Mapping Cyberbit Range to MITRE ATT&CK for Enhanced Training

Introduction

When an organization is breached, attackers will remain on networks for months before being detected. Once the attacker has been detected, there are a myriad of questions to answer:

- How did the attacker enter the network?
- How is the attacker moving around on the network?
- What action is the attacker taking while on the network?

For an experienced professional, many of the questions are second nature. However, mapping your training to the MITRE ATT&CK (Adversarial Tactics, Techniques, & Common Knowledge) Framework ensures that not only are these questions asked; they are answered as well.

About MITRE ATT&CK

MITRE's ATT&CK Framework is defined as globally-accessible knowledge base of adversary tactics and techniques based on real-world observations. The ATT&CK knowledge base is used as a foundation for the development of specific threat models and methodologies in the private sector, in government, and in the cybersecurity product and service community. The framework describes how attackers penetrate networks and then move laterally, escalate privileges, create a persistent state, or generally evade your defenses. ATT&CK looks at the "problem" from the perspective of the attacker, helping cybersecurity professionals determine what goals the attacker is aiming to achieve and what methods the attacker will use to achieve their goals. The Framework organizes attacker behaviors into a series of tactics, specific technical objectives that an attacker wants to achieve. For example, an attacker may perform lateral movement to move to a different part of the network where the specific data they are looking for is waiting to be exfiltrated.

Within each tactic category ATT&CK defines a series of techniques. Each technique describes one way an attacker may attempt to achieve their objective. Each tactic contains multiple techniques because different attackers may deploy different attack methodologies based on their own knowledge or circumstance (availability of tools, system configuration, etc.). Each technique defined in ATT&CK includes a description of the method deployed by the attacker, the systems or platforms the methodologies apply to, and, where known, which attackers or attack groups have been associated with the defined technique. Techniques also provide the process by which the SOC team can mitigate attacker behavior along with any published references to the technique being deployed.

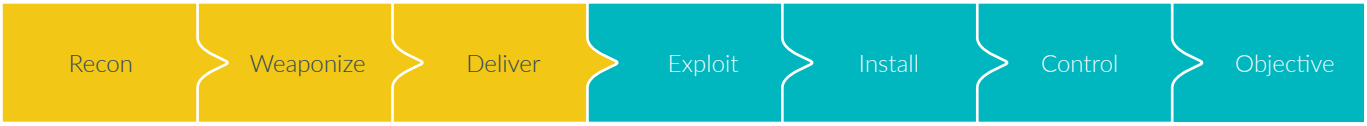
Another important use of ATT&CK is to help you learn how to detect an attacker's actions on your network. The ATT&CK Framework includes resources that are purpose built to help you develop analytics that detect the techniques used by attackers as they attempt to breach, explore, and exfiltrate data from your databases. ATT&CK will also provide information on hacking collectives or groups and the campaigns they've conducted, allowing you to be as prepared as possible for a future attack.

ATT&CK helps you understand how attackers might operate so that you can plan and build response playbooks to mitigate attacker incidents. Armed with this knowledge and "attack playbooks" you are now better prepared to understand how your adversaries prepare for, launches, and execute their attacks to achieve specific desired objectives.

Enterprise Matrix in the ATT&CK Framework

ATT&CK Enterprise and PRE-ATT&CK combine to form the full list of tactics that align with the Cyber Kill Chain. While PRE-ATT&CK mostly aligns with the first three phases the Cyber Kill Chain, ATT&CK Enterprise aligns with the final four phases.

PRE-ATTACK ENTERPRISE



The Enterprise Matrix included in the ATT&CK Framework consists of 12 tactics that attackers may use to breach and exfiltrate data from your network. The Matrix includes techniques spanning Windows, macOS, Linux, AWS, GCP, Azure, Azure AD, Office365 and SaaS tools. You can use the MITRE ATT&CK Navigator to filter through the different tactics and their assigned MITRE ATT&CK Techniques. This framework is on the MITRE Git and makes navigating attack techniques significantly easier.

How does the ATT&CK Framework help advance SOC Team Operations?

MITRE ATT&CK helps companies who are interested in in threat-informed defense. The frameworks help you to identify attacks and likely threat actors by helping you map the way malicious actors behave on your network. By breaking down the different techniques and mapping them together, Blue Teams can use ATT&CK to anticipate an attackers next move or a Red Team can mimic an incident using known attack methodologies from specific hacking collectives. To learn more about getting started with MITRE ATT&CK you can check out their whitepaper: Getting Started with ATT&CK.

