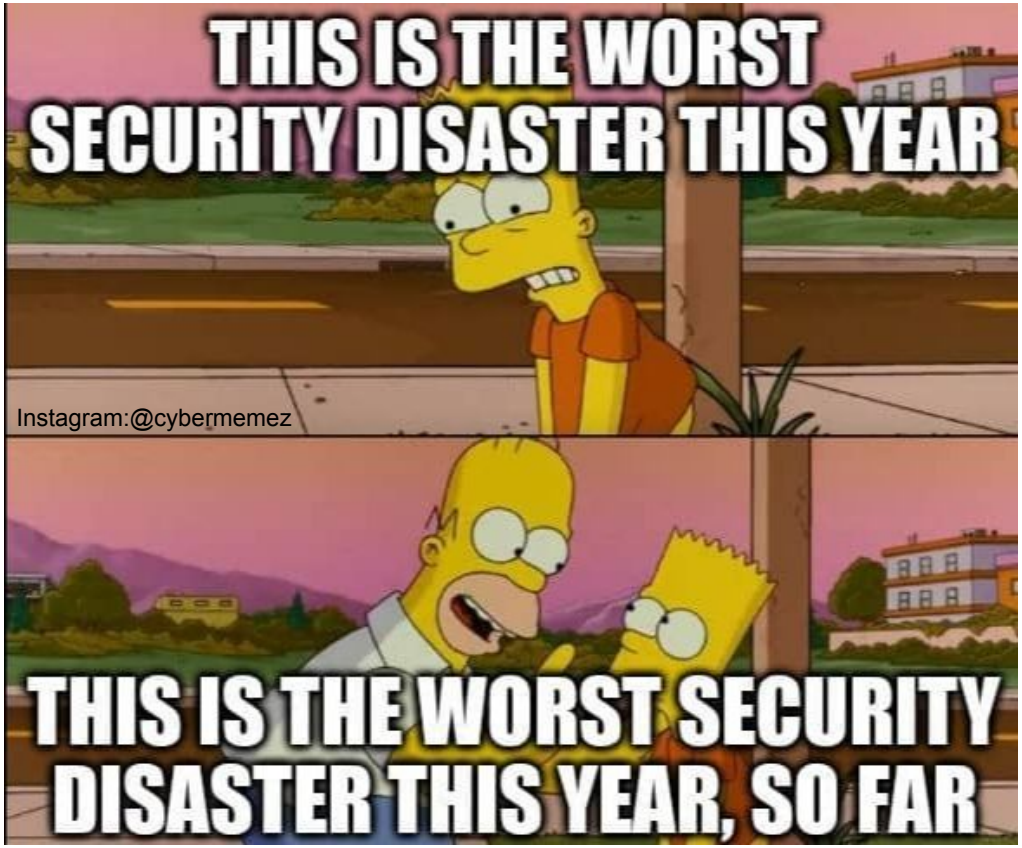

THIS IS THE WORST SECURITY DISASTER THIS YEAR
Instagram:@cybermemez
THIS IS THE WORST SECURITY DISASTER THIS YEAR, SO FAR

ATTACKS ARE SO STEALTHY

OF ATTACKS GENERATE ALERTS (MANDIANT)

YET, ON AVERAGE

RECEIVED BY SECURITY TEAMS (FORRESTER)

AND WITH UP TO

IN USE BY SECURITY TEAMS (PALO ALTO NETWORKS)

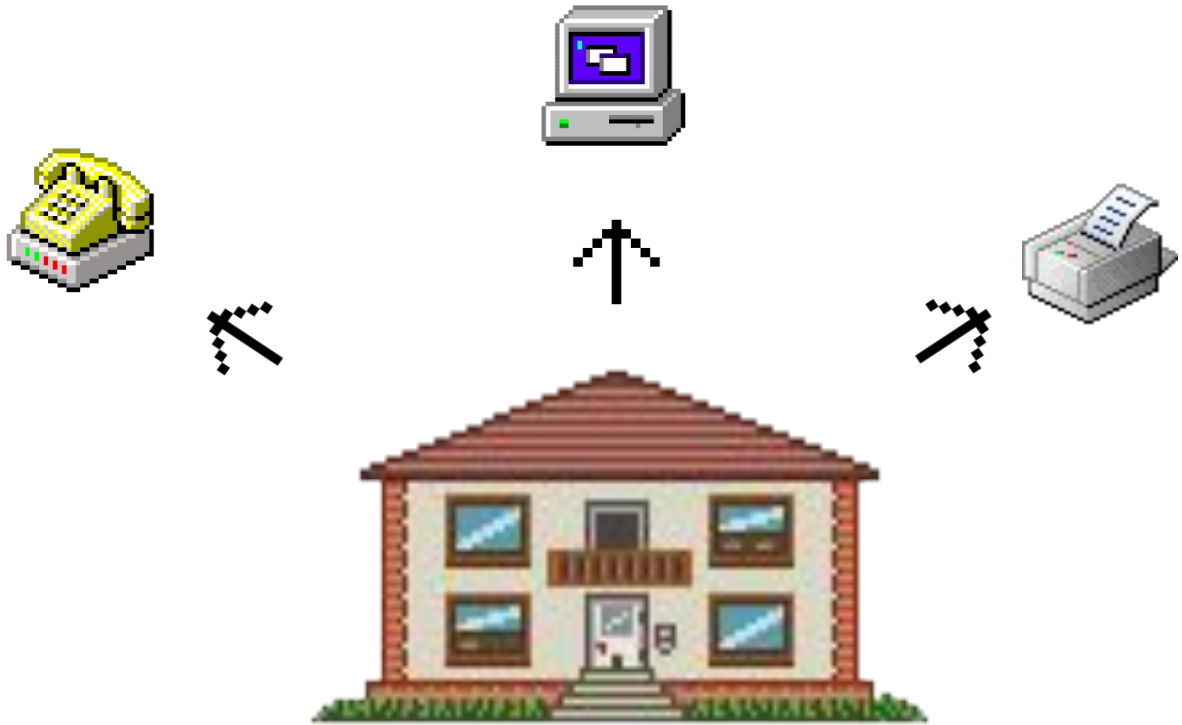
THERE IS NO DOUBT, ATTACK DETECTION IS

IN FACE OF RAPIDLY EVOLVING ADVERSARIES

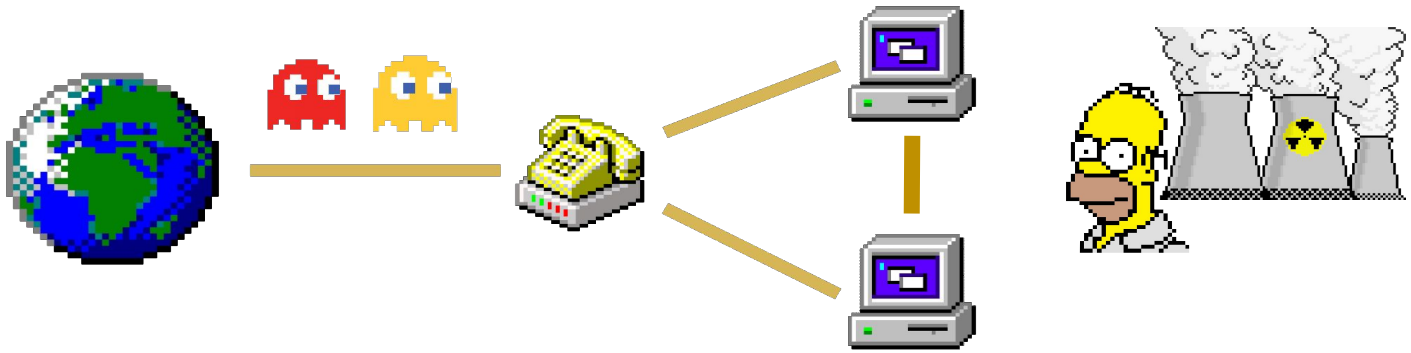
Our systems today are less secure than those of the

