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Protection and Detection in the Cloud

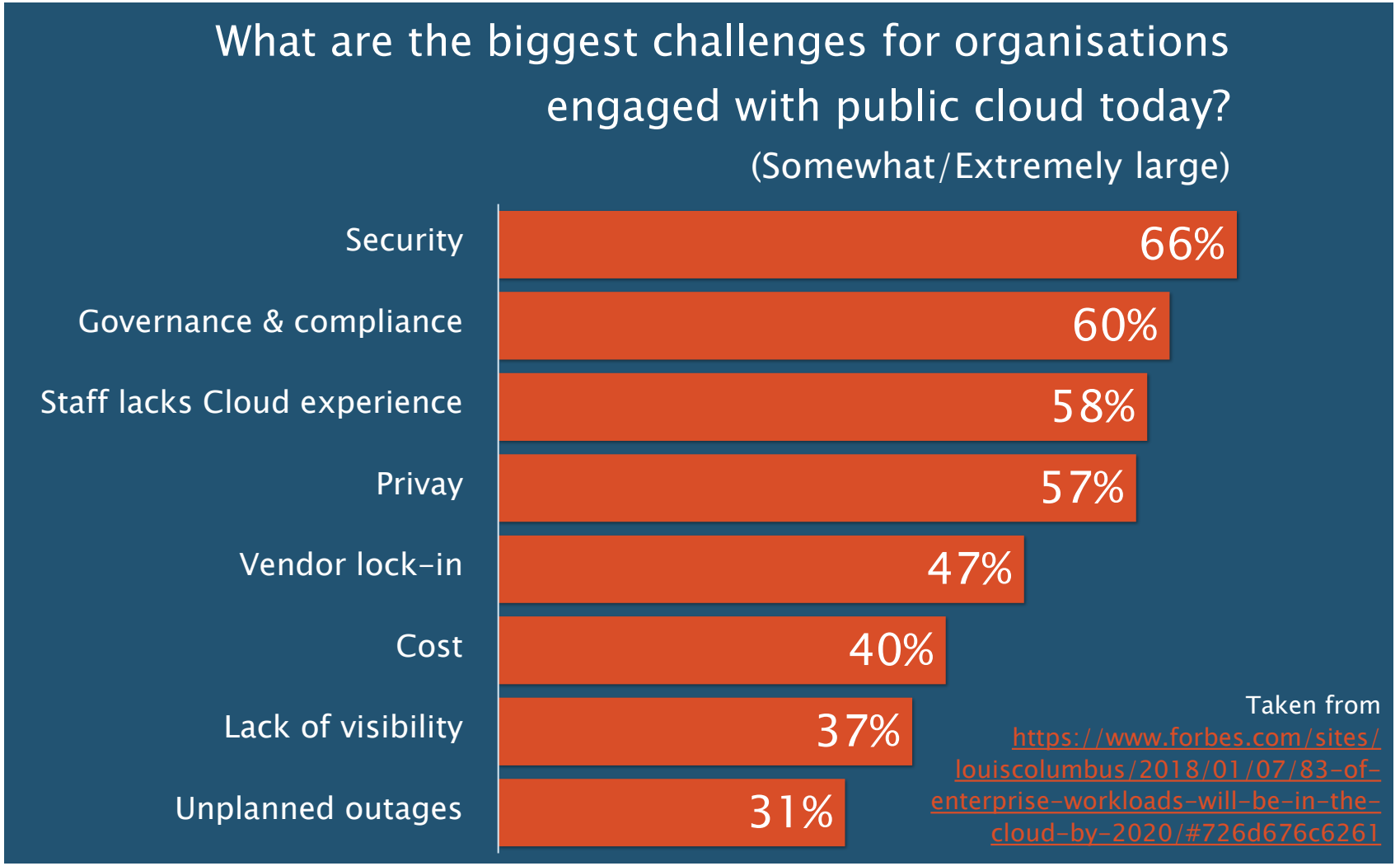
Nick Jones

31st January 2019

Cloud Computing

Forbes: 83% Of Enterprise Workloads In The Cloud By 2020

MWR: >50% of IR cases last year involved the cloud



Takeaways

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Where traditional assurance falls short in the cloud

How to automate cloud assurance to:

- Remediate issues faster
- Scale security efforts
- Reduce costs

How to detect attacks in the cloud

Who Am I?

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- Nick Jones
- Consultant for >4 years, previously a software developer
- Research interests:
  - Cloud
  - DevOps/Automation
  - Attack Detection

*aaS

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Bare Metal

IaaS

Virtual machines in the cloud

PaaS

Managed services – databases, app hosting, storage etc.