Mapping Training and Education Programs to MITRE ATT&CK

For Educators

Ensuring your students are armed with the "attacker playbook" will ensure their success while working in a SOC. MITRE ATT&CK is a valuable reference tool to develop curriculums, coursework, seminars, and research of different combinations of attack techniques. Knowledge of attacker behavior is vital to the success of students who plan to have a bright future in cybersecurity. For example: if a student is knowledgeable enough to understand that attackers who use certain entry techniques will usually also perform lateral movement as their next step and be familiar with the different techniques that can be used by attackers to achieve this goal, they can mitigate the lateral movement, and thus the attack itself. Taking the next step and allowing your students to experience the technique on a cyber range will give them the experience to identify the technique in the real-world, giving your students a leg up on the malicious actor.

For SOC Managers and CISOs

Preventing a critical attack is one of the primary responsibilities of any SOC. Critical to achieving this goal is advance knowledge of how your attacker will behave when attempting or after they successfully breach a network. Since a lack of skilled staff is the top issue facing a SOC for the past two years (SANS SOC Survey 2019), arming your team with the knowledge of attacker behavior and allowing them to train against these known behaviors gives your SOC team an advantage when attempting to expel and lock out an attacker from your network. Building your training plan with MITRE ATT&CK at the forefront ensures that you can expose your team to many of the techniques outlined in ATT&CK, ensuring true preparation in the face of any attack. Training your team on a cyber range allows them to mitigate the techniques being used, ensuring that your team will be able to perform when they see a malicious attacker on the network they've been tasked with protecting.

For Recruiters and HR Managers

It is becoming increasingly difficult and competitive for you to hire candidates who are truly qualified to be a member of the SOC team in your organization. Mapping recruiting guidelines to MITRE ATT&CK will allow you to accurately test if incoming Pen Testers can execute the techniques they should be able to given the skills they may claim to have. Additionally, Blue Team members should also have intimate knowledge of MITRE ATT&CK to ensure they know how attacker behave. Possessing this knowledge will allow potential job candidates to perform more effectively and efficiently in their role. Testing incoming Blue and Red Team members on a cyber range against live attacks can provide evidence to their knowledge of MITRE ATT&CK and prove their strategic ability to mitigate incidents while they are occurring on a network.

Mapping Cyberbit Range to MITRE ATT&CK

Cyberbit Range and all scenarios included within Cyberbit Range are mapped to the techniques and methodologies used by attackers as set out by MITRE ATT&CK. This will allow you to break down your training so that your team is exposed, in real time, to the different techniques and methodologies outlined by ATT&CK, ensuring that your team will be prepared for the inevitable attack when it comes.

In order to fully grasp the number of techniques students or trainees will be exposed to in a single scenario on Cyberbit Range, we have broken down a few of our scenarios:

Dragonfly

Today more than ever, the human factor is the focus of attacks over the internet - targeting users as the weakest link in the security chain. In this attack scenario, a seemingly innocent email can be the source of a sophisticated cyber attack. While closely monitoring the attacker's steps, trainees will get a close look at different attack techniques for lateral movement, privilege escalation and data exfiltration using web vulnerability.

MITRE Techniques in Scenario:

Initial Access	Execution	Persistence	Privilege Escalation	Defense Evasion	Lateral Movement	Collection	Command and Control
Spearphishing Link (T1192)	Command-Line Interface (T1059)	Hidden Files and Directories (T1158)	Web Shell (T1100)	Hidden Files and Directories (T1158)	Exploitation of Remote Services (T1210)	Data from Local System (T1005)	Fallback Channels (T1008)
	Exploitation for Client Execution (T1203)	Redundant Access (T1108)		Redundant Access (T1108)		Data Staged (T1074)	Web Service (T1102)
	PowerShell (T1086)	Web Shell (T1100)		Scripting (T1064)		Screen Capture (T1113)	
	Scripting (T1064)			Template Injection (T1221)			
	User Execution (T1204)			Web Service (T1102)			

Apache Shutdown

This attack scenario emulates an attack on an organization's publicly accessible services. The attack disrupts the operation of the service and utilizes basic methods to strengthen the attacker's foothold in the system. In this scenario, the trainees will be confronted with a disruption to business-critical components and will be required to act swiftly in order to maintain as much up-time as possible and mitigate the attack. The trainees will also witness different techniques for housekeeping and persistence.

