


1-2 czerwca 2017

How to build my own Castle – securing administrator access to infrastructure.

Why and How?

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 Security and Cloud Infrastructure
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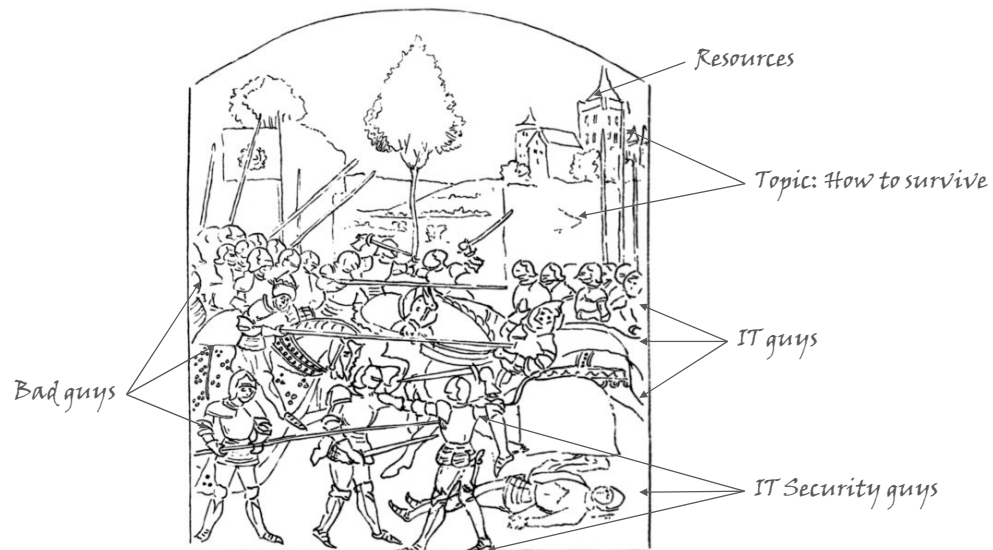




