatability across shifts, using same live scenarios
 - Customized scenarios that simulate events your team hasn’t encountered yet, but should be ready for
 - Scenarios tailored to methodically test SIEM coverage & alerting
- You can only respond to what you’re already collecting & alerting on
 - “Don’t know what you don’t know” about gaps in sensors / alerting

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Great, so the Red Team can't scale (or doesn't even exist)

“What now?”

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Automation to the rescue!



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Ever wondered how your Blue Team would respond to Mirai botnet activity on your internal network?

Let's find out!

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Don't have a Red Team but wish you had an easy way to run controlled drills against all of your SOC shift teams?

Plug-n-spray!

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Wish you could support a Red Team engagement against that remote team that's 8 timezones away, without waking up at 3:00am?

Hit that snooze button!

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Wish you could simultaneously rickroll all of your opponents' sub-networks during your annual cyberwarfare exercise?



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And while we're at it...

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Why settle for just one automated friend?



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But first...

Let's talk about Shenanigans

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Staying Employed & Out of Federal Prison

- Standard rules-of-engagement boilerplate may not cover additional activities
 - If it's not in writing, it's not happening
- Simulate, don't destroy / corrupt
 - Goal is help Blue Team tune & improve, not impact business
- No automated pivoting
 - Too hard to control, can't guarantee you're still in scope
 - Building & deploying a worm **will never be in scope**

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Red Team Shenanigans

- Go beyond the standard attack chain we all know & love
 - Recon -> Scan -> Attack -> Persist -> Pivot
- Advantages in manipulating Blue Team
- 3 Categories
 - Distract
 - Lure onto Compromised System
 - Overwhelm

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Advantages in Manipulating Blue Team

- Move beyond the standard attack chain scenarios
- Better reflects evolving advanced attacks that follow up original attack chains with secondary infections & attacks meant to cover up the initial campaign
- Create parallel security events that provide SOC analysts with an easier investigative path to pursue (and close)
 - Generate the Occam's Razor you wish them to find
- Lure privileged users into your credential traps

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Goals in Manipulating Blue Team

- Move beyond the standard attack chain scenarios
 - Sound familiar yet?
- Give Blue Teams direct experience in managing layered attack scenarios, hands-on in their operational environment
- Help Blue Teams get to the next level, which in turn forces Red Team to get to their next level
 - Positive security feedback loop
 - Help analysts think strategically, not just tactically
 - Prepare analysts for evolving real-world threats

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Distract

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Manipulating Blue Team - Distraction

- Create distractions to throw Blue Team off your trail
- Build & execute complete parallel competing narratives
- Alternate points of compromise
 - Visits website; malicious app installed; loud activity
- Create scapegoats & decoys, mimicking methodologies and C&C infrastructure of known campaigns
 - Lead Blue Team down enticing (& utterly false) paths

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(But seriously, you really don't want your activities associated with an APT's methodologies / external C&C infrastructure / etc.)

(No, seriously. Just don't.)

(Unless it's in scope. In writing. And signed by people with authority to handle inquiries from the Feds.)

(Remember, we operate in a world where an externally sourced default nmap scan will make some orgs scream "APT!" and get your proxy provider subpoenaed.)

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Lure

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("Pearls Before Swine" is an amazing comic strip, btw)

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Manipulating Blue Team - Lure

- Sometimes admin credentials are hard to come by
- Credential traps are like fishing off a dock
 - “Hurry up and wait”
- Move from dock fishing to chumming the waters
 - Create events to lure admin users onto the network & systems that are hosting your credential traps
 - Use lower privilege accounts to socially engineer IT dept.

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Manipulating Blue Team - Lure (cont.)

- Using an unprivileged user's account, send email / Slack chat to admin(s) with a URL you're trying to access (compromised and hooked, of course)
- Fill a local or shared directory to capacity, requiring privileged user to access and cleanup
- Generate faulty network activity that interferes with users
- Any activity that will likely cause a privileged user to remotely authenticate to the resource (login, fileshare, etc.)

