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TRANSFORM

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Linked-Out: Security Principles to Break Software Supply Chain Attacks

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Agenda

- Introduction to Supply Chain Attacks
- Supply Chain Attack Anatomy
- Website SCA : Magecart
- Datacenter SCA : Microsoft Exchange Server
- Public Cloud : Azure Pipeline
- Defense principles
- Best practices against Supply Chain Attacks

What are Supply Chain Attacks ?

- A cyber breach where attackers target less-secure but trusted 3rd party software
- More impactful as a single compromise of a 3rd party company can lead to 1000s of enterprise victims
- Attackers exploit enterprises' trusted use of software without validation of its integrity.
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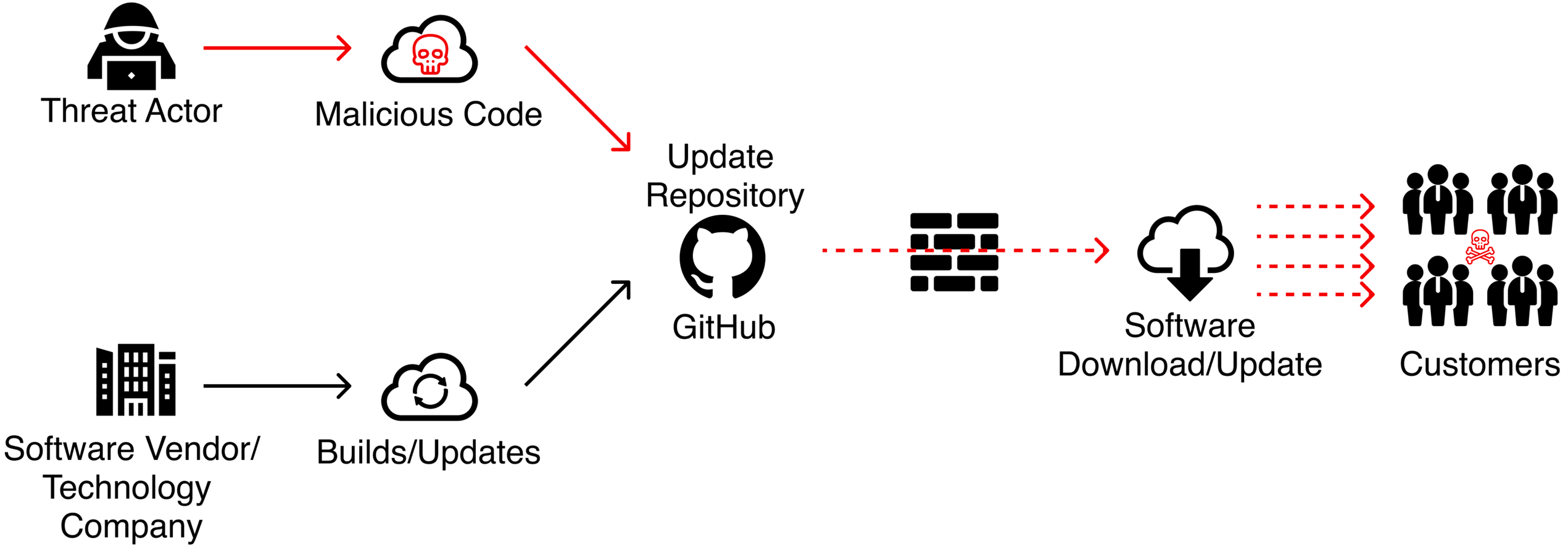
Supply Chain Attack Anatomy