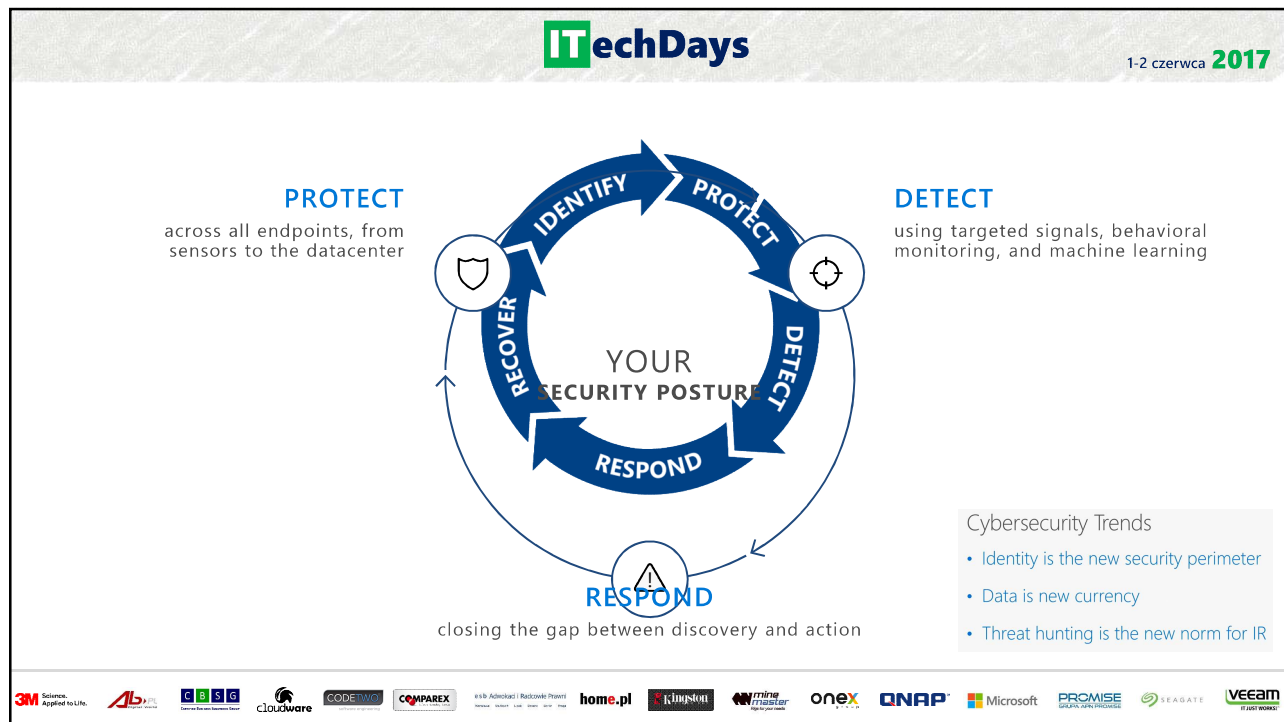


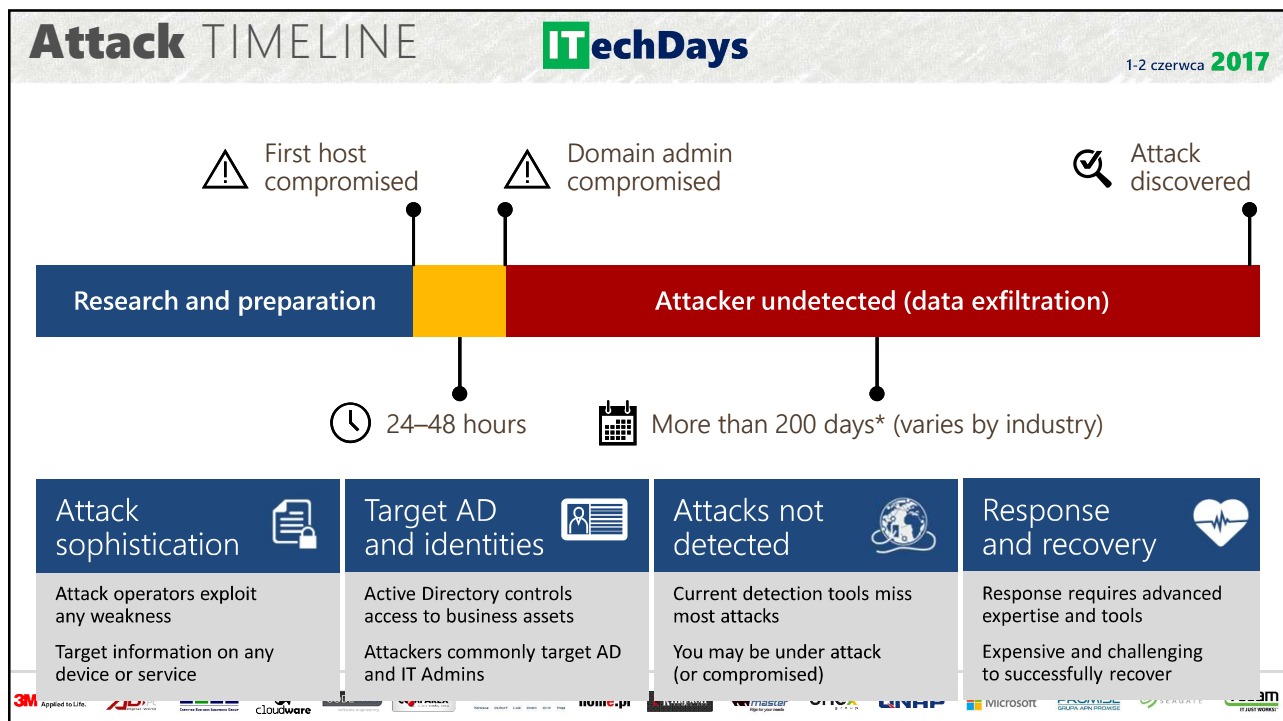
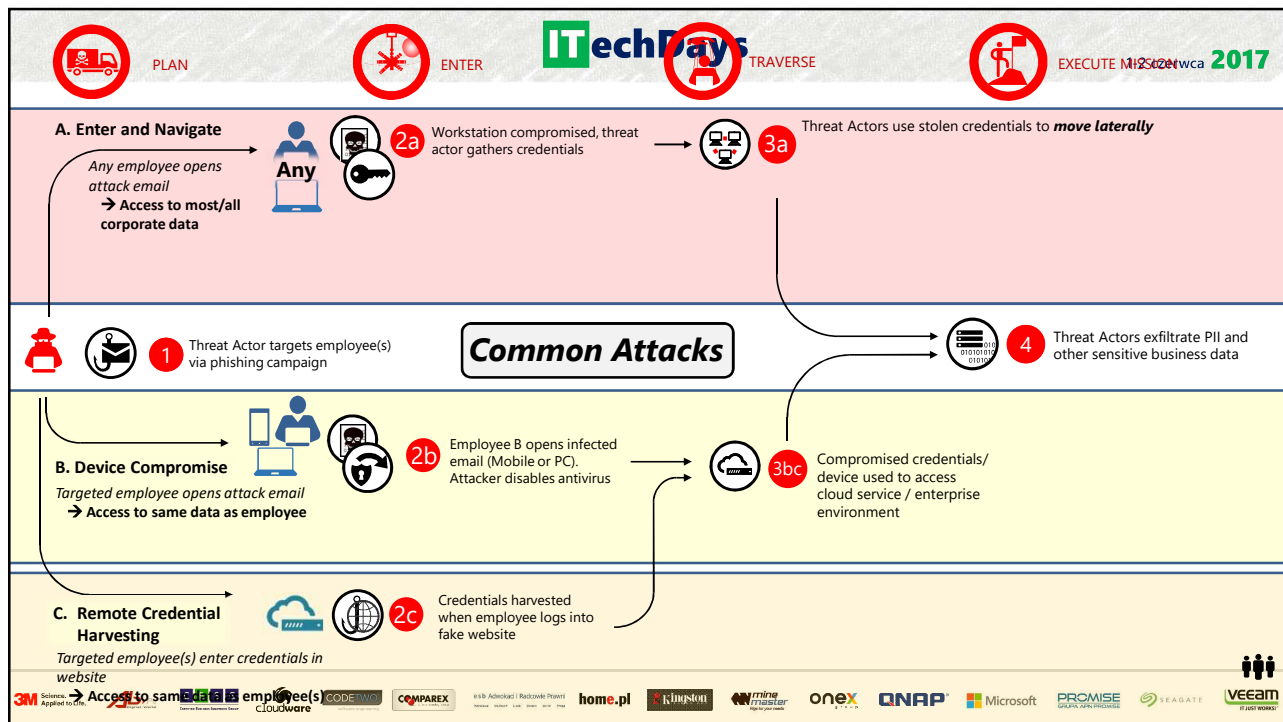