MITRE Techniques in Scenario:

Initial Access	Execution	Persistence	Privilege Escalation	Defense Evasion	Credential Access	Discovery	Lateral Movement	Command and Control	Impact
External Remote Services (T1133)	Local Job Scheduling (T1168)	External Remote Services (T1133)	Scheduled Task (T1053)	Redundant Access (T1108)	Brute Force (T1110)	Network Service Scanning (T1046)	Remote Services (T1021)	Fallback Channels (T1008)	Service Stop (T1489)
Valid Accounts (T1078)	Scheduled Task (T1053)	Local Job Scheduling (T1168)	Valid Accounts (T1078)	Valid Accounts (T1078)				Web Service (T1102)	
		Redundant Access (T1108)		Web Service (T1102)					
		Scheduled Task (T1053)							
		Valid Accounts (T1078)							

CI Flaw

Domain Admins members have FULL administrative rights to all workstations, servers, Domain Controllers, Active Directory, Group Policy and more. This excessive power makes the domain admin credentials a gold mine for attackers. rom slowly collecting pieces of information on the target network using different techniques such as sniffing and brute-forcing, to generating payloads using Metasploit, the trainees will need to find their way to achieve the goal of retrieving the domain admin credentials.

MITRE Techniques in Scenario:

Execution	Persistence	Privilege Escalation	Defense Evasion	Credential Access	Credential Access	Discovery
Graphical User Interface (T1061)	File System Permissions Weakness (T1044)	Hooking (T1179)	Masquerading (T1036)	Brute Force (T110)	Network Sniffing (T1040)	Exploitation of Remote Services (T1210)
PowerShell (T1086)	Hooking (T1179)		Redundant Access (T1108)	Credential Dumping (T1003)	Software Discovery (T1518)	Remote Desktop Protocol (T1076)
Scripting (T1064)	Redundant Access (T1108)		Scripting (T1064)	Forced Authentication (T1187)	System Network Configuration Discovery (T1016)	
Service Execution (T1035)	Shortcut odification (T1023)			Hooking (T1179)	System Owner/ User Discovery (T1033)	
				Network Sniffing (T1040)		

About Cyberbit Range

Cyberbit Range is a cybersecurity training platform providing SOC teams with the closest possible experience of a real-world cybersecurity incident. The platform simulates real-world cyberattacks which are injected into a virtual network. Trainees are immersed in a virtual SOC, where they practice responding to the attacks using commercially licensed security tools like the ones they would use in their day-to-day work. Cyberbit Range provides scenarios ranging from entry-level network security to extensive multi-stage attacks, ransomware, DDoS and Trojans. The combination of real-world attacks, networks and security tools, results in a hyper-realistic experience that dramatically improves trainees' skill levels, reduces time-to-respond, and improves soft skills like teamwork and communications.

Key Capabilities of Cyberbit Range

- **Automated Cyberattack Simulation** accurately simulates attack scenarios ranging from basic threats to complex multi-stage attacks
- **Comprehensive Virtual Networks** are included within Cyberbit Range, resembling a typical corporate network infrastructure
- **Real-World Security Tools** including commercial SIEMs, firewalls, and endpoint security tools
- **Individual and Team Training** to work on both individual skills as well as teamwork and communication skills
- **Automated Trainee Assessment** tracks and grades users automatically based on their performance
- **OT Training Options** enabling critical infrastructure security and network staff to train in responding to OT specific and IT/OT attacks

ABOUT CYBERBIT™

Cyberbit provides hands-on cybersecurity education and training and addresses the global cybersecurity skill gap through its world-leading cyber range platform. Colleges and universities use Cyberbit Range to increase student enrollment and retention, train industry organizations, and position their institution as regional cybersecurity hubs by providing simulation-based learning and training. The Cyberbit Range platform delivers a hyper-realistic experience that immerses learners in a virtual security operations center (SOC), where they use real-world security tools to respond to real-world, simulated cyberattacks. As a result, it prepares students for their careers in cybersecurity from day-one after their graduation and reduces the need to learn on the job. Cyberbit delivers over 100,000 training sessions annually across 5 continents. Customers include Fortune 500 companies, MSSPs, system integrators, higher education institutions and governments. Cyberbit is headquartered in Israel with offices in the US, Europe, and Asia.

sales@cyberbit.com | www.cyberbit.com

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