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Website SCA : Magecart

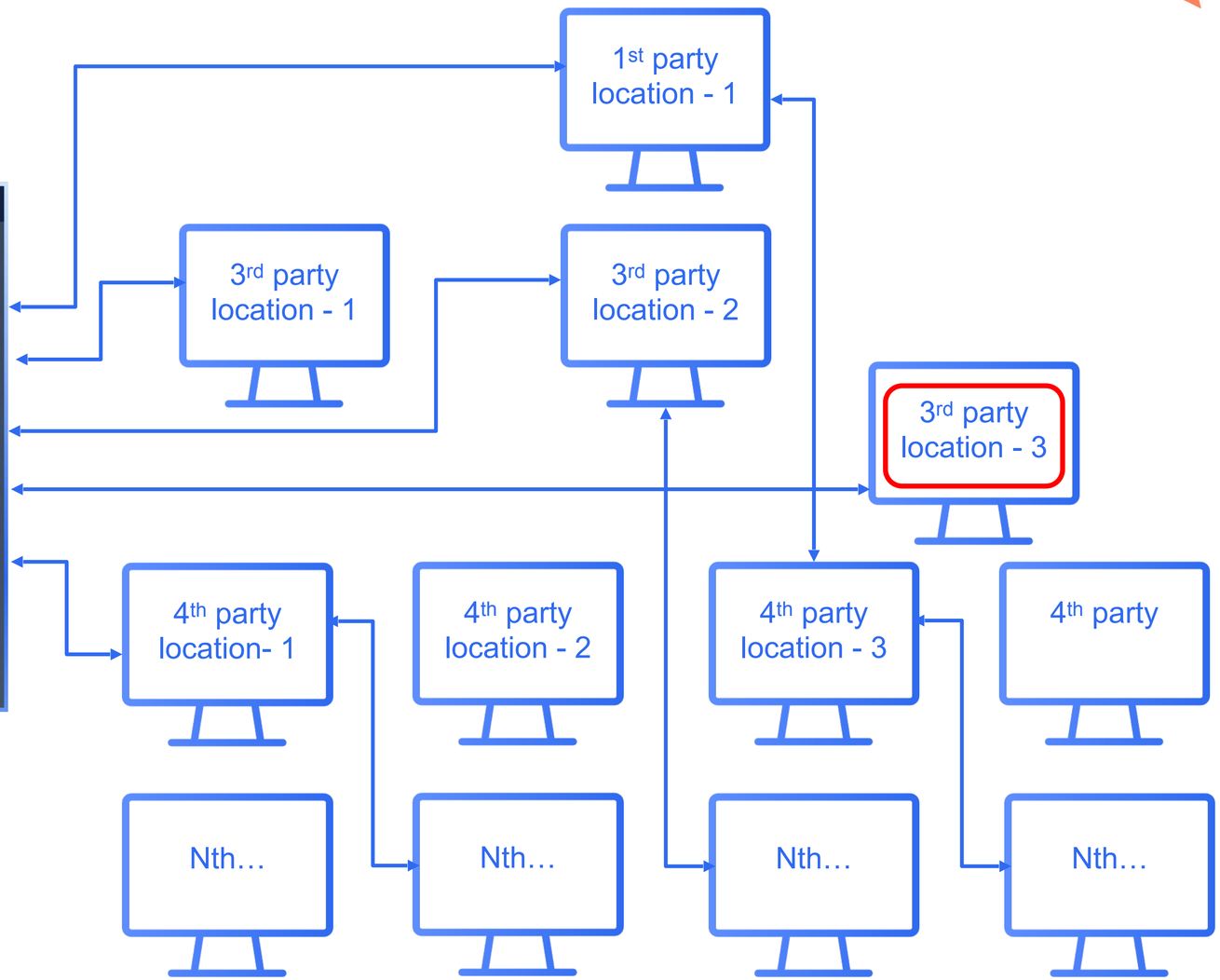
Website SCA : Magecart

Webpage

```
//1st party
<script src="/script.js">

//3rd party JSs
<script src="hxxps://somelocation/statically-loaded1.js">
<script src="hxxps://somelocation/statically-loaded2.js">...
...
```

inserted malicious script

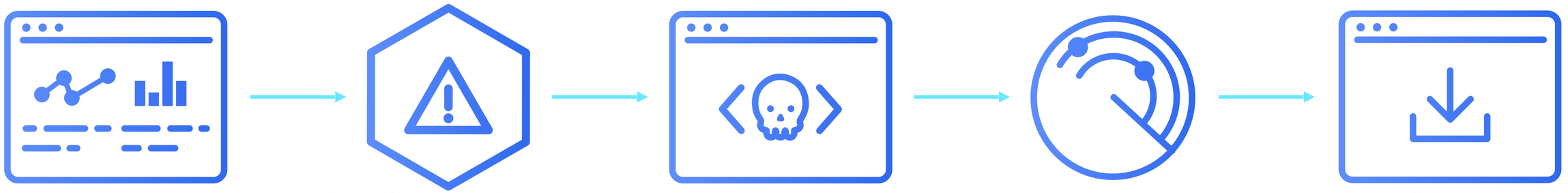
```
//4th party JSs
<script src="hxxps://Differentlocation/dynamically-loaded1.js">
...
...
...

//nth party JSs
```



All it takes is ONE compromised JS

Typical Magecart Attack Sequence

Magecart ≈ JavaScript Skimming Attack



Analyze Website → Infect 3rd party → Load my script → Avoid detection → Exfiltrate user data

Or any other Attack ...