AGENDA


ITechDays



CYBER SECURITY
THREATS
 VIDEO











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Cerential Thief




DEMO



<http://aka.ms/credtheftdemo>






























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SOLUTION

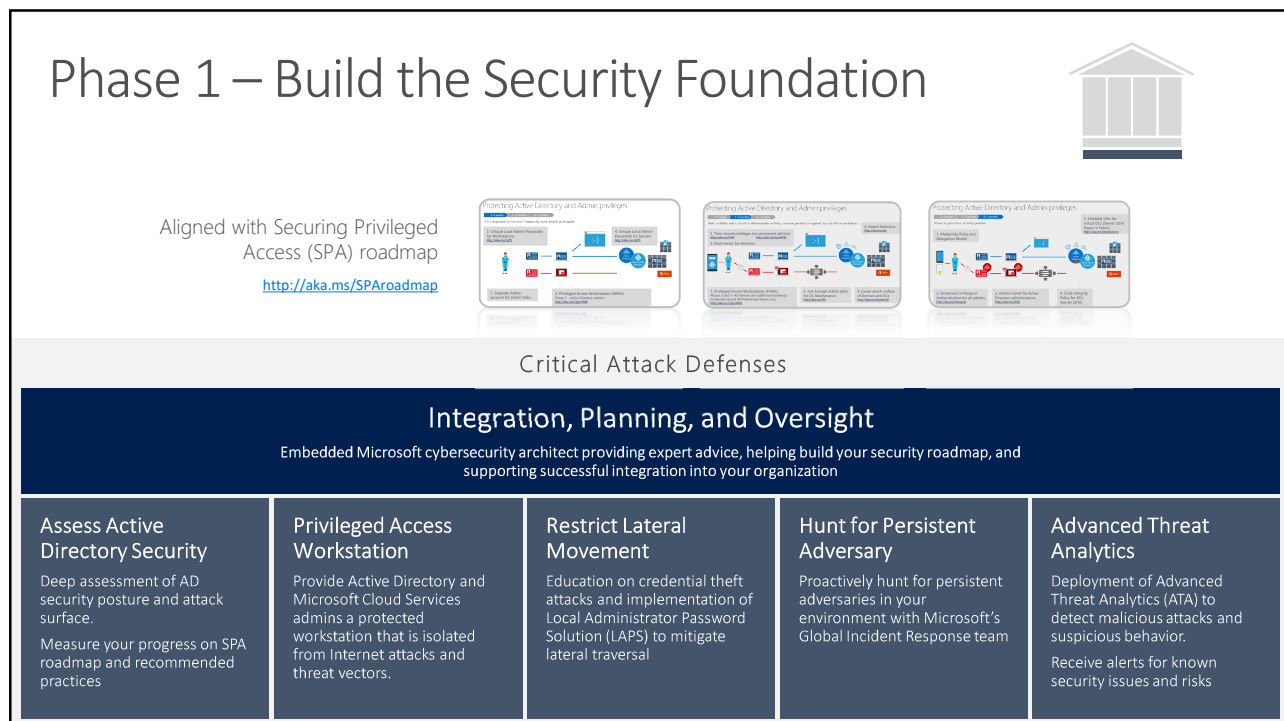
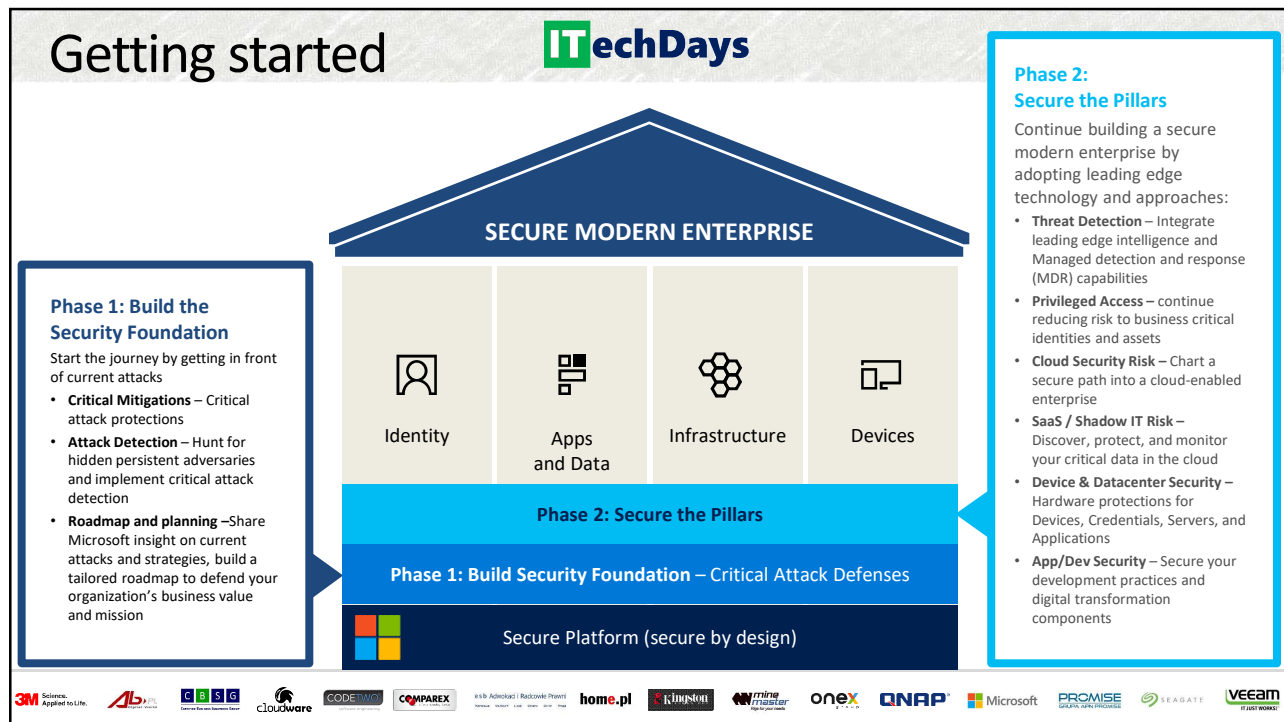




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Phase 2 – Secure the Pillars



CRITICAL CAPABILITIES FOR EACH PILLAR

Integration, Planning, and Oversight

Embedded Microsoft cybersecurity architect providing expert advice, helping build your security roadmap, and supporting successful integration into your organization

Identity

Strongest protections for identity systems and admins

Protect identities with threat intelligence and hardware assurances

Apps and Data

Increase visibility & protection for data in the cloud and on premises

Reduce risk to applications you develop, SaaS apps, and legacy / on-premises apps.

Infrastructure

Integrate cloud infrastructure securely

Protect using hardware integrity and isolation, detect with analysts and threat intelligence

Devices

Deploy hardware protections for devices, data, applications, and credentials

Advanced attack detection and remediation technology and analyst support

Foundation: Critical Attack Defenses



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Modern Security Architecture - Foundation



Central risk: **Administrator privileges**

Administrative Privileges

Most attack-types seek out & exploit privileged accounts

These privileged accounts have the keys to the kingdom; we gave them those keys decades ago

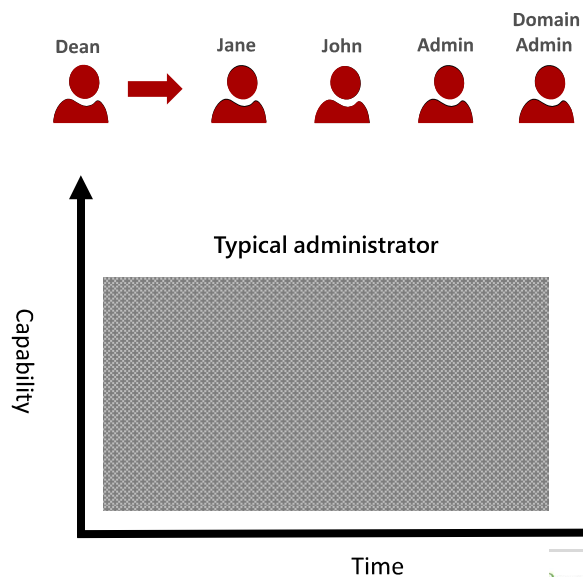
But now, those administrators' privileges are being compromised through social engineering, bribery, coercion, private initiatives, etc.


Challenging to **protect credentials**

Social engineering leads to credential theft

Most attacks seek out and leverage administrative credentials (PtH)

Administrative credentials often inadvertently provide more privilege than strictly necessary... and for an unlimited time




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MODERN SECURITY APPROACH


Credential Guard prevents Pass the Hash and Pass the Ticket attacks by protecting stored credentials and credential artifacts using Virtualization based Security (VBS)

Remote Credential Guard works in conjunction with Credential Guard for RDP sessions providing SSO for RDP sessions while eliminating the need for credentials to be passed to the RDP host

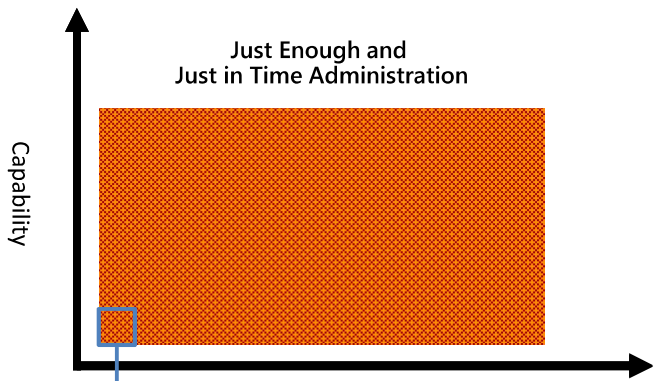
Just Enough Administration limits administrative privileges to the bare-minimum required set of actions (limited in space)