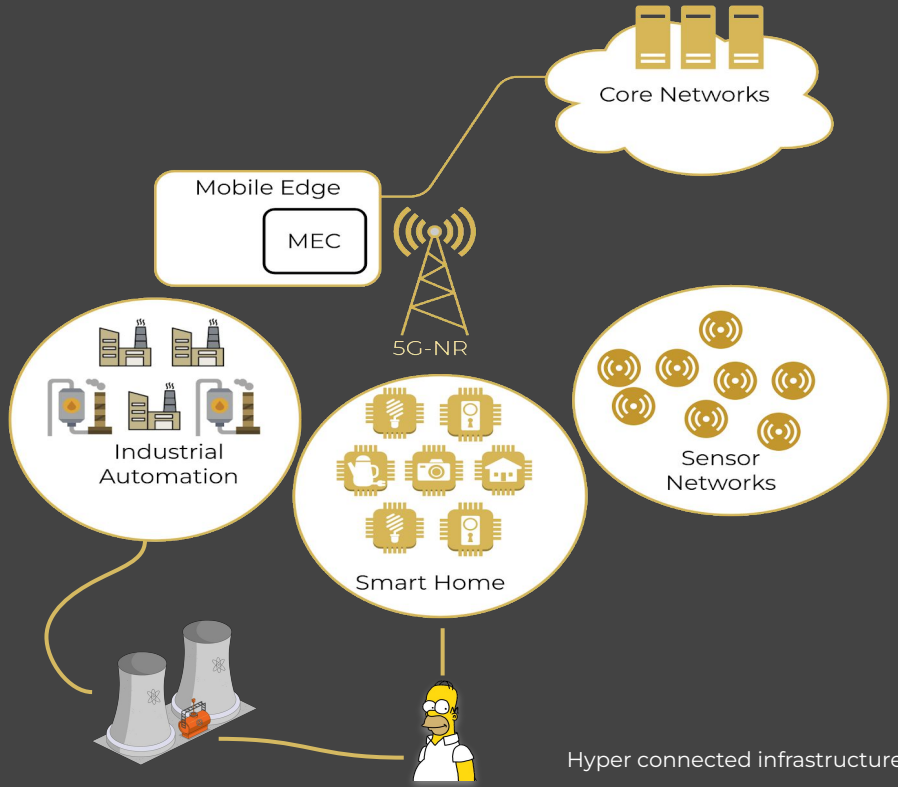
1970s



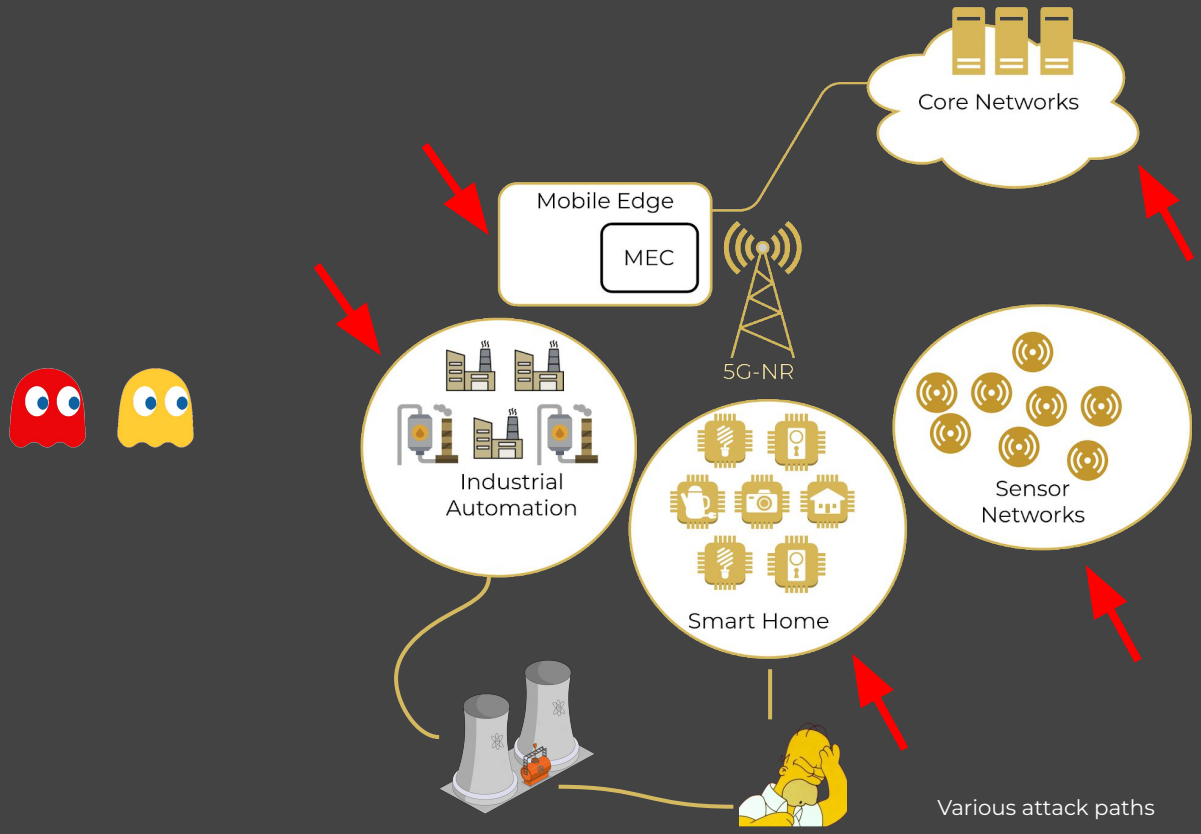



5G
AI
VR

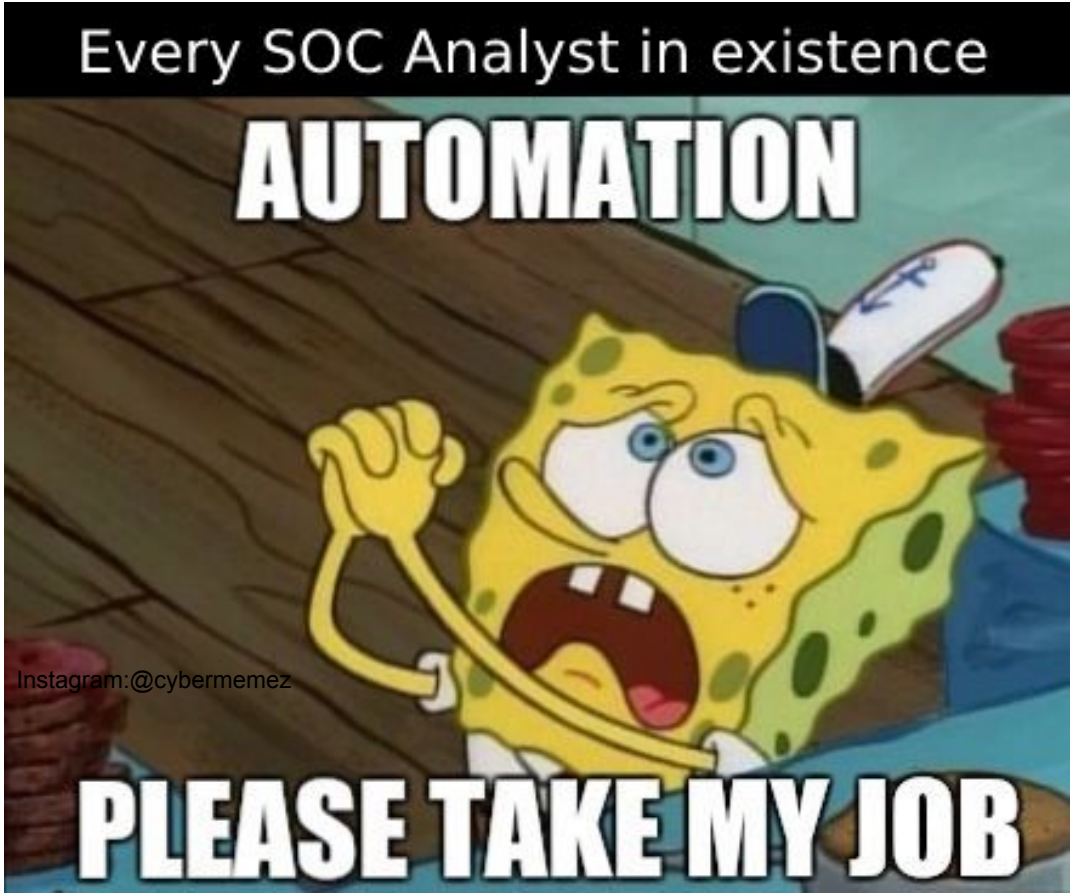





Hyper connected infrastructure

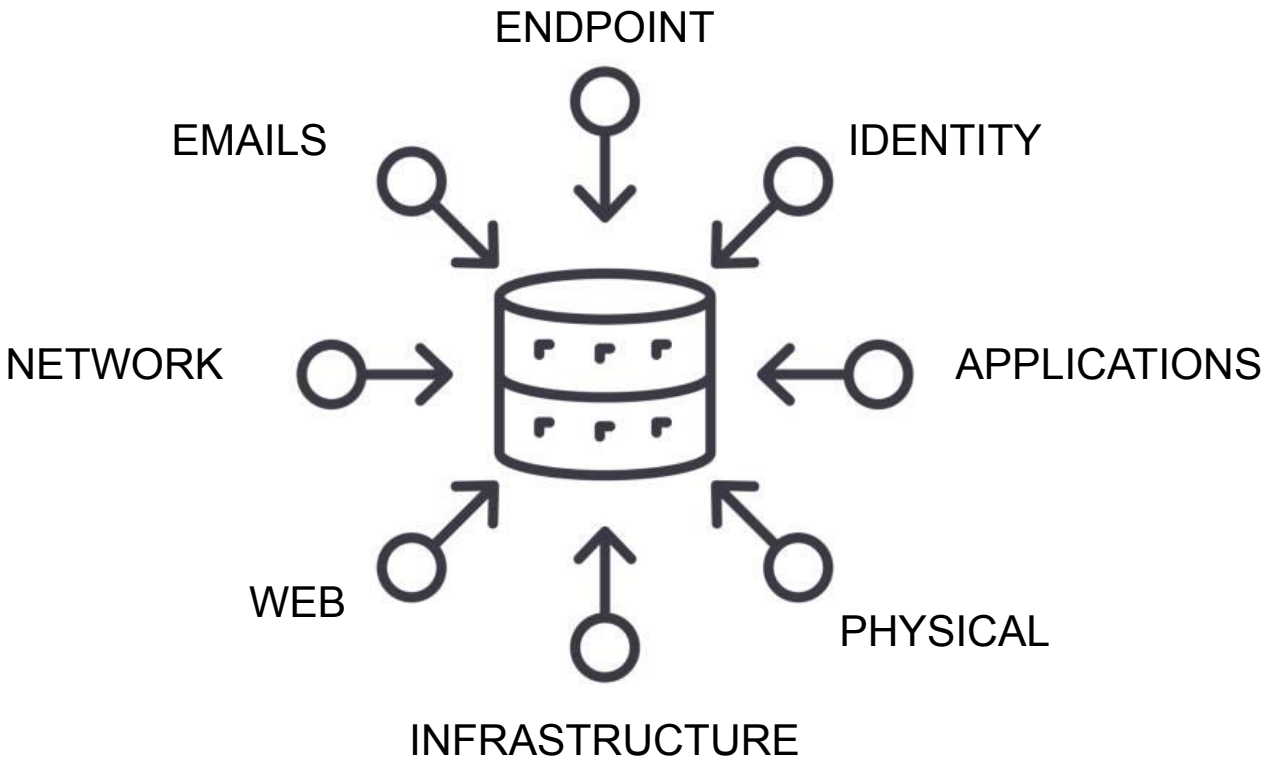



Various attack paths


Every SOC Analyst in existence
AUTOMATION
Instagram:@cybermemez
PLEASE TAKE MY JOB

