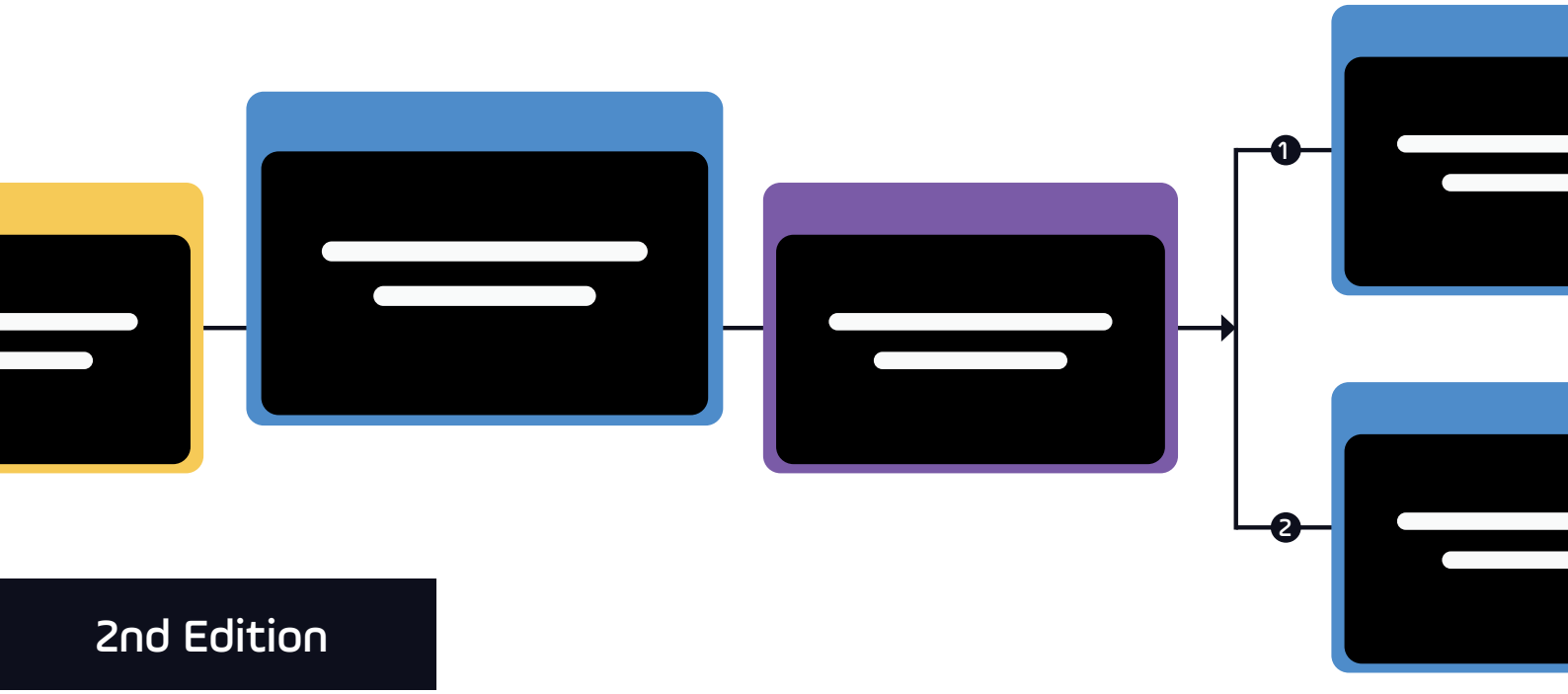
Siemplify



2nd Edition

SOC Investigation and Response in the Anywhere Era

Top Security Playbooks

2021 - 2022

WHITE PAPER

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INTRODUCTION

The security operations center (SOC), to borrow parlance from the legendary comedian Rodney Dangerfield, doesn't get the respect it deserves. But anyone who understands how the beating heart of your security program functions knows otherwise. The SOC is the regulator of the business, responsible for ensuring nothing disrupts it and that its proverbial kingdom keys and secret sauces stay protected.

But with that great responsibility comes great pressure for SOC inhabitants, as they must successfully follow security events from inception to resolution, while in the process overcoming key stressors endemic to a modern-day infosec command center: skills shortages, disparate detection tools and, of course, an abundance of threats amid an even greater number of false alarms.

Security analysts, engineers, architects and managers in the SOC are engaged in a zero-sum game where there can be only one winner. To give the SOC team the best chance to win, they must identify, investigate and respond to threats as quickly and consistently as possible. The key to fast and effective response is having processes documented in what is commonly referred to as playbooks (also known as runbooks).

Cybercriminals are sophisticated – but they're also business savvy, meaning they know what works and what doesn't and aren't keen on exerting unnecessary time and energy. In fact, security operations teams have seen many times before what cybercriminals can throw at them, but where they've stumbled is because of things like human error, poor prioritization or even burnout.

Playbooks help address each of these downsides by providing security teams with a single source of truth to turn to in high-pressure situations, helping to ensure response processes are executed systematically and repeatably. The purpose of this document is to provide security teams with a set of dependable playbooks targeted at the most common types of investigations undertaken by SOCs to drive down mean time to resolution. Added benefits include documenting so-called tribal knowledge, defined as unwritten information not commonly known by others within a business, and onboarding new analysts.

Siemplify, a leading provider of security orchestration, automation and response technology, provides these purpose-built playbook templates, and dozens more, in its Security Operations Platform with the goal of making analysts more efficient, engineers and architects more effective, and managers more informed. Since every organization has different needs, the Siemplify platform makes editing existing and creating new playbooks easy thanks to the drag-and-drop playbook editor. Now let's get into the playbooks!