Just in Time Administration provides privileged access upon request through a workflow that is audited and limited in time



JEA + JIT = limited in time & capability




Just Enough and Just in Time Administration



Required capability and time


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```

Privilege '20' OK
mimikatz # sekurlsa:logonpasswords
Authentication Id : 0 ; 1335576 (00000000:00146118)
Session : Interactive from 2
User Name : ben
Domain : CRED
Logon Server : DC
Logon Time : 10/19/2015 9:24:54 PM
SID : S-1-5-21-1451754193-4262585781-767460384-1107

msv :
[00000003] Primary
* Username : ben
* Domain : CRED
* Flags : I00/N01/L00/S01
* LSA Isolated Data: NtLmHash
Unk-Key : cb3c821938acf97e0f9c6f9f0e14d270a4fd68dbae6cc515f114a449f6af
86e17ec49abcfed88f1021b3b6a925031e
Encrypted: 86d5476ba632a847e19412fc844c5244ffa89a682985f06705a0fe3768a0
40f38b3fa9c8b8305ad40f6ff300d9d33564178cbca
[00010000] CredentialKeys
* RootKey : 7393bd3cb20162cf646ff4d30e17822979877d10ed9442653681da78b5097bf
4
* DPART : 50c7438c7857aac6a72h8hf8a075r559
tspkg :
udissect :

```

```


mimikatz # privilege::debug
Privilege '20' OK
mimikatz # sekurlsa:logonpasswords
Authentication Id : 0 ; 570593 (00000000:0008b4e1)
Session : RemoteInteractive from 2
User Name : ben
Domain : CRED
Logon Server : DC
Logon Time : 10/19/2015 9:29:44 PM
SID : S-1-5-21-1451754193-4262585781-767460384-1107