Website Security Practices

Content Security Policy

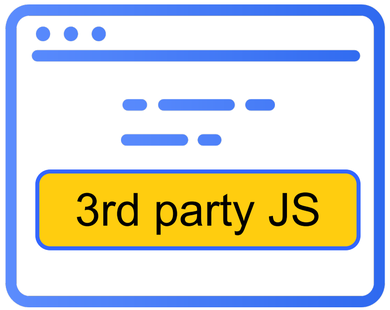
Locks down web resources origins and data outflow

SubResource Integrity

```
<script integrity-hash=abcd-xyz
src=”3rd-party/foo-1.js”>
```

Verifies content hash of a resource during runtime

iFrame Sandboxing



Browser fully isolates untrusted content

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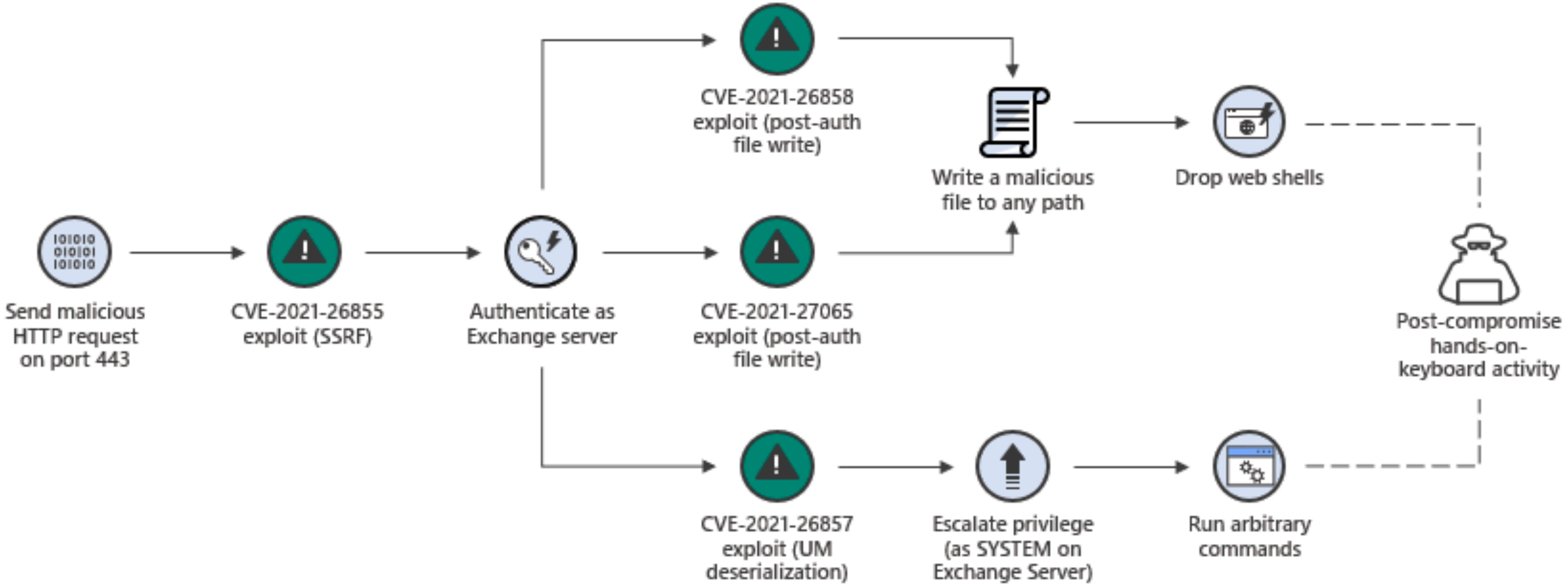
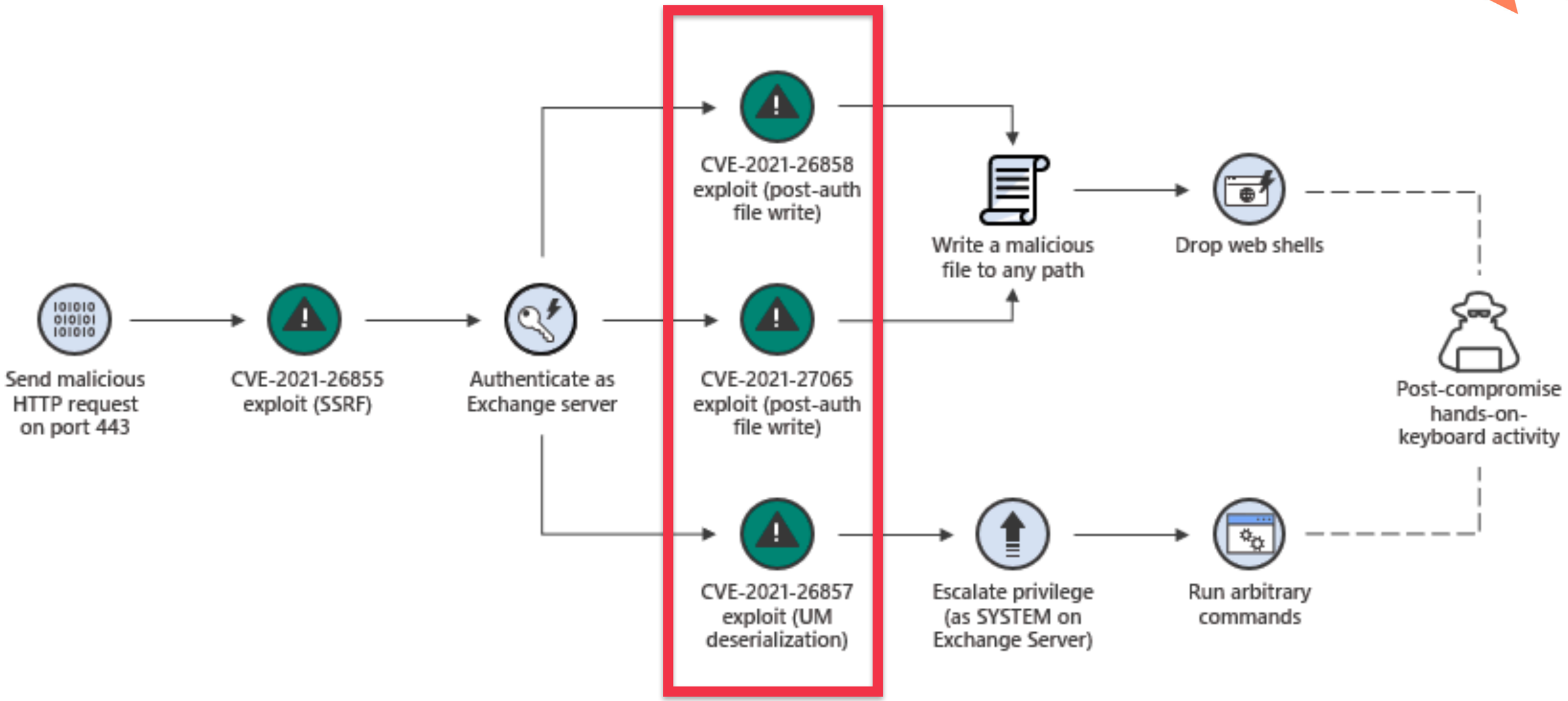
Datacenter SCA : Microsoft Exchange Server