> *Playbooks [provide] security teams with a single source of truth to turn to in high-pressure situations, helping to ensure response processes are executed systematically and repeatably.*

THE NEW X-FACTOR: ANYWHERE SECURITY OPERATIONS

Actually, hang on a minute.

Before we dive into the goods, let's touch on the elephant in the room, which did not exist when this handbook was first created more than two years ago but is now omnipresent. COVID-19, indeed, has changed a lot of things, but one of its largest legacies may be its impact on the workplace.

And what an influence it has had: not just from the obvious location of where you work (odds are you are reading this from home) but also from the all-important security perspective. Even now, many months after the virus first surfaced, organizations are still troubled with staying protected in the era of remote work.

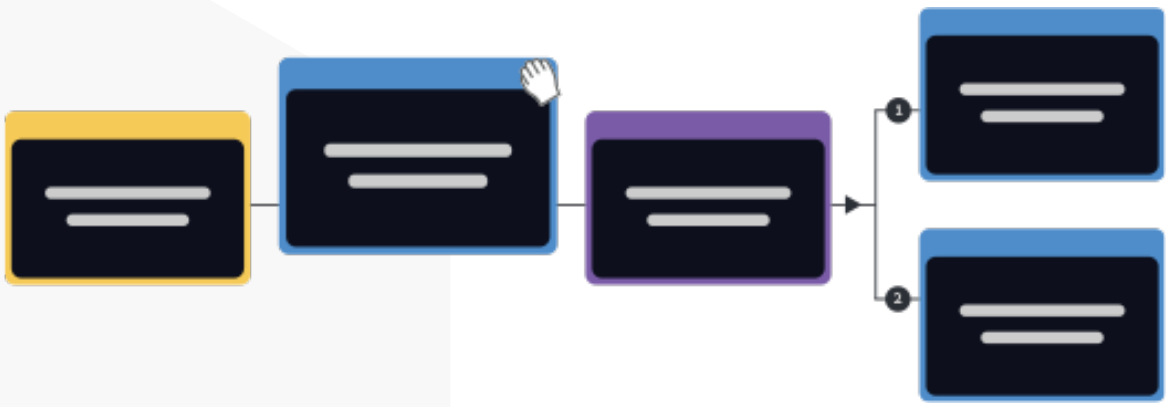
Recently research firm ONR reported that over 60 percent of companies have been unable to provide appropriate levels of security for employees to work remotely, resulting in increased risk.

It would be disingenuous to attribute this paradigm shift entirely to the pandemic. Frenetic digital transformation has been underway for many years, and it is finally reaching a crescendo that invites greater risks than ever thanks to an expanded attack surface.

To achieve sustainable resiliency in the anywhere era, you require not only sound security controls (which studies have shown your workers may attempt to bypass anyway) but also tried-and-true automated processes and workflows that introduce scalability, efficiency and acceleration, thereby allowing your analysts to remain highly collaborative and work on more strategic priorities.

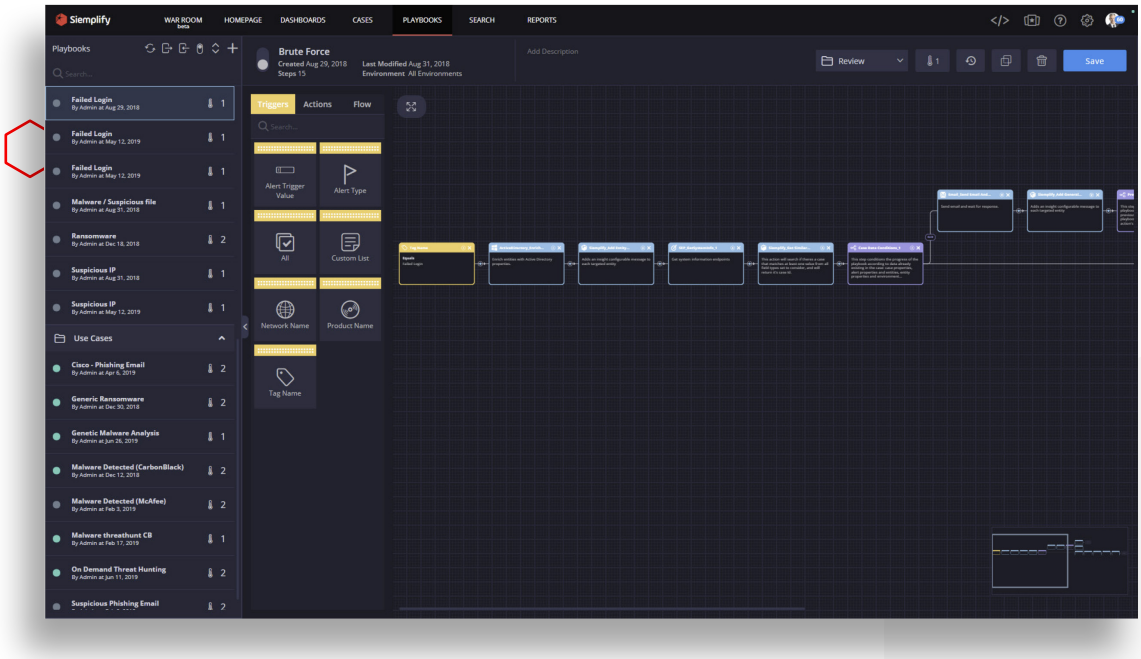
Ideas and behaviors are changing. A new business model is emerging and the traditional way of operating your SOC is quickly becoming a thing of the past. All of the following top playbooks are as applicable as ever in the remote era, but we have added three new ones (at the end, so please skim ahead if you are anxious to see them). They are especially timely and relevant in the anywhere period.

