RSAConference2022
San Francisco & Digital | June 6 – 9

TRANSFORM

SESSION ID: **TECH-M06**

Network Based Threat Hunting: Lessons Learned, Techniques to Share

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Cato Networks

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Cato Networks

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Agenda & Intro

Agenda

- Quick Intro
- Case Studies
  - Phishing + demo
  - Malware deep dive
  - Ransomware + live demo
- Take-aways

The Single Point Of Failure Fallacy

Cybersecurity

Hackers Breached Colonial Pip
Compromised Password

Twitter Hack: The Spotlight that Insider Threats Need

The high profile attack should spur serious board-level conversations around the importance of insider threat prevention.

Shareth Ben

Executive Director, Field Engineering, Securonix

August 20, 2020

Hackers breach Lineage

unpatched

LineageOS source code, O

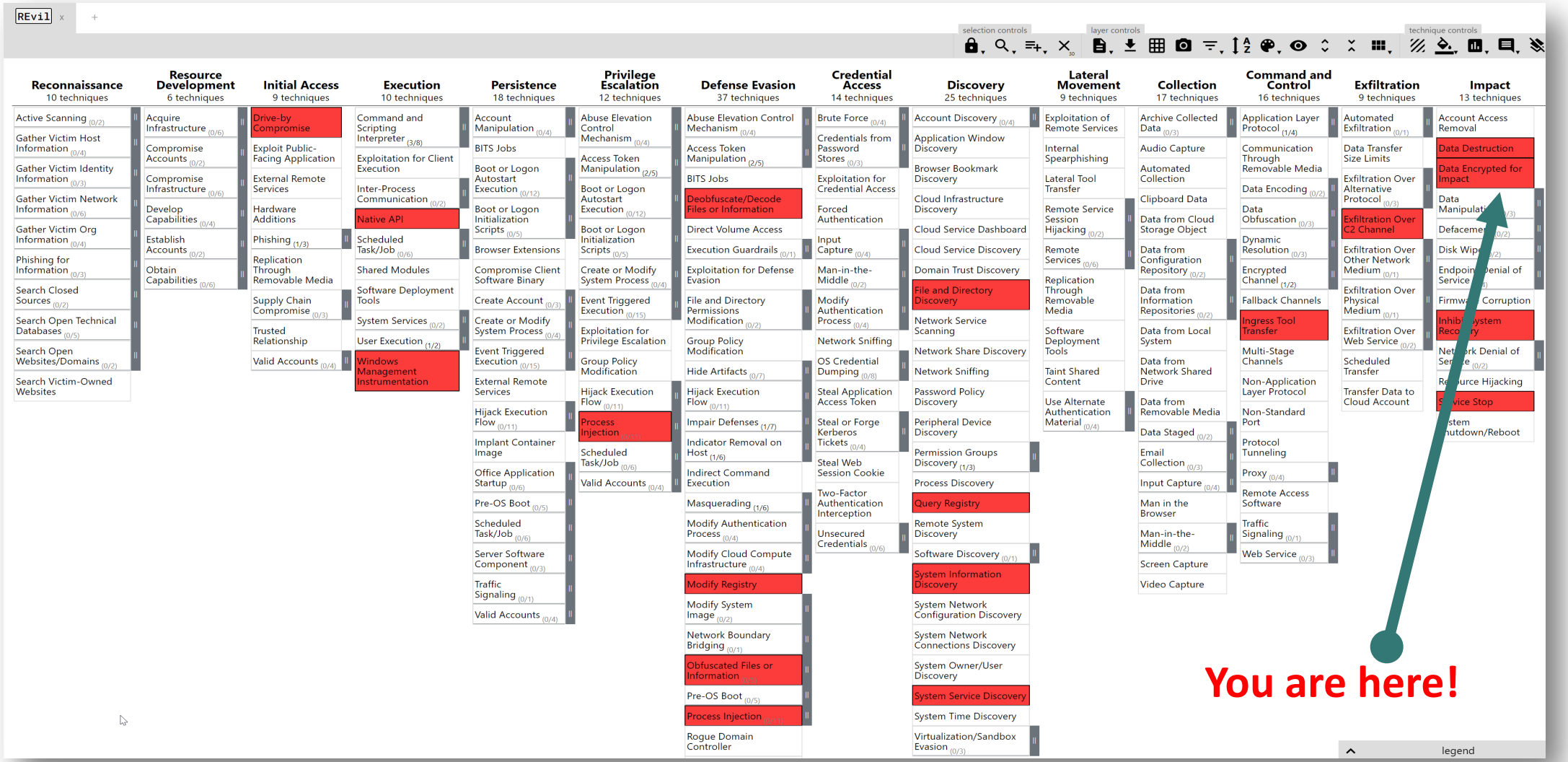
A hacker stole more than $55 million in crypto after a bZx developer fell for a phishing attack

Kevin Shalvey Nov 7, 2021, 5:10 AM

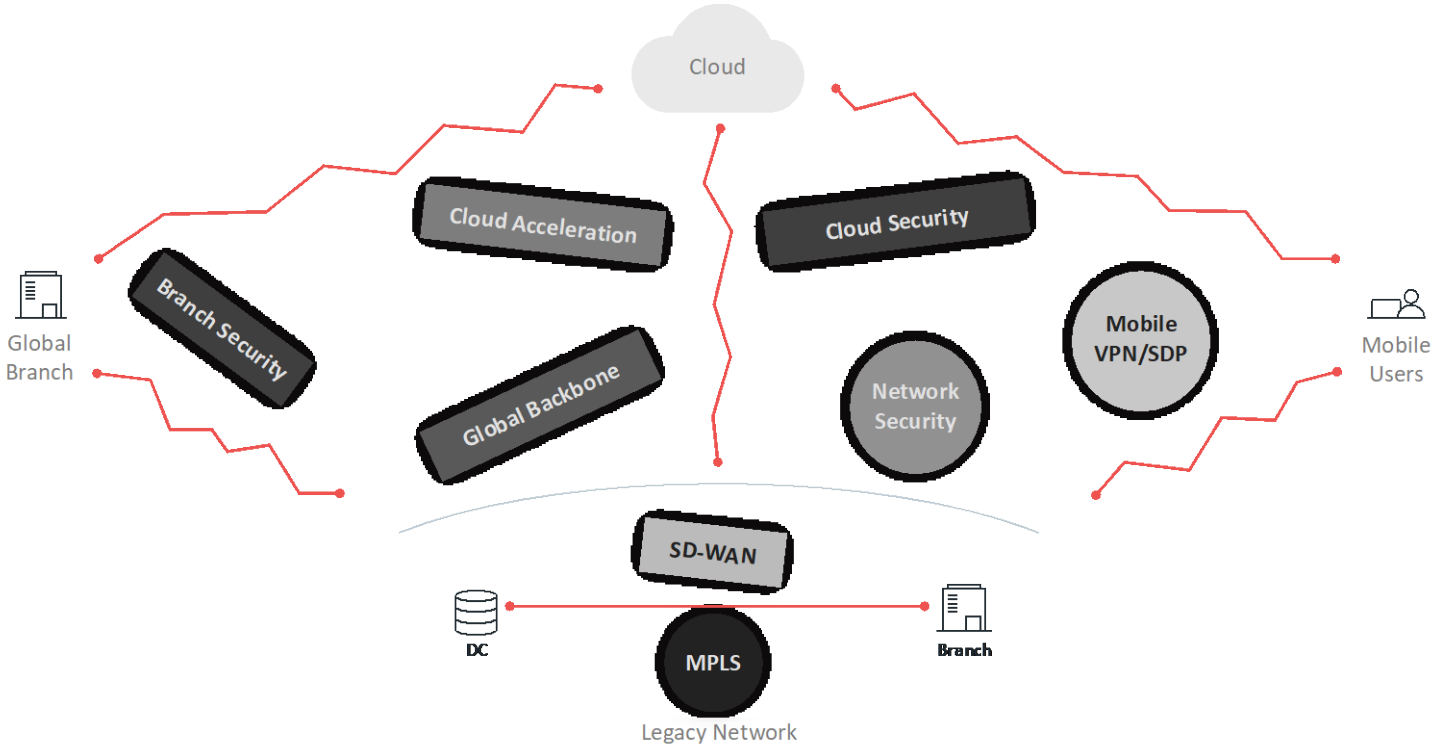
SQL injection flaw in billing software app tied to US ransomware infection