msv :
[00000003] Primary
* Username : ben
* Domain : CRED
* Flags : I00/N01/L00/S01
* NTLM : 859eb0795f476c39eac7dee0841cd823
* SHA1 : 023ceda421a7e25df46a1b98e2720f3ebbc46a7b
[00010000] CredentialKeys
* NTLM : 859eb0795f476c39eac7dee0841cd823
* SHA1 : 023ceda421a7e25df46a1b98e2720f3ebbc46a7b
tspkg :
wdigest :
* Username : ben
* Domain : CRED






```





Credential Guard


DEMO

<https://www.youtube.com/watch?v=urqXgBbVyWY>


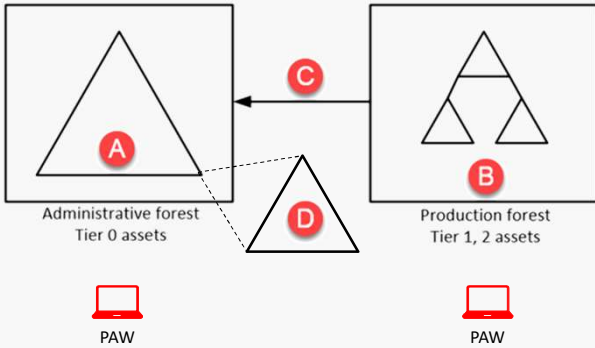









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A: Administrative forest
Tier 0 assets

B: Production forest
Tier 1, 2 assets

C: One-way forest trust


D: Privilege forest mechanism

A: This is the "red" forest in which we isolate Tier 0 assets, including administrative identities and groups, in their own Active Directory forest. Because this forest stores all high-value assets, we use it as the target of regular penetration tests.


B: This is the production forest. Tier 1 assets are identities that control enterprise servers and applications. Tier 2 assets are identities that control user workstations and devices.

C: We use a one-way forest trust and selective authentication to strictly control authentication flow and resource access. Remember that resources trust accounts, so the production forest trusts the administrative accounts stored in the administrative (red) forest.


D: Privilege forest mechanism (or separate Forest) that implements [Microsoft Identity Manager](#) (MIM) and [Privileged Access Management](#) (PAM). The nutshell summary here is that MIM and PAM add fine-grained control and reporting to the use of privileged accounts.




PAW



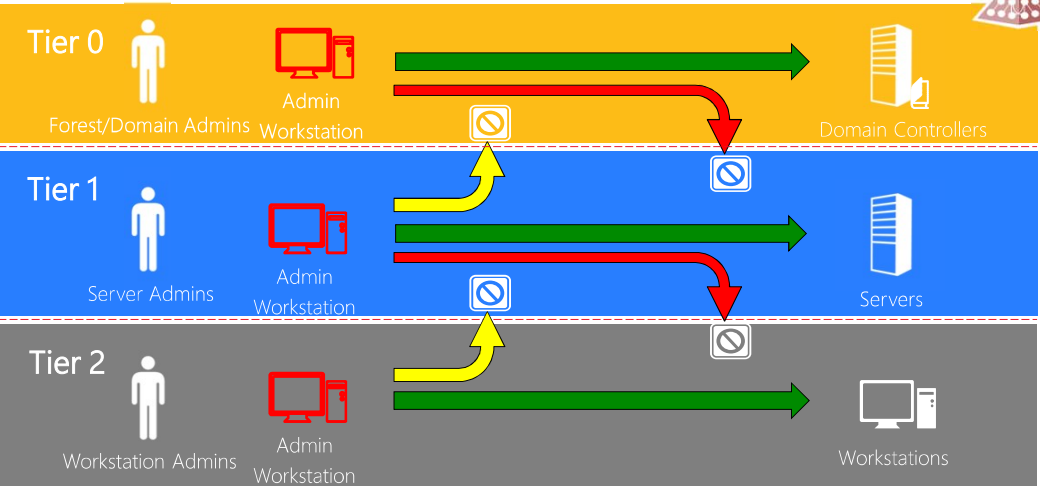