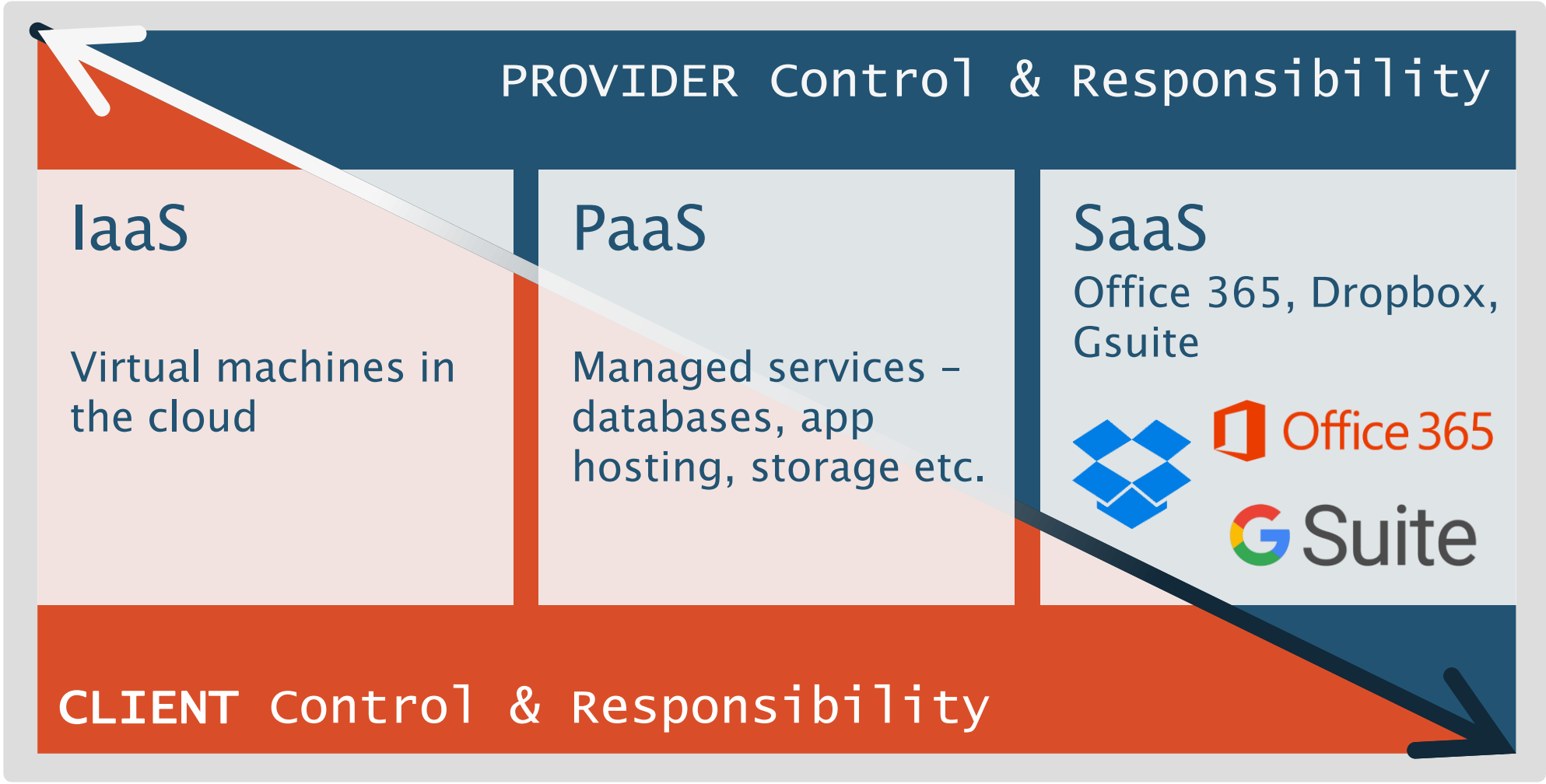
SaaS

Office 365, Dropbox, Gsuite

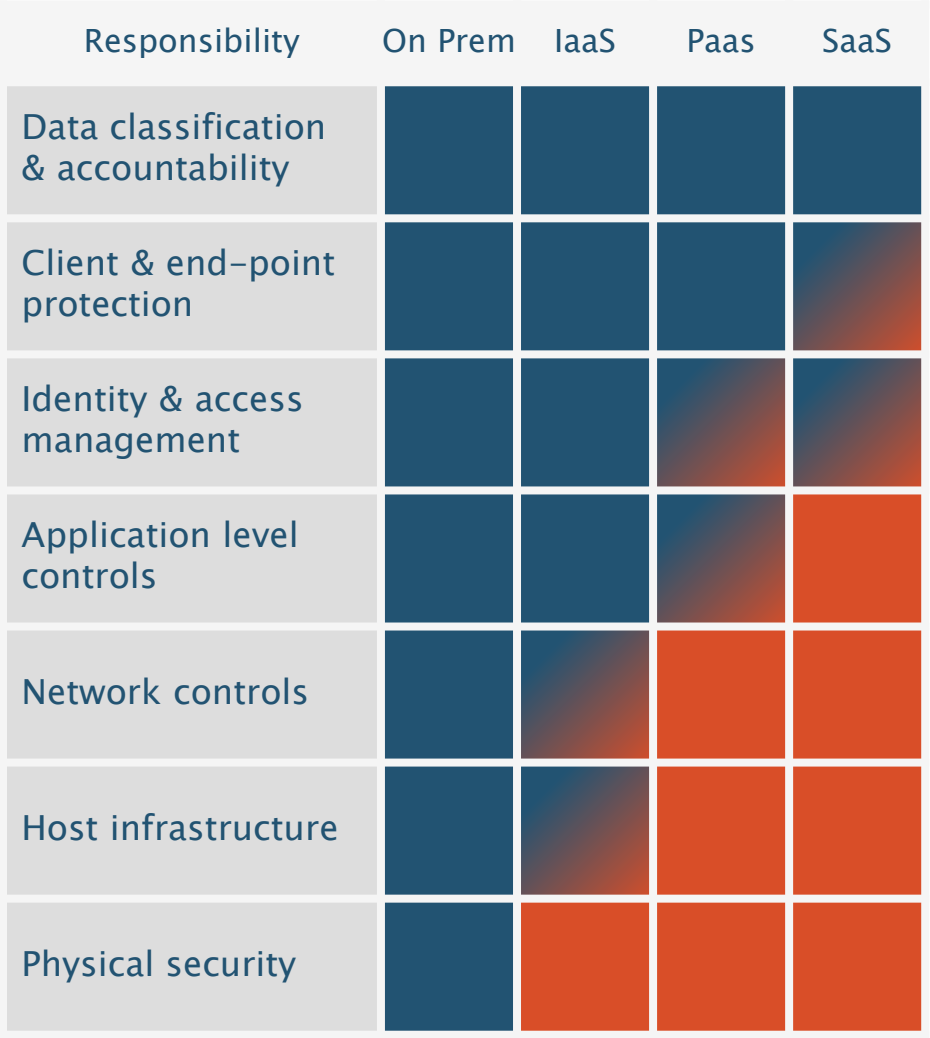
Office 365

G Suite

*aaS


PROVIDER Control & Responsibility
IaaS
Virtual machines in the cloud
PaaS
Managed services – databases, app hosting, storage etc.
SaaS
Office 365, Dropbox, Gsuite
Office 365
G Suite
CLIENT Control & Responsibility

Shared Responsibility Model



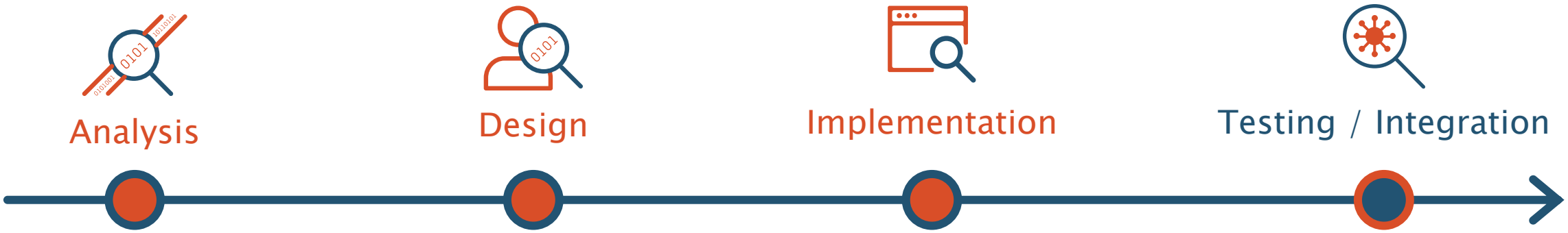
- Outlines who is responsible for securing what
- Varies depending on IaaS vs Paas vs SaaS
- Rules out traditional security assessment techniques for many cloud resources
- Security mindset shift
  - Vulnerabilities -> misconfigurations

Cloud Customer

Cloud Provider

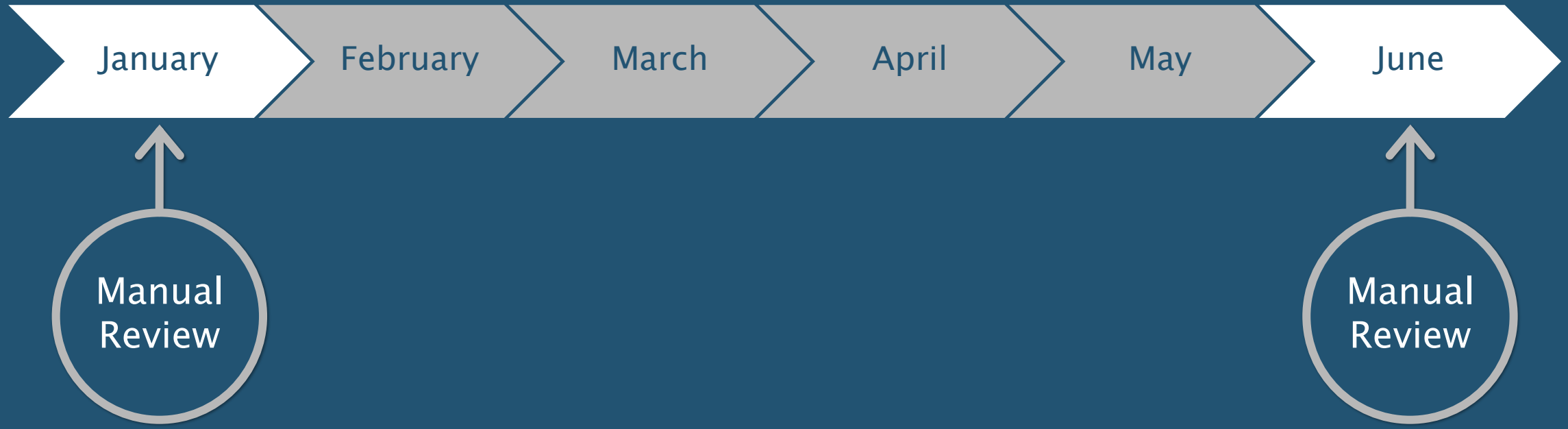
Image taken from https://blogs.msdn.Microsoft.com/azuresecurity/2016/04/18/what-does-shared-responsibility-in-the-cloud-mean/