Enjoy the read! We hope you find it useful for your SecOps endeavors.



Playbooks

Brute Force Attacks



As mentioned previously, a brute force attack occurs when an attacker attempts to break into an environment by repeatedly attempting to login to a system or systems. Generally, the attacker has either reverse engineered or purchased on the dark web legitimate usernames and applies a vast library of potential passwords to gain access to a system. While IT departments can implement a policy that locks out users after a given number of failed attempts, many organizations do not take this approach as they are concerned about remote and in-the-field employees being frozen out of their computers, causing business disruption.

Details & Workflow

Enrichment & Context

- Source IP address –is it internal or external
- Target IP and OS information

Investigation

1 **Is the source IP internal or external?**

a) If internal: Search of any previous alerts raised on the entity (source IP). The machine might be already compromised and might still be compromised.

I) If the alerts are involving a malware alert, escalate the case to Tier 2.

II) Tier 2: Block the traffic from the source IP, disinfect the machine, verify the source of the malware and unblock the machine once no threats are found.

b) If external: Search the IP using IP reputation sites and act accordingly (continue the next steps of this playbook to gather information for Tier 2).

2

Determine which data source was used to trigger the alert. Is the alert based on network logs or actual on-host login information?

3

Network based logs: Here we assume that the product triggering the alert cannot be sure about the traffic it monitors, as it might be encrypted. In this case, we only try to find out indicator of failure.

a) Find out which ports were used for the brute force.

b) Search the IP using IP reputation sites and act accordingly (continue the next steps of this playbook to gather information for Tier 2).

c) If the attack port does not match any listening service or and previously running service, mark the case as a 'false positive' (since there is no chance of success without a service listening on the port). Escalate the source IP's information to Tier 2 for further hunting, as this is still considered an indication of a malicious presence trying its 'luck' around the network.

4

Host-based logs (or logs from the last step of the previous section)

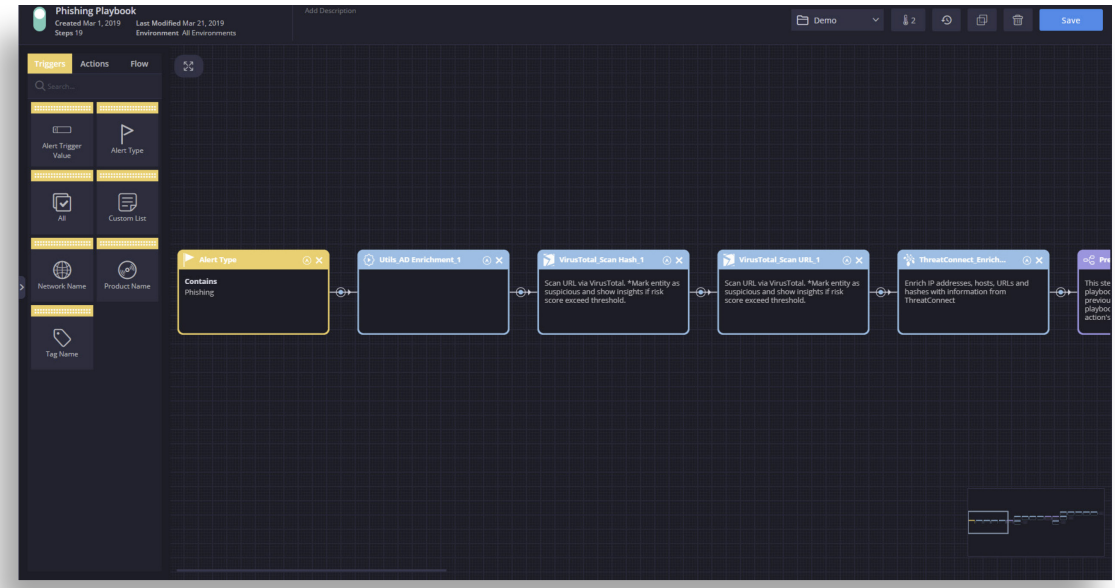
a) Search the logs for events indicating a 'failure to login' or 'user does not exist' (depends on the attacked service). If such logs exist, measure the time span during which they occurred. If the time span is very short, aka mere seconds between attempts, escalate the case to Tier 2, an indication of a malicious presence trying its 'luck' around the network.

b) Search the logs for a successful login log entry. If such entry is found, escalate the case to Tier 2 for further investigation.

Containment & Remediation

1. Find out all users that were used in the brute force attack. Look for any suspicious username from this list and search for other hosts that these usernames were used on.
2. Notify the owners of the legitimate accounts and the owners of the targeted machines that a brute force attempt was made on their assets.
3. Perform a more thorough investigation on the possibly affected hosts and act accordingly.
4. If the attacker is an external IP, block it and ensure that the firewall is configured to prevent remote login attempts for the specific port in the case it was unnecessarily open to the public.
5. If the attacker is an internal IP, search for any malware infections and past malware alerts on the source host to see if the host is vulnerable.