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Overwhelm

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Manipulating Blue Team - Overwhelm

- Create a volume of security events that overwhelm available resources, useful in various circumstances
 - Tactical Feint (e.g. loudly attack exposed Website login page while quietly exploiting RDP on adjacent network)
 - When you're ready to burn your operation
 - When Blue Team is hot on your trail & you need more time
- Each event requires fixed overhead of resources
 - Ticket Management - Open / Investigate / Close
 - Ties up at least one analyst
 - Simulating severe events raises priority & necessitates immediate attention

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Manipulating Blue Team - Overwhelm (cont.)

- Playing a numbers game
 - If staff can handle X critical events at a time, then generating 3X events means 2/3rds of those events will lay idle until the other events are investigated and closed out
 - If your staged distractions are perceived to be higher criticality than evidence of your actual operations, you can buy your team some critical time to complete your goals
- Best to only use “Overwhelm” during wargames or other exercises where operational SOC/CIRT teams will not be pulled away from critical duties

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Manipulating Blue Team - Overwhelm (cont.)

- Separate waves of events by time
 - Battlestar Galactica “Every 33 Minutes” effect
 - Just as responders are getting a handle on the current wave of events, the next series triggers
 - Only works if the event trigger mechanisms remain undiscovered
 - Fun to make each successive wave generate increasingly severe events

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Manipulating Blue Team - Overwhelm (cont.)

- Separate waves of events by time (cont.)
 - Example Scenario: Organization has Port 22 open on most systems for remote admin access. Network is segmented, but compromised credentials that give attackers access to all subnets.
 - Target multiple subnets for time-delayed, sequenced brute-force login attempts over SSH on Port 22 on local subnet. (Credentials are purposely chosen to fail.)
 - Select a system on each targeted subnet, login remotely and attempt to download payload from Red Team controlled external endpoints (Whack-a-Mole!)

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Shenanigans Bonus Round

Sometimes you just want to make things
extra interesting

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Shenanigans Bonus Round

Linux/Unix: Edit global .bashrc / .cshrc / .bash_profile

Locations: /etc/bash.bashrc /etc/bashrc (check your baseline)

- `stty s erase`
 - 's' key is now the backspace key, annoys in random ways
 - Try typing 'ls' / 'netstat' / 'stty' / 'erase'
- `alias ls='echo'`
 - Blank line printed instead of directory listing

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Shenanigans Bonus Round (cont.)

Linux/Unix: Edit global .bashrc / .cshrc / .bash_profile

- alias pwd='echo "Directory not found"'
- alias cd='echo "Directory not found"'
- alias df='echo "Error accessing device"'
- alias du='echo "Error accessing device"'
- alias vi='echo "Could not allocate inode"'

Troll emacs users while you're at it:

- alias emacs='echo "vi refusing to allow emacs"'
- (.cshrc uses different format but you get the idea)

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Shenanigans Bonus Round (cont.)

Cross-Platform

- Take screenshot of active desktop, install as desktop background
- Hide all other open apps

or

- Download screen-grab of ransomware lock screen, install as desktop background
- Hide all other open apps

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[Back to DumpsterFire!](#)

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- “Security Incidents In A Box!”
- Build & execute custom event chains to generate incident narratives / activities
- Time-Date Delayed Execution
 - Allows you to generate automated, sequenced events
 - Converts to Universal Coordinated Time (UTC) internally to avoid timezone confusion across global sites
- Parallel Deployments
 - Generate security incidents at scale, anytime, anywhere
- Numerous Fires plus pre-configured DumpsterFires to jumpstart your activities

DumpsterFire Toolset

- Lightweight, easy to use, easy to deploy
 - Menu-driven
 - Written in Python for cross-platform support
 - Quick start, immediate results
- Extensible - Customize for your unique threat space
 - Create your own Fire modules, add to Fires directory, start DumpsterFire Factory, burn away!
- No 3rd-party dependencies
- Open Source (MIT License)
 - “Free as in No Budget Approval Needed”

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“That’s a lot of word salad. Details please.”