Traditional Security Testing



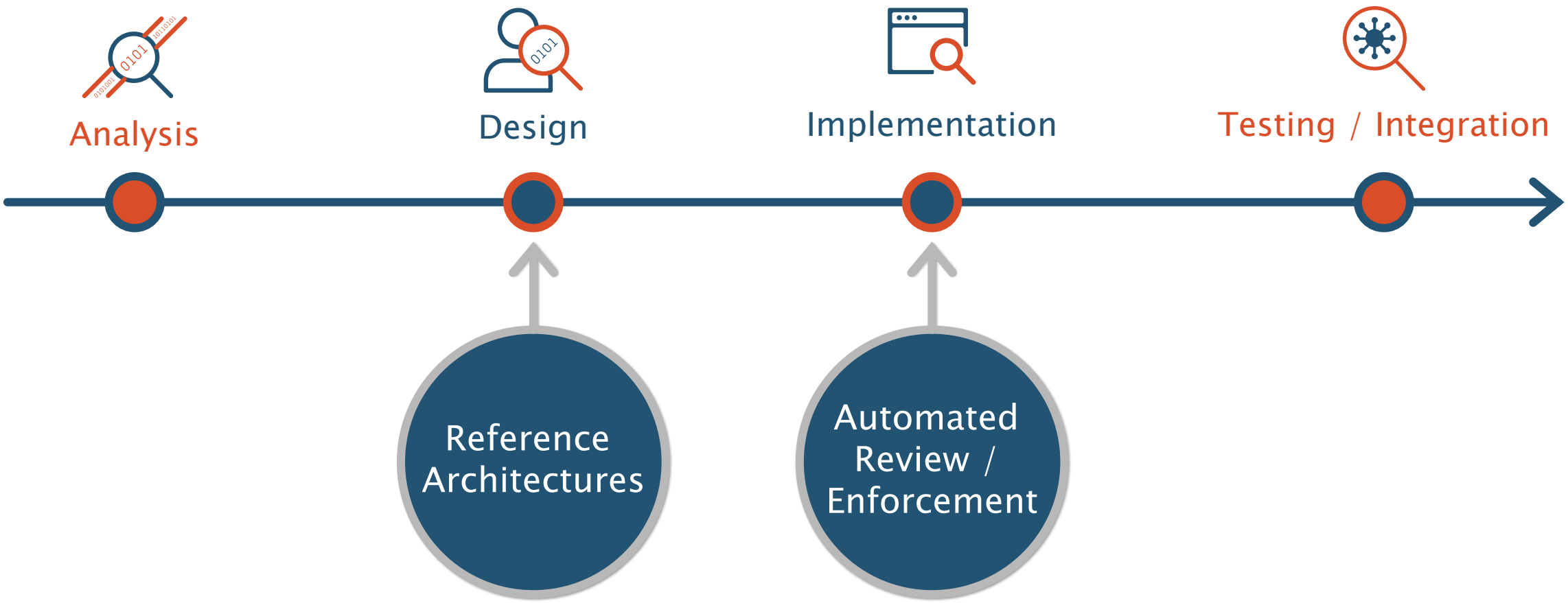
- IaaS – traditional network and application testing still applies
- PaaS – application assessment as before, configuration review for infrastructure