Phishing Attacks



Phishing is one of the most prevalent attack types organizations experience across all industries and size and has been the source of some of the most prolific breaches of all time. It's also the type of attack that your CEO is familiar with and comfortable enough asking you about in the hallway. In a typical scenario, an attacker attempts to trick an unsuspecting employee to divulge sensitive information. In the early days of phishing, the attackers would send seemingly legitimate emails to employees with the hopes the worker would click on a link in the message and subsequently provide the proverbial keys to the kingdom.

Today, phishing attacks are more sophisticated, ranging from email, text message, and even company executive and cloud-based file storage/sharing site impersonation. Given the large set of threat vectors associated with phishing attacks, many SOCs cite phishing investigations as among their largest consumers of available resources.

Details & Workflow

Enrichment & Context

- Note the source and destination IP addresses and ports.
- List all the email addresses against which the alerts were found.
- Go through the email content and filter out all the URLs found.

Investigation

1

Resolve all URLs to IPs and check the reputation for each IP

a) Mark 'true positive' if bad and escalate the collected information, otherwise.

2

Analyze URLs in sandboxed environment by following the

a) Note any suspicious behavior such as: file downloaded, websites that seem to be aimed at mimicking very well-known sites in their appearance, opens, and unknown redirections.

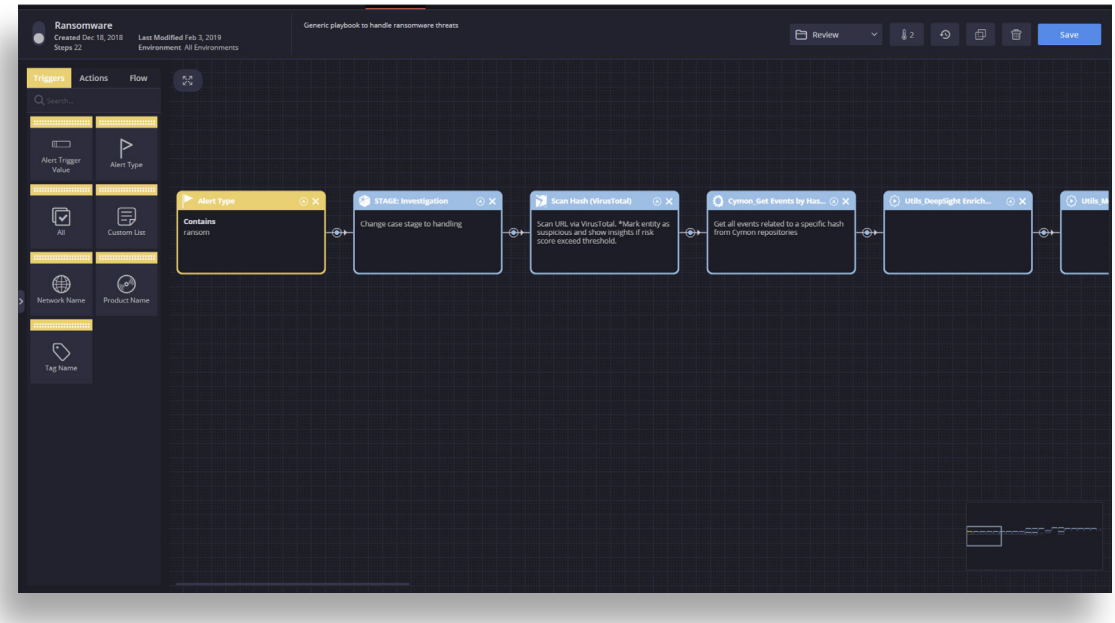
3

If any of these found, mark 'true positive' and escalate.

Containment & Remediation

1. Once phishing is confirmed, send a security alert email to entire organization, notifying them about the targeted activity going on.
2. Block all the malicious URLs found in the alerts (and IP addresses) with firewall.
3. Run thorough anti-malware scans against the users who received the emails (found in alerts).

Ransomware



Ransomware is a popular attack vector that involves holding an organization's data hostage and threatening destruction unless a ransom is paid. The threat moved into the mainstream in 2016 with the WannaCry outbreak, which affected companies around the world.

When the victim employee accidentally installs the malicious payload, the ransomware begins to encrypt all the data on the drive and can only be decrypted with the attacker's key. If the victim organization pays the ransom – as many companies have been forced to do, fearing capitulation as their only option – the attacker will provide the key to decrypt the data. However, once the ransom is paid, the attackers may decide to stick around and target the victim again through backdoor they created. (Digital crooks aren't exactly known for keeping their word.)

Details & Workflow

Enrichment & Context

- Verify the log source (network based, anti-virus, host-based or threat intel) and locate/extract the actual suspicious file

Investigation

1

Search third party sources for information on malware and its associated variants to determine the severity and impact of the specific threat.

2

Upload the suspicious binary to VirusTotal and examine the detection ratio.

3

If the detection ratio indicates a malicious signature, escalate to Tier 2 with the gathered information.

4

If the detection ratio indicates of a clean file, make the case 'false positive' and close.

5

If the case was escalated to Tier 2, supply Tier 2 with the following extra information:

a) Binary file (for static/dynamic analysis.

b) Any infected files to determine whether business critical data was affected.

c) Victim's IP and source IP (if the source is known – in case the alert originated from a network-based product).