PAW



TIER MODEL RESTRICTIONS



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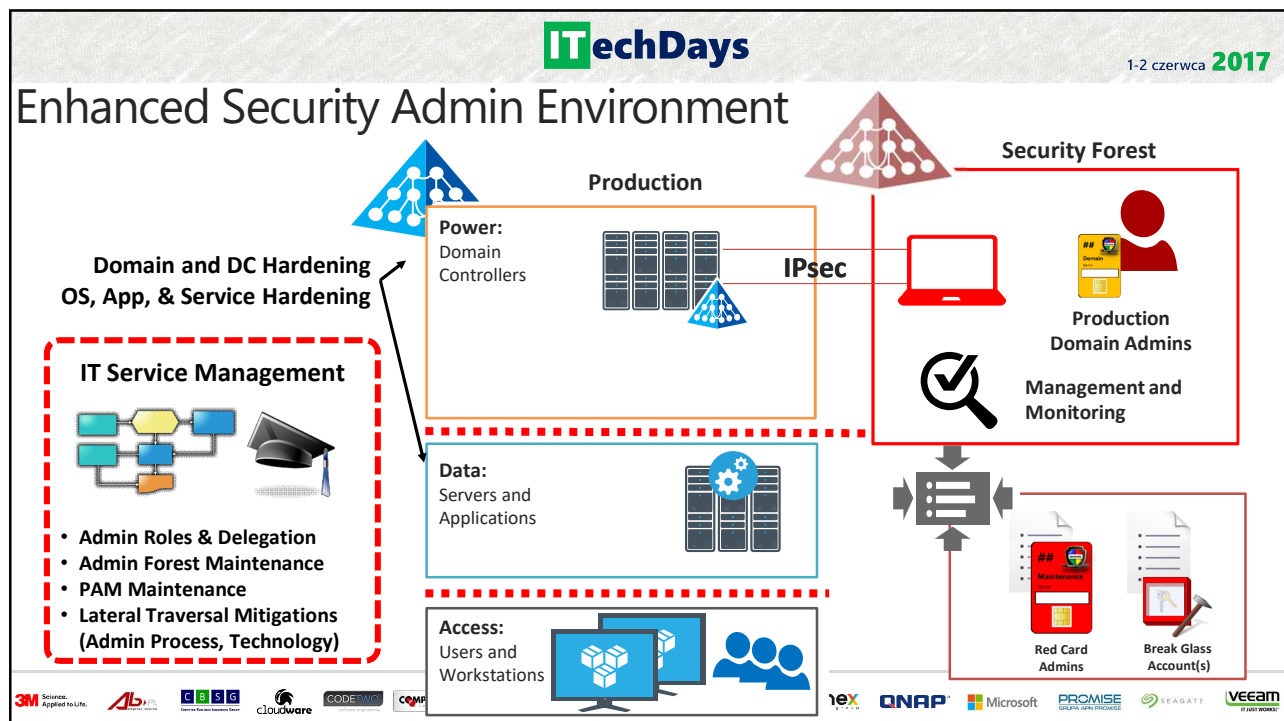
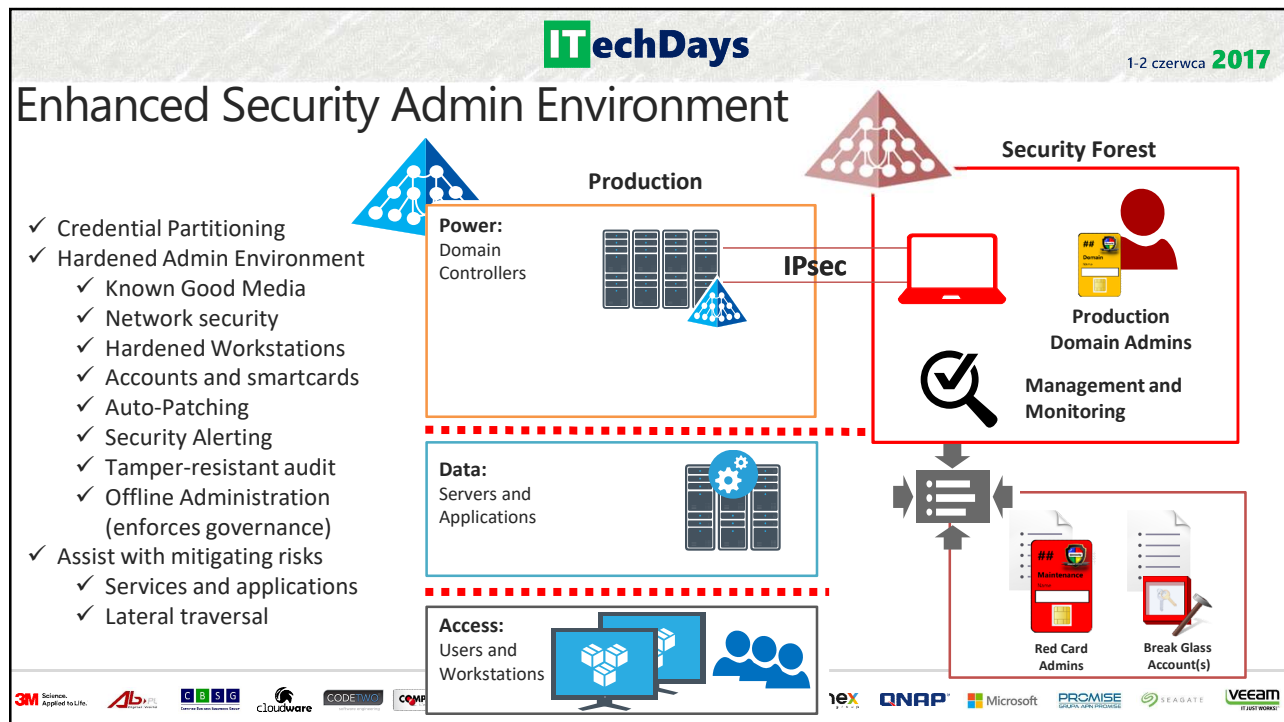
Same Tier Logon


Higher Tier Logon

Lower Tier Logon

Blocked






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Mitigate Threats to Administrator Workstations


Privileged Account Workstation (PAW)


Block primary entry points









- Internet Browsing and Email
 - Block internet access
- USB attacks
 - Block GPO Devices
- Attacks from enterprise environment
 - Host Firewall
 - Credential Isolation (local and domain)
 - Remove/Harden Management Agents


Apply defense in depth

- Software Exploits
 - Rapid patching
 - Windows 10 Control Flow Guard
- Malware Infection
 - Windows Defender
 - Windows Defender ATP
 - AppLocker and Device Guard
- Disabling of security controls
- ...and more







































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20+ Security Controls

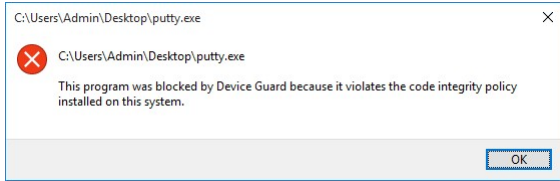
- UEFI/TPM/Secure Boot enabled
- BitLocker
- Standard User Configuration
- AppLocker/Device Guard
- USB Media Restrictions
- Outbound Traffic restrictions (no Internet)
- Inbound Traffic restrictions (default block)
- Automatic patching
- Credentials Guard/Remote CG
- System Center Endpoint Protection

- Rapid rebuild process
- Known Good Media Build Process
- Logon Restrictions
- Microsoft Security Baselines (SCM)
- Unsigned code analysis
- Attack Surface Analysis
- OU and GPO ACL Lockdowns
- Lateral Traversal Mitigation(s)
- Restricted administrators membership
- Only authorized management tools














