# Counterintelligence in Red Teaming using MITRE ENGAGE in 15min

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# Who am I

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Penetration Testing since 2006
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APT “Happy Turtle”

- Targets Power Plants PP
- Wants to disrupt
- Knows Robby is an OT Op
- Knows PP uses certain tech
- Knows PP uses cool WebApp OT

# Who we are

# Agenda

1. How We Attack: MITRE ATT&CK
2. How Enterprises Can Defend: MITRE Engage
3. Adjusted Red Team Attack Playbooks
4. Key Takeaways

# 1. How We Attack: MITRE ATT&CK

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**Privilege Escalation**
13 techniques

- Create Process with Token
- Make and Impersonate Token
- Parent PID Spoofing
- SID-History Injection
- Token Impersonation/Theft
- Active Setup
- Authentication Package
- Kernel Modules and Extensions
- LSASS Driver
- Plist Modification
- Port Monitors
- Print Processors
- Re-opened Applications
- Registry Run Keys / Startup Folder
- Security Support Provider

**Defense Evasion**
39 techniques

- Abuse Elevation Control Mechanism (0/4)
- Access Token Manipulation (1/5)
- BITS Jobs
- Build Image on Host
- Deobfuscate/Decode Files or Information
- Deploy Container
- Direct Volume Access
- Domain Policy Modification (0/2)
- Execution Guardrails (0/1)
- Exploitation for Defense Evasion
- Hidden File System
- Hidden Files and Directories
- Hidden Users
- Hidden Window
- NTFS File Attributes
- Run Virtual Instance
- VBA Stomping

Deobfuscate/Decode Files or Information (T1140)
Score: 1
Comment: An [APT28] (https://attack.mitre.org/groups/G0007) macro uses the command certutil -decode to decode contents of a .txt file storing the base64 encoded payload. (Citation: Unit 42 Sofacy Feb 2018) (Citation: Palo Alto Sofacy 06-2018)

**Credential Access**
15 techniques

- Brute Force (2/4)
- Credential Stuffing
- Password Cracking
- Password Guessing
- Password Spraying
- Credentials from Password Stores (0/5)
- Exploitation for Credential Access
- Forced Authentication
- Forge Web Credentials (0/2)
- Input Capture (1/4)
- Credential API Hooking
- GUI Input Capture
- Keylogging
- Web Portal Capture
- Man-in-the-Middle (0/2)
- Modify Authentication Process (0/4)
- Network Sniffing
- OS Credential Dumping (1/8)
- /etc/passwd and /etc/shadow
- Cached Domain Credentials
- DCSync
- LSA Secrets
- LSASS Memory
- NTDS

**Discovery**
27 techniques

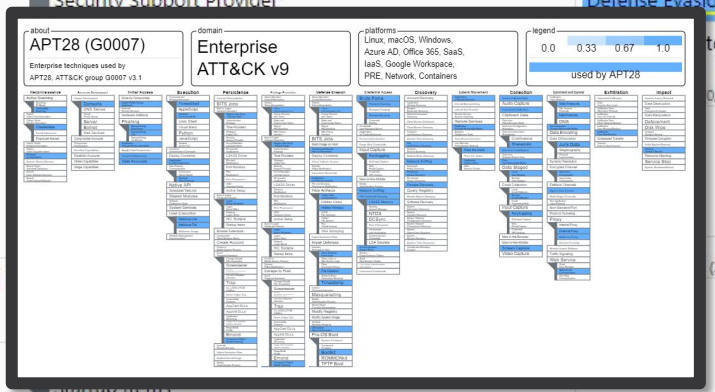
- Account Discovery (0/4)
- Application Window Discovery
- Browser Bookmark Discovery
- Cloud Infrastructure Discovery
- Cloud Service Dashboard
- Cloud Service Discovery
- Container and Resource Discovery
- Domain Trust Discovery
- File and Directory Discovery
- Network Service Scanning
- Network Share Discovery
- Network Sniffing
- Password Policy Discovery
- Peripheral Device Discovery
- Permission Groups Discovery (0/3)
- Process Discovery
- Query Registry
- Remote System Discovery
- Software