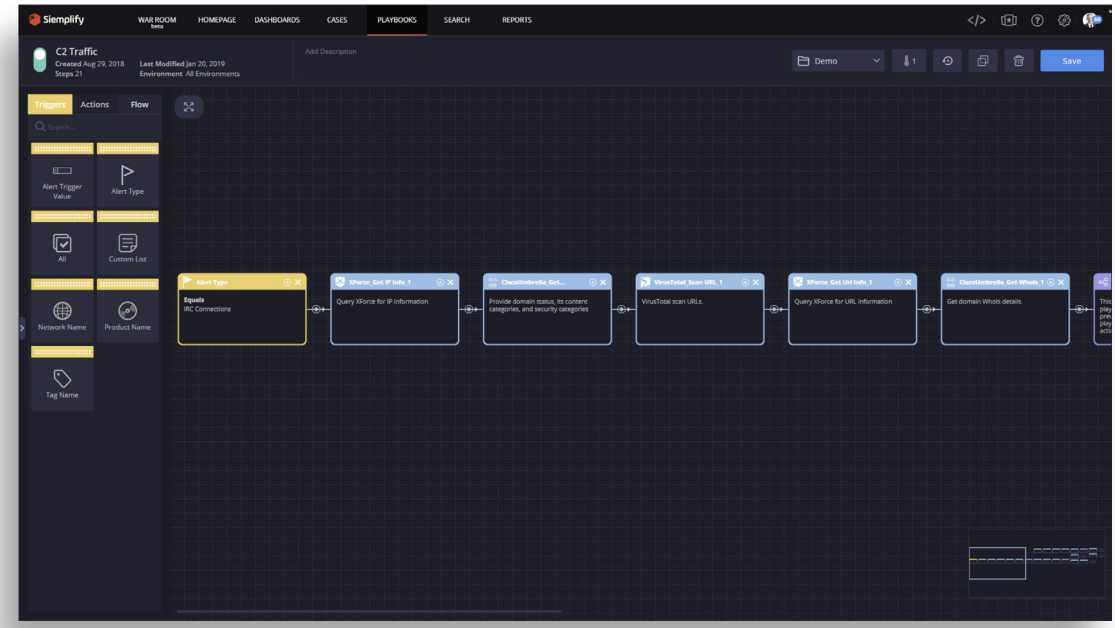
d) Initial information gathered about the malware type/family.

e) Potential impact on victim.

Containment & Remediation

1. If there is a source to the file, block it.
2. Disinfect the affected hosts that were found during the enrichment of Tier 1.
3. Determine the ransomware used to see if recovery will be possible and the way it works.
4. Determine the source of ransomware infection to patch it.
5. If asset value is high:
   a) Is high, recover the data if data decryption tools available for ransomware.
   b) If low, reimage the machine.

Command-and-Control (C2) Traffic



Command-and-control (C2) traffic confirms your worst nightmare: that your environment has one, or more, compromised systems. If an attacker can penetrate the network and establish a communication channel to a remote server, they can exfiltrate data in seconds.

Unfortunately, detection of C2 traffic can be difficult, especially when the adversary understands how to remain covert. For instance, advanced attackers will limit the bandwidth and duration of communications so not to alert network monitoring systems. Additionally, attackers may encrypt their communications, making it virtually impossible to discern the type of data moving across – and out of – the network.

Details & Workflow

Enrichment & Context

- List all the IPs against which the alarm was raised for later escalation to Tier 2.

Investigation

1

Gather the following details

a) Attack pattern (many to one, one to one, etc.)

I) Large volume of traffic outbound alerts.

b) Any prior malware alerts about the victim IP (compromised system).

I) If found, determine the source of malware and repeat your malware investigation steps.

II) If found, mark 'true positive' and escalate all the collected information are found.

2

Identify the CnC servers:

a) List the destination IPs found in infected machines (Source IPs) NetFlow logs.

b) Capture the network traffic of infected machines (source IPs).

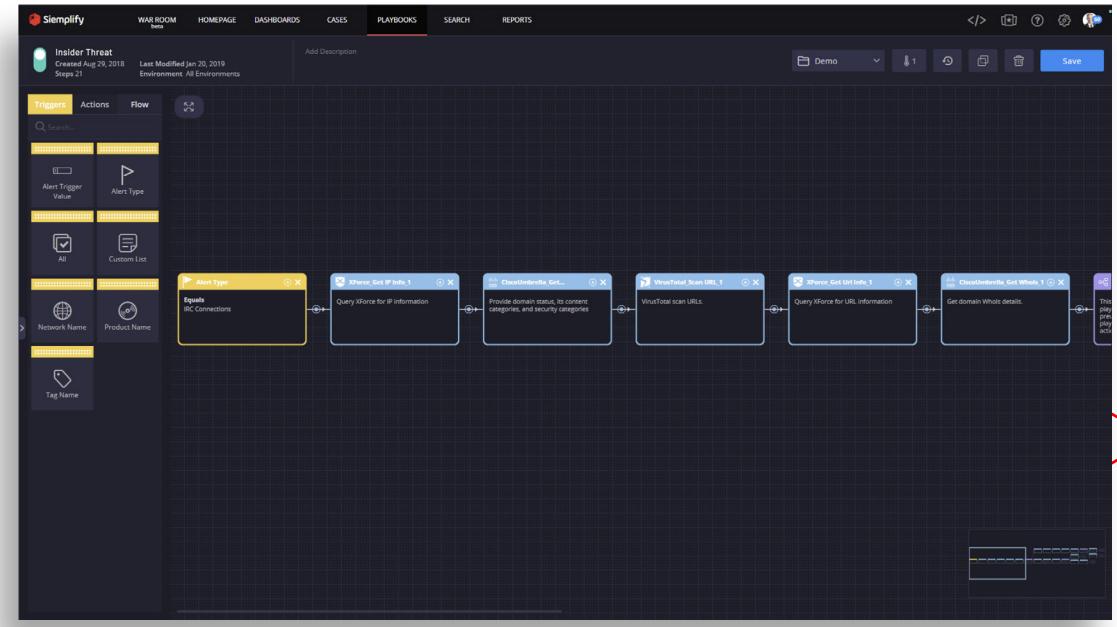
I) List destination IPs for any malicious communications found.

c) Check reputation for destination IPs found.

