LEADERSHIP FOR IT SECURITY & PRIVACY ACROSS HHS

HHS CYBERSECURITY PROGRAM

OFFICE OF INFORMATION SECURITY

ATT&CK for Emotet

01/28/2021

TLP: WHITE, ID# ***202101281030***

Agenda

- What Is ATT&CK?
- Why Use ATT&CK?
- How To Start With ATT&CK
- Emotet Malware Profile
- Recent Emotet Updates
- Emotet Threat to HPH
- ATT&CK Techniques for Emotet
- ATT&CK Mitigations for Emotet
- References

Slides Key:

Non-Technical: Managerial, strategic and high-level (general audience)

Technical: Tactical / IOCs; requiring in-depth knowledge (sysadmins, IRT)

What Is ATT&CK?

- ATT&CK framework developed by the MITRE Corporation in 2013 and released to the public in May 2015
- Stands for “Adversarial Tactics, Techniques, and Common Knowledge”
- Comprehensive matrix of tactics and techniques associated with malware families and threat groups
- Leveraged by cybersecurity professionals to better classify attacks and assess an organization’s risk
- Platforms: Windows, macOS, Linux, Cloud, Network
- Three different matrices:
  - Enterprise ATT&CK
  - Pre-ATT&CK
  - Mobile ATT&CK
- 14 tactics correspond to attack stages
- 177 techniques and 348 sub-techniques
- 42 enterprise mitigations
- 512 software / malware
- 109 groups
- And growing!

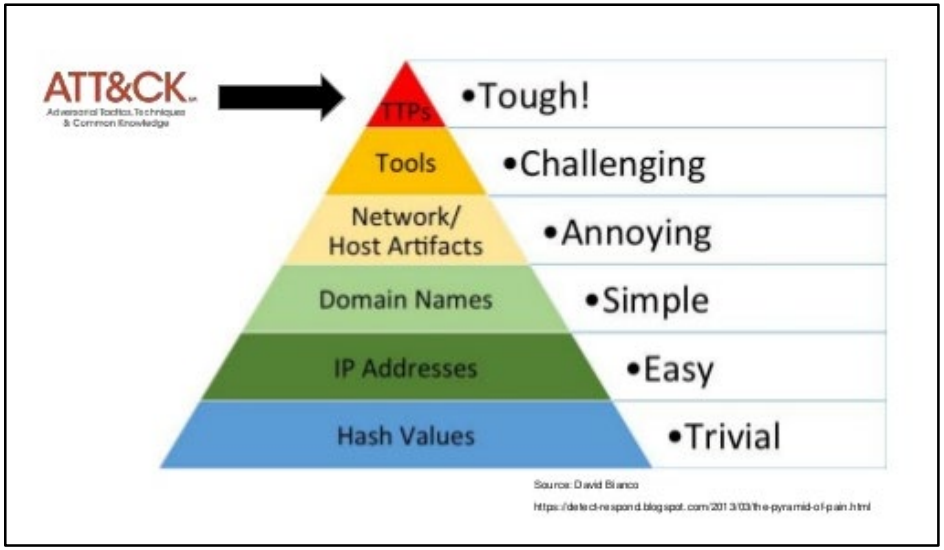
ATT&CK®

Enterprise Tactics

1. Reconnaissance
2. Resource Development
3. Initial Access
4. Execution
5. Persistence
6. Privilege Escalation
7. Defense Evasion
8. Credential Access
9. Discovery
10. Lateral Movement
11. Collection
12. Command and Control
13. Exfiltration
14. Impact

Why Use ATT&CK?

- David Bianco's Pyramid of Pain (2013)
- TTPs are tough for adversaries to change!
- ATT&CK provides a framework for analyzing and defending against attacker TTPs
- Improve threat intelligence and detection capabilities
- ATT&CK helps teams communicate in common language
- ATT&CK can be leveraged by teams of all sizes and maturity levels
- Identify security gaps and rate detection coverage
- Compare TTPs across threat groups to identify overlaps
- Improve post-compromise detection of adversaries