Send malicious HTTP request on port 443
CVE-2021-26855 exploit (SSRF)
Authenticate as Exchange server
CVE-2021-26858 exploit (post-auth file write)
CVE-2021-27065 exploit (post-auth file write)
CVE-2021-26857 exploit (UM deserialization)
Write a malicious file to any path
Escalate privilege (as SYSTEM on Exchange Server)
Drop web shells
Run arbitrary commands
Post-compromise hands-on-keyboard activity

Defense mechanisms



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Public Cloud : Azure Pipeline

Azure DevOps Server: A Brief Overview

What Makes the Attack Possible?

- The agent does not verify if the reply is coming from the legitimate server or otherwise.
- The AES key that is used for encrypting a job specification can be successfully replaced by a custom AES key.
- TLS is not configured by default. The user needs to manually configure it.

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How to protect your organization from Supply Chain Attacks ?

Defense against Supply Chain Attacks

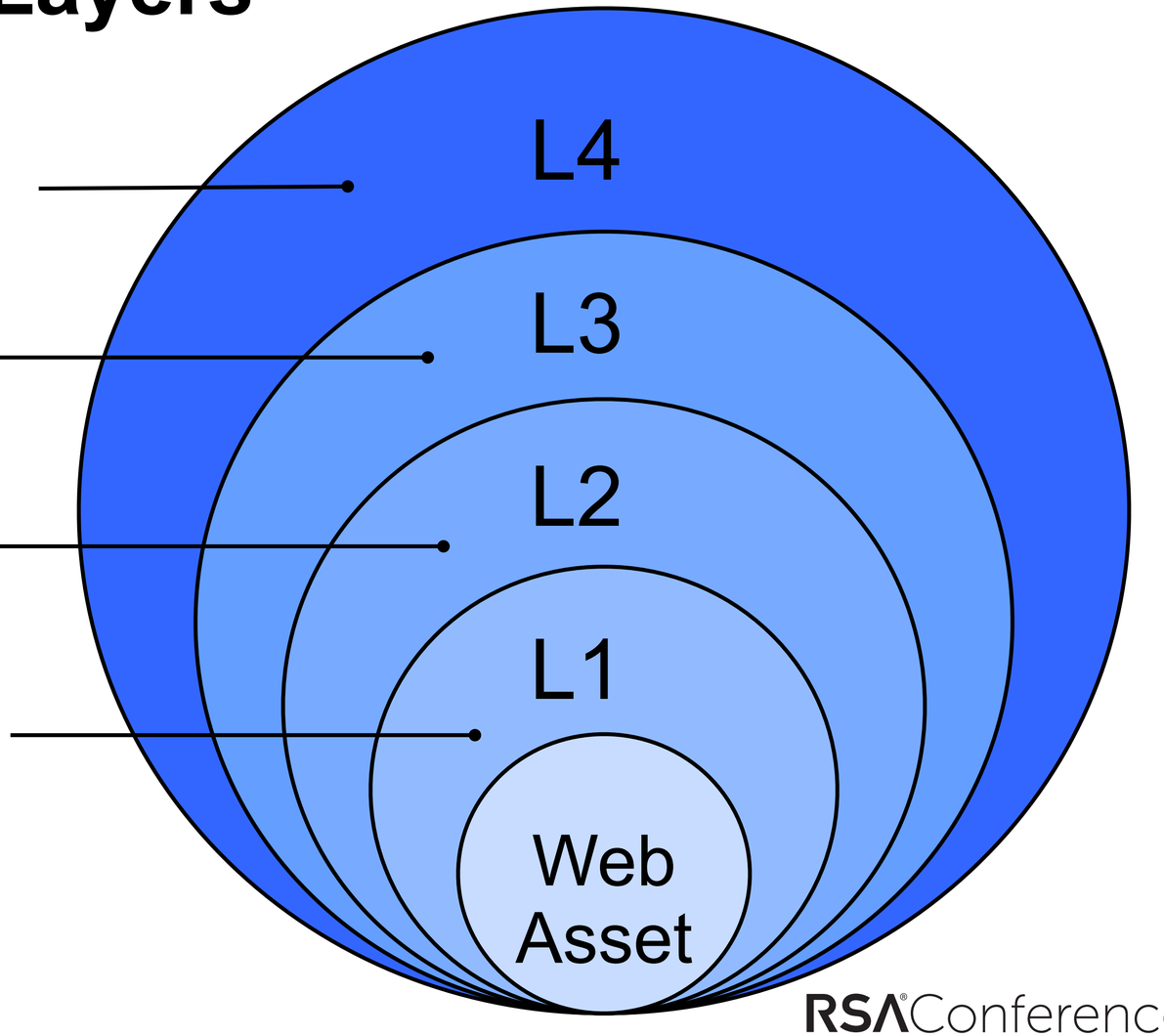
Defense in Layers

Layer 4 : Periodic App Monitoring

Layer 3 : Active Protection

Layer 2 : Minimize Exposure

Layer 1 : Resource Inventory



Best Practices against Software Supply Chain Attacks

- Avoid an implicit chain of trust between software and enterprises
- Minimize exposure to 3rd Party software
- Prioritize sensitive infrastructure
- Extend the Zero Trust principle

Apply What You Have Learned Today

- Next week you should :
  - Identify which Web Assets are the most vulnerable in your organization
  - Identify which Web Assets have an implicit chain of trust with 3rd parties
- Next three months you should :
  - Inventory of all 3rd party software
  - Apply defenses to break chain of trust in case of a breach
  - Minimize 3rd Party exposure

Apply What You Have Learned Today

- Next six months you should
  - Apply Zero Trust across your organization
  - Monitor and verify 3rd Party Security Posture on a continuous basis
  - Help protect other team’s web assets as well!

Thank You for Your Attention!

Q&A Session

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