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DumpsterFires

- Fires are modular events
 - Ex. Download a file; Scan a network; Login attempts
- DumpsterFires are collections of Fires
 - Chained together to create sequences of events
 - Functionality inspired by *nix command line utilities
- Tremendous power by chaining simple tools

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DumpsterFires (cont.)

Chained Linux Tools:

```
% cat log.txt | cut -d ';' -f3,5- | grep -i "login" | sort -un
```

Chained Fires for an Insider Threat DumpsterFire:

Visit Webpage about revenge -> Download Metasploit -> Scan local subnet for Top 20 ports -> Brute force attacks against Port 22 SSH -> Upload random data tarball to Red Team controlled external node -> Visit Webpage about modifying logs

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DumpsterFires (cont.)

- Building DumpsterFires is fun & fast, the tool guides you
- Modular process
 - Create a list of Fires in whatever order you want
 - Assign optional time-delta triggers to each Fire
 - Configure settings for selected Fires
 - Assign optional DateTime trigger to new DumpsterFire
 - Distribute & Ignite!

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Just Like Building a Teddy Bear!



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(Except the Teddy Bear is Evil)

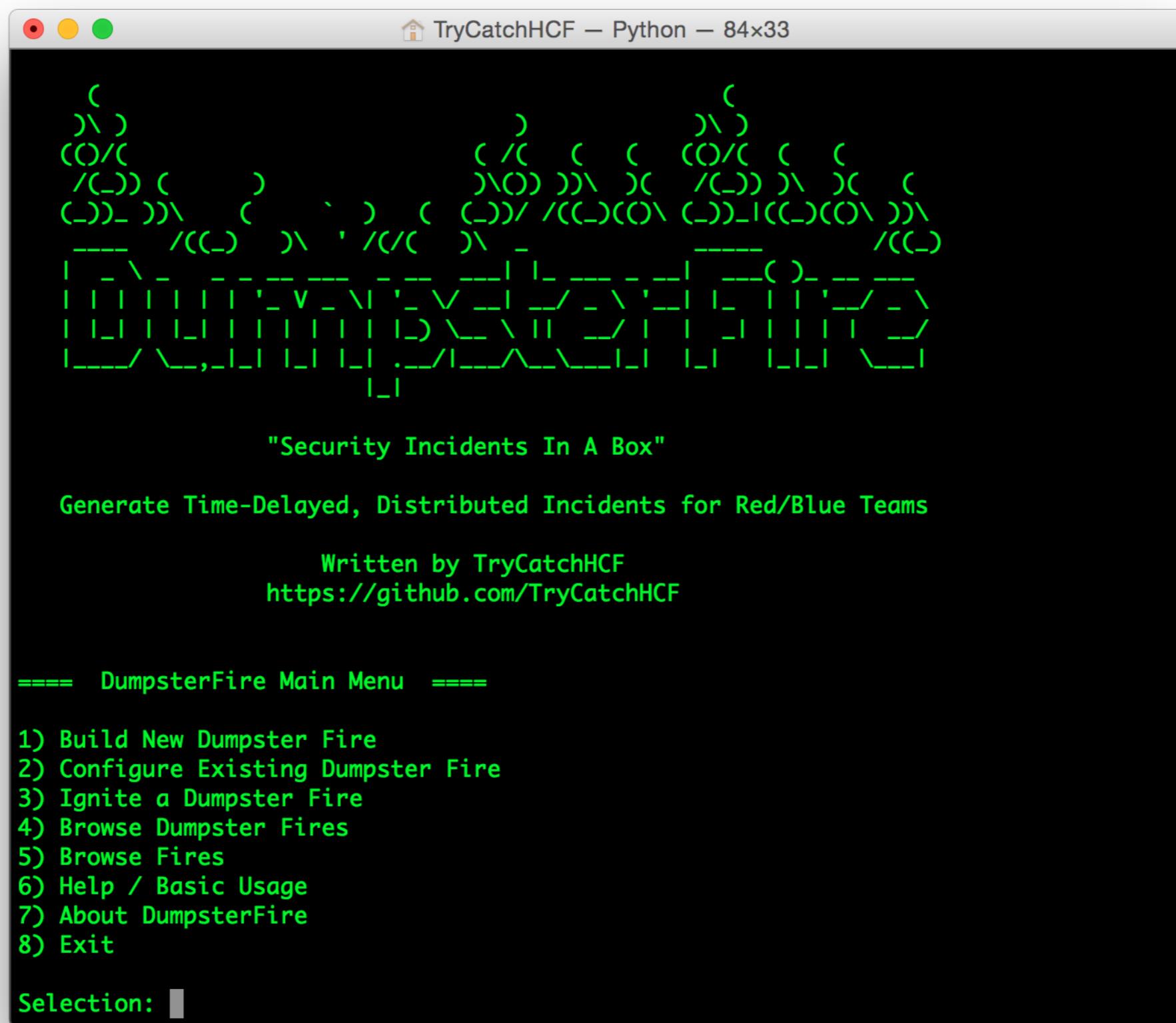


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Fire Categories

- Network Scans (Loud & Wide; Targeted; Slow & Narrow)
- File Downloads (Github; Filesharing; Hacking Tools)
- Websurfing (Preconfigured URLs; Custom URLs)
- Account Bruteforcing (e.g. Simulated Mirai botnet activity)
- Filesystem Activities (Fill directory; Create IOC artifacts)
- Malware (Known C&C connects; Sinkholes; Custom)
- Custom OS Commands (Executes string you provide)
- Cheap Tricks (Annoying entries in shell profiles, etc.)

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```