Cloud Configuration Review - Issues

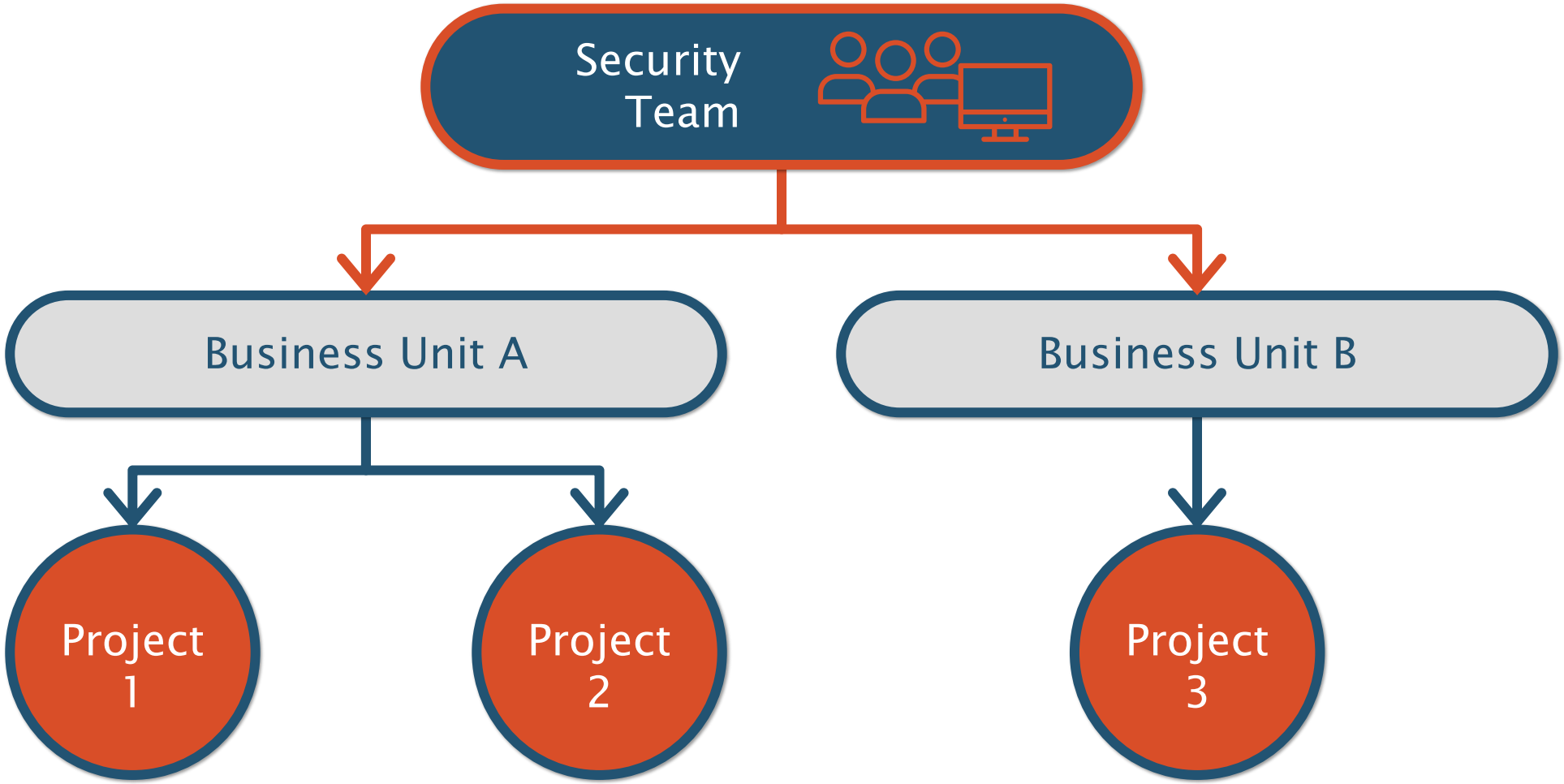


Cloud Configuration Review - Issues

Complements to Manual Review



Reference Architectures / patterns



Reference Architectures – How To

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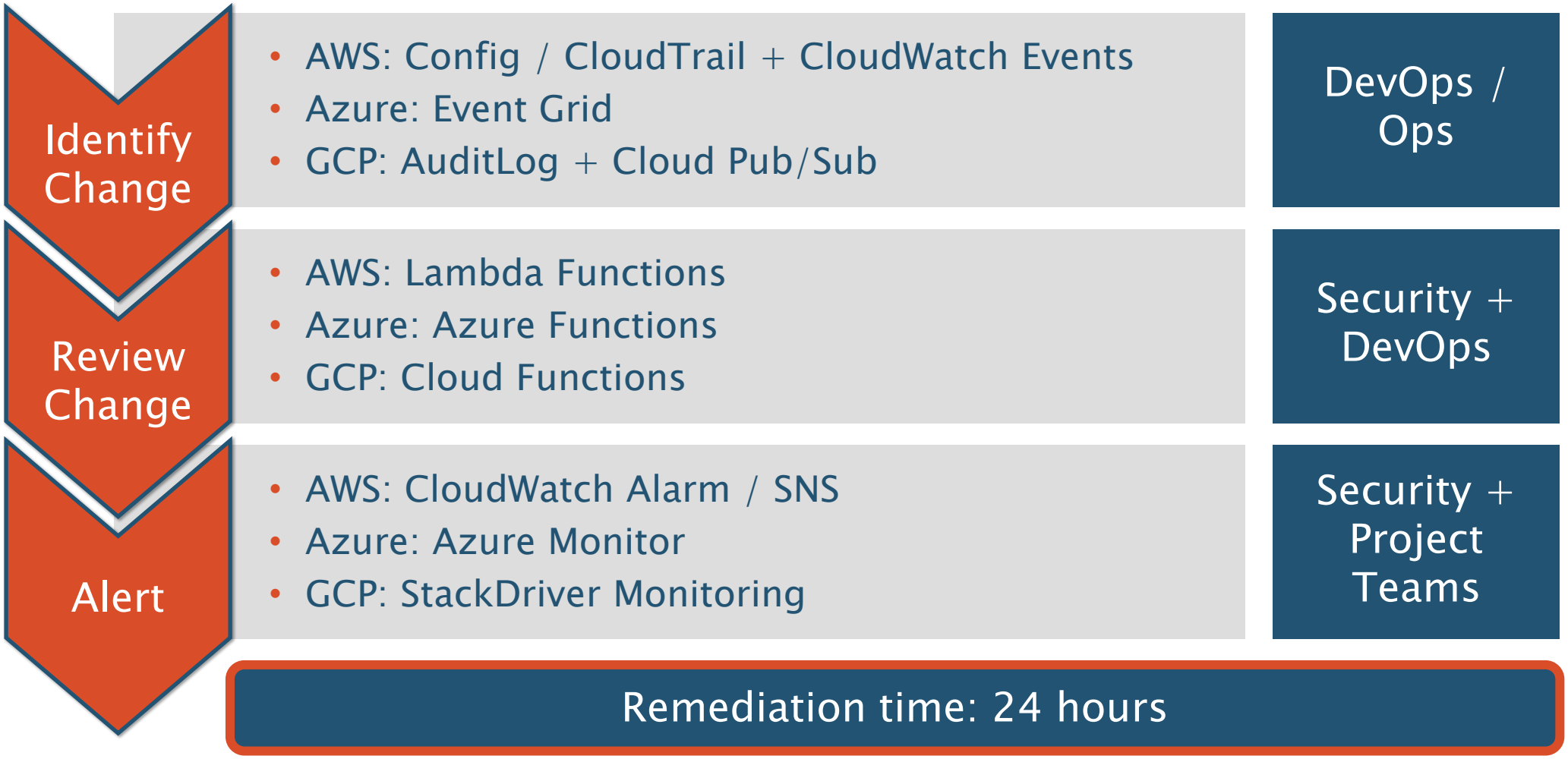
Identify common services

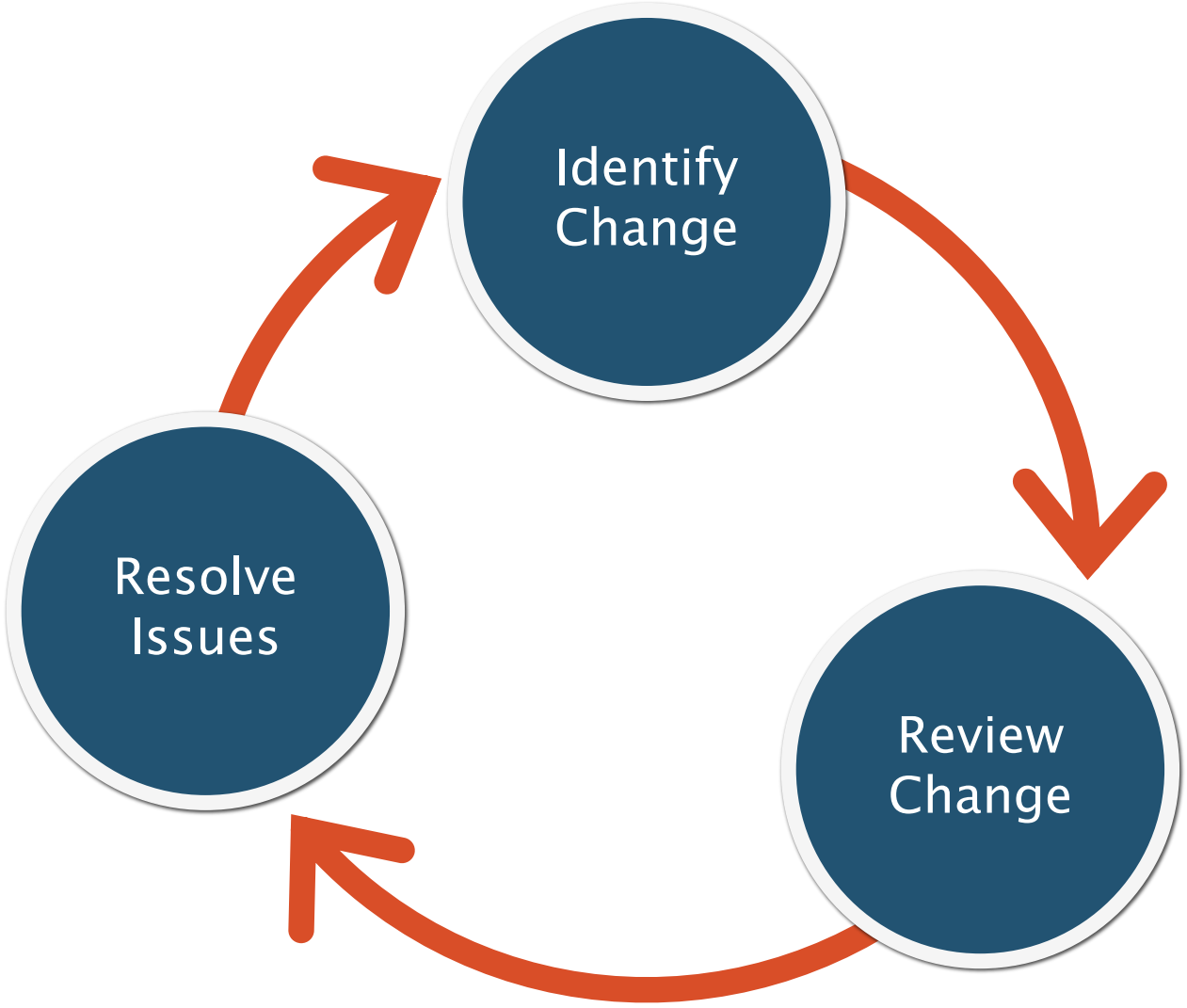
Review Internal/ External Guidance

Implement Architecture in IaC tool

Continuous Configuration Review



Continuous Configuration Enforcement



Remediation time: 30 minutes

Existing Work

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- AWS Whitepaper – Automating Governance on AWS
- OSS Frameworks:
  - Cloud Custodian
  - Security Monkey
  - Forseti Security