Containment & Remediation

1. Blacklist all the identified CnC servers with firewall.
2. Hunt for any backdoors on affected hosts and remove them.
3. Hunt for the origin of attack.
   a) Look for any previous alarms for the affected hosts and use corresponding playbook

Insider Threat (Data Leakage)



While conceiving that a trusted user could become a threat to the business may be difficult, many examples exist in which a rogue insider got the better of their employer. While most of your security controls are likely geared toward halting external threats, the insider threat can be equally, or even more, damaging. That's because malicious insiders don't need to coax anyone into giving them access to the environment. They're already in and have free run of the network under the guise of routine behavior.

This means they have access to a treasure trove of sensitive data and with a simple USB device can move potentially millions of dollars' worth of data off the network in the snap of a finger – and without raising an eyebrow.

Enrichment & Context

- Note the host IP against which the alert was raised (victim machine, source).
- Note the suspicious attacker IP (attacker, destination).
- Study the rule against which the alarm was raised and note the signature/checks in the rule.
- Note the outbound traffic volume of the host within the respective time
- Calculate/extract average traffic per host before the time of alert (from NetFlow).

Investigation

1

If the destination IP is private:

a) If the destination IP can retrieve data from source IP (Security Policy).

I) Mark 'false positive'.

II) TLook for any previous alerts of type (compromise/suspicious behavior/CnC) against the victim host and use relevant playbook (Additional).

2

If the volume of data from local IP (victim machine) to remote IP (attacker's machine) is unusually high (more than average calculated), mark 'true positive' and escalate.

3

If the volume of data from local IP is around average, mark 'false positive'.

Containment & Remediation

1. if marked 'true positive':

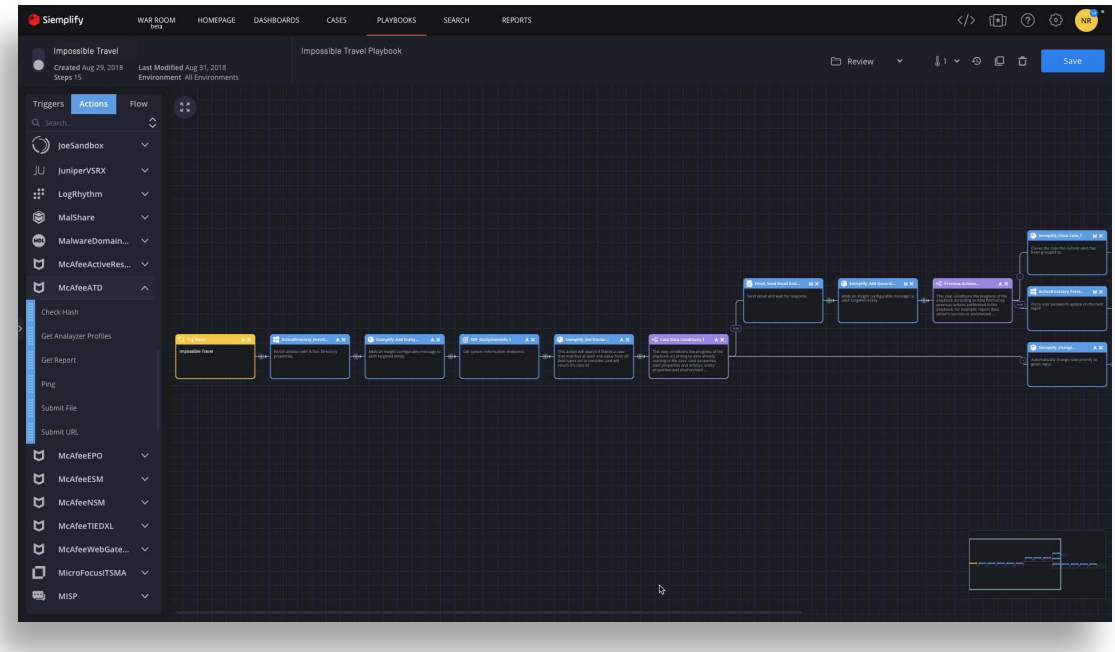
a) Block the destination IP in firewall.

b) Assess the asset value based upon the business criticality of data residing on the victim machine.

I) If data is business critical, take a backup and reimage the host.

II) If data is not business critical, reimage the host completely.

Impossible Travel



While often overlooked as an alert type, "impossible travel" is an extremely timely Office 365 feature that enables you to compare a user's last known location to their current location, then judge whether the trip is normal or not given the time that has elapsed between the two coordinates.

According to Microsoft, "this detection uses a machine learning algorithm that ignores obvious 'false positives' contributing to the impossible travel condition, such as VPNs and locations regularly used by other users in the organization."

Most relevant to remote workers, the below workflow will help enable you to identify potential cloud breaches and ensure your workers are following pertinent policies.

How can this workflow help the business?
Repeatable, 24/7 instant handling of an often overlooked alert type.

How can this workflow help the SOC?
Rich case study presented for a quick "allow/block" decision.