**Lateral Movement**
9 techniques

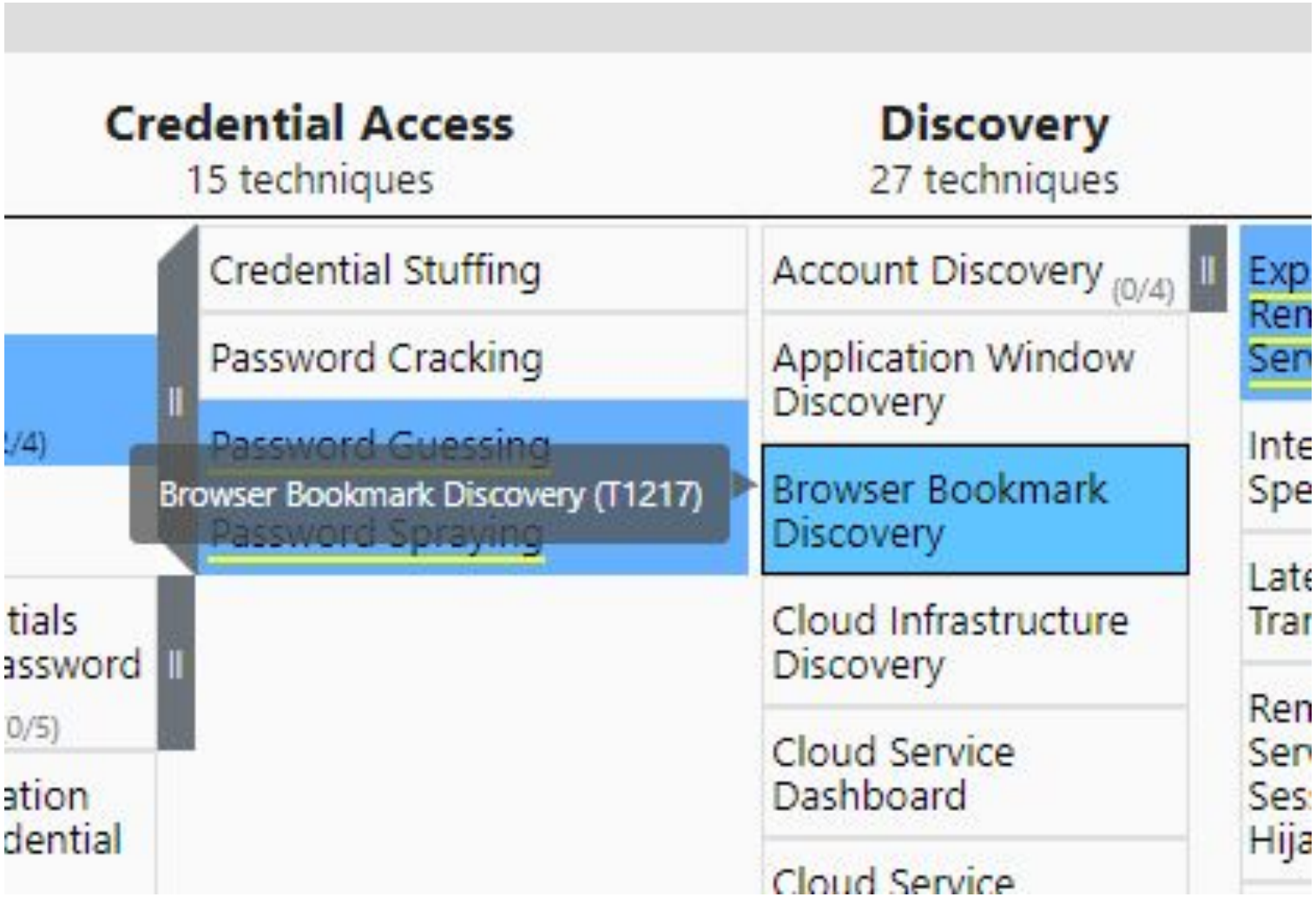
- Exploitation of Remote Services
- Internal Spearphishing
- Lateral Tool Transfer
- Remote Service Session Hijacking (0/2)
- Remote Services (0/6)
- Replication Through Removable Media
- Software Deployment Tools
- Taint Shared Content
- Use Alternate Authentication Material (2/4)
- Application Access Token
- Pass the Hash
- Pass the Ticket
- Web Session Cookie