TryCatchHCF — Python — 95x43

Selection: 1

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=====
Build a Dumpster Fire
=====

Recipe:

- Build a list of Fires, in the desired order of execution
  + Select a Fire Category
  + Review and Select a Fire from Category
  + Repeat until list is complete
- Review list of selected fires
- Choose timing of sequential Fire execution: Immediate or Relative Offset
  + Immediate: Each Fire starts immediately after previous Fire completes
  + Relative Offset: Each Fire delays for [hours:minutes] after previous Fire completes
    * Set separate Relative Offset for each Fire in your Dumpster Fire
- Review Dumpster Fire
- Save new Dumpster Fire into your collection

==== Select a Fire Category ====

Fire Categories:

1 - AccountBruting
2 - CheapTricks
3 - FileDownloads
4 - Filesystem
5 - Malware
6 - Misc
7 - NetworkScans
8 - OSCommand
9 - Websurfing

Enter Fire Category#: 
```

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```
TryCatchHCF — Python — 95x40

===== Select a Fire Category =====

Fire Categories:

1 - AccountBrutling
2 - CheapTricks
3 - FileDownloads
4 - Filesystem
5 - Malware
6 - Misc
7 - NetworkScans
8 - OSCommand
9 - Websurfing

Enter Fire Category#: 9

Selected Fire Category: Websurfing

===== Select a Fire =====

Available Websurfing Fires:

1 - craigslist_search.py
2 - custom_url.py
3 - facebook.py
4 - google_search.py
5 - hacking.py
6 - insider_revenge.py
7 - linkedin.py
8 - porn_sites.py
9 - snapchat.py
10 - tinder.py
11 - tor_org.py
12 - twitter.py
13 - warez_sites.py

Enter Fire #: 4

Add another Fire? [y/n]: 
```

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```
TryCatchHCF — Python — 95x30

===== Review Dumpster Fire =====

Selected Fires (in order of execution):

Websurfing/google_search.py
Websurfing/insider_revenge.py
Websurfing/hacking.py
FileDownloads/download_kali.py
NetworkScans/scan_local_subnet_top_40.py
AccountBrutling/ssh_top_100_defaults.py
OSCommand/os_cli_command.py