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Device Guard

DEMO

<https://www.youtube.com/watch?v=g24e29U97K8>




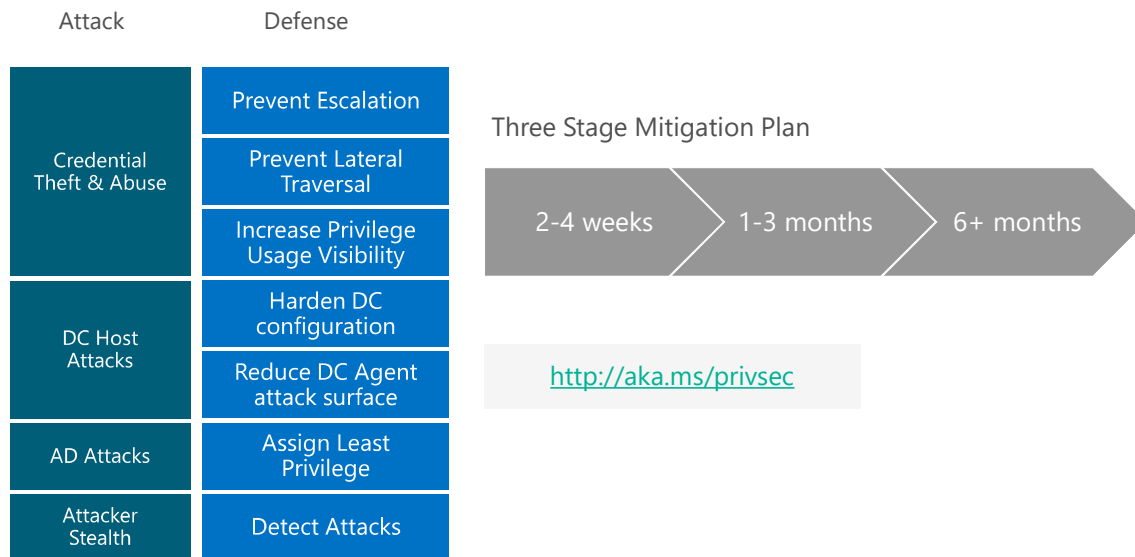

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Enhanced Security Admin Environment - Step-by-Step

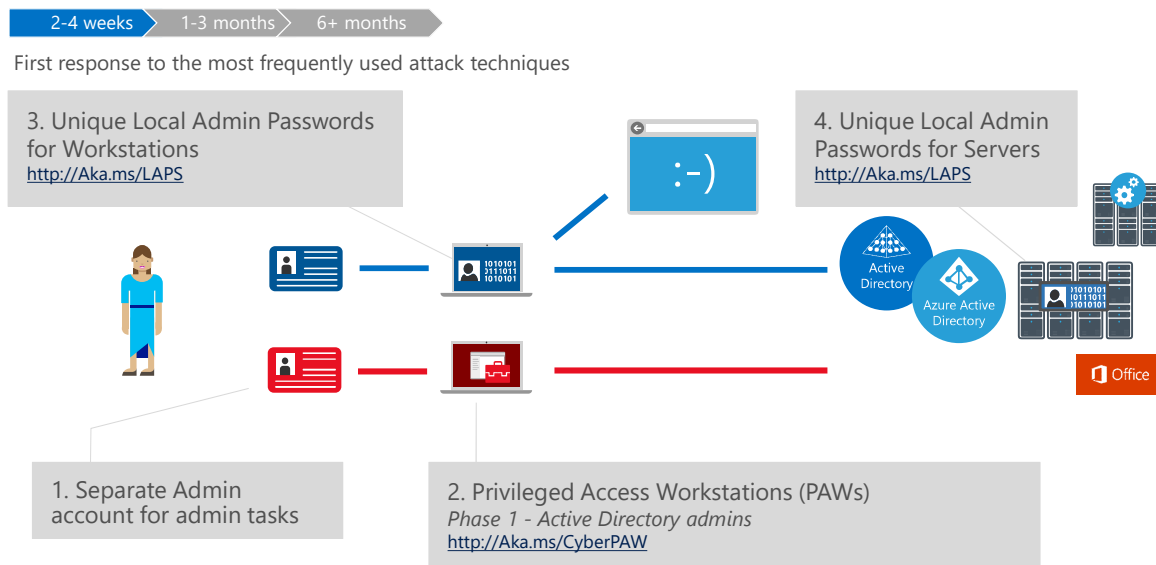




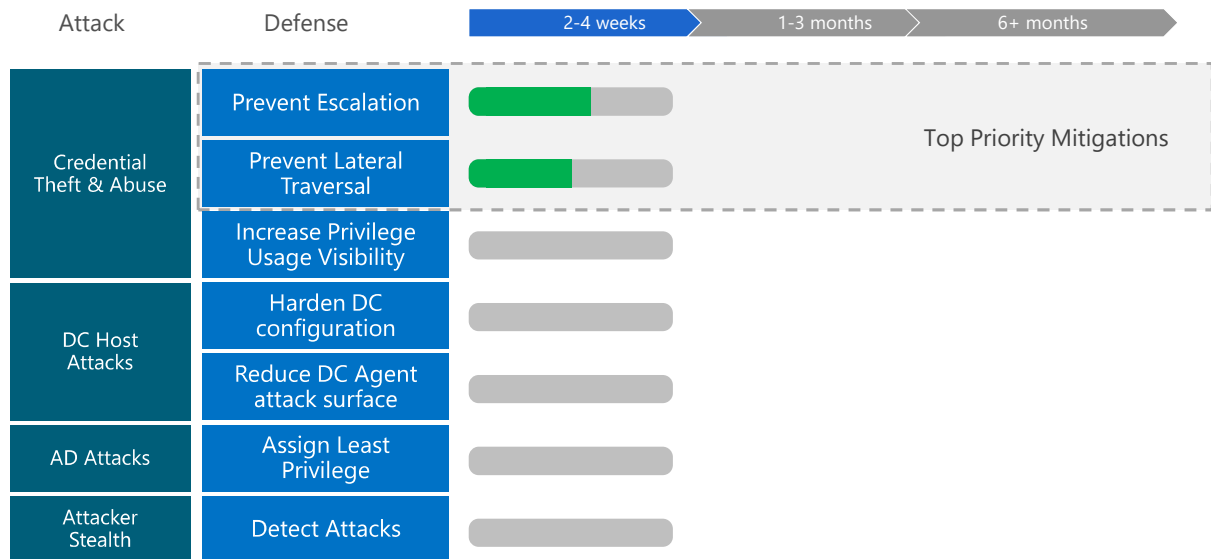
How to protect your privileges against modern attacks



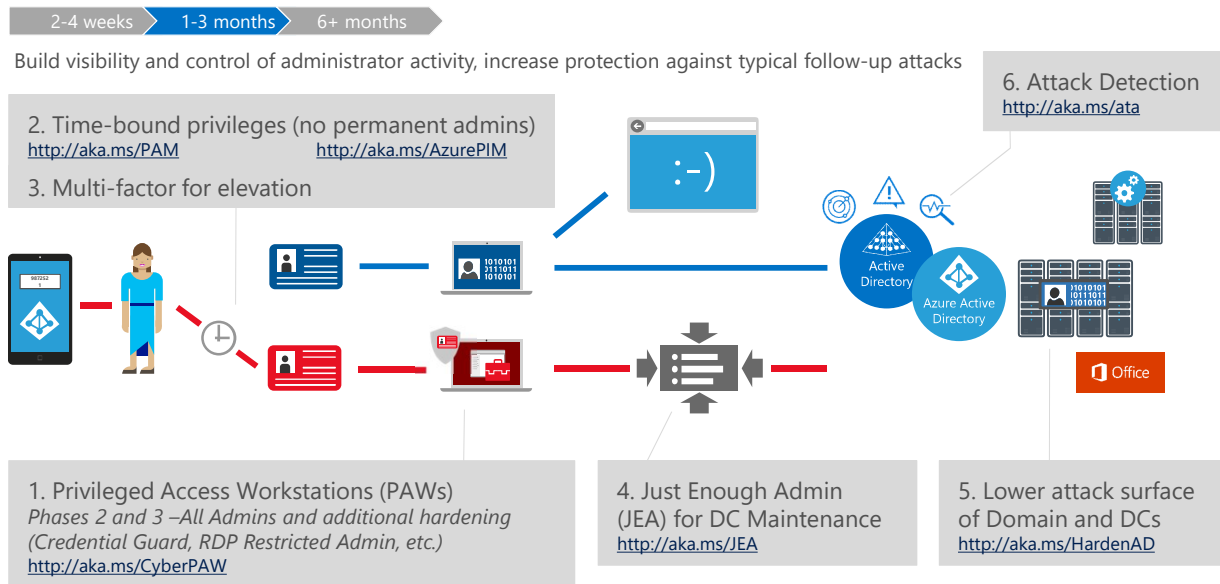
Protecting Active Directory and Admin privileges



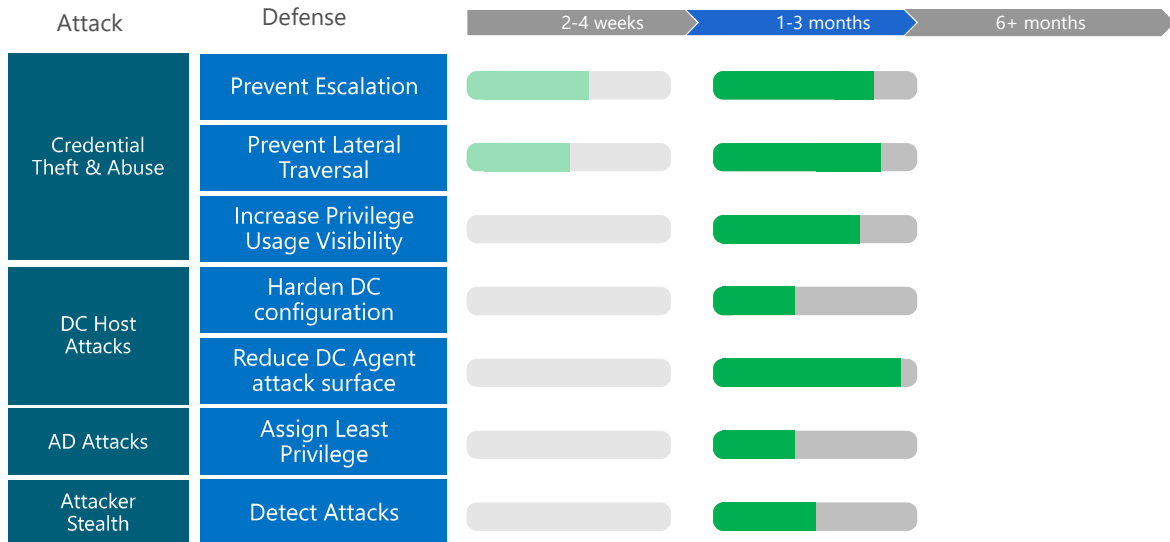
First response to the most frequently used attack techniques



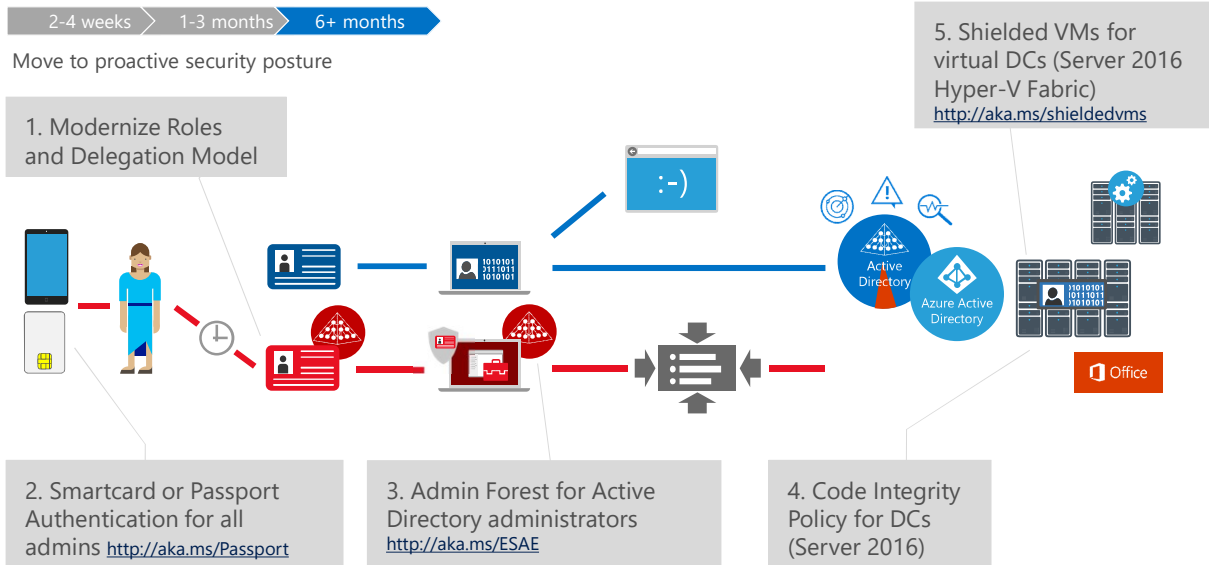
Protecting Active Directory and Admin privileges



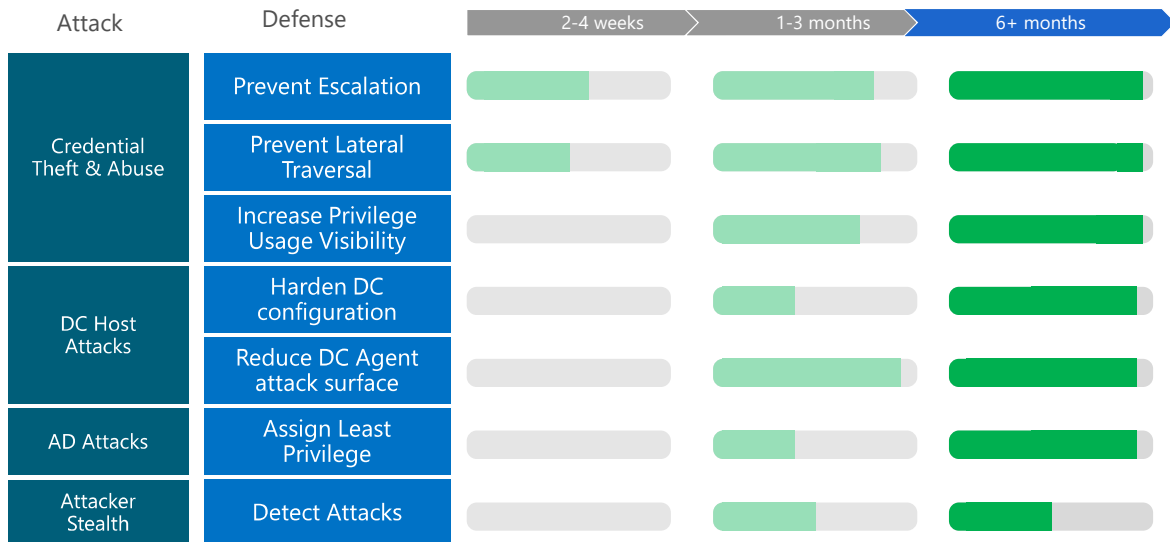
Build visibility and control of admin activity



Protecting Active Directory and Admin privileges



Move to proactive security posture




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SUMMARY

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Tier 0 Administration Security

Domain/Enterprise Admins and Equivalent

Best

↑

Better

↑

Good/Minimum

















- Administrative Forest (for AD admin roles in current releases)
- Isolated User Mode (IUM)
- Microsoft Passport and Windows Hello


↑

- Detection - Advanced Threat Analytics
- Multi-factor Authentication (Smartcards, One Time Passwords, etc.)
- Just in Time (JIT) Privileges - Privileged Access Management
- Extensive overhaul of IT Process and Privilege Delegation

↑

- Separate Admin Desktops
 - and associated IT Admin process changes
- Separate Admin Accounts
- Remove accounts from Tier 0
 - Service Accounts
 - Personnel - Only DC Maintenance, Delegation, and Forest Maintenance