**Collection**
17 techniques

- Archive Collected Data (0/3)
- Audio Capture
- Automated Collection
- Clipboard Data
- Data from Cloud Storage Object
- Data from Configuration Repository (0/2)
- Data from Information Repositories (1/2)
- Data from Local System
- Data from Network Shared Drive
- Data from Removable Media
- Data Staged (1/2)
- Email Collection (1/3)
- Input Capture (1/4)
- Confluence
- Sharepoint
- Local Data Staging
- Remote Data Stagi
- Email Forwarding F
- Local Email Collect
- Remote Email Coll
- Credential API Hoo
- GUI Input Capture
- Keylogging
- Web Portal Captur



# 1. How We Attack: MITRE ATT&CK




*Browser bookmarks may also highlight additional targets after an adversary has access to valid credentials, especially Credentials In Files associated with logins cached by a browser.*

# 1. How We Attack: MITRE ATT&CK

| **Playbook** | T1217 | Browser Bookmark Discovery |
|---|---|---|
| Goal | 1. Enumerate local browsers<br>2. Extract history<br>3. Extract passwords from browser<br>4. Identify often used OT control interfaces<br>5. Identify how the operator authenticates i.e. via SSO or local credentials | |
| Method | SharpWeb, Browserloot.ps1<br>Metasploit: post/multi/gather/firefox_creds | |
| ATT&CK Defense | *"This type of attack technique cannot be easily mitigated with preventive controls since it is based on the abuse of system features."* | |

# 1. How We Attack: MITRE ATT&CK

History:

Heatingcontrols.kplant

Browser Credentials:

XN5896 / Nioij()/&*

# 2. How Enterprises Can Defend: MITRE Engage

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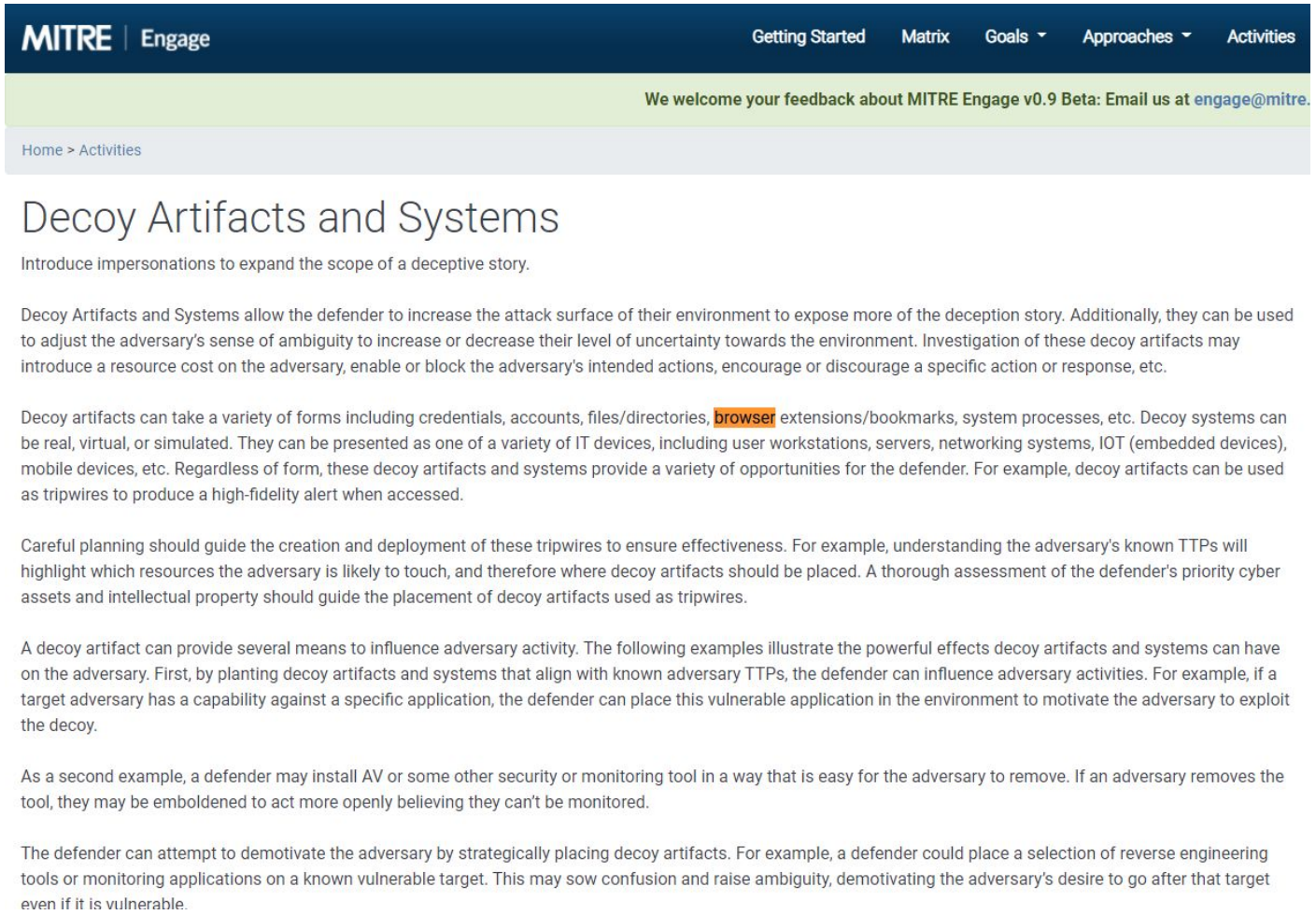
| Prepare | Expose | | Affect | | | Elicit | | Understand |
|---|---|---|---|---|---|---|---|---|
| Planning | Collection | Detection | Prevention | Direction | Disruption | Reassurance | Motivation | Analysis |
| Define Exit Criteria | API Monitoring | Decoy Artifacts and Systems | Baseline | Decoy Artifacts and Systems | Decoy Artifacts and Systems | Application Diversity | Application Diversity | Distill Intelligence |
| Develop Threat Model | Network Monitoring | Detonate Malware | Hardware Manipulation | Detonate Malware | Isolation | Artifact Diversity | Artifact Diversity | Hotwash |
| Persona Creation | Software Manipulation | Network Analysis | Isolation | Email Manipulation | Network Manipulation | Burn-In | Detonate Malware | Inform Threat Model |
| Strategic Goal | System Activity Monitoring | | Network Manipulation | Migrate Attack Vector | Software Manipulation | Email Manipulation | Information Manipulation | Refine Operation Activities |
| Storyboarding | | | Security Controls | Network Manipulation | | Information Manipulation | Personas | |
| | | | | Peripheral Management | | Network Diversity | Network Diversity | |
| | | | | Security Controls | | Peripheral Management | | |
| | | | | Software Manipulation | | Pocket Litter | | |