John Leyden 26 October 2021 at 14:54 UTC
Updated: 26 October 2021 at 15:26 UTC

The Attacker Needs To Be Right Just Once, The Defenders Need To Be Right All The Time?



So, What Are We Missing?



account_name	uniq_host	flows_cou
	507	760
	141	7543
	78	5489
	64	19351
	59	3891
	55	7397
	51	294
	48	12648
	47	22570
	46	664
	44	1234
	42	549
	40	2305
	39	2287
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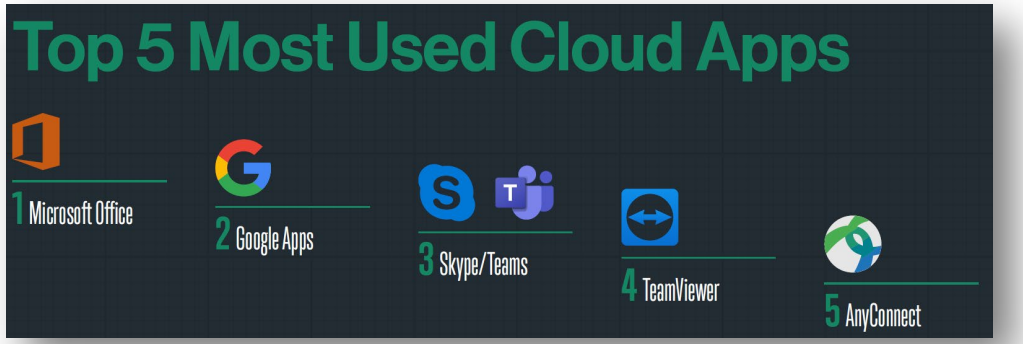
	35	5717
	34	1541
	34	7235
	33	3851
	32	840
	31	1315
	30	10033