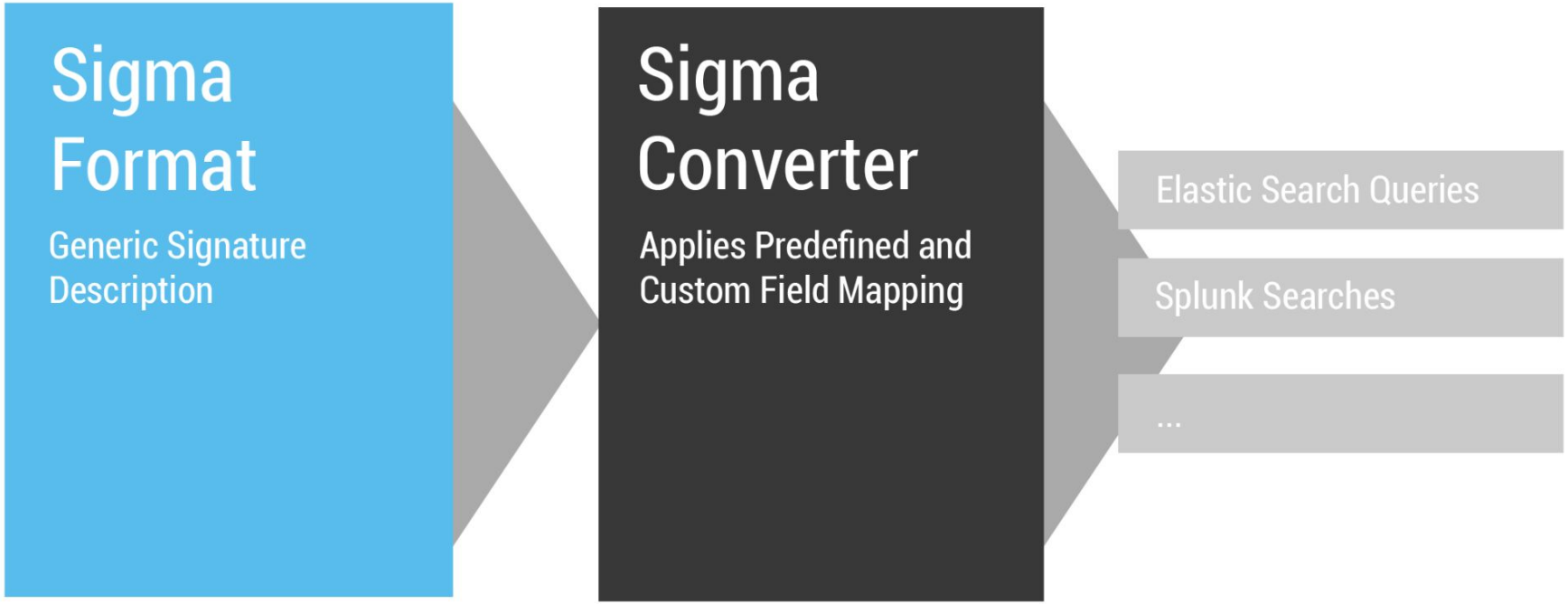
Surveyed in 2017-2023 (by SANS), security experts blame

of seemingly disparate events. Hidden within, are attack kill chains.


ENDPOINT
EMAILS
IDENTITY
NETWORK
APPLICATIONS
WEB
PHYSICAL
INFRASTRUCTURE


Query

```yaml
title: Webshell ReGeorg Detection Via Web Logs
id: 2ea44a60-cfda-11ea-87d0-0242ac130003
status: test
description: >
    Certain strings in the uri_query field when combined with
    null referer and null user agent can indicate activity
    associated with the webshell ReGeorg.
references:
    - https://community.rsa.com/community/products/netwitness/blog/2019/02/19/
    - https://github.com/sensepost/reGeorg
author: Cian Heasley
date: 2020/08/04
modified: 2023/01/02
tags:
    - attack.persistence
    - attack.t1505.003
logsource:
    category: webserver
detection:
    selection:
        cs-uri-query|contains:
            - 'cmd=read'
            - 'connect&target'
            - 'cmd=connect'
            - 'cmd=disconnect'
            - 'cmd=forward'
    filter:
        cs-referer: null
        cs-user-agent: null
        cs-method: POST
    condition: selection and filter
falsepositives:
    - Web applications that use the same URL parameters as ReGeorg
fields:
```


Sigma Format
Generic Signature Description
Sigma Converter
Applies Predefined and Custom Field Mapping
Elastic Search Queries
Splunk Searches
...

```yaml
title: Webshell ReGeorg Detection Via Web Logs
id: 2ea44a60-cfda-11ea-87d0-0242ac130003
status: test
description: >
    Certain strings in the uri_query field when combined with
    null referer and null user agent can indicate activity
    associated with the webshell ReGeorg.
references:
    - https://community.rsa.com/community/products/netwitness/blog/2019/02/
    - https://github.com/sensepost/reGeorg
author: Cian Heasley
date: 2020/08/04
modified: 2023/01/02
tags:
    - attack.persistence
    - attack.t1505.003
```

# Tactics: the adversary's technical goals

Techniques: how the goals are achieved

| Initial Access | Execution | Persistence | Privilege Escalation | Defense Evasion | Credential Access | Discovery | Lateral Movement | Collection | Command and Control | Exfiltration | Impact |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Drive-by Compromise | Scheduled Task | | | Binary Padding | Network Sniffing | | AppleScript | Audio Capture | Commonly Used Port | Automated Exfiltration | Data Destruction |
| Exploit Public-Facing Application | Launchctl | | Access Token Manipulation | | Account Manipulation | Account Discovery | Application Deployment Software | Automated Collection | Communication Through Removable Media | Data Compressed | Data Encrypted for Impact |
| | Local Job Scheduling | | Bypass User Account Control | | Bash History | Application Window Discovery | | Clipboard Data | | Data Encrypted | Defacement |
| External Remote Services | LSASS Driver | | Extra Window Memory Injection | | Brute Force | | Distributed Component Object Model | Data from Information Repositories | Connection Proxy | Data Transfer Size Limits | Disk Content Wipe |
| Hardware Additions | Trap | | Process Injection | | Credential Dumping | Browser Bookmark Discovery | | | Custom Command and Control Protocol | Exfiltration Over Other Network Medium | Disk Structure Wipe |
| Replication Through Removable Media | AppleScript | DLL Search Order Hijacking | | | Credentials in Files | | Exploitation of Remote Services | Data from Local System | | | Endpoint Denial of Service |
| | CMSTP | Image File Execution Options Injection | | | Credentials in Registry | Domain Trust Discovery | | Data from Network Shared Drive | Custom Cryptographic Protocol | Exfiltration Over Command and Control Channel | Firmware Corruption |
| Spearphishing Attachment | Command-Line Interface | Plist Modification | | | Exploitation for Credential Access | File and Directory Discovery | Logon Scripts | | | | Inhibit System Recovery |
| Spearphishing Link | Compiled HTML File | Valid Accounts | | | | Network Service Scanning | Pass the Hash | Data from Removable Media | Data Encoding | Exfiltration Over Alternative Protocol | Network Denial of Service |
| Spearphishing via Service | Control Panel Items | Accessibility Features | | BITS Jobs | Forced Authentication | Network Share Discovery | Pass the Ticket | Data Staged | Data Obfuscation | | Resource Hijacking |
| Supply Chain Compromise | Dynamic Data Exchange | AppCert DLLs | | Clear Command History | Hooking | Password Policy Discovery | Remote Desktop Protocol | Email Collection | Domain Fronting | Exfiltration Over Physical Medium | Runtime Data Manipulation |
| Trusted Relationship | Execution through API | AppInit DLLs | | CMSTP | Input Capture | Peripheral Device Discovery | Remote File Copy | Input Capture | Domain Generation Algorithms | | Service Stop |
| Valid Accounts | Execution through Module Load | Application Shimming | | Code Signing | Input Prompt | Permission Groups Discovery | Remote Services | Man in the Browser | | Scheduled Transfer | Stored Data Manipulation |
| | | Dylib Hijacking | | Compiled HTML File | Kerberoasting | Process Discovery | Replication Through Removable Media | Screen Capture | Fallback Channels | | Transmitted Data Manipulation |
| | Exploitation for Client Execution | File System Permissions Weakness | | Component Firmware | Keychain | Query Registry | | Video Capture | Multiband Communication | | |
| | Graphical User Interface | Hooking | | Component Object Model Hijacking | LLMNR/NBT-NS Poisoning and Relay | Remote System Discovery | Shared Webroot | | Multi-hop Proxy | | |
| | InstallUtil | Launch Daemon | | | | Security Software Discovery | SSH Hijacking | | Multilayer Encryption | | |
| | Mshta | New Service | | Control Panel Items | Password Filter DLL | System Information Discovery | Taint Shared Content | | Multi-Stage Channels | | |
| | PowerShell | | | | | | | | | | |
| | Regsvcs/Regasm | Serv | | | | | | | | | |
| | Regsvr32 | | | | | | | | | | |
| | Rundll32 | | | | | | | | | | |
| | Scripting | | | | | | | | | | |
| | Service Execution | .bash_profile a | | | | | | | | | |
| | Signed Binary Proxy Execution | Account Mani | | | | | | | | | |
| | | Authentication | | | | | | | | | |
| | Signed Script Proxy Execution | BITS J | | | | | | | | | |
| | | Boot | | | | | | | | | |
| | Source | Browser Ext | | | | | | | | | |
| | Space after Filename | Change D | | | | | | | | | |
| | Third-party Software | File Assoc | | | | | | | | | |
| | Trusted Developer Utilities | Component | | | | | | | | | |
| | User Execution | | | | | | | | | | |
| | Windows Management Instrumentation | Component Model Hij | | | | | | | | | |
| | | Create Ac | | | | | | | | | |
| | Windows Remote Management | External Remo | | | | | | | | | |
| | | Hidden Files an | | | | | | | | | |
| | XSL Script Processing | Hypervisor | | | | | | | | | |
| | | Kernel Modules and Extensions | | | | | | | | | |
| | | | | from Tools | | | | | | | |
| | | | | Indicator Removal on Host | | | | | | | |
| | | | | Indirect Command Execution | | | | | | | |

## Procedures: Specific technique implementation

### Spearphishing Attachment

#### Procedure Examples

| Name | Description |
|---|---|
| APT12 | APT12 has sent emails with malicious Microsoft Office documents and PDFs attached. [88] [89] |
| APT19 | APT19 sent spearphishing emails with malicious attachments in RTF and XLSM formats to deliver initial exploits. [62] |

# Phishing: Spearphishing Attachment

Other sub-techniques of Phishing (3)

Adversaries may send spearphishing emails with a malicious attachment in an attempt to gain access to victim systems. Spearphishing attachment is a specific variant of spearphishing. Spearphishing attachment is different from other forms of spearphishing in that it employs the use of malware attached to an email. All forms of spearphishing are electronically delivered social engineering targeted at a specific individual, company, or industry. In this scenario, adversaries attach a file to the spearphishing email and usually rely upon User Execution to gain execution. Spearphishing may also involve social engineering techniques, such as posing as a trusted source.

There are many options for the attachment such as Microsoft Office documents, executables, PDFs, or archived files. Upon opening the attachment (and potentially clicking past protections), the adversary's payload exploits a vulnerability or directly executes on the user's system. The text of the spearphishing email usually tries to give a plausible reason why the file should be opened, and may explain how to bypass system protections in order to do so. The email may also contain instructions on how to decrypt an attachment, such as a zip file password, in order to evade email boundary defenses. Adversaries frequently manipulate file extensions and icons in order to make attached executables appear to be document files, or files exploiting one application appear to be a file for a different one.