The Other View of Security Enforcement

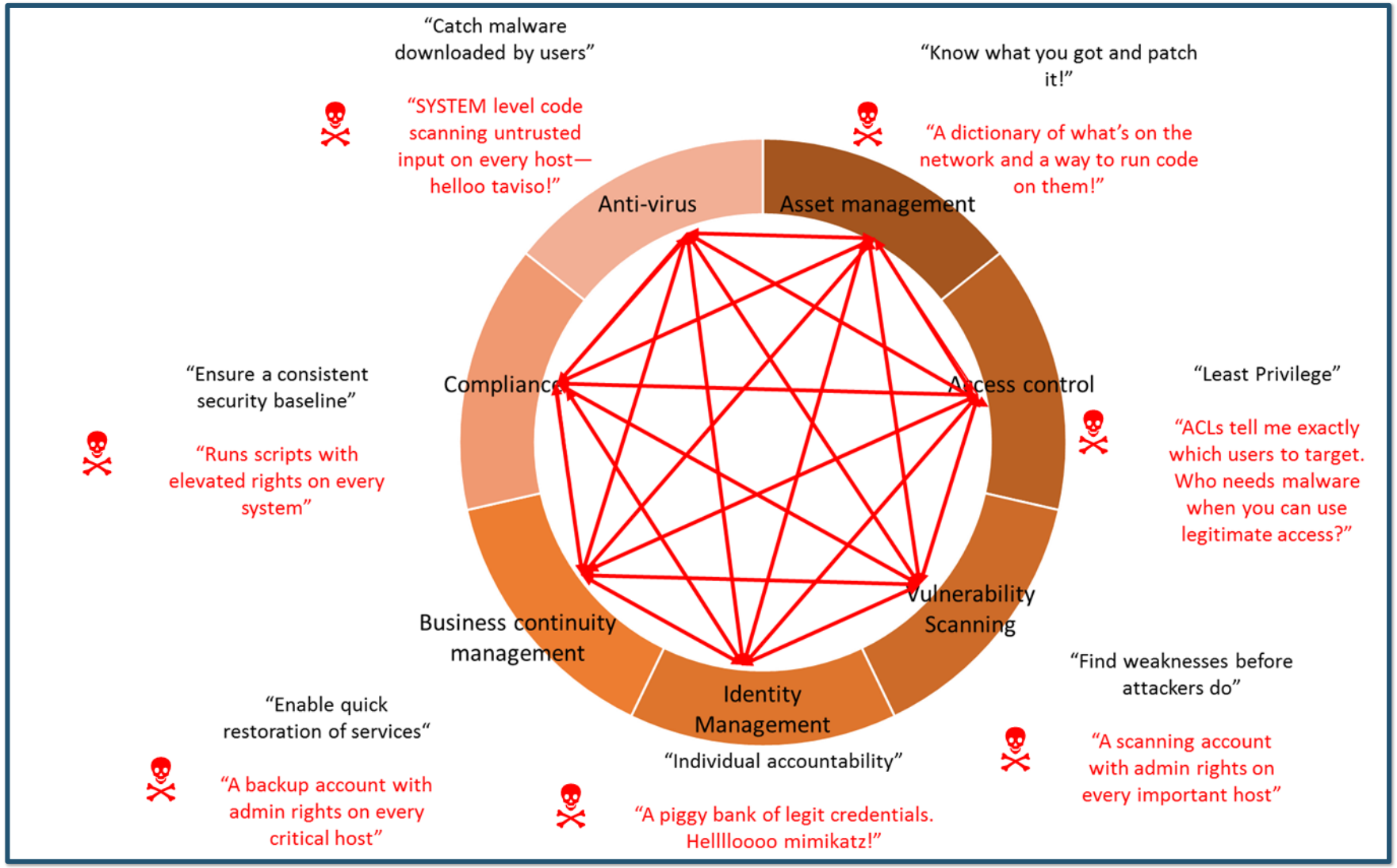

Image taken from John Lambert
https://twitter.com/johnlatwc/status/699304590500634625