There were more TikTok flows than Gmail, LinkedIn or Spotify flows

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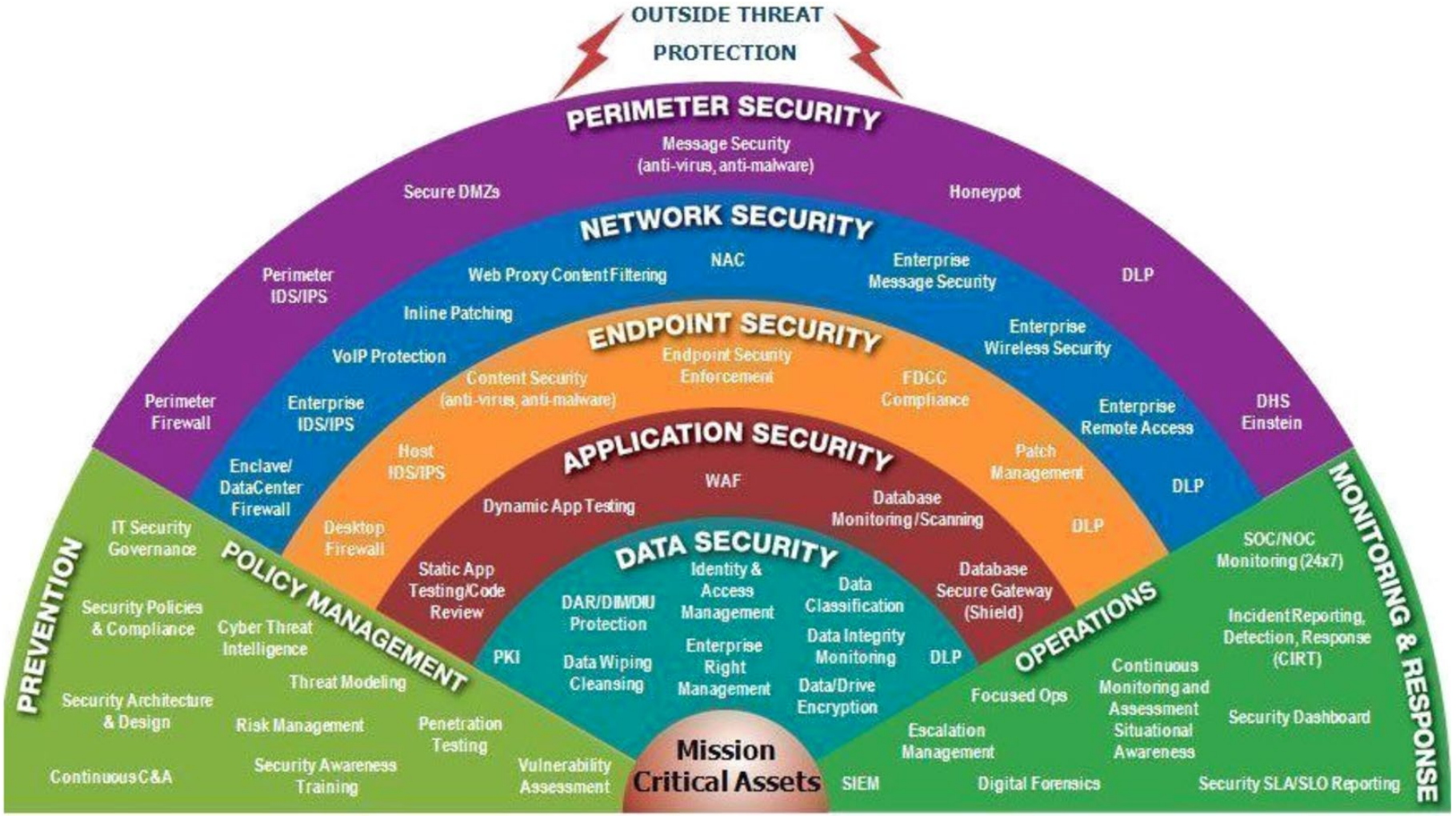
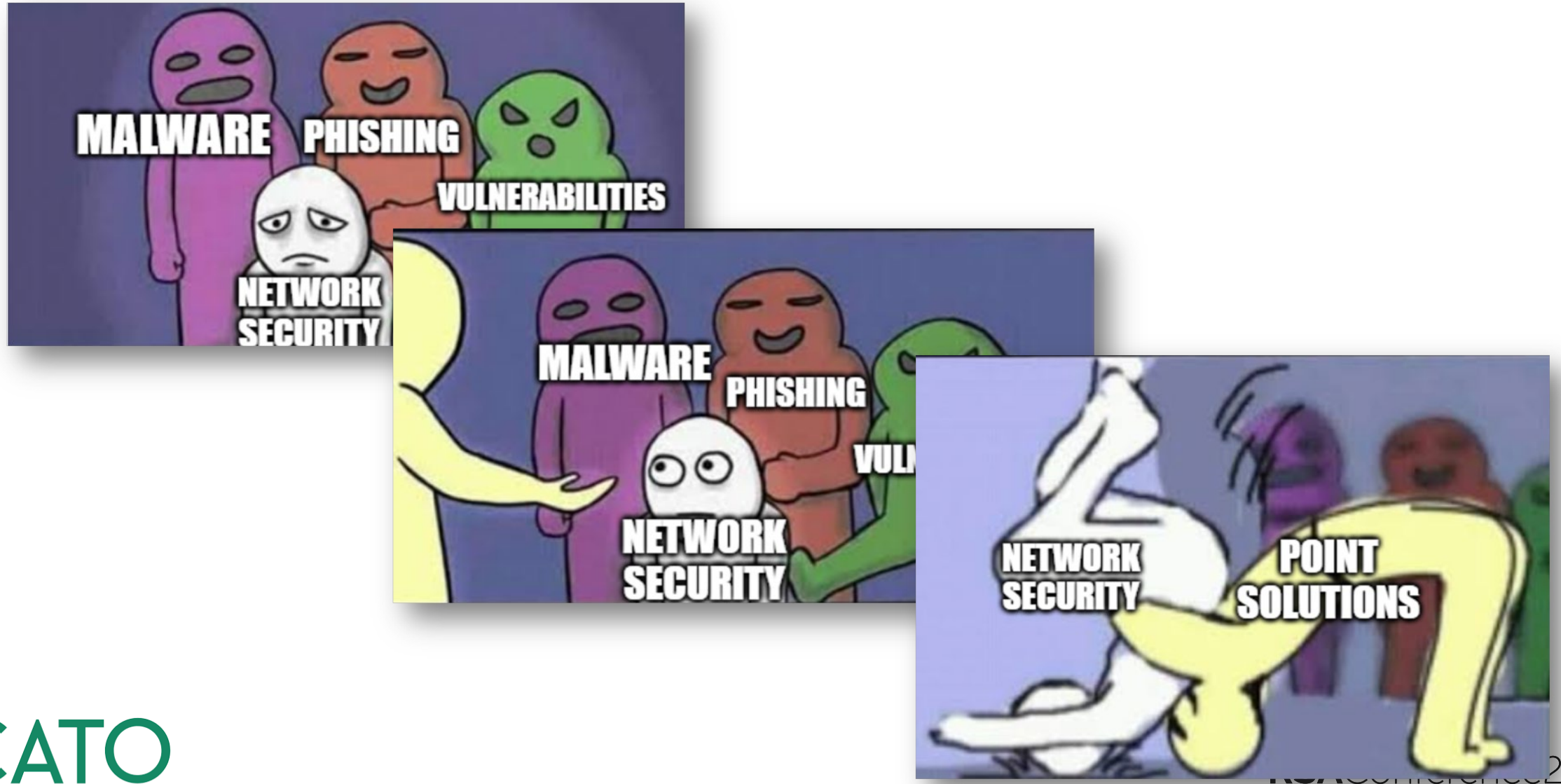
More Point Solutions Means Better Security (?)



Source: Michael Fisher

Did We Add Fat Or Muscle?



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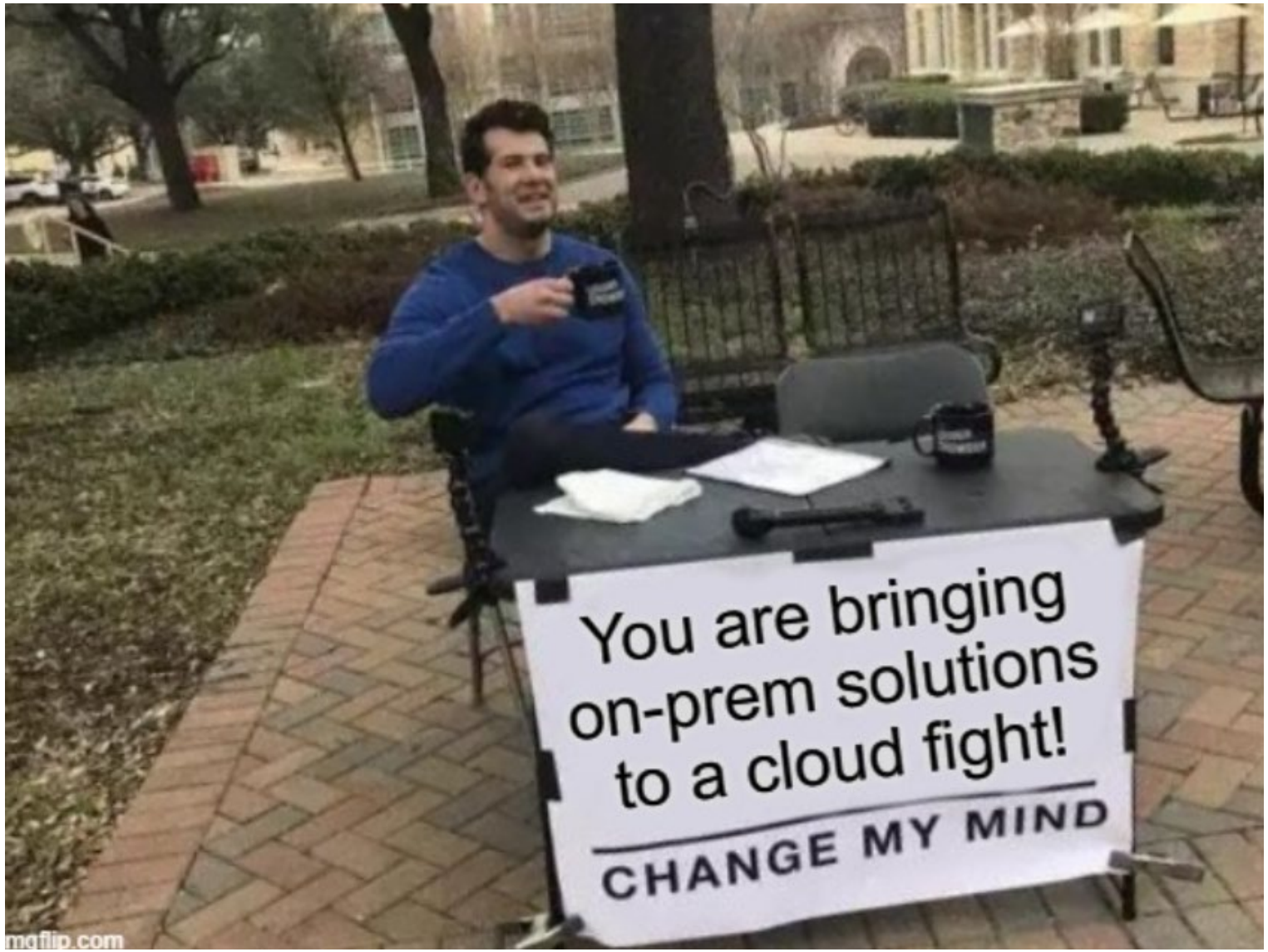
Why Is This Happening?