ID: T1566.001
Sub-technique of: T1566
Tactic: Initial Access
Platforms: Linux, Windows, macOS
CAPEC ID: CAPEC-163
Contributors: Philip Winther
Version: 2.2
Created: 02 March 2020
Last Modified: 18 October 2021

Version Permalink

## Detection

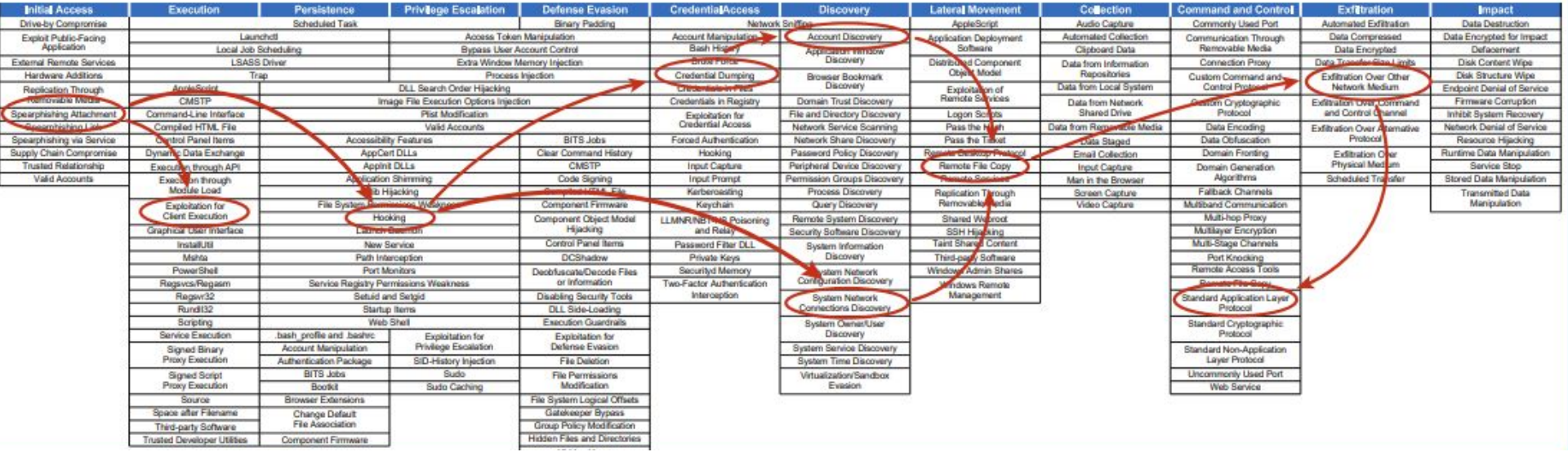
| ID | Data Source | Data Component | Detects |
|---|---|---|---|
| DS0015 | Application Log | Application Log Content | Monitor for third-party appl based on DKIM+SPF or hea on the email server or on th |
| DS0022 | File | File Creation | Monitor for newly construc |

## Procedure Examples

| ID | Name | Description |
|---|---|---|
| G0018 | admin@338 | admin@338 has sent emails with malicious Microsoft Office documents a |
| S0331 | Agent Tesla | The primary delivered mechaism for Agent Tesla is through email phishing |
| G0130 | Ajax Security Team | Ajax Security Team has used personalized spearphishing attachments.[3] |
| G0138 | Andariel | Andariel has conducted spearphishing campaigns that included malicious |
| S0622 | AppleSeed | AppleSeed has been distributed to victims through malicious e-mail attach |
| G0099 | APT-C-36 | APT-C-36 has used spearphishing emails with password protected RAR att |

## Mitigations

| ID | Mitigation | Description |
|---|---|---|
| M1049 | Antivirus/Antimalware | Anti-virus can also automatically qu |
| M1031 | Network Intrusion Prevention | Network intrusion prevention systen |


Initial Access
Drive-by Compromise
Exploit Public-Facing Application
External Remote Services
Hardware Additions
Replication Through Removable Media
Spearphishing Attachment
Spearphishing Link
Spearphishing via Service
Supply Chain Compromise
Trusted Relationship
Valid Accounts
Execution
Scheduled Task
Launchctl
Local Job Scheduling
LSASS Driver
Trap
AppleScript
CMSTP
Command-Line Interface
Compiled HTML File
Control Panel Items
Dynamic Data Exchange
Execution through API
Execution through Module Load
Exploitation for Client Execution
Graphical User Interface
InstallUtil
Mshta
PowerShell
Regsvcs/Regasm
Regsvr32
Rundll32
Scripting
Service Execution
Signed Binary Proxy Execution
Signed Script Proxy Execution
Source
Space after Filename
Third-party Software
Trusted Developer Utilities
Persistence
DLL Search Order Hijacking
Image File Execution Options Injection
Plist Modification
Valid Accounts
Accessibility Features
AppCert DLLs
AppInit DLLs
Application Shimming
Bootkit
File System Permissions Weakness
Hooking
Launch Daemon
New Service
Path Interception
Port Monitors
Service Registry Permissions Weakness
Setuid and Setgid
Startup Items
Web Shell
.bash_profile and .bashrc
Account Manipulation
Authentication Package
BITS Jobs
Bootkit
Browser Extensions
Change Default File Association
Component Firmware
Privilege Escalation
Access Token Manipulation
Bypass User Account Control
Extra Window Memory Injection
Process Injection
Exploitation for Privilege Escalation
SID-History Injection
Sudo
Sudo Caching
Defense Evasion
Binary Padding
BITS Jobs
Clear Command History
CMSTP
Code Signing
Component Firmware
Component Object Model Hijacking
Control Panel Items
DCShadow
Deobfuscate/Decode Files or Information
Disabling Security Tools
DLL Side-Loading
Execution Guardrails
Exploitation for Defense Evasion
File Deletion
File Permissions Modification
File System Logical Offsets
Gatekeeper Bypass
Group Policy Modification
Hidden Files and Directories
Credential Access
Network Sniffing
Account Manipulation
Bash History
Brute Force
Credential Dumping
Credentials in Files
Credentials in Registry
Exploitation for Credential Access
Forced Authentication
Hooking
Input Capture
Input Prompt
Kerberoasting
Keychain
LLMNR/NBT-NS Poisoning and Relay
Password Filter DLL
Private Keys
Securityd Memory
Two-Factor Authentication Interception
Discovery
Account Discovery
Application Window Discovery
Browser Bookmark Discovery
Domain Trust Discovery
File and Directory Discovery
Network Service Scanning
Network Share Discovery
Password Policy Discovery
Peripheral Device Discovery
Permission Groups Discovery
Process Discovery
Query Registry
Remote System Discovery
Security Software Discovery
System Information Discovery
System Network Configuration Discovery
System Network Connections Discovery
System Owner/User Discovery
System Service Discovery
System Time Discovery
Virtualization/Sandbox Evasion
Lateral Movement
AppleScript
Application Deployment Software
Distributed Component Object Model
Exploitation of Remote Services
Logon Scripts
Pass the Hash
Pass the Ticket
Remote Desktop Protocol
Remote File Copy
Remote Services
Replication Through Removable Media
Shared Webroot
SSH Hijacking
Taint Shared Content
Third-party Software
Windows Admin Shares
Windows Remote Management
Collection
Audio Capture
Automated Collection
Clipboard Data
Data from Information Repositories
Data from Local System
Data from Network Shared Drive
Data from Removable Media
Data Staged
Email Collection
Input Capture
Man in the Browser
Screen Capture
Video Capture
Command and Control
Commonly Used Port
Communication Through Removable Media
Connection Proxy
Custom Command and Control Protocol
Custom Cryptographic Protocol
Data Encoding
Data Obfuscation
Domain Fronting
Domain Generation Algorithms
Fallback Channels
Multiband Communication
Multi-hop Proxy
Multilayer Encryption
Multi-Stage Channels
Port Knocking
Remote Access Tools
Remote File Copy
Standard Application Layer Protocol
Standard Cryptographic Protocol
Standard Non-Application Layer Protocol
Uncommonly Used Port
Web Service
Exfiltration
Automated Exfiltration
Data Compressed
Data Encrypted
Data Transfer Size Limits
Exfiltration Over Other Network Medium
Exfiltration Over Command and Control Channel
Exfiltration Over Alternative Protocol
Exfiltration Over Physical Medium
Scheduled Transfer
Impact
Data Destruction
Data Encrypted for Impact
Defacement
Disk Content Wipe
Disk Structure Wipe
Endpoint Denial of Service
Firmware Corruption
Inhibit System Recovery
Network Denial of Service
Resource Hijacking
Runtime Data Manipulation
Service Stop
Stored Data Manipulation
Transmitted Data Manipulation

# Attack Flow

## Problem

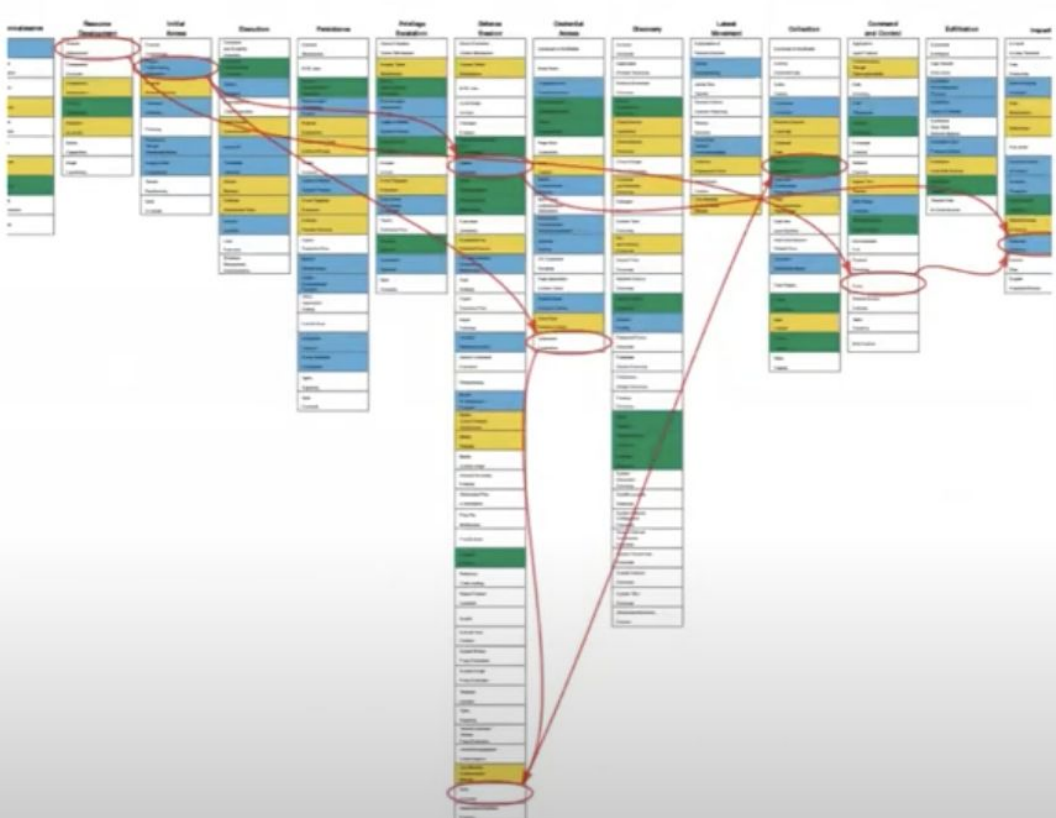
Defenders **often track adversary behaviors atomically**, focusing on one specific action at a time. This makes it **harder to understand adversary attacks and to build effective defenses** against those attacks.