Attacking Continuous Enforcement

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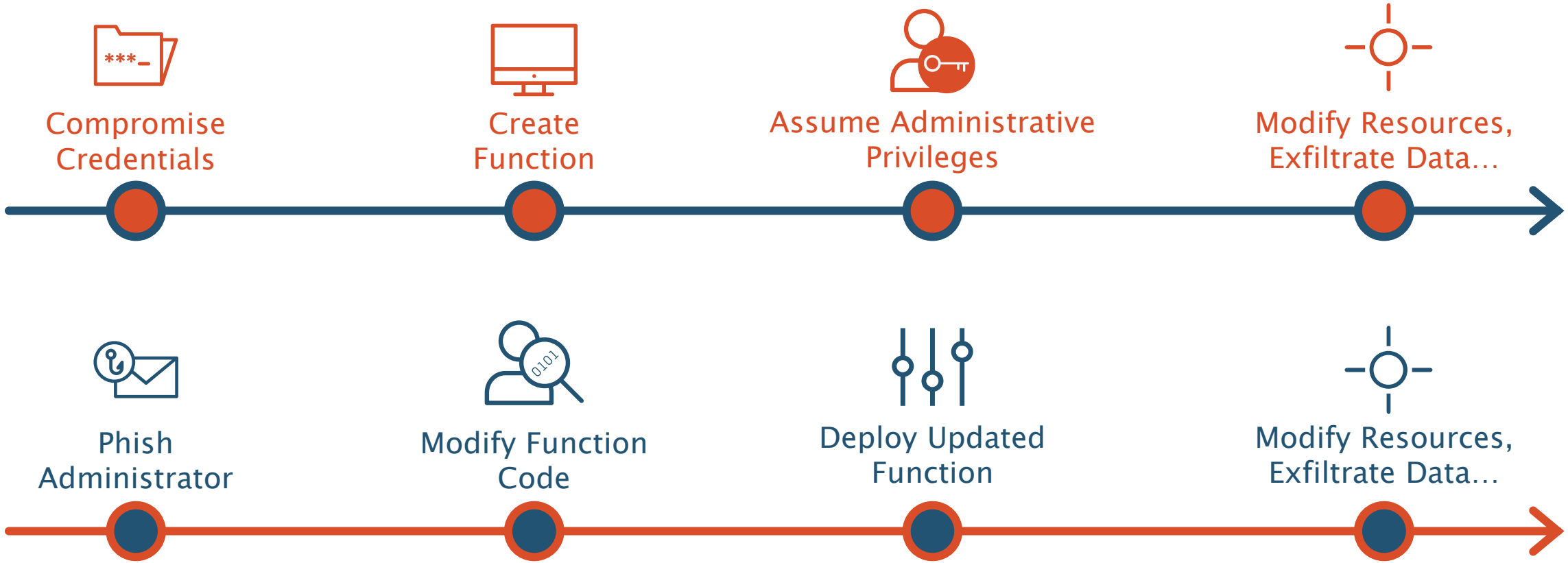
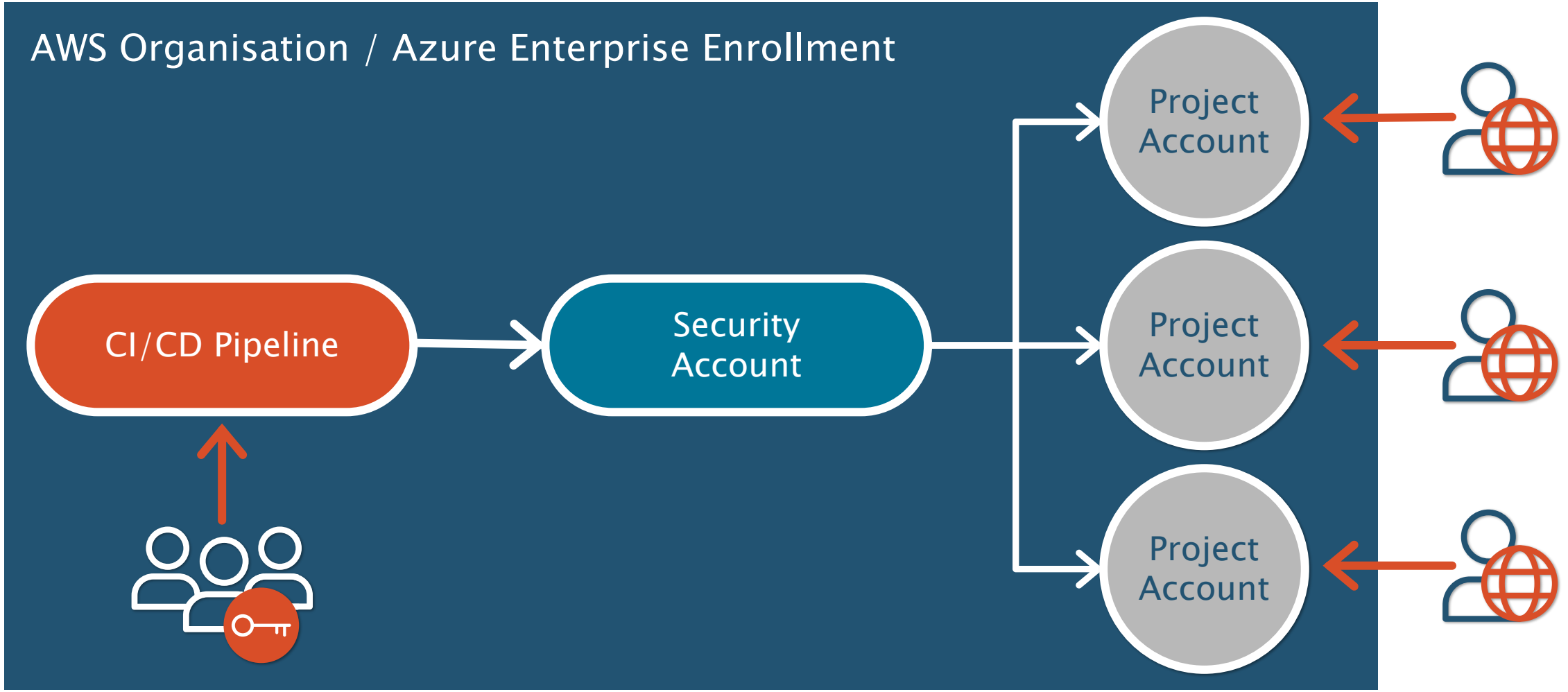
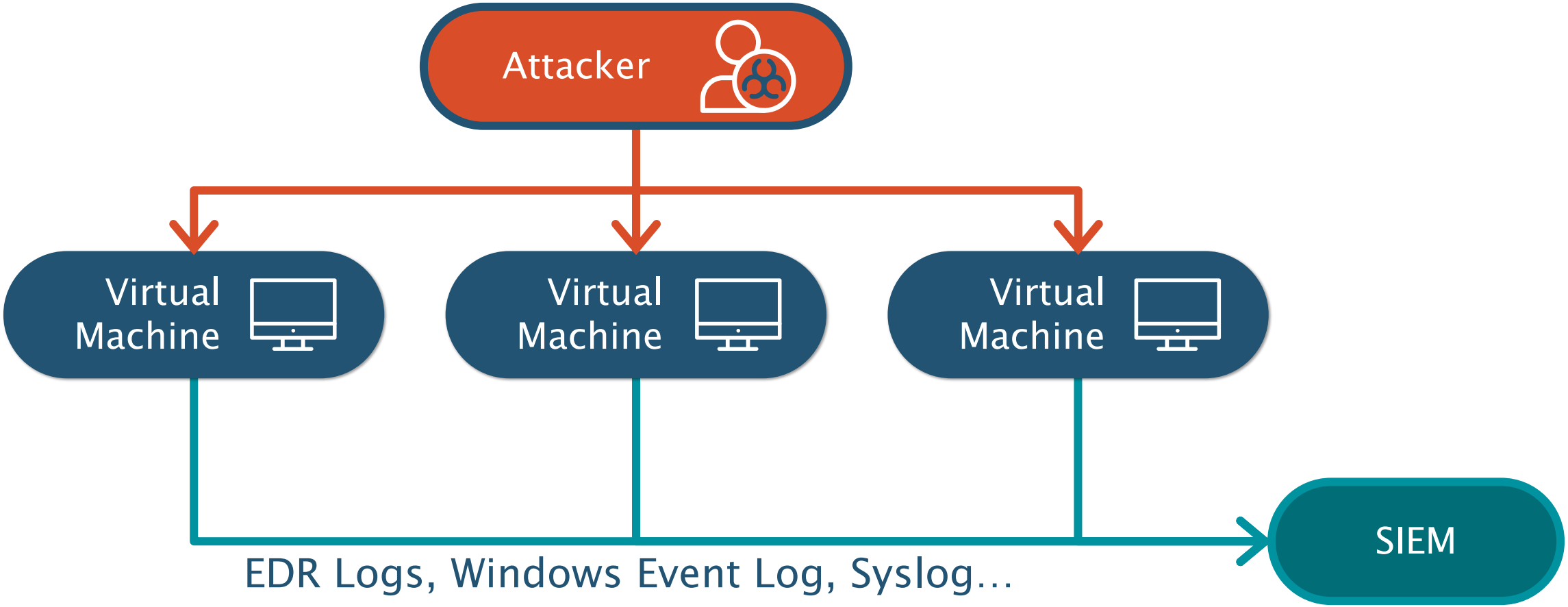
Enforcement functions often assigned lots of permissions



Reduce The Risk



What about Detection and Response?



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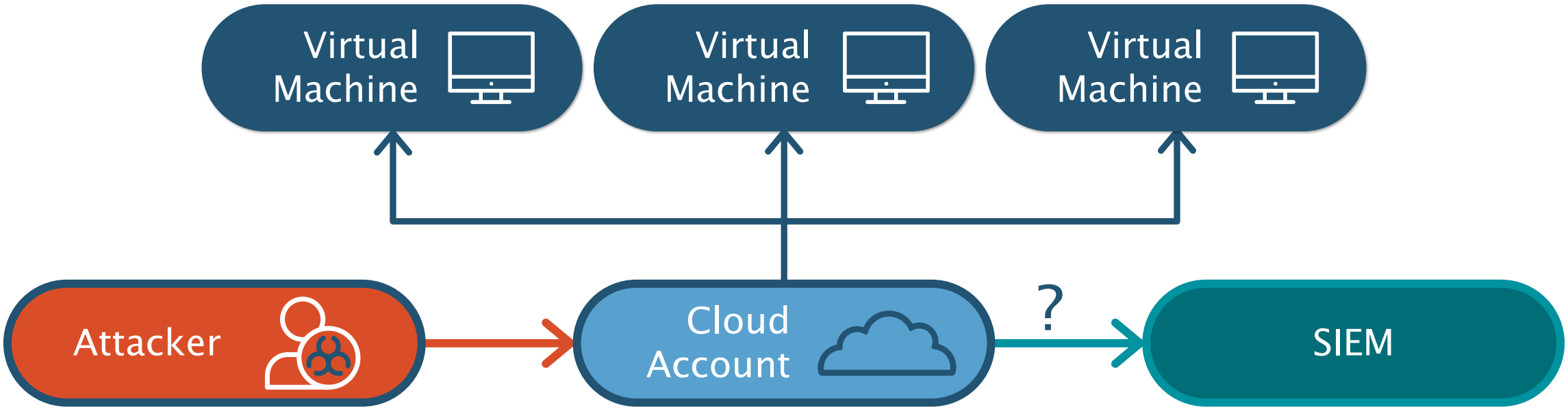

Cloud Log Sources

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- Cloud API call logs (CloudTrail, Audit Log etc)
- Output from automated review and enforcement
- VPC/NSG flow logs
- Storage access logs
- System logs from any VMs
- Application logs from PaaS

what does an attack look like?