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Tier 1 Administration Security

Human admins of Servers, Cloud Services, Virtualization, Management Tools, etc. (that aren't Tier 0)

Best

↑

Better

↑

Good/Minimum

















- Isolated User Mode (IUM)
- Microsoft Passport and Windows Hello

↑

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- Multi-factor Authentication (Smartcards, One Time Passwords, etc.)
- Just in Time (JIT) Privileges - Privileged Access Management
- Extensive overhaul of IT Process and Privilege Delegation

↑

- Separate Admin Accounts
- Separate Admin Desktops
 - Associated IT Admin process changes
 - Enforce use of RDP RestrictedAdmin Mode
- Local Administrator Password Solution (LAPS)
 - Or alternate from PTHv1

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Tier 2 Administration Security

Human admins of User Workstations, User Devices, Printers, etc. (Typically helpdesk and PC support)

Best

↑

Better

↑

Good/Minimum

- Isolated User Mode (IUM)
- Microsoft Passport and Windows Hello

↑

- Detection - Advanced Threat Analytics
- Multi-factor Authentication (Smartcards, One Time Passwords, etc.)
- Just in Time (JIT) Privileges - Privileged Access Management
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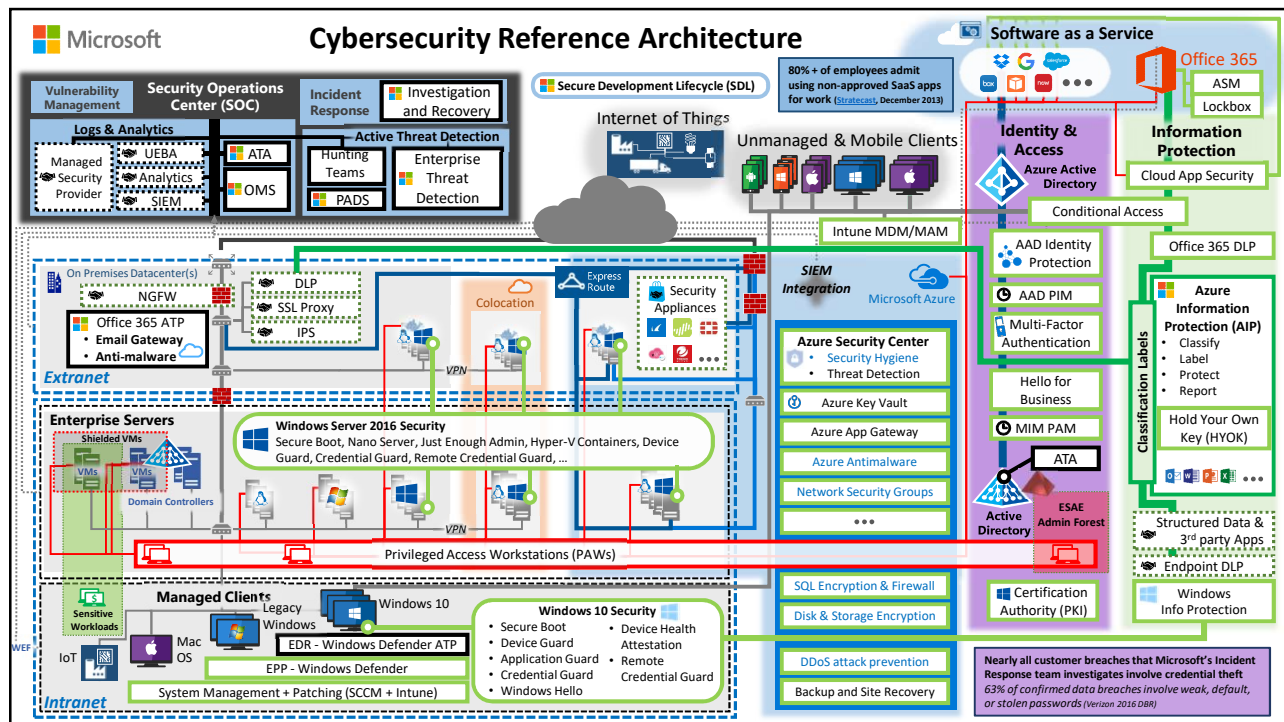
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AM I SAFE?

NOT EXACTLY ...

IT SECURITY IS MORE COMPLICATED...

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QUESTIONS?

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Partners: 3M, Science Applied to Life, ALB, C&S, cloudware, CODE, COMPAREX, home.pl, KUNST, mine, onex, ONAP, Microsoft, PROMISE, SEAGATE, VEEAM.