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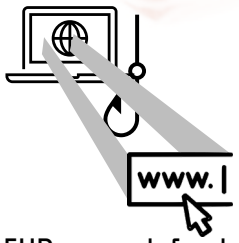
Case Study 1

Phishing

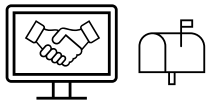
Office365 Phishing Attack Chain

Targeted Phishing Attack launched

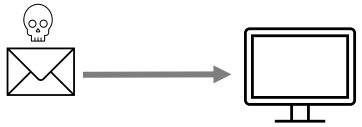


FUD in intel. feeds

Attacker compromises partner's mailbox



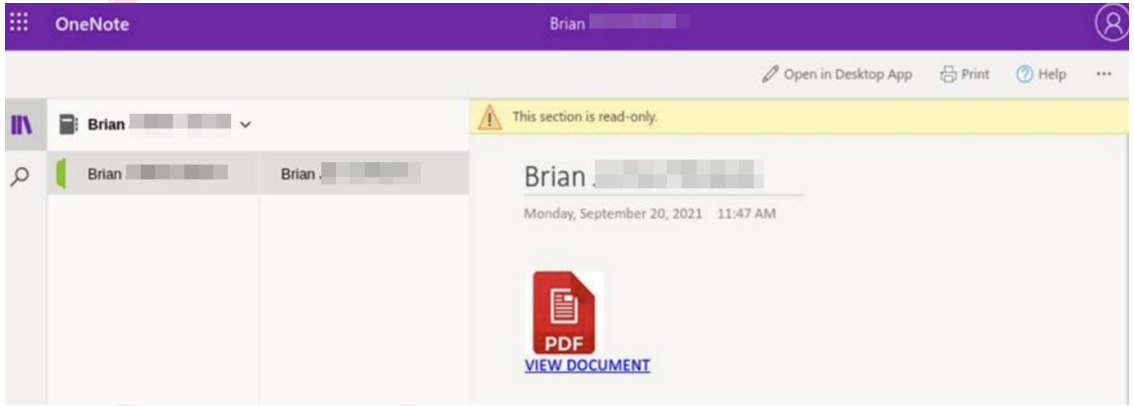
Phishing email sent



compromised "OneNote", "ClickUp", and "Glitch" web services

ClickUp

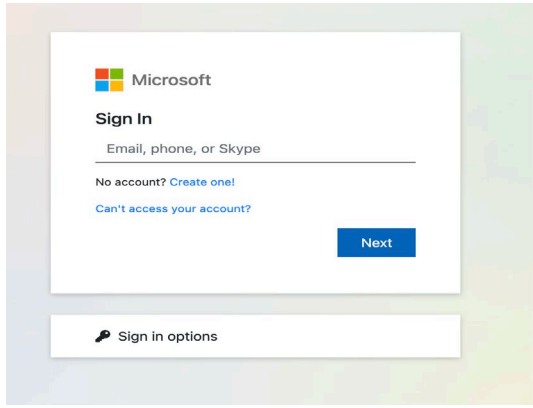
Glitch



How this can be hunted?