Details & Workflow

Enrichment & Context

- Enrich the user: Gauge the risk profile of the user (i.e. traveling engineer vs CxO vs domain admin?) Has the user travelled to these countries before?
- Enrich the IP: Are the countries on a sanction list? Is the IP an approved business VPN exit point?

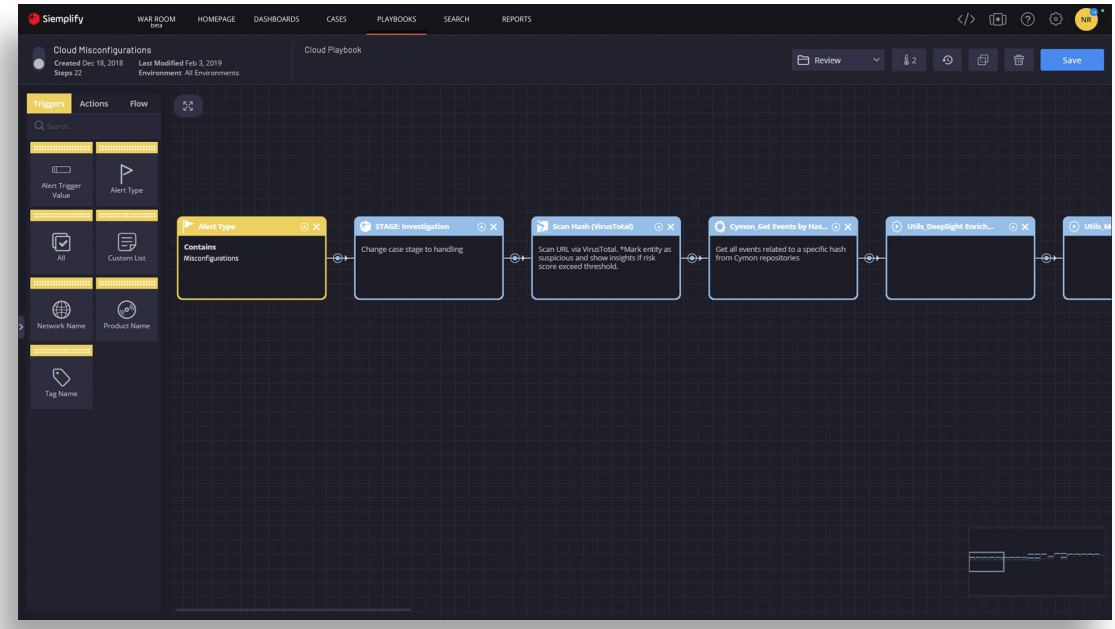
Investigation

Decide: Consider the time of day, risk of user and SOC analyst opinions to help decide if false positive.

Containment & Remediation

1. Contain the access: Remove groups/permissions to systems, disable account, block source login IP addresses, escalate user to require two-factor authentication.
2. Eradicate the access: Reset user password, notify HR/the user's manager that the account needs resetting.
3. Recover: Initiate automatic communication (e.g. Slack, Teams) to the user/their manager asking them to explain recent actions. Investigate how the incident could happen.

Cloud Misconfigurations



The misconfiguration alert risk is rising by the day, especially amid the rapid adoption of public cloud computing, whose benefits have become especially stark during the pandemic and the subsequent work-from-home binge. Cloud demand has risen across Amazon Web Services (AWS) – which controls roughly half the market share – as well as Microsoft Azure and Google Cloud Platform (GCP), through the huge intake of collaboration tools and other resources.

A recent survey by Check Point Software Technologies determined that misconfigurations are now officially the top threat to cloud security, with three-quarters of respondents saying they are "very" or "extremely" concerned about cloud security and 68% naming misconfigurations as their biggest cloud worry. Their concerns are not unfounded.

Cloud misconfigurations were responsible for potentially exposing an estimated 33.4 billion records in 2018 and 2019, victimizing high-profile organizations and costing organizations some $5 trillion.

Considering many misconfigurations go unreported, the figures are likely significantly larger. And not only are misconfigurations obvious harbingers of data exposure and punitive compliance transgressions, they also can present the ideal foothold to launch a more complex (and potentially more devastating) attack on an organization.

How can this workflow help the business?
More freedom is afforded employees to be dynamic and agile with their own infrastructure without reducing visibility and compliance.

How can this workflow help the SOC?
Cases where the asset owner approves the risk are closed with no SOC intervention. Cases are only raised to analyst attention when a non-satisfactory outcome is decided by the asset owner.

Details & Workflow

Enrichment & Context

- Enrich the asset: What is the type of OS? Is the asset owner identifiable either through the CMDB. Or use billing code to identify the owning department.
- Enrich the owner: Name, email, other contact info, manager.
- Enrich the risk: Trigger vulnerability scan, trigger SSL validity scan, confirm the endpoint is installed.