# 2. How Enterprises Can Defend: MITRE Engage




Decoy artifacts can take a variety of forms including credentials, accounts, files/directories, browser extensions/bookmarks, system processes, etc. Decoy systems can be real, virtual, or simulated.

# 3. Adjusted Red Team Attack Playbooks

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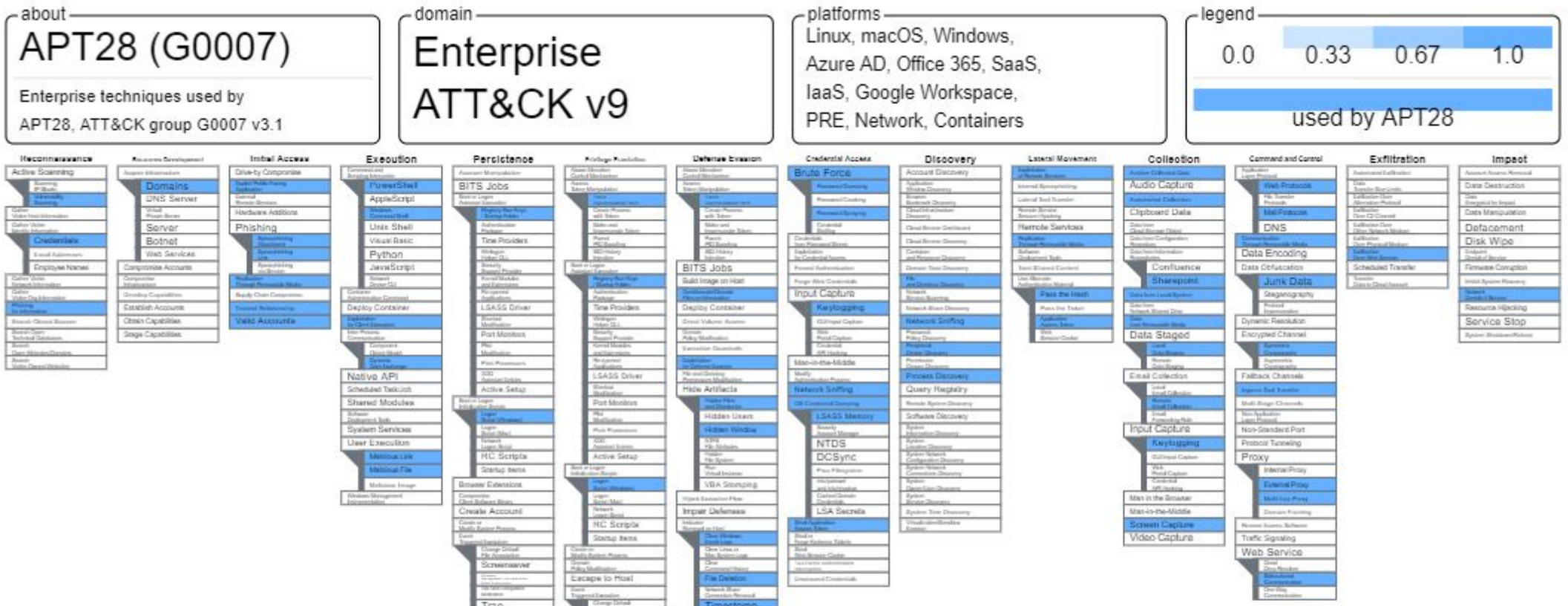
https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcQtks9MCB6oj3vdueBR1fPGOUj6D00yAFqjnQ&usqp=CAU