## Solution

Create a language, and associated tooling, to **describe flows of ATT&CK techniques and combine those flows into patterns of behavior**.

## Impact

Help defenders and leaders understand how adversaries operate and compose atomic techniques into attacks to better understand defensive posture.



# Recipe to correlate data and find attacks

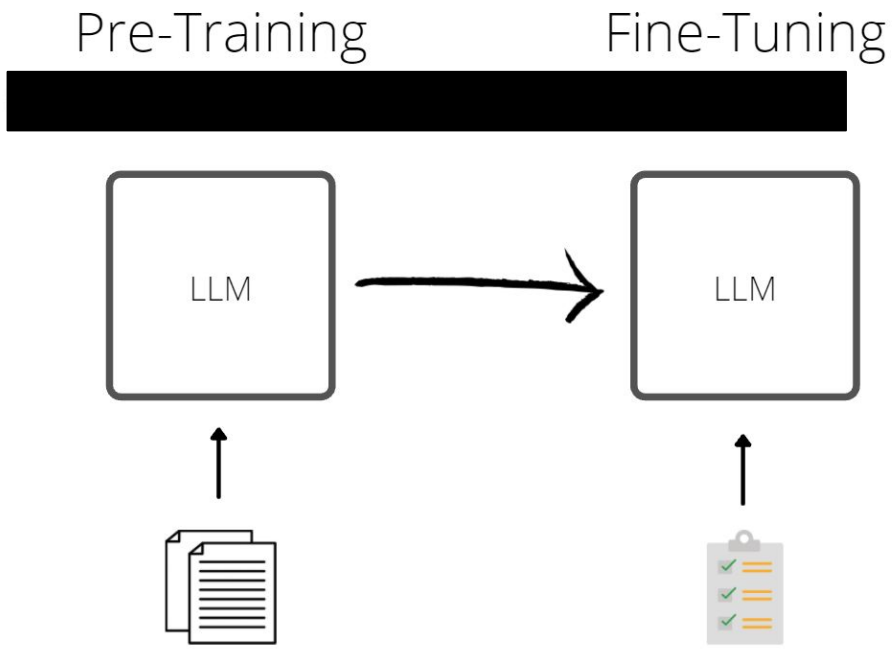
Spot the killchain progression!

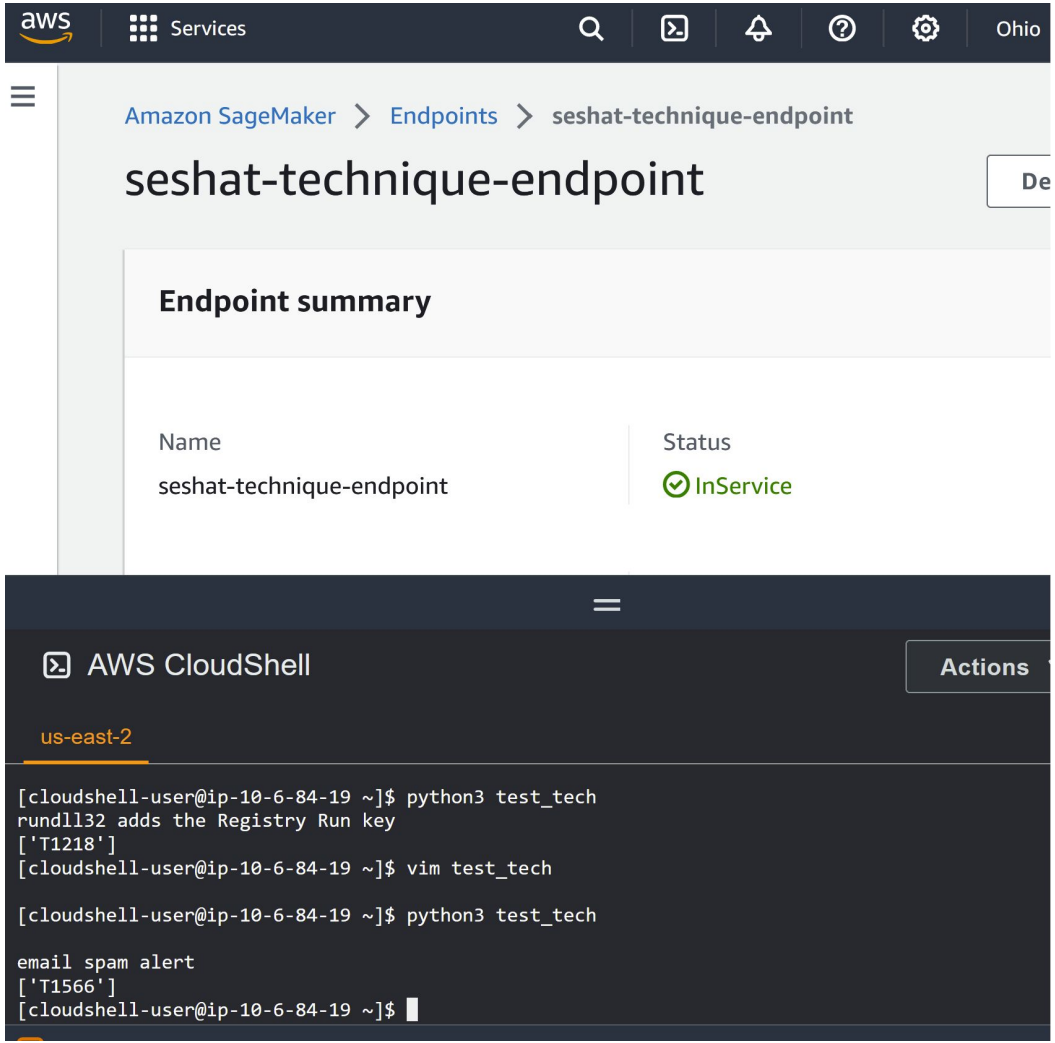
- Step 1: Get relevant MITRE ATT&CK Techniques & Tactics for all events
- Step 2: Find events that are highly related to each other and form MITRE ATT&CK FLOWS

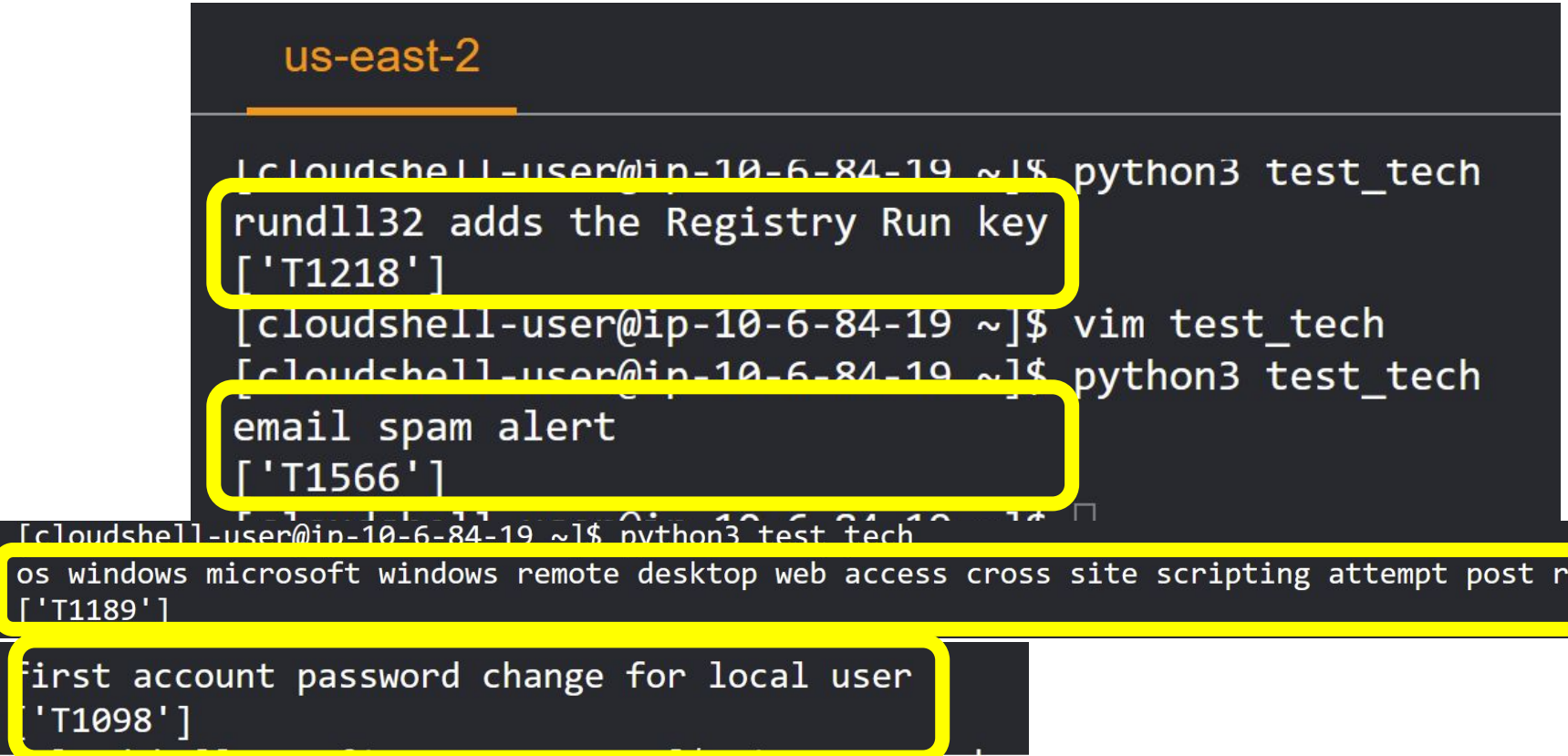
# Step 1: Get relevant MITRE ATT&CK Techniques & Tactics for ALL events