Continue building this Dumpster Fire? [y/n]: y

Add time offsets to each Fire? [y/n]: y

===== Add Time Offsets To Fires =====

Select time offsets for each Fire

Assigning time offset for Fire: Websurfing/google_search.py

Enter Hour (0-23): 0
Enter Minutes (0-59): 0

Time offset for Fire ' Websurfing/google_search.py ': 0 hours, 0 minutes

Keep time offset? (y/n): 
```

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```
Save this Dumpster Fire? [y/n]: y
Enter name for new Dumpster Fire: Disgruntled_Employee
** Saving new Dumpster Fire: Disgruntled_Employee

Name: Disgruntled_Employee
Delayed Ignition: 0
Delayed Ignition Start: 2017-09-29 14:16:36.493529

Websurfing/google_search.py , 0 , 0
Websurfing/insider_revenge.py , 0 , 0
Websurfing/hacking.py , 0 , 0
FileDownloads/download_kali.py , 0 , 0
NetworkScans/scan_local_subnet_top_40.py , 0 , 0
AccountBruting/ssh_top_100_defaults.py , 0 , 0
OSCommand/os_cli_command.py , 0 , 0

** Successfully saved: Disgruntled_Employee

Press return to continue...
```

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Red Team Benefits

- Scale your Red Team network / system activities
- Reproducible tailored engagements
- Date/Time triggers allow your operations to proceed without you having to enter sleep deprivation
- Logging can be activated, each Fire generating datetimestamps of their activities for later review (and accountability) w/ Blue Team

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Blue Team Benefits

- Create and run tailored drills for your analysts
- Train and evaluate analysts in controlled scenarios
- Map & identify gaps in sensor coverage and alerting configuration
- Monitor & measure response
- Build history of results to demonstrate progress

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Creating Custom Fires

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Extensible Design

- Meant to be used, tailored for your operational needs
- NO HARDCODED CRUD TO MODIFY!
- Create your own custom Fire modules, drop into the collection of Fires, you're ready to go!
- Tool dynamically loads component content at runtime, based on contents of DumpsterFire's "FireModules/" directory
 - Fire Categories (generated from directory names)
 - Names of all Fire modules in each Category directory

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Extensible Design (cont.)

- Recommend you keep your custom Fire modules simple and functionally encapsulated
- Minimizing dependencies and complexity allows you to quickly combine your Fire modules in novel sequences to meet operational needs
- In many cases, you may instead be able to do what you need by using the existing “os_cli_command” Fire module
 - Include as many as you need in your DumpsterFire
 - Each “os_cli_command” Fire module in your DumpsterFire can have its own unique command string

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Extensible Design (cont.)

- For a quick start, copy and modify an existing Fire module that has similar functionality
- In the FireModules/ directory there is a Fire module template file you can copy (“custom_fire_template.py”)
 - Contains comments, descriptions, and skeleton of all functions that must be implemented for your custom Fire module to integrate seamlessly with the tool
- Do NOT remove the “__init__.py” files in the subdirectories
 - They are required for the tool to be able to dynamically load the Fire modules at runtime (it’s a Python thing)

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Extensible Design (cont.)

- To create a new Fire Category, create a new directory under “FireModules/”
- When you add new Fire modules to a Fire Category directory, the tool will automatically make them available (**do not use spaces in your Fire names**)
- Have to restart the tool to pick up Fire Category changes
- Your Fire module must implement the following methods
 - Configure()
 - Description()
 - GetParameters()
 - SetParameters()
 - ActivateLogging()
 - Ignite()

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FireModule Template

- **Configure()**
 - Prompts user for input, populates FireModule's parameters
- **Description()**
 - Return a string containing a description of the FireModule
- **GetParameters()**
 - Returns a single string of Fire's parameters
- **SetParameters(string)**
 - Takes a single string & populates Fire's members
- **ActivateLogging(boolean)**
 - Sets flag for Fire to generate a log of its activities (great for review)
- **Ignite()**
 - Executes Fire's actions

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<https://github.com/TryCatchHCF>



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