Source: David Bianco

How To Start With ATT&CK

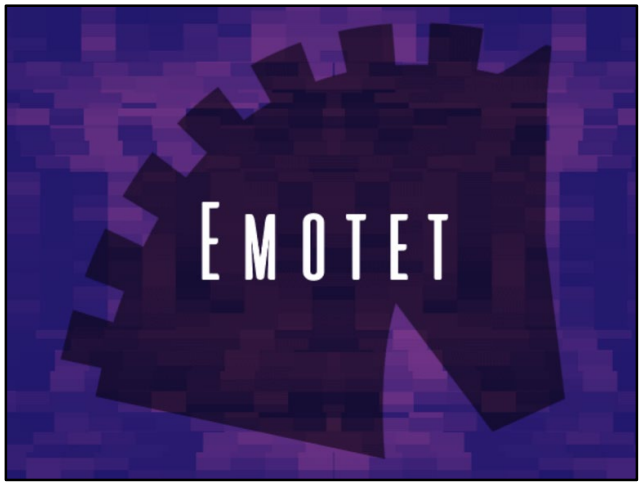
- Start small!
- Choose one threat group or software that targets your industry
- Choose one ATT&CK technique each week to discuss across teams on how your organization can detect, defend, and emulate this attacker behavior
- Collect one log source that will improve ATT&CK visibility
- What are the countermeasures or mitigations for each ATT&CK technique?

Source: iamWire

For more:
Getting Started with ATT&CK by The MITRE Corporation
Using ATT&CK for Cyber Threat Intelligence Training by MITRE
Getting Started with ATT&CK: Threat Intelligence by Katie Nickels

Malware Profile: Emotet

- **Malware Name**: Emotet (aka Geodo)
- **Malware Description**: Emotet is a modular Trojan initially associated with banking fraud which, since 2017, has been limited to spam and secondary payload distribution. There are hundreds of variants of Emotet and the malware continues to update with new capabilities and evasion techniques.
- **Malware Type**: Trojan
- **Associated Threat Group(s):** TA542, MummySpider, Mealybug; Wizard Spider, UNC1878, Temp.MixMaster, Grim Spider
- **First Discovered:** 2014
- **Last Active**: December 2020
- **Primary Distribution**: phishing e-mails
- **Malware Capabilities**: self-propagation, brute-forcing passwords, credential theft, defense evasion, lateral movement, persistence
- **Secondary Payloads**: Qakbot, Dridex, IcedID, Trickbot, Ryuk, Conti, ProLock, Zloader, and more.
- **Targeted Industries**: Pharmaceutical, Healthcare, Biotechnology, Government, Technology, Transportation, and more.



Source: ZDNet

Recent Emotet Updates

Feb 2020:
Non-US countries targeted with COVID-19-themed phishing emails to lure victims to download Emotet

July 2020:
US businesses targeted with COVID-9-themed phishing emails with previously used Emotet URLs

Aug 2020:
1,000 percent increase in downloads of Emotet loader with uptick targeting state and local governments in US

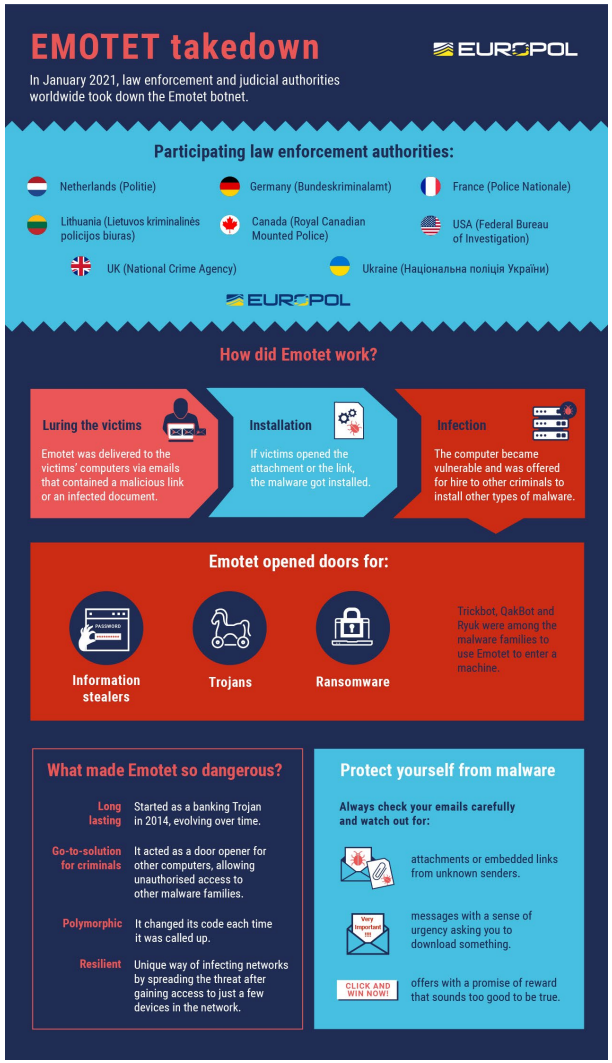
Sep-Oct 2020:
Emotet surge impacting Canada, France, Japan, New Zealand, Italy, and Netherlands.