# Step 1: ATT&CK Technique Detector Model

Classify Events with their relevant ATT&CK Techniques


Pre-Training
Fine-Tuning
LLM
LLM
Large
Unlabeled Corpus
Small
Labeled Corpus

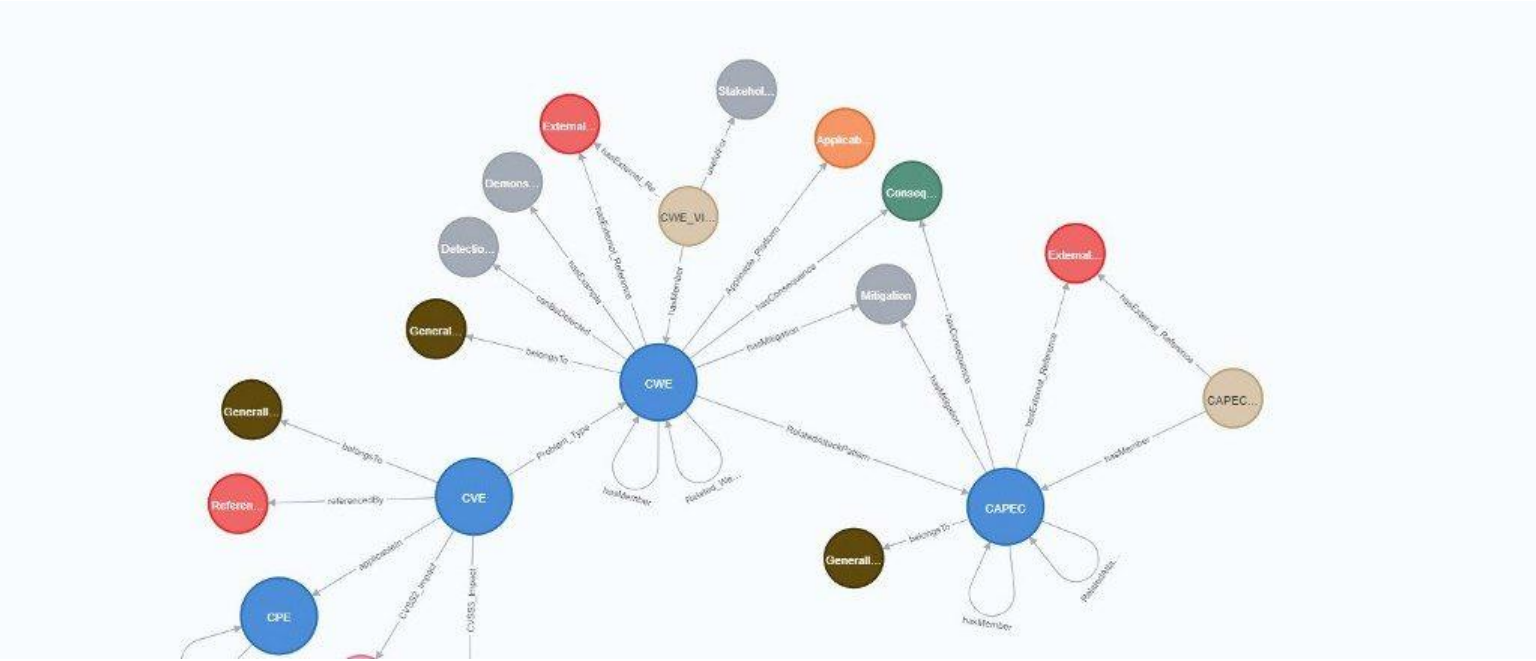

aws
Services
Ohio
Amazon SageMaker
Endpoints
seshat-technique-endpoint
seshat-technique-endpoint
De
Endpoint summary
Name
seshat-technique-endpoint
Status
InService
AWS CloudShell
Actions
us-east-2
[cloudshell-user@ip-10-6-84-19 ~]$ python3 test_tech
rundll32 adds the Registry Run key
['T1218']
[cloudshell-user@ip-10-6-84-19 ~]$ vim test_tech
[cloudshell-user@ip-10-6-84-19 ~]$ python3 test_tech
email spam alert
['T1566']
[cloudshell-user@ip-10-6-84-19 ~]$

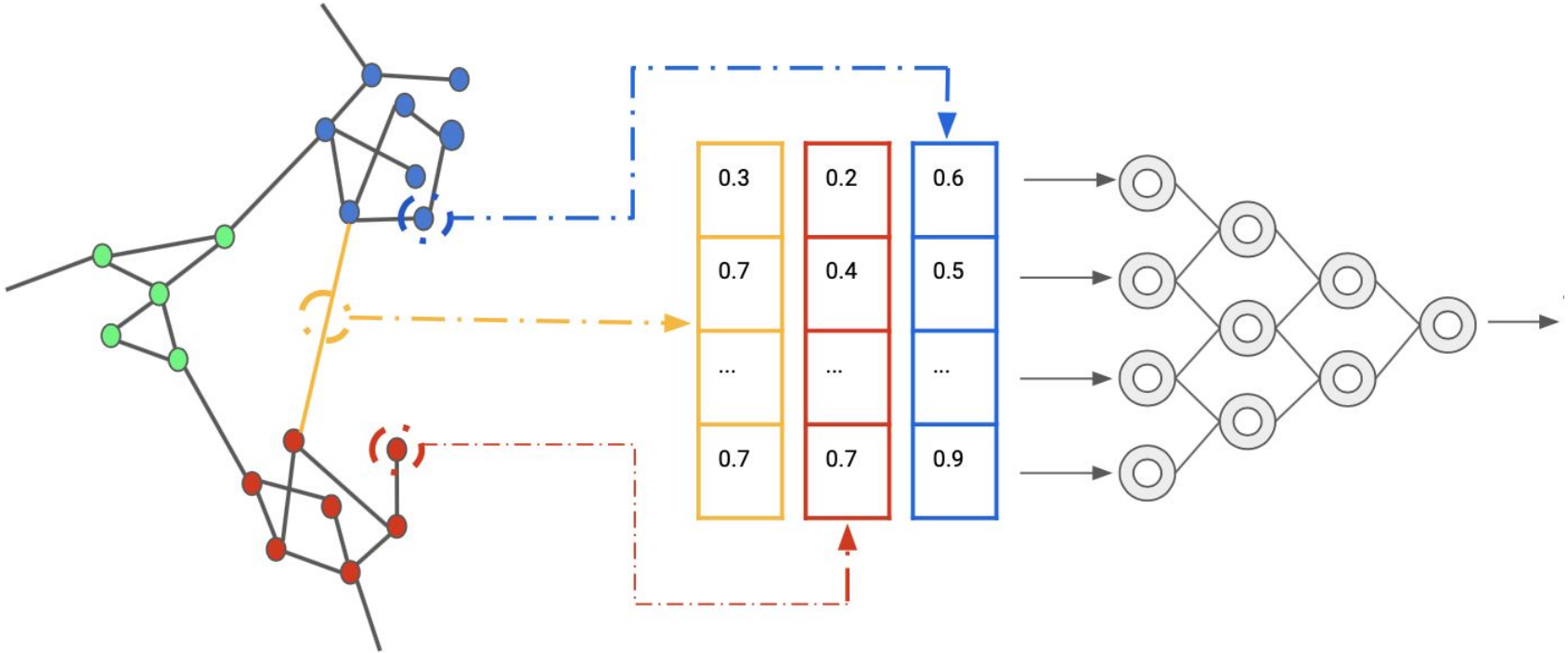

us-east-2
[cloudshell-user@ip-10-6-84-19 ~]$ python3 test_tech
rundll32 adds the Registry Run key
['T1218']
[cloudshell-user@ip-10-6-84-19 ~]$ vim test_tech
[cloudshell-user@ip-10-6-84-19 ~]$ python3 test_tech
email spam alert
['T1566']
[cloudshell-user@ip-10-6-84-19 ~]$ python3 test_tech
os windows microsoft windows remote desktop web access cross site scripting attempt post request
['T1189']
first account password change for local user
['T1098']

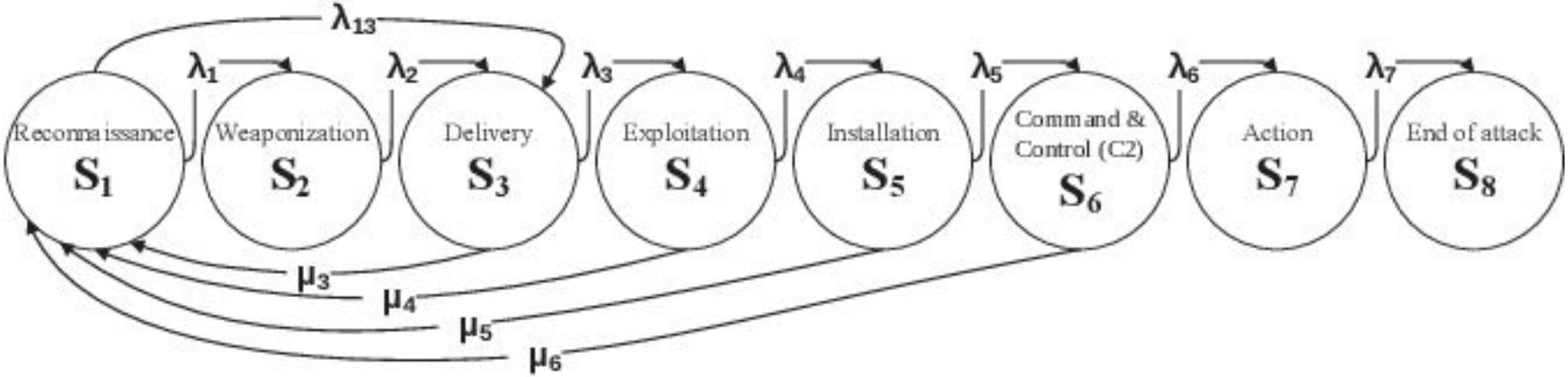
# Step 2: Find events that are highly related to each other and form MITRE ATT&CK FLOWS