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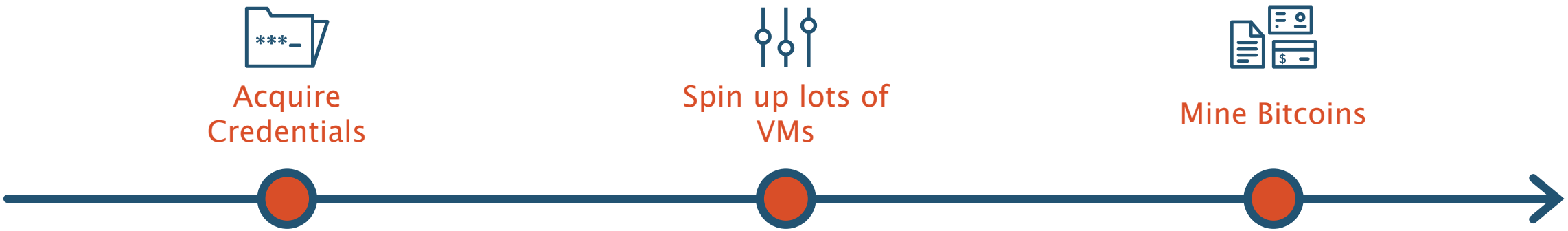
Sophisticated

Low skill/effort



what does an attack look like?

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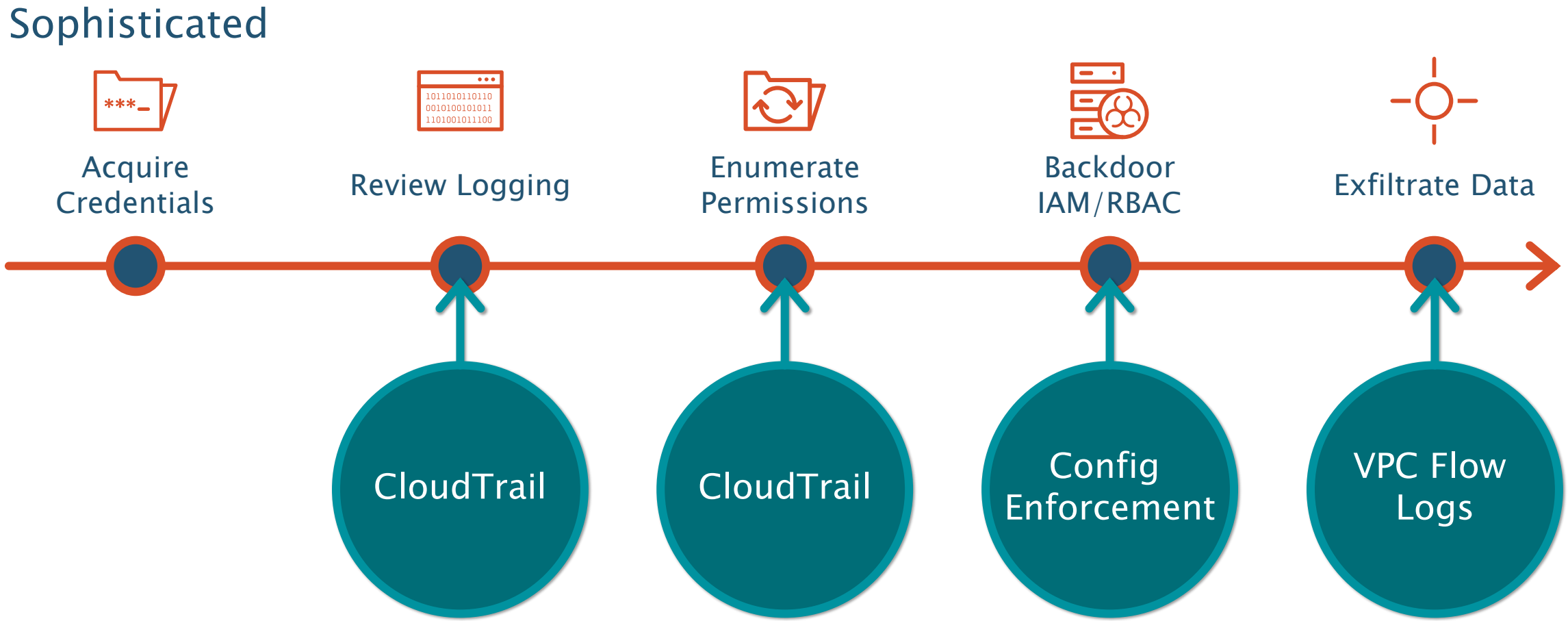