Dec 2020:
Emotet returns with 100k daily emails and new evasion tactics

Jan 27, 2021:
Europol announces international law enforcement takedown of the EMOTET botnet

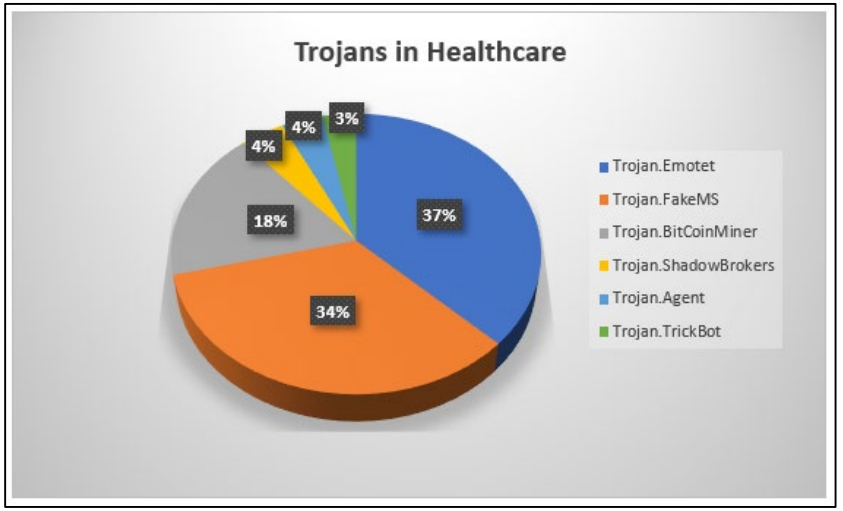
Emotet Takedown – January 2021

- Authorities from Netherlands, Germany, the United States, the United Kingdom, France, Lithuania, Canada and Ukraine, with international activity coordinated by Europol
- Emotet infrastructure involved several hundreds of servers located across the world
- The infected machines of victims have been redirected to law enforcement-controlled infrastructure
- Dutch police have launched a website that lets users see if their emails were present in Emotet's internal spam database
- Ukrainian police announced the arrest of two suspects who were allegedly tasked with keeping Emotet infrastructure up and running
- Possible that actors who remain at large could rebuild the botnet in the future
- Emotet will be uninstalled globally on March 25



Source: EUROPOL

- **April 2019: "Emotet Trojan Is the Most Prevalent Threat in Healthcare Systems" according to Malwarebytes**
  - 80% of malware affecting computer systems in the healthcare industry are Trojans, with the most common one being Emotet
  - 37% of Trojans affecting healthcare were a result of Emotet infections in 2019
- **January 2021: "Cyber-attacks on global healthcare organizations (HCOs) increased at more than double the rate of those targeting other sectors over the past two months," according to Check Point.**
  - 45% increase in attacks on the healthcare sector, versus less than half this figure (22%) for all other industry verticals.
  - Ryuk and Sodinokibi (REvil) were highlighted as the main culprits and it is widely known that Emotet is often leveraged in Ryuk ransomware attacks



Source: BleepingComputer

- **Emotet hit a European country's national public health center in December 2020. The following details were pulled from media reports:**
    1. Phishing emails socially engineered targets to open Zipped archive with password included in message
    2. Malware was encrypted and password-protected
    3. Evaded anti-malware solutions by using password-protected archives as attachments
    4. Emotet loader contained benign code from a Microsoft DLL to evade antivirus solutions
    5. Thread hijacking to distribute malicious code using password-protected archives as attachments
    6. Compromised systems at the health center were leveraged to send malicious emails to other government entities in the same country as well as researchers
    7. E-mail systems shut down temporarily to stop further spread of Trojan
    8. Impacted internal networks
    9. Likely attempted to distribute Trickbot

ATT&CK Interpretation

1. T1566.001 - Spearphishing Attachment
2. T1204.002 - User Execution: Malicious File
3. T1027 - Obfuscated Files or Information
4. T1036 - Masquerading
5. T1586.002 - Compromise Accounts: Email Accounts
6. T1586.002 - Compromise Accounts: Email Accounts
7. T1499 - Endpoint Denial of Service
8. T1498 - Network Denial of Service