Submission of data into a potential risky Web forms

ML models trained on different page elements



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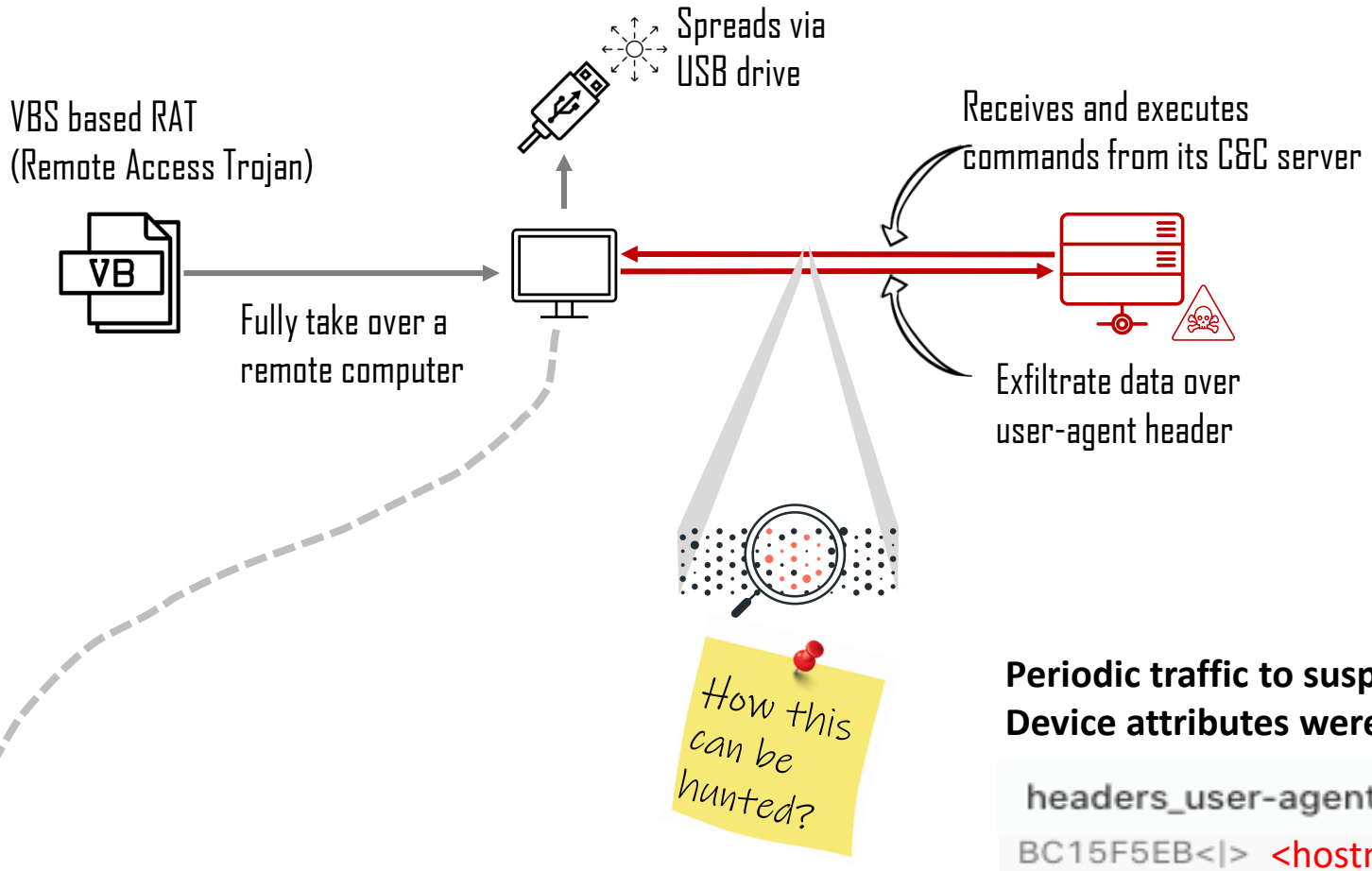
Case Study 2

Malware

Houdini Remote Access Trojan (RAT)



Periodic traffic to suspicious domains
Device attributes were found in the HTTP user-agent header

headers_user-agent

BC15F5EB<|> <hostname> <|> <username> <|>Microsoft Windows 10 Enterprise<|>plus<|>Windows Defender .Trend Micro OfficeScan Antivirus .<|>false - 4/21/2021

Threat dwell-time lasted for days

Existing external NGAV didn't detect it

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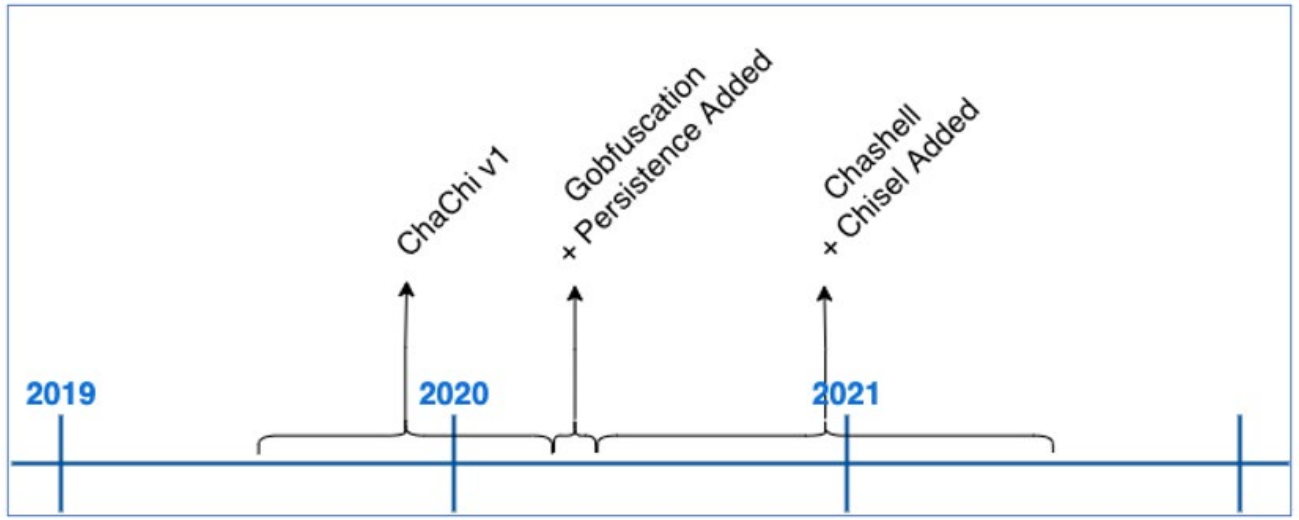
ChaChi Backdoor

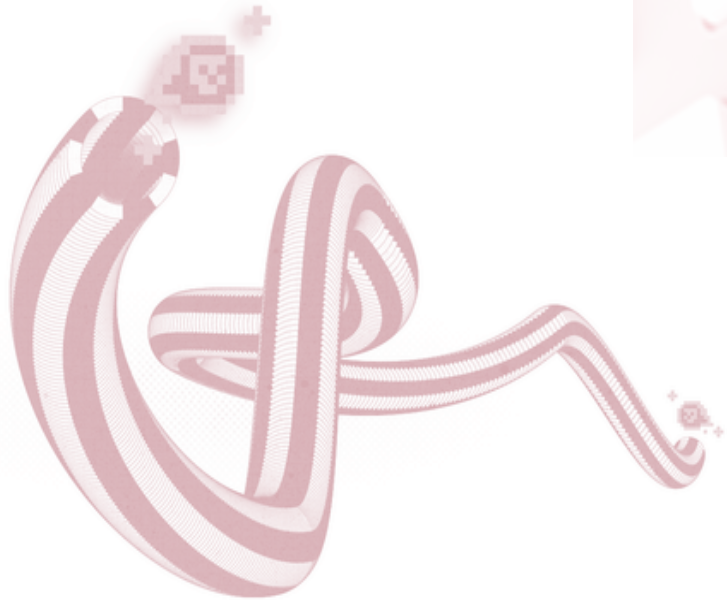
Characteristics:

- Golang based backdoor, first observed in 2019
- Cross Platform
- Stealing device attributes
- Data exfiltration via DNS Tunneling/Fallback over HTTP
- Dropping PYSA Ransomware



ChaChi Backdoor – DNS Tunneling

For attackers, DNS tunneling provides a convenient way to exfiltrate data and to gain access to a network because DNS communications are often unblocked



How this can be hunted?