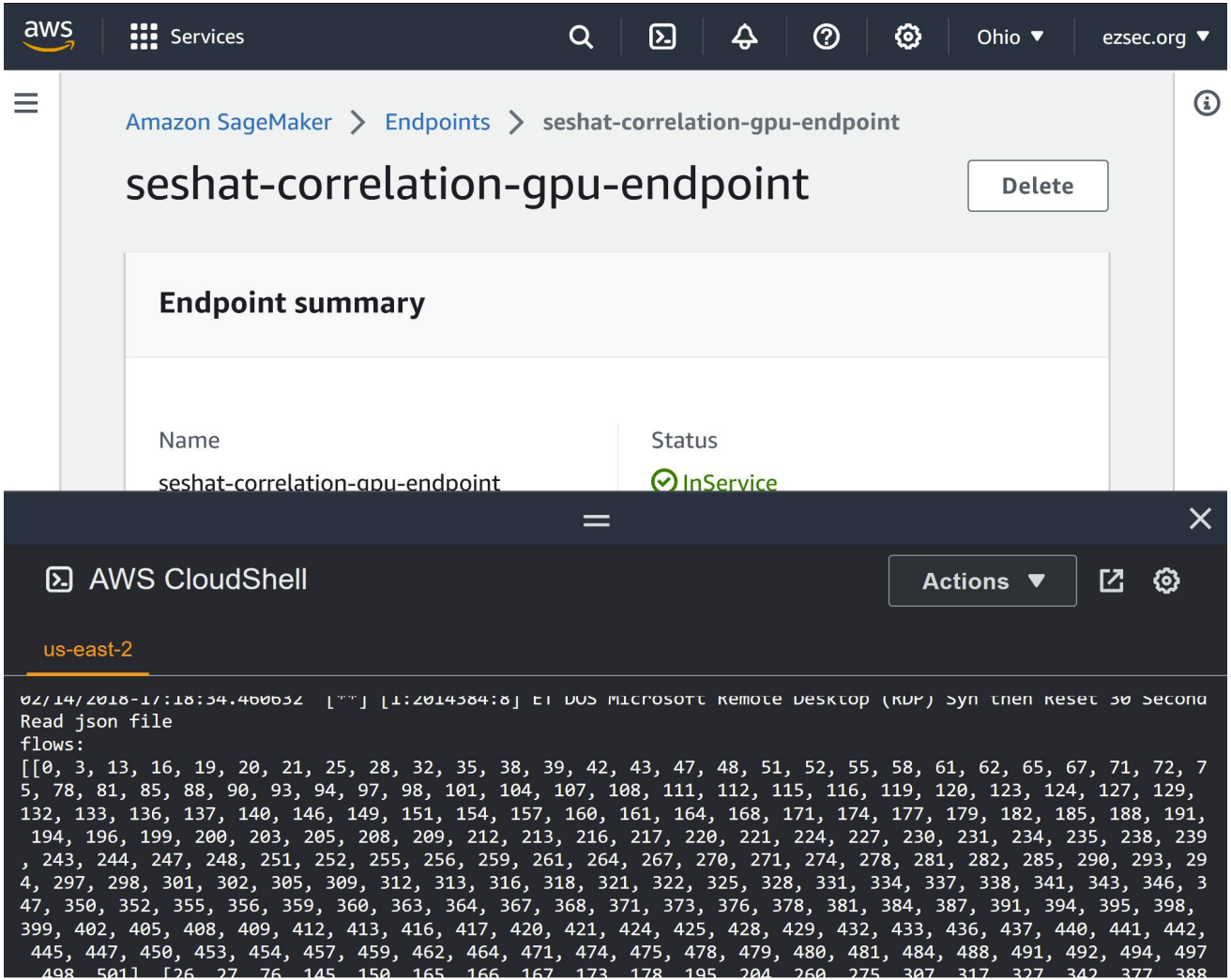
# Step 2: MITRE ATT&CK FLOW Detector Model

Cluster events that are related.
Find event clusters that are causal and sequential.


Stakehol...
Extemal...
Applicab...
Demons...
Conseq...
CWE_VI...
Detectio...
Extemal...
Mitigation
General...
CWE
CAPEC...
Generall...
CVE
CAPEC
Referen...
Generall...
CPE


0.3
0.7
...
0.7
0.2
0.4
...
0.7
0.6
0.5
...
0.9

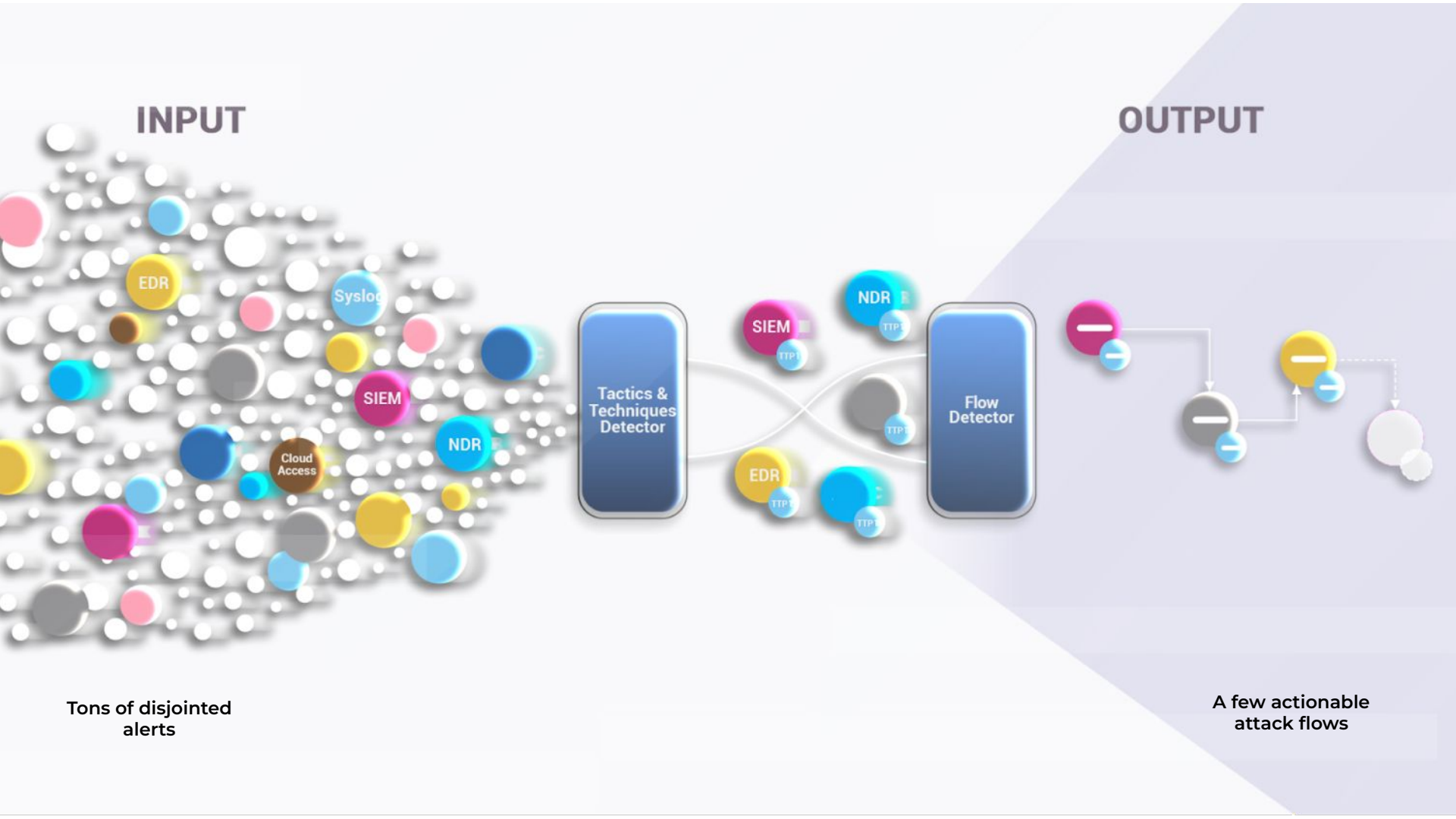

λ13
λ1
λ2
λ3
λ4
λ5
λ6
λ7
Reconnaissance
S1
Weaponization
S2
Delivery
S3
Exploitation
S4
Installation
S5
Command &
Control (C2)
S6
Action
S7
End of attack
S8
μ3
μ4
μ5
μ6