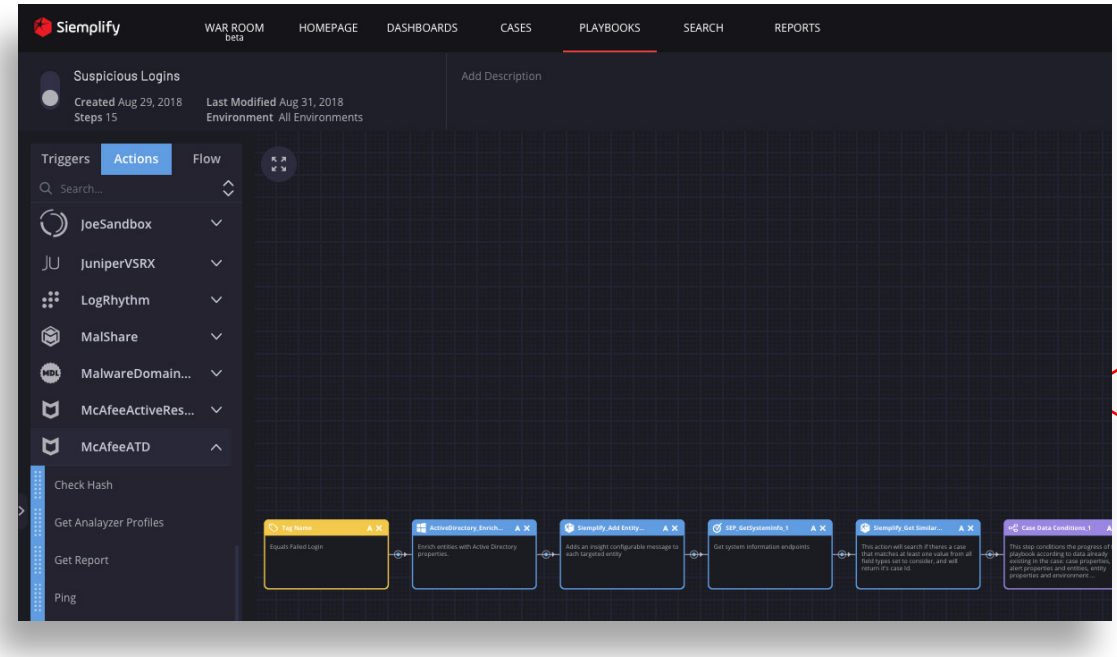
Investigation

Decide whether to act on different aspects: If the server is low criticality and the owner approves the configuration, a 'true positive' is likely, where the risk is audited as accepted. If the device is high criticality, continue playbook automation.

Containment & Remediation

1. Contain the asset: Quarantine the server and modify the firewall ruleset.
2. Recovery: After informing the asset owner of the issue, scan again in 24 hours. If non-compliance is gone then the case can auto-closed.

Suspicious Logins



A spike in cloud services usage, plus increasing use of remote access services, has naturally resulted in unusual authentication behavior across businesses. While consecutive failed login attempts may be by nothing more than an inebriated employee working after hours, it could be indicative of something much more sinister.

Unusual or failed logins may indicate system probing by attackers or that a hacking or insider theft attempt is underway. Whether they are login attempts happening during off hours or emanating from a strange location, it is important to swiftly respond to these threats.

With roughly fourth-fifths of hacking-related breaches caused by stolen or weak credentials, this type of alert can easily devolve into a worst-case scenario for security teams, as there is nothing more spine-shivering than a hacker appearing as a trusted user and being able to operate freely throughout the network.

And criminals need not be sophisticated. While authentication bypass vulnerabilities are one popular means for exploitation, adversaries also have at their disposal billions of user credentials that have been leaked online following breaches over the past 15+ years.

How can this workflow help the business?
Organizations are able to gain end-user visibility and improve awareness among employees.

How can this workflow help the SOC?
Analysts are able to perform quick, effective and sophisticated investigations.

Details & Workflow

Enrichment & Context

- Enrich the assets: Is this username a common offender. Is the source IP a common offender? Does this IP often login successfully (aka a valid customer)?
- Enrich the patterns: Check SIEM for failures against platforms.

Investigation

If the volumes are high, communicate with the user and ask if they are experiencing problems against "system x."

Containment & Remediation

1. Assess user feedback.
2. Reset passwords.
3. Ask them if the password is strong/needs changing.
4. Block source IP at the firewall.

CONCLUSION

The key to driving efficient SOC investigation and response is to understand how individual alerts relate to each other. By adopting a context-driven approach, security analyst efficiency and effectiveness will dramatically increase, with cases being closed faster than ever before.

While these gains are obviously desirable, the real added value to the organization comes from limiting an attacker's ability to remain hidden in the shadows because the SOC team is buried under an avalanche of alert data.

Efficient and effective investigation and response in the anywhere era is the future of modern security operations, and these top playbooks will act as an optimal first step for putting alerts and incidents into their proper context.

Playbooks are, of course, valuable even if they are just in flowcharts that you can manually apply to your activities, as they provide a definitive and reliable sequence to shadow during security incidents and investigations, when time is of the essence.

But there is a way to formalize and execute these playbooks using security automation, orchestration and response (SOAR) technology, which can ensure consistency, save you time, track and measure your progress, and provide you with machine learning-based recommendations for best courses of action.

Siemplify playbook capabilities offer the best of both worlds: a simple user interface that makes building and editing actions, triggers, and flows flexible, while incorporating a powerful IDE that delivers virtually unlimited customizability.

For more information, visit siemplify.co.

Siemplify

About Siemplify

Siemplify is a security orchestration, automation and response (SOAR) provider that is redefining security operations for enterprises and MSSPs worldwide. Its holistic security operations platform is a simple, centralized workbench that enables security teams to better investigate, analyze, and remediate threats. And, using automated, repeatable processes and enhanced measurement of KPIs, Siemplify empowers SOC teams to create a culture of continuous improvement. Siemplify's patented context-driven approach reduces caseload and complexity for security analysts, resulting in greater efficiency and faster response times. Founded by Israeli Defense Forces security operations experts with extensive experience running and training numerous SOCs worldwide, Siemplify is headquartered in New York with offices in Tel Aviv.

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