# 3. Adjusted Red Team Attack Playbooks




*What do we need to prepare against?*
*What do we want to benchmark for?*

# 3. Adjusted Red Team Attack Playbooks

| Playbook | T1217 | Browser Bookmark Discovery |
|---|---|---|
| Goal | 1. Enumerate local browsers<br>2. Extract history<br>3. Extract passwords from browser<br>4. Identify often used OT control interfaces<br>5. Identify how the operator authenticates i.e. via SSO or local credentials<br><br>Do not engage before:<br>Compare browsing history between browsers to identify honeypot URLs, i.e. a browser that only surfs to two, three high impact websites is suspicious<br>Compare credentials from browsers against standard credentials: If they seem very different it could be a honeypot | |
| Method | SharpWeb, Browserloot.ps1<br>Metasploit: post/multi/gather/firefox_creds | |
| ATT&CK Defense | This type of attack technique cannot be easily mitigated with preventive controls since it is based on the abuse of system features. | |
| Engage | Decoy artifacts can take a variety of forms including credentials, accounts, files/directories, browser extensions/bookmarks, system processes, etc. | |

# 3. Adjusted Red Team Attack Playbooks

History:

Heatingcontrols.kplant

Browser Credentials:

XN5896 / Nioij()/&*

History:

maintainance.kplant

Browser Credentials:

Kplant\Johnny.s / Start2021!

# 4. Key Takeaways

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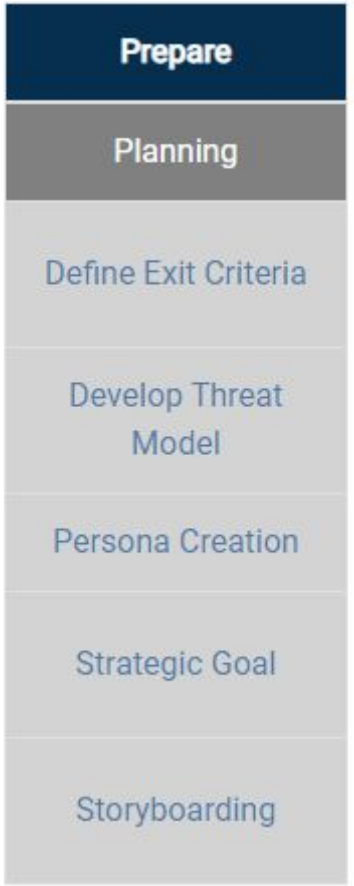
**Use MITRE Engage to augment your Red Teaming TTPs**

Understand the options the Blue Team has to defend, i.e. if a single security control is not available, it does not mean there is not defense in place

Identify Engage controls in place to derive further controls: If they have honeypot credentials in the browser, what about Active Directory?

**Align your results**

We are now able to better advise on remediations by citing MITRE Engage and how it would have impacted the engagement



BlackHills: OPSEC Fundamentals for Remote Red Teams

X33fCon: OPSEC Obsessed

CYBV436 Counter Cyber Threat Intelligence

# Questions?

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