DNS record detection heuristics
ML models trained on DNS traffic/Domain squatting

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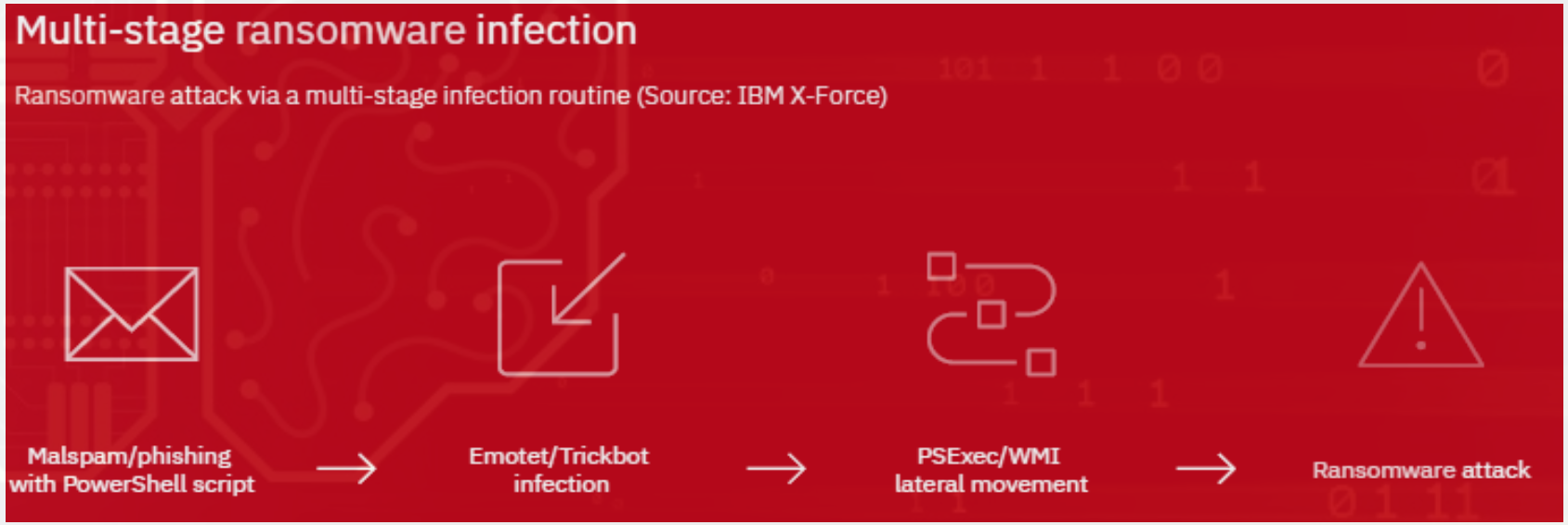
Case Study 3

Ransomware

Ransomware Propagation and Encryption

Characteristics:

- Ransomware typically encrypts files and renames them too, **usually by changing their file extension**
- Ransomware determines what data to encrypt by iterating through files on local systems and **SMB network shares**



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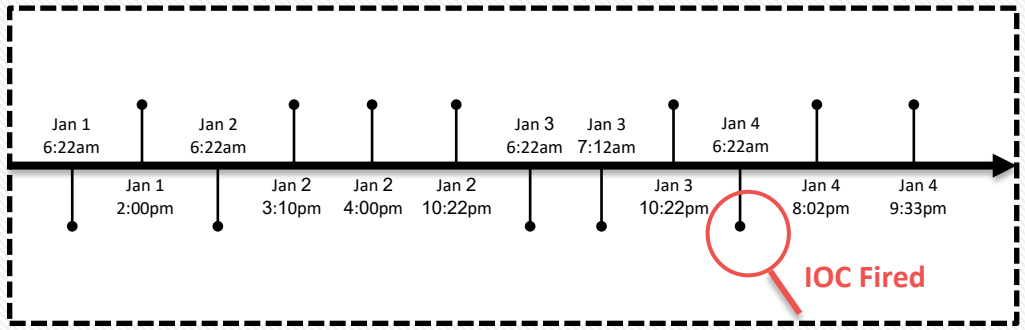
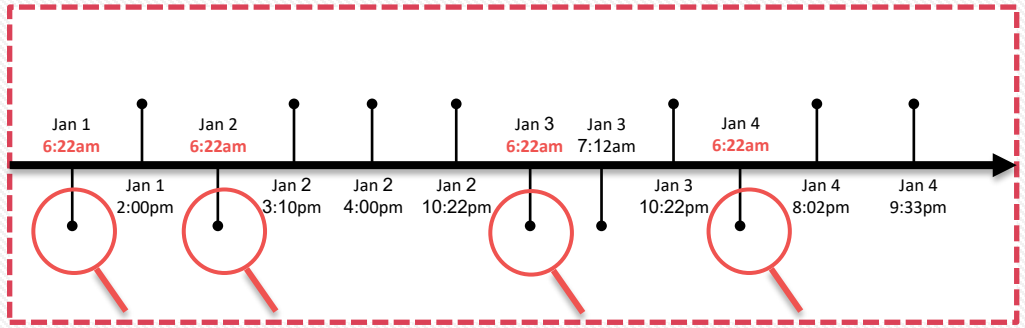
Summary

Combating cyber threats using AI & ML





100TB Daily

Raw Flows

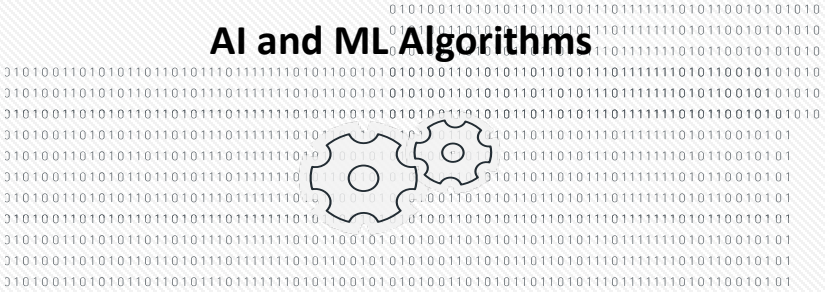
Rich Flow Context

Src IP | Application | Dest IP | Protocol | Target | OS | URI | URL

TLS signature | DNS resolving | Client type | User agent | DGA | Port

Request body | HTTP header | Header order | First packet

AI and ML Algorithms



~20 Flows

For verification, containment, and communication

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Malware Network Activity

4DD551A2A853C411E005795FA63CE640.online

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A9D5F0F6FF1E417FD0F26A42405A6F5E.online

DEF651313D9BBF292A6C6484E3F076CF.online

Domain	URI
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4E4ECDE4BD35A25A212C438F7CFE55B9.online	/sta.php?g=[redacted]&o=6&b=&v=3.0&l=pub1all&i=all&s=[redacted]