IoCs to Watch For

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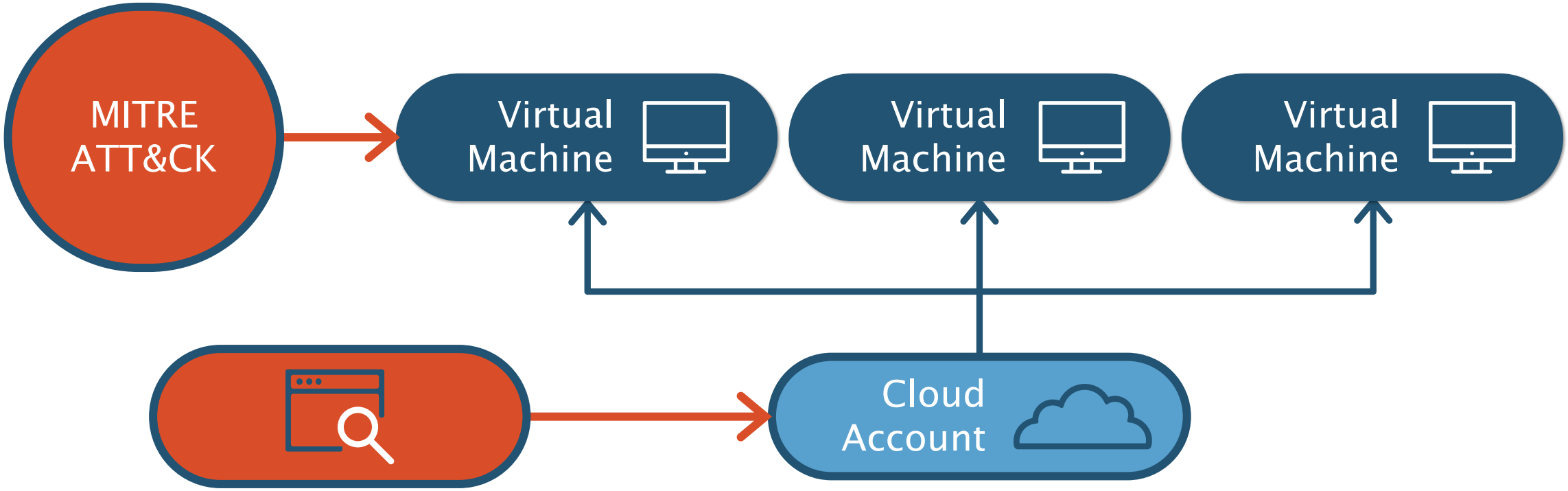
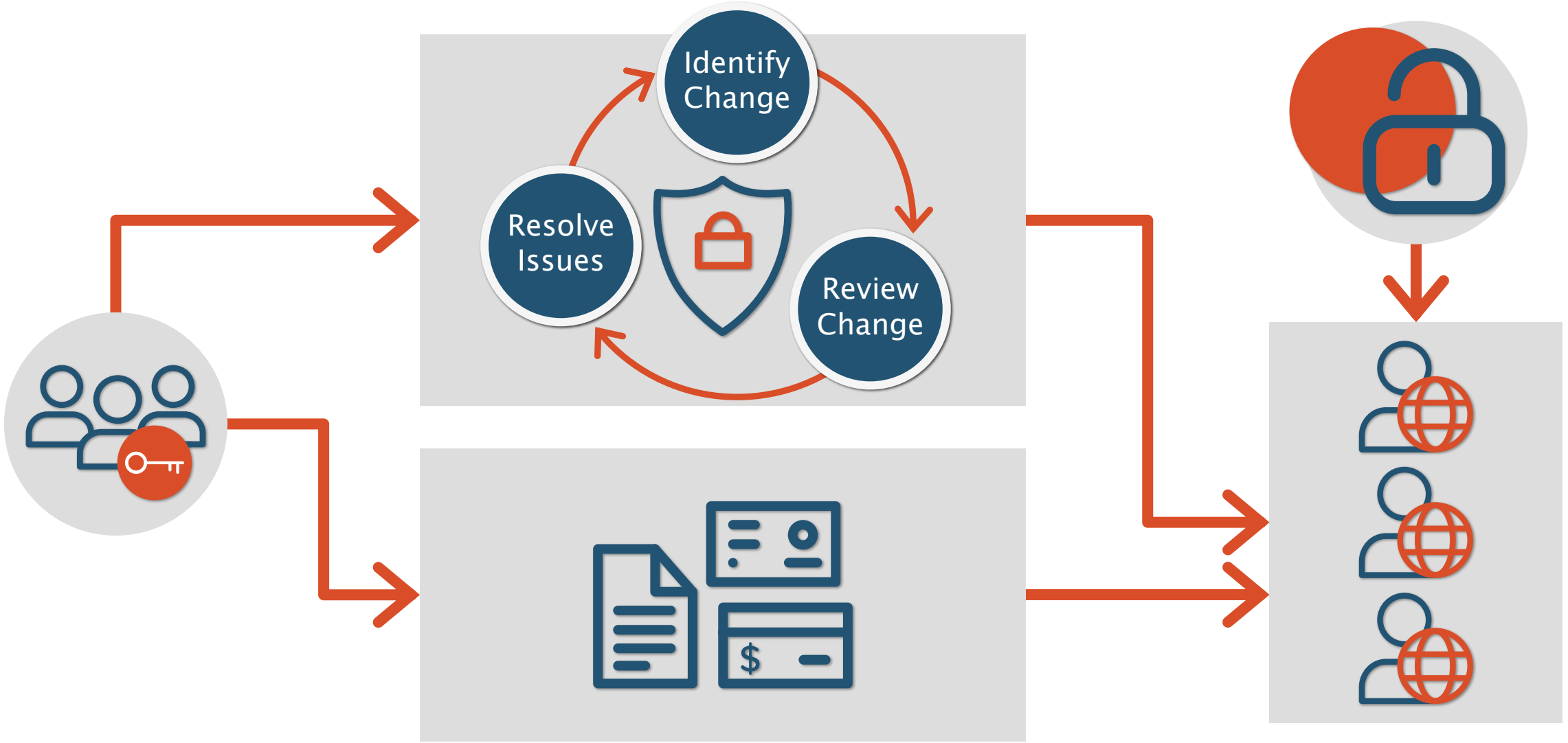
- Use of credentials from unexpected locations
- Creation of resources in unused regions
- Repeated failed authentication attempts
- Creation of new IAM/AAD users
- Modifications of roles, policies, network security controls
- Outbound traffic to odd locations or in odd volumes

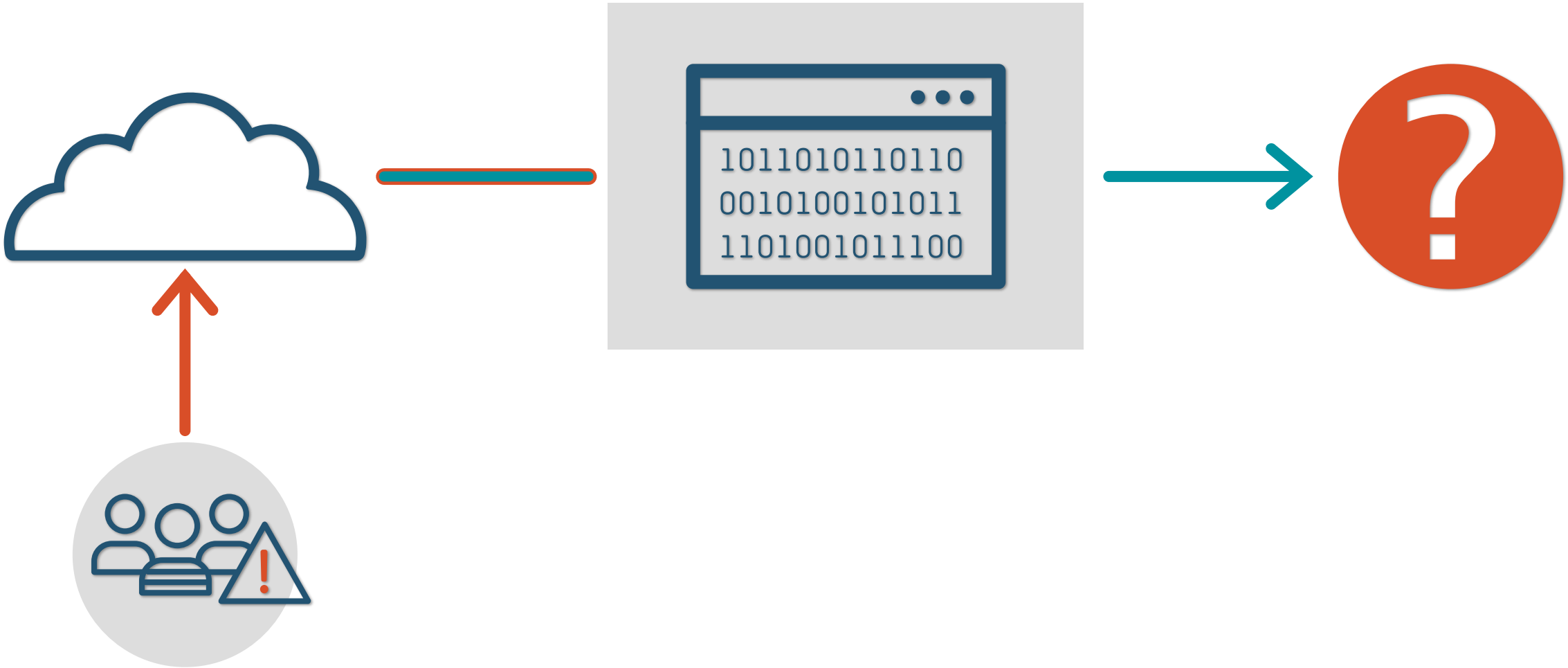
How do we Assess Detection In the Cloud?



Conclusions



Conclusions




Questions?
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