ATT&CK Techniques for Emotet (Graphic)

Source: Mitre

ATT&CK Techniques for Emotet (Table)

ATT&CK ID	Tactic	Technique
T1566.002	Initial Access	Phishing: Spearphishing Link
T1566.001	Initial Access	Phishing: Spearphishing Attachment
T1078.003	Initial Access	Valid Accounts: Local Accounts
T1059.001	Execution	Command and Scripting Interpreter: PowerShell
T1059.005	Execution	Command and Scripting Interpreter: Visual Basic
T1059.003	Execution	Command and Scripting Interpreter: Windows Command Shell
T1053.005	Execution	Scheduled Task/Job: Scheduled Task
T1204.001	Execution	User Execution: Malicious Link
T1204.002	Execution	User Execution: Malicious File
T1047	Execution	Windows Management Instrumentation
T1547.001	Persistence	Boot or Logon Autostart Execution: Registry Run Keys / Startup Folder
T1543.003	Persistence	Create or Modify System Process: Windows Service
T1055.001	Privilege Escalation	Process Injection: Dynamic-link Library Injection

Source: Mitre

ATT&CK Techniques for Emotet (Table) (continued)

ATT&CK ID	Tactic	Technique
T1027	Defense Evasion	Obfuscated Files or Information
T1027.002	Defense Evasion	Software Packing
T1110.001	Credential Access	Brute Force: Password Guessing
T1555.003	Credential Access	Credentials from Password Stores: Credentials from Web Browsers
T1040	Credential Access	Network Sniffing
T1003.001	Credential Access	OS Credential Dumping: LSASS Memory
T1552.001	Credential Access	Unsecured Credentials: Credentials In Files
T1087.003	Discovery	Account Discovery: Email Account
T1057	Discovery	Process Discovery
T1210	Lateral Movement	Exploitation of Remote Services
T1021.002	Lateral Movement	Remote Services: SMB/Windows Admin Shares
T1560	Collection	Archive Collected Data
T1114.001	Collection	Email Collection: Local Email Collection
T1573.002	Command and Control	Encrypted Channel: Asymmetric Cryptography
T1571	Command and Control	Non-Standard Port
T1041	Exfiltration	Exfiltration Over C2 Channel

Source: Mitre

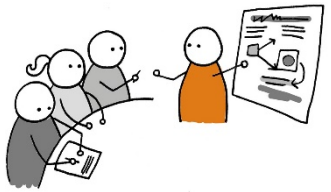
ATT&CK Mitigations for Emotet (Graphic)

Source: Mitre

ATT&CK Mitigations for Emotet

Mitigation ID	Mitigation Name
M1049	Antivirus/Antimalware
M1031	Network Intrusion Prevention
M1021	Restrict Web-Based Content
M1017	User Training
M1027	Password Policies
M1026	Privileged Account Management
M1045	Code Signing
M1042	Disable or Remove Feature or Program
M1038	Execution Prevention
M1047	Audit
M1028	Operating System Configuration
M1018	User Account Management
M1040	Behavior Prevention on Endpoint
M1036	Account Use Policies

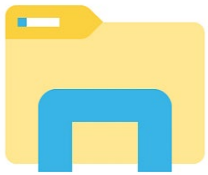
Source: Mitre



ATT&CK Mitigations for Emotet (cont.)

Mitigation ID	Mitigation Name
M1032	Multi-factor Authentication
M1041	Encrypt Sensitive Information
M1043	Credential Access Protection
M1025	Privileged Process Integrity
M1022	Restrict File and Directory Permissions
M1048	Application Isolation and Sandboxing
M1050	Exploit Protection
M1030	Network Segmentation
M1019	Threat Intelligence Program
M1051	Update Software
M1016	Vulnerability Scanning
M1037	Filter Network Traffic
M1035	Limit Access to Resource Over Network
M1020	SSL/TLS Inspection

Source: Mitre



Takeaways

- ATT&CK knowledge base and training is FREE!
- TTPs are TOUGH for adversaries to change which makes ATT&CK valuable from a security standpoint
- It is EASY to get started implementing ATT&CK!
- While Emotet was taken down this week, it remains to be seen if this will have a long standing impact

Source: BleepingComputer

Reference Materials

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Questions

Upcoming Briefs

- Threats in Healthcare Cloud Computing (2/4)
- Malicious SendGrid Campaigns (2/11)

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