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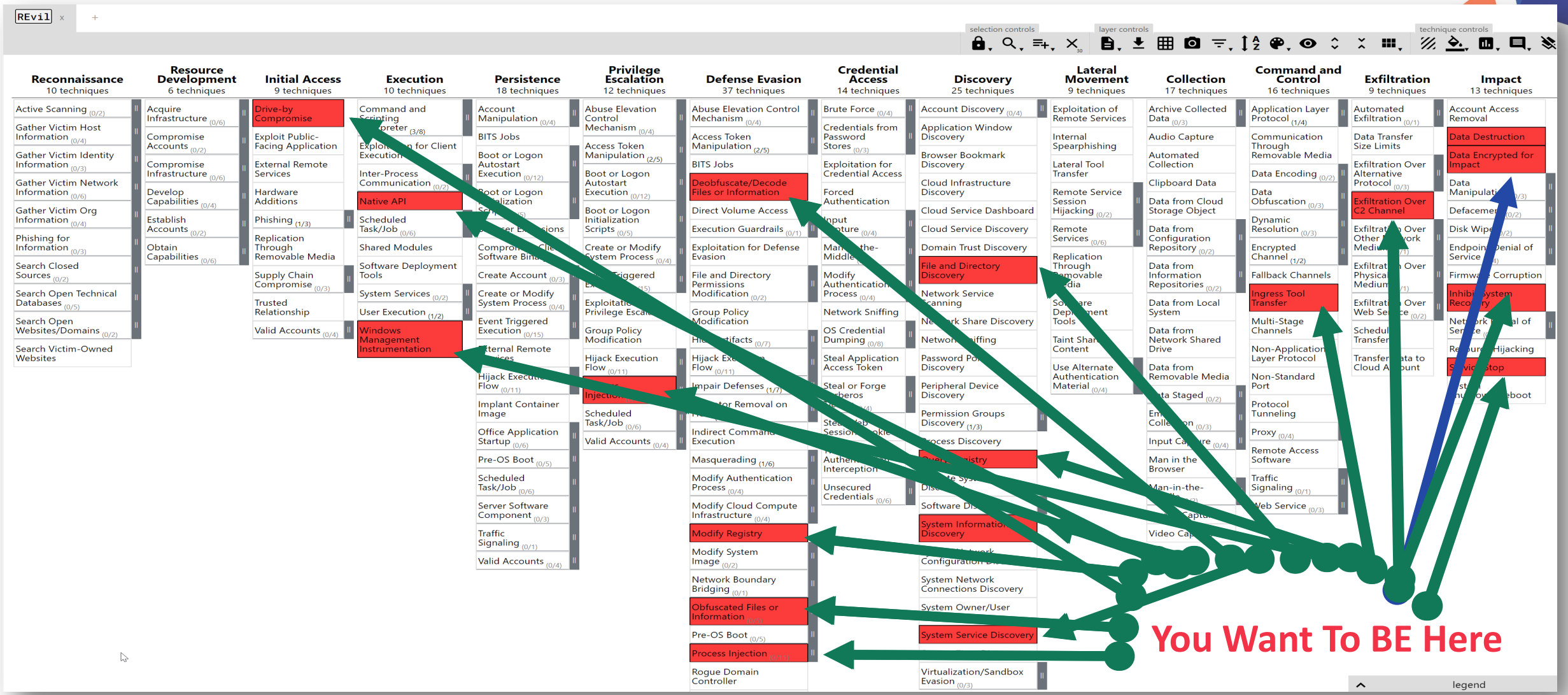
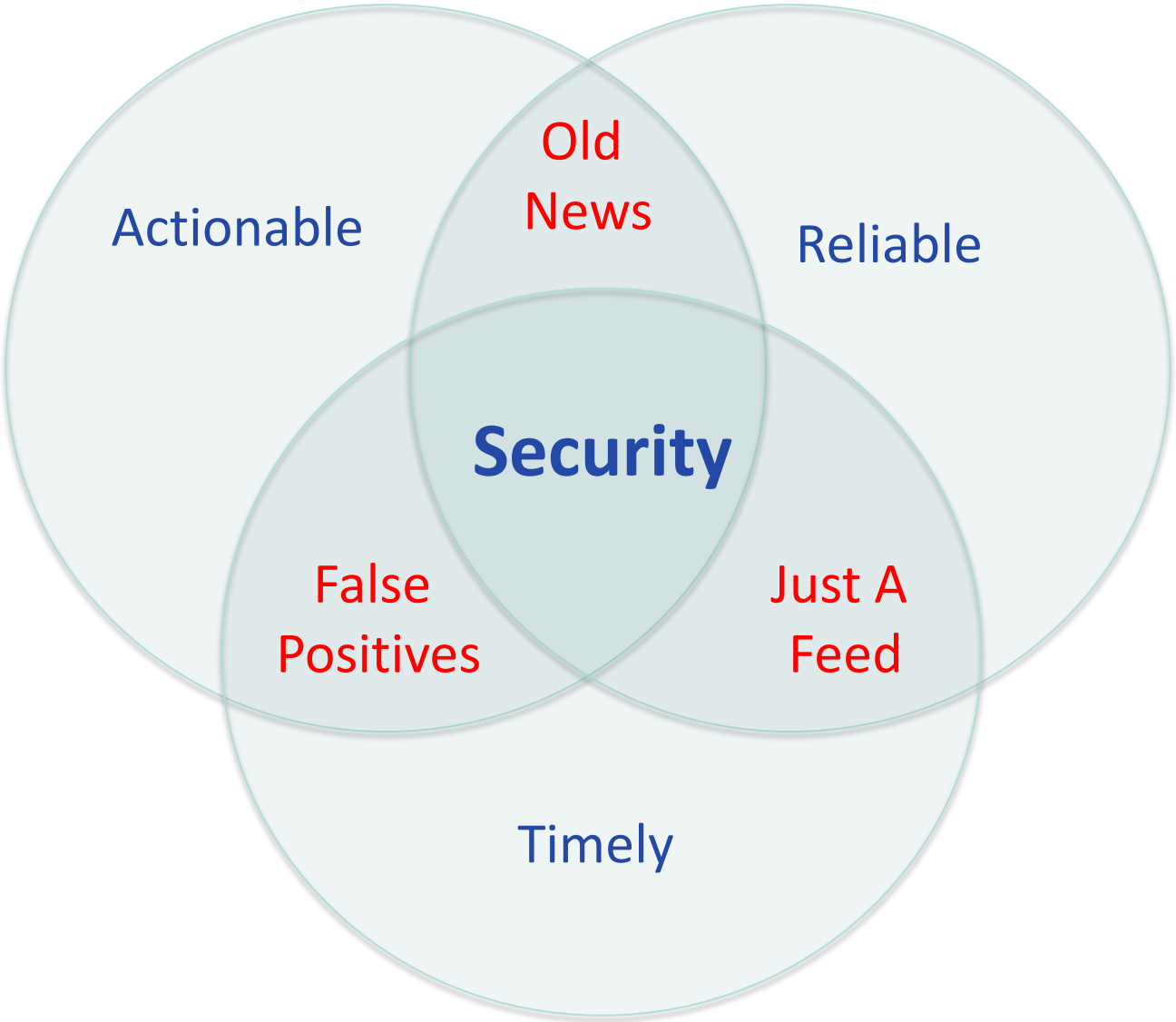
To This