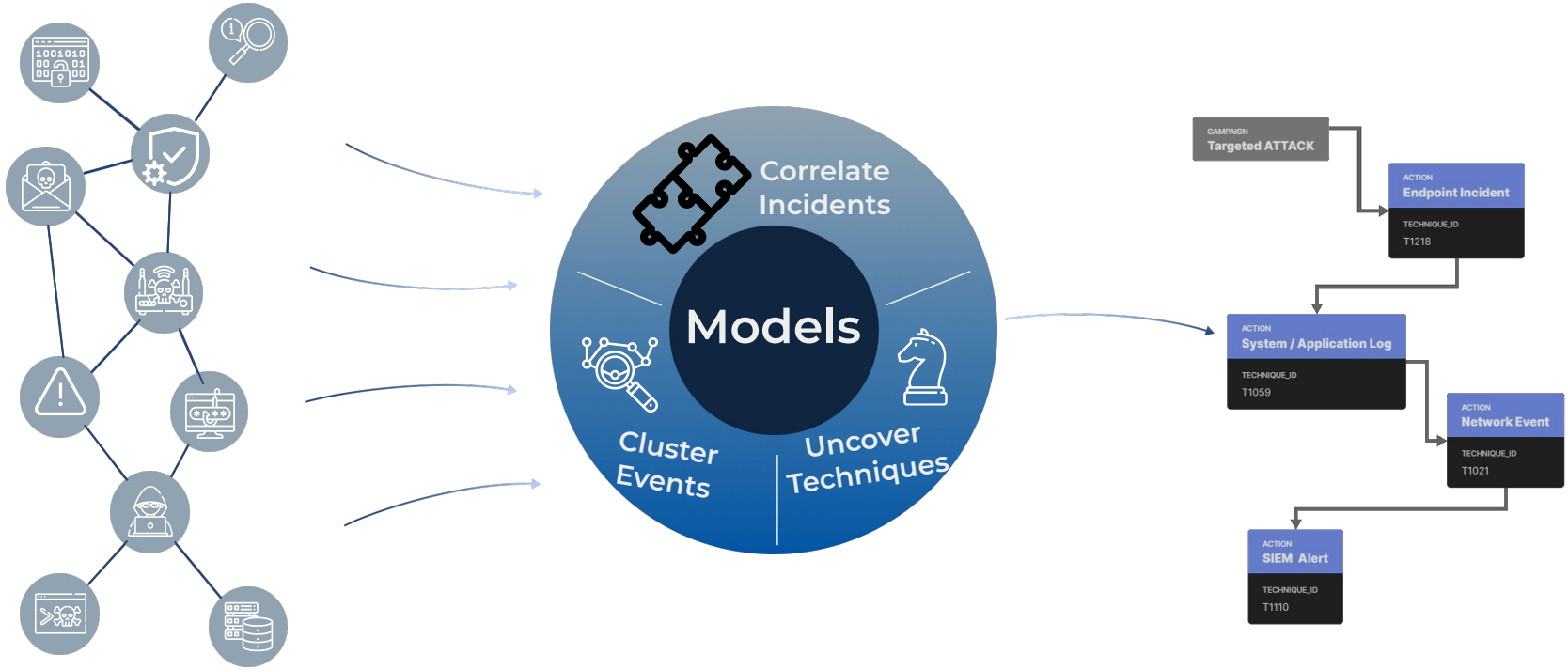

aws
Services
Ohio
ezsec.org
Amazon SageMaker
Endpoints
seshat-correlation-gpu-endpoint
seshat-correlation-gpu-endpoint
Delete
Endpoint summary
Name
seshat-correlation-gpu-endpoint
Status
InService
AWS CloudShell
Actions
us-east-2
Read json file
flows:
[[0, 3, 13, 16, 19, 20, 21, 25, 28, 32, 35, 38, 39, 42, 43, 47, 48, 51, 52, 55, 58, 61, 62, 65, 67, 71, 72, 75, 78, 81, 85, 88, 90, 93, 94, 97, 98, 101, 104, 107, 108, 111, 112, 115, 116, 119, 120, 123, 124, 127, 129, 132, 133, 136, 137, 140, 146, 149, 151, 154, 157, 160, 161, 164, 168, 171, 174, 177, 179, 182, 185, 188, 191, 194, 196, 199, 200, 203, 205, 208, 209, 212, 213, 216, 217, 220, 221, 224, 227, 230, 231, 234, 235, 238, 239, 243, 244, 247, 248, 251, 252, 255, 256, 259, 261, 264, 267, 270, 271, 274, 278, 281, 282, 285, 290, 293, 294, 297, 298, 301, 302, 305, 309, 312, 313, 316, 318, 321, 322, 325, 328, 331, 334, 337, 338, 341, 343, 346, 347, 350, 352, 355, 356, 359, 360, 363, 364, 367, 368, 371, 373, 376, 378, 381, 384, 387, 391, 394, 395, 398, 399, 402, 405, 408, 409, 412, 413, 416, 417, 420, 421, 424, 425, 428, 429, 432, 433, 436, 437, 440, 441, 442, 445, 447, 450, 453, 454, 457, 459, 462, 464, 471, 474, 475, 478, 479, 480, 481, 484, 488, 491, 492, 494, 497

```
flows:
[[0, 3, 13, 16, 19, 20, 21, 25, 28, 32, 35, 38, 39, 42, 43, 47, 48, 51, 52, 55, 58, 61, 62, 65, 67, 71, 72, 7
5, 78, 81, 85, 88, 90, 93, 94, 97, 98, 101, 104, 107, 108, 111, 112, 115, 116, 119, 120, 123, 124, 127, 129,
132, 133, 136, 137, 140, 146, 149, 151, 154, 157, 160, 161, 164, 168, 171, 174, 177, 179, 182, 185, 188, 191,
 194, 196, 199, 200, 203, 205, 208, 209, 212, 213, 216, 217, 220, 221, 224, 227, 230, 231, 234, 235, 238, 239
, 243, 244, 247, 248, 251, 252, 255, 256, 259, 261, 264, 267, 270, 271, 274, 278, 281, 282, 285, 290, 293, 29
4, 297, 298, 301, 302, 305, 309, 312, 313, 316, 318, 321, 322, 325, 328, 331, 334, 337, 338, 341, 343, 346, 3
47, 350, 352, 355, 356, 359, 360, 363, 364, 367, 368, 371, 373, 376, 378, 381, 384, 387, 391, 394, 395, 398,
399, 402, 405, 408, 409, 412, 413, 416, 417, 420, 421, 424, 425, 428, 429, 432, 433, 436, 437, 440, 441, 442,
 445, 447, 450, 453, 454, 457, 459, 462, 464, 471, 474, 475, 478, 479, 480, 481, 484, 488, 491, 492, 494, 497
, 498, 501], [26, 27, 76, 145, 150, 165, 166, 167, 173, 178, 195, 204, 260, 275, 307, 317, 327, 342, 377, 388
, 390, 403, 404, 458, 467, 470, 486, 487, 503], [190, 326, 332, 372], [24, 46, 70], [4, 5, 6, 7, 8, 9, 10, 12
, 31, 56, 57, 66, 77, 82, 83, 84, 89, 102, 103, 128, 143, 172, 189, 225, 226, 306, 308, 333, 351, 389, 446, 4
63, 493, 502], [1, 2, 14, 15, 17, 18, 22, 23, 29, 30, 36, 37, 40, 41, 44, 45, 49, 50, 53, 54, 59, 60, 63, 64,
 68, 69, 73, 74, 79, 80, 86, 87, 91, 92, 95, 96, 99, 100, 105, 106, 109, 110, 113, 114, 117, 118, 121, 122, 1
25, 126, 130, 131, 134, 135, 138, 139, 147, 148, 152, 153, 158, 159, 162, 163, 169, 170, 175, 176, 180, 181,
186, 187, 192, 193, 197, 198, 201, 202, 206, 207, 210, 211, 214, 215, 218, 219, 222, 223, 228, 229, 232, 233,
 236, 237, 241, 242, 245, 246, 249, 250, 253, 254, 257, 258, 262, 263, 268, 269, 272, 273, 279, 280, 283, 284
, 291, 292, 295, 296, 299, 300, 303, 304, 310, 311, 314, 315, 319, 320, 323, 324, 329, 330, 335, 336, 339, 34
0, 344, 345, 348, 349, 353, 354, 357, 358, 361, 362, 365, 366, 369, 370, 374, 375, 379, 380, 385, 386, 392, 3
93, 396, 397, 400, 401, 406, 407, 410, 411, 414, 415, 418, 419, 422, 423, 426, 427, 430, 431, 434, 435, 438,
439, 443, 444, 448, 449, 455, 456, 460, 461, 465, 466, 472, 473, 476, 477, 482, 483, 489, 490, 495, 496, 499,
 500], [33, 34, 141, 142, 144, 155, 156, 183, 184, 265, 266, 276, 277, 286, 287, 288, 289, 382, 383, 451, 452
, 468, 469, 485], [11, 240]]
```

```
num of alerts:
2460
```

```
206
29
4
3
34
202
24
2
```


INPUT
OUTPUT
EDR
Syslog
SIEM
NDR
Cloud Access
Tactics & Techniques Detector
SIEM
NDR
EDR
Flow Detector
Tons of disjointed alerts
A few actionable attack flows


Correlate Incidents
Models
Cluster Events
Uncover Techniques
CAMPAIGN
Targeted ATTACK
ACTION
Endpoint Incident
TECHNIQUE_ID
T1218
ACTION
System / Application Log
TECHNIQUE_ID
T1059
ACTION
Network Event
TECHNIQUE_ID
T1021
ACTION
SIEM Alert
TECHNIQUE_ID
T1110

```
        "priority": 3
    }
}, {
    "instalertid": 29732,
    "time": 1499460957.94943,
    "src": "172.16.0.1",
    "dst": "192.168.10.50",
    "name": " ET SCAN Potential SSH Scan ",
    "tech": [],
    "other_attributes_dict": {
        "sid": "2001219",
        "port": 22,
        "functionality": "missile guiding"
    }
}, {
    "instalertid": 29733,
```

```
}, {
    "src": "192.168.10.19",
    "dst": "91.189.92.152",
    "tech": ["T1041", "T1205"],
    "name": " ET POLICY GNU/Linux APT User-Agent Outbound likely related to package management ",
    "count": 15,
    "other_attributes_dict": {
        "priority": 3,
        "sid": "2013504"
    },
    "start_time": 1499358653.040222,
    "finish_time": 1499358654.458431,
    "alert_id": 55,
    "avg_time": 1499358653.7493265,
    "tac": [10, 3, 5, 11],
    "stage": [4, 2, 2, 4]
}, {
```

```
[
{"cluster_id":0,
"cluster_aggalertids":[0,1,30,31,36,42,43,57,59,65,75,77,81,83,84,85,86,87,88,90,92,93,95],
"cluster_starttime":1499097405.578172,
"cluster_endtime":1499097405.580233,
"cluster_aggalertsinstcounts":[4,2,8,20,13,4,1,16,18,4,14,11,4,6,13,8,8,1,1,4,4,2,4],
"cluster_avgtimes":[1499097405.5792027,1499097425.7034035,1499099184.7989412,1499100875.252252,
1499104739.010302,1499100357.800194,1499100357.801032,1499107218.832768,1499107410.0530129,
1499108778.7735716,1499114361.9800575,1499117370.1295162,1499116062.1096836,1499120105.754424,
1499122817.2008875,1499120745.391366,1499121099.9550355,1499121447.229496,1499121447.229975,
1499122165.814289,1499124785.835641,1499124785.8357886,1499183837.3205105],
"cluster_srcips":["192.168.10.9","192.168.10.3","192.168.10.16","192.168.10.17"],
"cluster_dstips":["192.168.10.3","192.168.10.1","23.194.182.93"],
"cluster_techs":["T1071","T1021","T1071","T1071","T1071","T1071","T1071","T1071","T1071","T1082","T1071",
"T1071","T1071","T1071","T1071","T1071","T1071","T1071","T1071","T1071","T1071","T1071","T1071"],
"cluster_tacs":[8,11,7],
"cluster_stages":[3,4],
"all_int_ips":["U0001","U0002","U0004","U0003"]
},
```

```
[
    {
        "Flow_id": 0,
        "cluster_ids": [
            0,
            1,
            2,
            3,
            4,
            5,
            6,
            7,
            8,
            9,
            10,
            11,
            12
        ]
    },
    {
```