REvil
selection controls
layer controls
technique controls
Reconnaissance
10 techniques
Active Scanning (0/2)
Gather Victim Host Information (0/4)
Gather Victim Identity Information (0/3)
Gather Victim Network Information (0/6)
Gather Victim Org Information (0/4)
Phishing for Information (0/3)
Search Closed Sources (0/2)
Search Open Technical Databases (0/5)
Search Open Websites/Domains (0/2)
Search Victim-Owned Websites
Resource Development
6 techniques
Acquire Infrastructure (0/6)
Compromise Accounts (0/2)
Compromise Infrastructure (0/6)
Develop Capabilities (0/4)
Establish Accounts (0/2)
Obtain Capabilities (0/6)
Initial Access
9 techniques
Drive-by Compromise
Exploit Public-Facing Application
External Remote Services
Hardware Additions
Phishing (1/3)
Replication Through Removable Media
Supply Chain Compromise (0/3)
Trusted Relationship
Valid Accounts (0/4)
Execution
10 techniques
Command and Scripting Interpreter (3/8)
Inter-Process Communication (0/2)
Native API
Scheduled Task/Job (0/6)
Shared Modules
Software Deployment Tools
System Services (0/2)
User Execution (1/2)
Windows Management Instrumentation
Persistence
18 techniques
Account Manipulation (0/4)
BITS Jobs
Boot or Logon Autostart Execution (0/12)
Create Account (0/3)
Create or Modify System Process (0/4)
Event Triggered Execution (0/15)
Implant Container Image
Office Application Startup (0/6)
Pre-OS Boot (0/5)
Scheduled Task/Job (0/6)
Server Software Component (0/3)
Traffic Signaling (0/1)
Valid Accounts (0/4)
Privilege Escalation
12 techniques
Abuse Elevation Control Mechanism (0/4)
Access Token Manipulation (2/5)
Boot or Logon Autostart Execution (0/12)
Boot or Logon Initialization Scripts (0/5)
Create or Modify System Process (0/4)
Group Policy Modification
Hijack Execution Flow (0/11)
Scheduled Task/Job (0/6)
Valid Accounts (0/4)
Defense Evasion
37 techniques
Abuse Elevation Control Mechanism (0/4)
Access Token Manipulation (2/5)
BITS Jobs
Deobfuscate/Decode Files or Information
Direct Volume Access
Execution Guardrails (0/1)
Exploitation for Defense Evasion
File and Directory Permissions Modification (0/2)
Group Policy Modification
Hijack Execution Flow (0/11)
Impair Defenses (1/7)
Indirect Command Execution
Masquerading (1/6)
Modify Authentication Process (0/4)
Modify Cloud Compute Infrastructure (0/4)
Modify Registry
Modify System Image (0/2)
Network Boundary Bridging (0/1)
Obfuscated Files or Information
Pre-OS Boot (0/5)
Process Injection
Rogue Domain Controller
Credential Access
14 techniques
Brute Force (0/4)
Credentials from Password Stores (0/3)
Exploitation for Credential Access
Forced Authentication
Modify Authentication Process (0/4)
Network Sniffing
OS Credential Dumping (0/8)
Steal Application Access Token
Unsecured Credentials (0/6)
Discovery
25 techniques
Account Discovery (0/4)
Application Window Discovery
Browser Bookmark Discovery
Cloud Infrastructure Discovery
Cloud Service Dashboard
Cloud Service Discovery
Domain Trust Discovery
File and Directory Discovery
Network Service Scanning
Password Policy Discovery
Peripheral Device Discovery
Permission Groups Discovery (1/3)
Software Discovery
System Information Discovery
System Network Connections Discovery
System Owner/User
System Service Discovery
Virtualization/Sandbox Evasion (0/3)
Lateral Movement
9 techniques
Exploitation of Remote Services
Internal Spearphishing
Lateral Tool Transfer
Remote Service Session Hijacking (0/2)
Remote Services (0/6)
Use Alternate Authentication Material (0/4)
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 (0/2)
Data from Local System
Data from Network Shared Drive
Data from Removable Media
Man in the Browser
Video Capture
Command and Control
16 techniques
Application Layer Protocol (1/4)
Communication Through Removable Media
Data Encoding (0/2)
Data Obfuscation (0/3)
Dynamic Resolution (0/3)
Encrypted Channel (1/2)
Fallback Channels
Ingress Tool Transfer
Multi-Stage Channels
Non-Application Layer Protocol
Non-Standard Port
Protocol Tunneling
Proxy (0/4)
Remote Access Software
Traffic Signaling (0/1)
Web Service (0/3)
Exfiltration
9 techniques
Automated Exfiltration (0/1)
Data Transfer Size Limits
Exfiltration Over Alternative Protocol (0/3)
Exfiltration Over C2 Channel
Exfiltration Over Web Service (0/2)
Scheduled Transfer
Transfer Data to Cloud Account
Impact
13 techniques
Account Access Removal
Data Destruction
Data Encrypted for Impact
Defacement (0/2)
Disk Wipe (0/2)
Endpoint Denial of Service (0/4)
Firmware Corruption
Inhibit System Recovery
Network Denial of Service
Resource Hijacking
Service Stop
System Shutdown/Reboot
You Want To BE Here
legend

It’s Only Good As Your Intel



A Converged Solution

Policy

- Bandwidth Management
- Quality of Service
- Risk-based Access Control
- Application Acceleration
- Threat Prevention
- Data Protection

Context

- Account
- Device
- Authentication
- Identity
- Network
- Application
- Data

Flows

- Branches
- Users
- Applications
- Clouds
- Systems
- IoT

Access

- Zero Trust Network Access
- Single Sign-On
- Multi Factor Authentication
- Risk-Based Application Access

Network

- Traffic Shaping
- Global Route Optimization
- WAN & SaaS Acceleration
- Multi-Cloud Networking

Security

- Next Generation Firewall
- Secure Web Gateway
- Next Generation Anti Malware
- Intrusion Prevention System
- Cloud Access Security Broker
- Data Loss Prevention
- Remote Browser Isolation

CATO NETWORKS

Apply

- Start looking for those blind spots in your security people, processes and technology
- Asses the threats your organization is likely to experience and financial losses
- Define a protection strategy that will reduce costs and friction for your clients
- Select a seamless omnichannel solution that is based on AI, ML with a combination of customized heuristics/rules security protections
- Continue to assess the ever-changing threat landscape and associated risks